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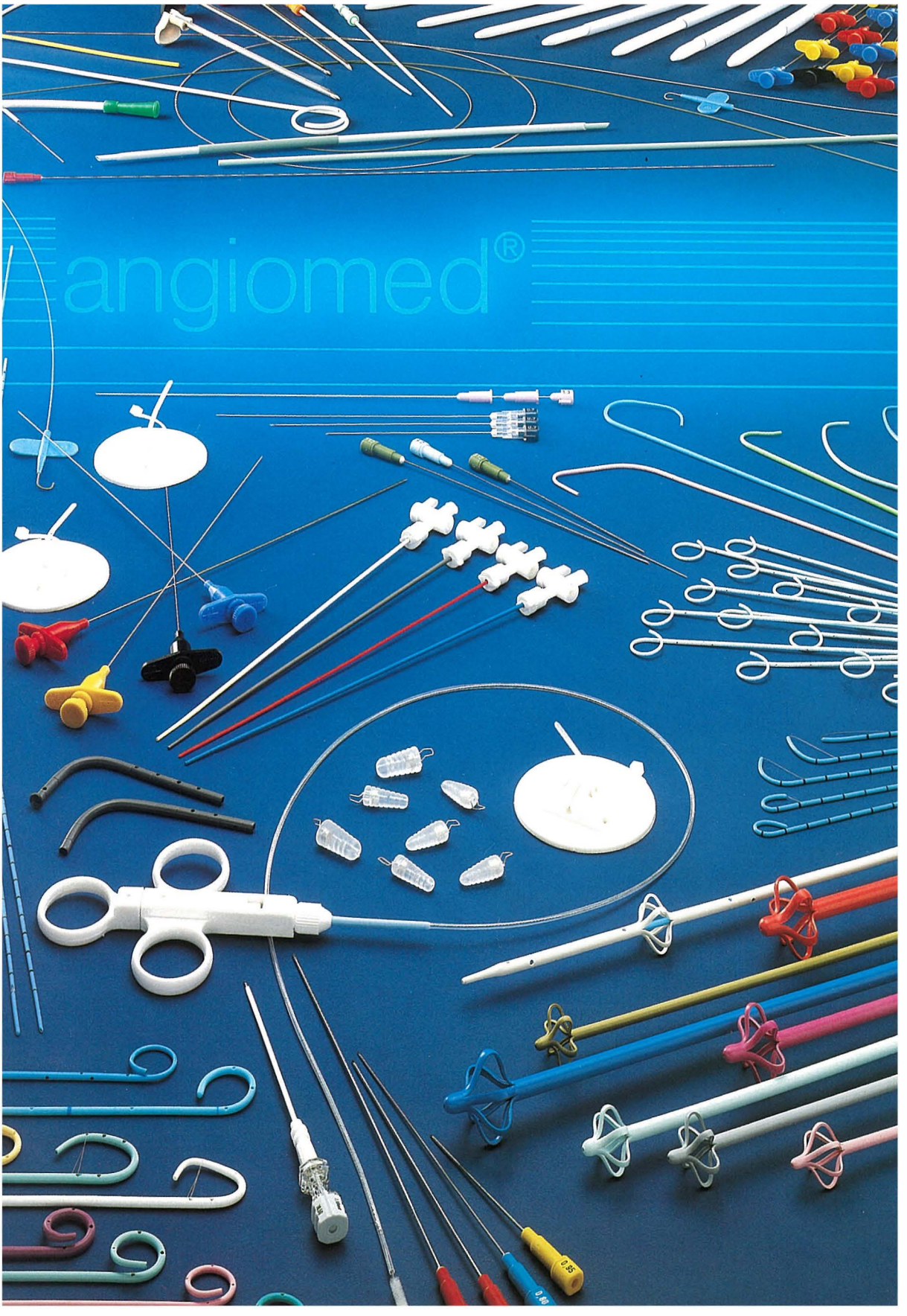
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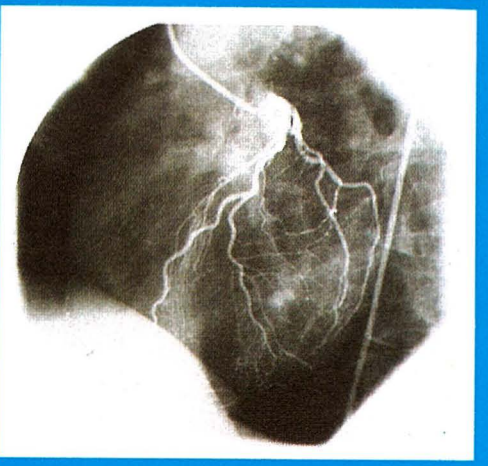

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FROM PRACTICE FOR PRACTICE

Case presentation

67-year old woman; first examination

Physical Examination

The breasts are symmetrical. In the upper outer quadrant of the left breast parenchyma remnants can be palpated. No palpable tumor in the breast. The axillae and supraclavicular spaces are NED

Aspiration Biopsy of the Left Breast

No cells in the specimen; the obtained material is not diagnostically relevant.

Mammography – see mammograms of the left breast.

Comment.

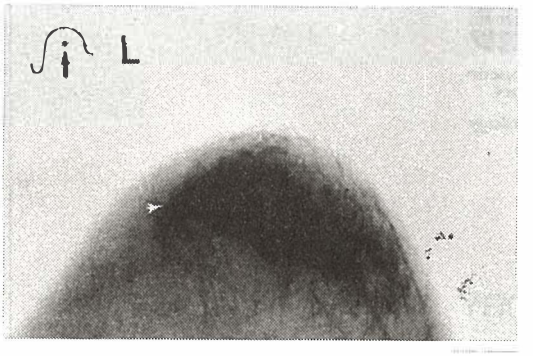

Fig. 1

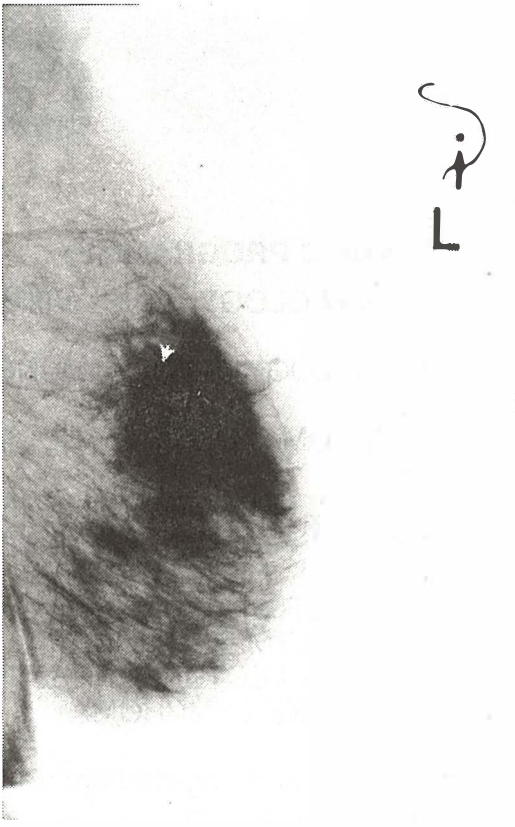

Fig. 2

Describe the mammograms and suggest further procedures:

- follow up at 6 months
- follow up before 6 months
- follow up later than after 6 months
- follow up is not necessary
- stereotactic biopsy
- open biopsy

(For answers see page 195.)

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UNIVERZITETSKO MEDICINSKI CENTAR
INSTITUT ZA RADIOLOGIJU I ONKOLOGIJU, SARAJEVO

KOMPJUTERIZIRANA TOMOGRAFIJA (CT) TORAKALNIH ORGANA U DIJAGNOSTICI EHINOKOKA

CHEST CT IN HYDATID DISEASE

Dalagija F, Bešlić Š

Abstract – Chest CT findings in 77 patients with pulmonary hydatid disease were analysed retrospectively and compared with similar data of plain radiography and surgery. Out of the total 89 (100%) operated pulmonary hydatid cysts, 58 (65%) were intact or simple, and 31 (35%) ruptured or complicated hydatid cysts. CT improved preoperative diagnosis of pulmonary, as well as the echinococcus of upper abdominal organs.
It proved to be superior to conventional radiologic diagnostic methods in the diagnosis of simple and complicated hydatid cysts, associated with difficulties in differential diagnosis in particular kinds of complicated cysts.

UDC: 616.24-002.951.21-073.75

Key words: echinococcosis pulmonary, tomography x-ray computed

Orig sci paper

Radiol Iugosl 1990; 24: 117-20

Uvod – Poznato je da Jugoslavija kao mediteranska zemlja spada među desetak zemalja u svijetu s najvećom učestalošću zaraženostil pasa i oboljevanja stoke i ljudi. Točnije, ona je na sedmom mjestu u svijetu po učestalosti ove parazitoze uzrokovane formom larve Echinococcus granulosus. Zbog prave epidemije oboljenja kadriovaskularnog sistema, malignoma i mirnodopskog traumatizma, smatra se da je ehinokokoza kao zdravstveni problem potisnuta, pa i zenemarena.

Tok bolesti je dugotrajan sa oskudnim i nekarakterističnim simptomima, pa se bolest često otkriva slučajno, a veliki broj bolesnika ostaje i neotkriven, izložen opasnosti nagle smrti. Pošto je vrijeme eradikacije još daleko, preporučeno je permanentno izučavanje dijagnostike i terapije ehinokoka (1).

Uz konvencionalne radiološke i druge dijagnostičko-laboratorijske metode, u našoj ustanovi se u dijagnostici ehinokoka od 1979. godine koristi i kompjuterizirana tomografija (CT).

Osnovni cilj ovog rada je bio da se na postojećem kliničkom materijalu iz svakodnevne prakse analiziraju mogućnosti CT i procjeni njen doprinos dijagnostici intratorakalnog ehinokoka.

Materijal i metode – Retrospektivnom metodom obrađeni su nalazi CT torakalnih organa 77 kliničkih pacijenata sa intratorakalnim ehinokokom, kod kojih je ova pretraga i izvršena u našoj ustanovi u toku posljednjih deset godina, uz operativnu potvrdu nalaza.

Od ukupno 77 (100%) pacijenata, 43 (56%) su bili muškog, a 34 (44%) ženskog pola, u životnoj dobi od 4 do 77 godina, prosječno 34 godine.

Pored CT torakalnih organa, kod svih 77 pacijenata predhodno je učinjena standardna radiografija torakalnih organa (posteroanteriorna i profilna projekcija), a kod nekolicine radioskopija, konvencionalna tomografija, bronhografija, angiografija i bronhoskopija. CT jetre, odnosno gornjeg abdomena, kliničko-laboratorijske pretrage i operativni zahvat, učinjeni su, također, kod svih 77 pacijenata. CT pregledi su izvršeni aparatom Somatom SF ili DRH u supinacionom položaju pacijenata, sa transverzalnim presjecima toraksa od nivoa apeksa do stražnjih freniko-kostalnih sinusa. CT presjeci su najčešće bili od po 8, a rjeđe i 4 mm, samo nativno ili i nakon aplikacije kontrastnog sredstva (infuzija i/ili »bolus«).

Received: February 2, 1990 – Accepted: March 24, 1990

Rezultati – Od ukupno 77 (100%) pacijenata, kod 64 (83%) utvrđena je jednostrana intratorakalna ehinokokoza i to kod 59 u plućnom parenhimu, kod dva u medijastinumu i kod tri sekundarno na pleuri. Kod 59 pacijenata utvrđena je jednostrana solitarna cista (desno kod 32 pacijenta i to kod 12 u gornjim i kod 20 u donjim partijama, a lijevo kod 26 pacijenata, kod 12 u gornjim i kod 14 u donjim partijama). Kod pet pacijenata utvrđene su po dve ciste jednostrano (desno kod tri i lijevo kod dva pacijenta), te kod jednog pacijenta multiple ciste desno (Tabela 1).

Od ukupno 89 (100%) operisanih intratorakalnih ehinokoknih cista (ne ubrajajući multiple obostrane ciste pluća kod tri pacijenta), 58 (65%) su bile jednostavne ili intaktne, a 31 (35%) komplicirane ili rupturirane ciste.

Diskusija – Ehinokokoza ili hidatidna bolest, koja je rasprostranjena u mnogim dijelovima svijeta, a u koje spada i Jugoslavija, kod čovjeka se manifestuje u formi ciste. Ove ciste se mogu razviti u svim organima ljudskog tijela, ali prema većini statistika najčešće u jetri, kod 60% i

Tabela 1 – Distribucija prema lokalizaciji cista u toraksu
Table 1 – Distribution according to the site of cysts in the torax

JEDNOSTRANO UNILATERAL 64 (83%									
po 1 cista by one cyst 58				po 2 ciste by two cysts 5				multiple multiple 1	
desno right 32		lijevo left 26		desno right 3		lijevo left 2		desno right 1	
gore up 12	dole down 20	gore up 12	dole down 14	gore up 3	dole down 3	gore up 0	dole down 4	gore up 0	dole down 1

Kod 13 (17%) pacijenata utvrđena je obostrana intratorakalna ehinokokoza, kod deset pacijenata po jedna cista obostrano i kod tri pacijenta multiple ciste obostrano. Kod 21 (27%) pacijenata, pored intratorakalne, utvrđena je i ehinokokoza organa gornjeg abdomena (kod 19 pacijenata u jetri, kod jednog u jetri, bubregu i peritoneumu, te kod jednog u bubregu) (Tabela 2.).

plućima, kod 30% u svim ostalim organima (slezena, bubrezi, rjeđe mišići, mozak, kosti itd.), kod 10% slučajeva (1, 2). Utvrđeno je da se najčešće sreće solitarna ehinokokna cista u jednom plućnom krilu, ali su moguće i multiple ciste, jednostrano ili obostrano.

Ciste su nešto češće u desnom plućnom krilu, periferno i u bazalnim partijama (1, 2, 3, 4, 5). Isto je potvrđeno i u ovom radu, vidljivo iz

Tabela 2 – Distribucija prema lokalizaciji cista u toraksu i gornjem abdomenu
Table 2 – Distribution according to the localization of cysts in the torax and upper abdomen

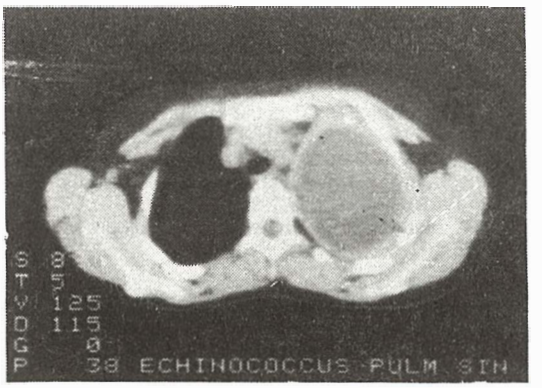
OBOSTRANO BILATERAL 13 (17%)		
po 1 ista by one cyst 10		multiple multiple 3
U GORNJEM ABDOMENU IN THE UPPER ABDOMEN 21 (27%)		
u jetri liver 19	u jetri, bubregu, peritoneumu liver, kidnney, peritoneum 1	u bubregu kidney 1

tabele 1 i tabele 2, gdje je izložena distribucija cista prema lokalizaciji.

Konvencionalne radiološke dijagnostičke metode, standardna radiografija i radioskopija, predstavljaju i danas osnovne metode u dijagnostici intratorakalne ehinokokoze.

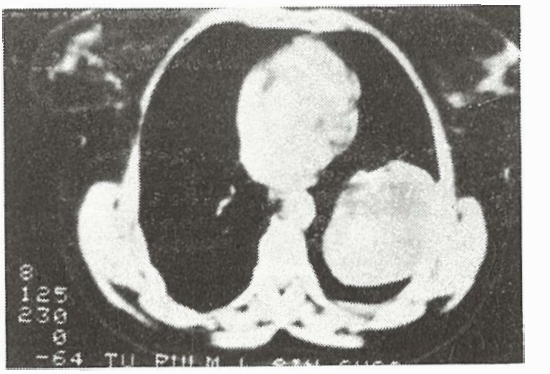
Kao što je već naprijed nevedeno, jednostavna ili nekomplicirana ehinokokna cista ima oligosimptomatski tok pa se često otkriva slučajno. Radiološki se obično prezentira kao okrugla, oštro ocrtana, homogena, mekotkivna sjena. U diferenciranju od oslidnih tumora koristan je poznati Escudero Nemen-ov znak, kod manjih i srednjih cista. U toku radioskopije, okrugla sjena ciste u inspiriju dobiva ovalnu formu, ali negativan nalaz ne isključuje cistu. Kod kompliciranih ehinokoknih cista poznati su brojni radiografski znaci (Zehbe, Kamalota, Escudero-Tobias, Cumb. Ivanissevich, Iessentisseur) od kojih su neki patognomični za ehinokok (1, 2, 3, 6).

Uz pomenute konvencionalne radiološke dijagnostičke metode u posljednjih desetak godina u dijagnostici ehinokoka koristi se i kompjuterizirana komografija (CT). Za razliku od hepatične ehinokokoze, o CT dijagnostici intratorakalne, u literaturi je znatno manje radova (2, 7). Kao što je poznato, CT je superiorna nad konvencionalnim radiološkim metodama, jer je zahvaljujući prvenstveno sposobnosti diferenciranja manjih razlilka u apsorbciji X-zraka, određivanjem stepena gustoće lezije, daje dijagnostičke informacije koje se ne mogu dobiti konvencionalnim metodama. Stoga se CT, između ostalog, potvrdila veoma korisnom i u dijagnostici cističnih lezija, diferencirajući ih od masa stepena gustoće solidnog ili masnog tkiva (1, 2, 4, 5, 7, 8, 9, 10).



Slika 1 – Jednostavna ehinokona cista sa zadebljanjem zida preko 10 mm

Fig. 1 – Simple hydatid cyst with more than 10 mm wall thickness



Slika 2 – Ehinokokna cista sa »đepićem« zraka u zadebljanom zidu kao znak prijeteće rupture endociste

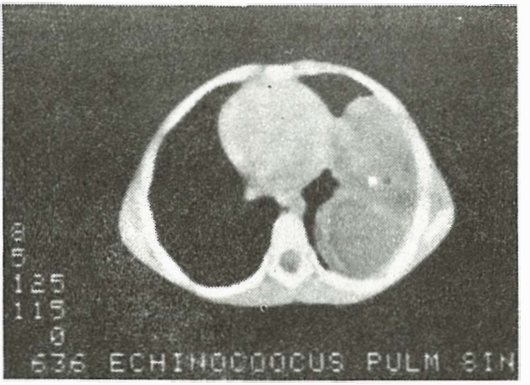
Fig. 2 – Hydatid cyst with a pocket of air in the thickened wall as a sign of menacing endocyst rupture

CT se pokazala najkorisnijom u dijagnostici jednostavnih ili nekompliciranih ehinokonih cista, što je potvrđeno i u ovom radu (CT nalazi su bili podudarni sa operativnim kod preko 90% slučajeva sa nekompliciranim cistama.) Ona daje jasan prikaz okrugle, oštro ocrtane, homogene formacije, stepena gustoće tečnosti (u ovom radu isti se kretao od +3 do +19, a prosječno +10 Haunsfildovih jedinica). Pored prikaza točne lokalizacije, forme, veličine, kontura, stepena gustoće i broja cista, CT i kod ovih lezija daje i znatno bolji prikaz odnosa prema okolnim strukturama-torakalnom zidu, odnosno pleuri, krvnim žilama, perikardu itd. (slika 1 i 2).

Međutim, a što je istaknuto i u literaturi, ove ciste nije moguće sa sigurnošću diferencirati od plućnih cista gustoće tečnosti druge etiologije na osnovu samo CT izgleda (2). Ipak, kod CT nalaza cistične formacije (prema vlastitom zapažanju, osobito onih sa intenzivnom prstenastom rubnom zonom, koja odgovara pericisti) u endemskim krajevima, u koje spada i naša zemlja, treba prvenstveno misliti na ehinokok (1, 2).

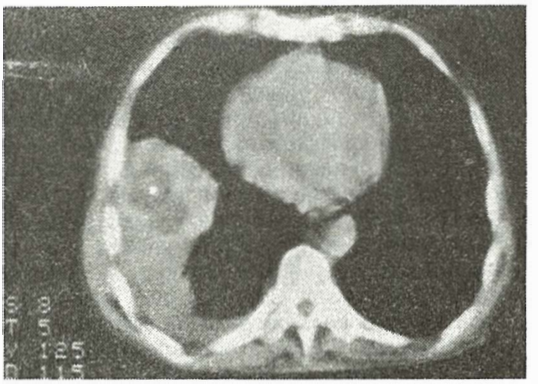
Smatra se da je CT korisna i u dijagnostici kompliciranih ili rupturiranih ehinokoknih cista. Utvrđeno je da ona, u odnosuč na standardnu radiografiju, može bolje vizualizirati karakteristične detalje kao što su odvojene ili kolabirane endocistične membrane, kolabirane membrane ciste kčerke i intaktne ciste kčerke, unutar preostale hidatidne tečnosti (slika 3 i 4).

Rupturirane ciste bez tih karakteristika teško se diferenciraju od tumora, jer zbog potpunog nedosatka tečnosti, kolabirana cista i membralne iste kčerki se ne diferenciraju, pa dobivaju CT gustoću solidnog tkiva. Također i hronično inficirane ciste, odnosno hidatidni apscesi u formi



Slika 3 – Jednostavna ehinokona cista sa cistama kćerkama poput septirane ciste

Fig. 3 – Simple hydatid cyst with daughter cysts as a septate cyst



Slika 4 – Sekundarna ehinokokoza pleure sa cistama kćerkama

Fig. 4 – Secondary hydatid pleural disease with daughter cysts

šupljine zadebljalog zida periciste sa zračno-tečnim nivoom, ne mogu se diferencirati od pravog ili piogenog apscesa ni pomoću CT-a (2).

Zaključak – Na osnovu naprijed iznesenog, može se reći da je CT korisna i da je znatno unaprijedila preoperativnu dijagnostiku intratorakalne, kao i ehinokokoze organa gornjeg abdomena.

CT je superiorna nad konvencionalnim radiološkim dijagnostičkim metodama u dijagnostici jednostavnih, a i kompliciranih ehinokoknih cista uz diferencijalno-dijagnostičke teškoće kod određenih vrsta kompliciranih cista.

Sažetak

Nalazi CT torakalnih organa 77 pacijenata sa intratorakalnim ehinokokom analizirani su retrospektivno i komparirani sa nalazima standardne radiografije i hirurgije. Od ukupno 89 (100%) operisanih intratorakalnih cista, 58 (68%) su bile intaktne ili jednostavne, a 31 (35%) rupturirane ili komplikovane.

CT je korisna i znatno je unaprijedila preoperativnu dijagnostiku intratorakalnog, kao i ehinokoka organa gornjeg abdomena. Ona je superiorna nad konvencionalnim radiološkim dijagnostičkim metodama u dijagnostici jednostavnih, a i kompliciranih ehinokoknih cista uz određene diferencijalno-dijagnostičke teškoće kod pojedinih vrsta kompliciranih cista.

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DOM ZDRAVLJA, RUMA
KABINET ZA RADIOLOGIJU

ULTRAZVUK I KLASIČNA GRUDNA RENDGENOLOŠKA DIJAGNOSTIKA

ULTRASOUND AND CLASSIC CHEST X-RAY DIAGNOSTICS

Jovanović G

Abstract – Two-dimensional real time ultrasonography can be a very helpful additional method to the classic chest x-ray diagnostics in indicated and selected cases, in the first line for pleural effusions (encapsulated, atypical or free). There are other conditions such as pleural tumors, and tumors of the lungs and mediastinum that are in immediate contact with the thoracic wall or diaphragm, which can also be investigated by this technique. Despite the modest number of evaluated cases, our first results point out the efficacy of the method.

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Key words: thoracic radiography, ultrasonic diagnosis

Profess paper

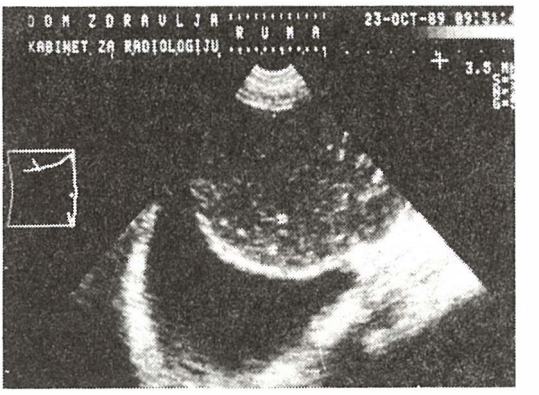
Radiol Iugosl 1990; 24: 121-5.

Uvod – Praktična primena real-time dvodimenzione ultrasonografije u grudnoj dijagnostici (sem ehokardiografije i ehomamografije) je slabo rašireni, a i podaci o tome iz stručne literature su relativno oskudni.

Ultrasonografija može da bude vrlo zahvalna dopunska metoda klasičnoj grudnoj rendgenološkoj dijagnostici u određenim slučajevima, i cilj ovog članka, koji je baziran skoro isključivo na svakodnevnoj praksi u našoj (vanbolničkoj) zdravstvenoj ustanovi, je da to prikaže, argumentuje i preporuči.

Materijal i metode – U početku smo razmatrali samo pleuralne izlive uglavnom pronađene uzgred pri ultrasonografskom pregledu gornjeg abdomena koji je i osnovna oblast našeg ultrasonografskog rada (1, 2, 3); (slika 1).

Zainteresovani za mogućnost primene real time ultrasonografije u grudnoj dijagnostici, prešli smo zatim na biranje slučajeva koji će se posle kliničke i rendgenske obrade pacijenta evaluirati i ovom metodom, pri čemu je razvijena saradnja sa Dispanzerom za pulmologiju našeg Doma zdravlja (4, 5).



Slika 1 – Pleuralni izliv desno
Fig. 1 – Right pleural effusion

U periodu od godinu dana (1989. g.) pregledali smo ukupno 45 odraslih pacijenata oba pola sa sonografski registrabilnim manifestacijama grudnog oboljenja. Od toga, jedna trećina pacijenata nam je upućivana na ultrasonografski pregled gornjeg abdomena (sa različitim uputnim dijagnozama ili bez njih), pri čemu je patološki proces u grudnom košu pronađen uzgred. Druga, veća

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grupa paciljenata nam je upućivana ciljano, od strane kolega-pulmologa iz Dispanzera za plućne bolesti, koji su prethodno upoznati sa mogućnostima i ograničenjima ultrazvučne dijagnostike. Ovde se uglavnom radilo o pacijentima kod kojih klinički i rendgenski pregled daju dvojben dijagnostički rezultat, pa se od ultrazvuka očekuje da odgovori na neko od sledećih pitanja:

– ima li pleuralnog izliva ili ne?
– radi li se o izlivu ili o adheziji?
– da nije u pitanju atipičan izliv?
– možda se radi o parakostalnom izlivu, a možda o tumoru pleure ili pluća koji je u neposrednom kontaktu sa zidom grudnog koša?
– da li je dijafragma stvarno ili prividno podignuta? Kakve je debljine i pokretljivosti?
– postoji li perikardijalni izliv, i sl.

Pregled obavljamo interkostalnim, transabdominalnim (transdijafragmalnim) ili supraklavikularnim pristupom grudnoj duplji: mehanička sektorska sonda pendularnog tipa od 3,5 MHz našeg aparata (Combison 320 »Kretz«) sa malom kontaktnom površinom omogućava dobijanje slike kroz uske »prozore«, pa je vrlo pogodna.

Male slobodne tečne kolekcije u frenikokostalnom sinusu se najlakše prikažu u stojećem položaju pacijenta oko zadnje aksilarne linije, pri čemu podignuta ruka olakšava interkostalni pristup toj strani.

Sondiranje u pojedinim slučajevima vršimo ciljano, prema kliničkom i/ili rendgenskom nalazu, uz moguće promene položaja pacijenta.

Rezultati i diskusija

1. Slobodni pleuralni izlivi (28 razmatranih slučajeva)

Ovde smo stekli srazmerno najviše iskustva; radilo se o izlivima različite etiologije (zapaljenske, posttraumatske, neoplastične ili kardijalne) i različitog obima, većina ih je bila jednostrana, manje je bilo obostranih. Praktično su svi pacijenti obrađeni i rendgenskim metodama, i to većina pre, a manji deo nakon ultrasonografskog pregleda.

Uverili smo se da je ultrazvučni pregled osetljiviji za registraciju male količine slobodnog pleuralnog izliva u dijafragmalnoj ili dijafragmalno-parakostalnoj fazi od rendgenskih metoda (kod tri pacijenta sa malim pleuralnim izlivima nađenim prvo ultrasonografski, rendgenskim metodama odmah potom rađenih čak nismo mogli da ih pronađemo), što potvrđuju i nalazi drugih autora (5). Ovim naravno ne želimo da proglasimo ultrasonografiju za metodu izbora u ovoj oblasti!

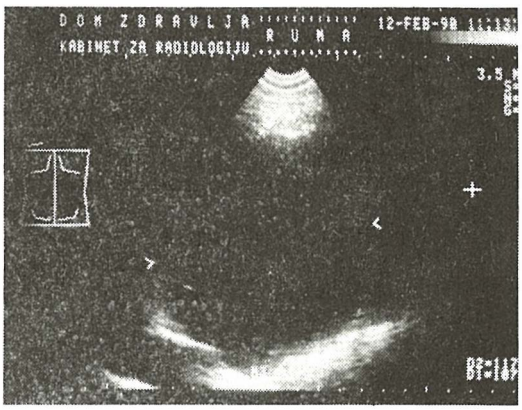
I desno i levo se izliv može pronaći sa istom lakoćom, lakše se nego rendgenski diferencira od adhezije (izliv se može uvek sa sigurnošću isključiti), a stiče se i uvid u količinu izlivene tečnosti (tu smo često bili iznenađeni neznatnim rendgenskim manifestacijama ultrasonografski pronađenih izliva).

Smatramo da je u dijagnostici kolateralnog pankreatitičnog pleuralnog izliva kod ležećih pacijenata ultrazvuk bez sumnje metoda izbora, zbog teškoća oko organizovanja standardnog snimanja pluća (imali smo pacijenta sa obilnim levostranim pleuralnim izlivom tog porekla koji je otpušten iz bolničke ustanove a da izliv uopšte nije verifikovan).

2. Atipični izlivi i učaureni pluralni izlivi dostupnih lokalizacija (5 slučajeva)

Ovde ultrasonografiju naglašavamo kao posebno korisnu metodu, jer objašnjava dvojbeni rendgenski nalaz: praktično se može dokazati svaka kolekcija tečnosti koja je dostupna ultrazvučnom snopu. Tu pre svega dolaze u obzir parakostalni izlivi (prednji, lateralni ili zadnji), prednji paramedijastinalni i dijafragmalni; rendgenska dijagnoza ovakvih izliva se inače potvrđivala tek punkcijama, a u novije vreme uz pomoć kompjuterizovane tomografije.

Razmatrali smo svega tri učaurena parakostalna izliva: lateralni, koji se na standardnom rendgenskom P-A snimku manifestovao jasno ograničenom vretenastom senkom uz unutrašnji zid grudnog koša, drugi, sličan – lateroposteriorni, i treći, veliki, posteriorni, koji je imitirao tumor (slika 2). Kod sva tri ova slučaja, ciljani interko-



Slika 2 – Veliki zadnji parakostalni izliv
Fig. 2 – Large posterior paracostal effusion

stalni ultrasonografski sken je lako pokazao da se radi o tečnim kolekcijama, a ne o solidnim promenama (pleuralni tumor, debela švarta i sl.).

U jednom smo se slučaju ultrasonografski uverili da je slika prividno podignute hemidijafragme (uz slobodan freniko-kostalni sinus) poticala od subpulmonalnog izliva.

Drugom smo prilikom potvrdili dijagnozu lokalizovanog pleuralnog izliva u donjoj polovini velike incizure desnog pluća: pod pretpostavkom da tečnost takvog izliva bar delom dodiruje parijetalnu pleuru održavajući se tamo fizičkim silama, planski je sondiran lateralni torakalni zid a u projekciji donje polovine velike incizure, pa je tu na malom, ograničenom mestu tečnost zaista i registrovana, dok se njeno prisustvo (kako smo i očekivali) nije moglo dokazati ni u okolini, ni u freniko-kostalnom sinusu, niti supradijafragmalno. Nakon desetak dana kardiotonične terapije, povukli su se rendgenski znaci ovog izliva.

Nažalost, nismo u mogućnosti da uporedimo ove nalaze sa rezultatima drugih autora, jer smo naišli na malo podataka u stručnoj literaturi koja nam je dostupna.

3. Uvid u stanje parijetalne i visceralne pleure

Sonografska determinacija debljine zida grudnog koša prikazom parijetalne pleure je u praktičnoj primeni u planiranju radioterapije (6).

U tri slučaja duže postojećih zapaljenskih izliva, viđali smo fibrinske naslage na pleuri, ponekad u vidu lelujavih traka ili mostova koji povezuju dva pleuralna lista (slika 3).

Posttraumatski hematotoraks se može manifestovati slojem sedimenta ispod bistre tečnosti, što smo jasno prikazali kod jednog pacijenta nekoliko dana nakon serijskog preloma rebara (isti pacijent je vraćen iz bolničke ustanove bez verifikacije izliva).

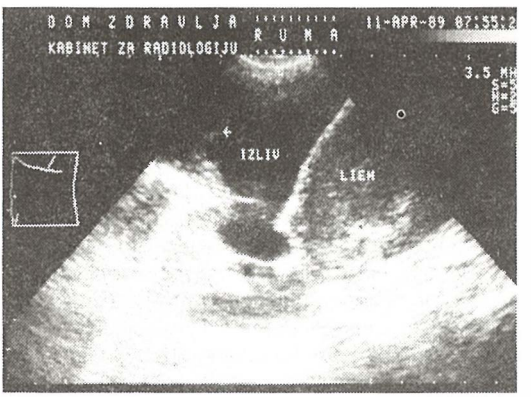
Kod četiri pacijenta sa izlivima malignog porekla viđali smo pleuralna zadebljanja i neoplastične čvoraste i krestaste depozite na pleuri. Slične nalaze pominju i drugi autori (5).

4. Intratorakalni tumori i ciste u neposrednom kontaktu sa zidom grudnog koša ili dijafragmom (4 pacijenta)

Ni ovde ne raspolažemo nikakvim podacima iz dostupne literature, ali sledeći zamisao da pokušamo da ultrasonografski prikažemo i takve lezije, uverili smo se da je to izvodljivo, pa smatramo da je realno moguće ovom metodom pregledati pleuralne tumore, tumore i ciste pluća, kao i tumore i ciste medijastinuma, uz uslov da su u neposrednom kontaktu sa zidom grudnog koša ili dijafragmom; ovde dolazi do izražaja poznata osobina ultrazvuka u lakom diferenciranju solidnih od cističnih lezija:

– ogroman tumor levog pluća u starijeg pacijenta, smešten između srca i levog torakalnog zida, u celini je prikazan lateralnim interkostalnim pristupom; radilo se o jasno ograničenom okruglom tumoru heterogene ehostrukture;

– okrugao tumor promera od nepunih 40 mm, lokalizovan u levom plućnom vrhu mlade ženske osobe pregledali smo ultrasonografskim skenovanjem supraklavikularne jame i jasno ga prikazali (sika 4);



Slika 3 – Izliv levo – pleuralna fibrinska traka (strelica)
Fig. 3 – Left effusion: pleural fibrinous strip (arrow)

Slika 4 – Tumor levog vrha pljuča
Fig. 4 – Tumor of the left pulmonal apex

– oveći tumor pluća druge pacijentkinje (ispostavilo se da je u pitanju fibrosarkom) lokalizovan u prednjem delu desnog freniko-kardijalnog ugla, prikazan je kosim desnim subksifoidnim skenom (slika 5).

Slika 5 – Tumor pluća smešten u prednjem desnom kardiofreničnom uglu (strelica)

Fig. 5 – Tumor of the lung situated in the right anterior cardiophrenic angle (arrow)

Sve napred pomenute promene smo tražili ciljano, prema rendgenskom nalazu.

Lokalizovanu tečnu kolekciju koja bi odgovarala perikardijalnoj cisti ili učaurenom prednjem donjem levom paramedijastinalnom izlivu, registrovali smo uz vrh srca šezdesetogodišnjeg pacijenta (slika 6).

Slika 6 – Parakardiljalna tečna kolekcija u prednjem donjem levom paramedijastinalnom prostoru (strelica)

Fig. 6 – Paracardial fluid collection in the left anteroinferior paramediastinal space

Promena je nađena prvo sonografski, a analiza aktuelnih i ranijih radiografija pluća istog pacijenta je pokazivala vrlo diskretan, dotle zanemarivan nalaz zasenčenja parakardijalno levo, maskiranog vrhom srca.

5. Uvid u stanje hemidijafragme (6 slučajeva)

Poznato je da se ultrasonografskim pregledom abdomena stiče uvid i u stanje dijafragme (1, 3, 7).

Desna hemidijafragma je pogodnija za pregled, ali se može dobiti dobar uvid i u izgled, debljinu i pokretljivost i leve.

Parcijalna relaksacija desne hemidijafragme sa hernijacijom jetrenog parenhima može se lako dokazati transabdominalnim skenovima; ovakve promene mogu da liče na tumore pluća ili dijafragme, perikardijalne ciste, a i fokalne jetrene lezije. Arbiter elegancije američke rendgenologije B. Felson opisuje u svom čuvenom udžbeniku (9) hepatičnu herniju u čijoj je dijagnostičkoj proceduri korišćen pneumoperitoneum a i scintigrafija jetre: danas, u eri ultrazvuka, ovo bi se svakako izbeglo, a upravo smo i imali dva takva slučaja, gde je jasno prikazano izbočenje jetrenog parenhima u relaksirani deo hemidijafragme.

Kod tri pacijenta u odmaklim fazama (operisanih) malignoma želuca viđali smo ekstenzivnu infiltraciju dijafragme neoplastičnim masama, sa njenom delimičnom ili potpunom imobilnošću.

U jednog pacijenta smo istom metodom isključenjem subpulmonalnog izliva ili druge promene potvrdili relaksaciju cele hemidijafragme.

6. Perikardijalni izliv (2 slučaja)

Pominjemo ih samo uzgred, jer su u užem domenu ehokardiografije.

Zaključak – Svakodnevna praksa pokazuje višestruku korist primene ultrasonografije kao dopunske a jednostavne i neškodljive metode klasičnoj radiološkoj dijagnostici nekih grudnih oboljenja i stanja (3, 5, 7, 8).

Ako već imamo na rapsolaganju ultrazvučnu tehnologiju, imperativ je da je tamo gde će koristiti pacijentu i primenjujemo, pa ovo zato ne treba shvatiti kao pomodnu egzibiciju. Naravno, mogućnosti ultrazvuka ne treba precenjivati, ali ovde, u grudnoj dijagnostici, uz pravilnu indikaciju on će često zameniti dopunski jonizujući dijagnostički postupak i dati korisnu informaciju, jer – da se ne zaboravi: ». . . radilolog je prvi pozvan da traži nove dijagnostičke metode, koje sa sobom nose manje hazarda od rendgenskog zračenja« (10).

Sažetak

Dvodimenziona real time ultrasonografija može da bude vrlo korisna dopunska metoda klasičnoj grudnoj rendgen-dijagnostici u indikovanim i odabranim slučajevima, u prvom redu za pleuralne izlive (učaurene, atipične ili slobodne), ali takođe i druga stanja: pleuralne tumore i tumore pluća i medijastinuma koji su u neposrednom kontaktu sa zidom grudnog koša ili dijafragmom, koja se također može pregledati ovom tehnikom. Uprkos skromnom broju razmatranih slučajeva, naši prvi rezultati uveravaju u efikasnost metoda.

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SRPSKO LEKARSKO DRUŠTVO

Poštovani kolega–ce,

Izveštavam Vas da su Predsedništvo i Skupština Sekcije za radiologiju Srpskog lekarskog društva na sednicama od 22. marta 1990. godine doneli odluku o održavanju SIMPOZIJUMA RADIOLOGA SRBIJE.

Predsedništvo Sekcije za radiologiju SLD-a izražava uverenje da će Simpozijum radiologa Srbije, uz učešće radiologa Jugoslavije, biti značajan doprinos savremenoj radiološkoj teoriji i praksi.

April 1990.
Kragujevac

ČLAN PREDSEDNIŠTVA SEKCIJE
ZA RADIOLOGIJU SLD-a
Mr sci med dr Željka Marković

PRVI SIMOZIJUM RADIOLOGA SRBIJE

PRELIMINARNO OBAVEŠTENJE

ORGANIZATORI:

– SEKCIJA ZA RADIOLOGIJU SLD-a
– ZAVOD ZA RADIOLOGIJU UKC KRAGUJEVAC
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KONGENITALNI NEDOSTATAK ŽUČNOG MJEHURA – PRIKAZ BOLESNIKA

CONGENITAL ABSENCE OF THE GALLBLADDER – CASE REPORT

Peršić M[1], Fučkar Ž[2], Šaina G[3], Leković A [3], Rubinić M[4], Roganović-Đorđević J[1]

Abstract – The authors present a 14-and a half year old girl with congenital absence of the galibladder. This is a case of a very rare anomaly which is generally diagnosed in mature age by surgery with simptoms of cholelithyasis. Our patient presented with abdominal pain and the diagnosis was made by ultrasonography of the abdomen and by intravenous cholangiography. Skeletal malformation of the thorax was a concomitant anomaly.

UDC: 616.366-007.21

Key words: gallbladder-abnormalities

Case report

Radiol Iugosl 1990; 24: 127-9.

Uvod – Kongenitalni nedostatak žučnog mjehura (u daljnjem tekstu KNŽM) veoma je rijetka malformacija hepatobilijarnog sistema. Iako se radi o kongenitalnoj anomaliji, otkriva se najčešće u odrasloj dobi sa simptomima koledokolelitijaza ili kolangitisa (1, 2, 3), ili autopsijom kao slučajan nalaz. Za dijagnozu je najčešće neophodna laparatomija (4). Rendgenske ili/i scintigrafske pretrage bilijarnog trakta ne mogu sa sigurnošću dijagnosticirati KNŽM zbog niza lažno negativnih nalaza (1, 5, 6). Noviji radovi (7) ukazuju na značajnu ulogu ultrazvuka abdomena u dijagnostici KNŽM.

Naš rad opisuje dijagnostiku ageneze žučnog mjehura u dječjoj dobi na osnovi neinvazivnih dijagnostičkih metoda; intravenozne kolangiografije i ultrazvuka abdomena. U domaćoj literaturi postoje opisi ove anomalije u odrasloj dobi (6), ali u djece ovo je prvi prikaz.

Prikaz bolesnice – I. A., MB: 1921/86, četrnaest godišnja djevojčica dolazi u bolnicu zbog bolova u trbuhu koji se povremeno javljaju zadnjih mjesec dana. Bolovi se javljaju nakon uzimanja hrane, najčešće navečer u predjelu žličice sa širenjem pod desni rebrani luk. Češći i jačeg intenziteta su nakon uzimanja masne hrane. Afebrilna, bez drugih smetnji. Premorbidna anamneza uredna, osim što je u dobi od četiri godine uočen deformitet desne strane grudnog koša zbog čega je u više navrata liječena.

Kod prijema za dob slabije uhranjena i razvijena, gracilne građe. Težinom odgovara dobi od jedanaest godina, a visinom dobi od trinaest godina. Afebrilna, pri svijesti, dobrog općeg stanja. Grudni koš kraći u odnosu na ostali dio tijela uz izraženu asimetriju. S prednje strane grudnog koša desno u području hvatišta rebara za sternum vidi se grebenasto izbočenje veličine šake. Ostali status uredan.

Laboratorijski nalazi: kompletna krvna slika, hepatogram s transaminazama, dijastaze seruma i urina, proteinogram, imunoglobulini seruma, urin i pretrage stolica urednog su nalaza. Intravenozna urografija i rendgenska pasaža želuca i duodenuma urednog nalaza. Ultrazvuk abdomena : uredan je sonografski prikaz jetre, pankreasa i obaju bubrega. Prikazao se i zajednički žučni vod (AP promjer 0,9 cm), no koleciste se nije vidjelo niti u jednom presjeku (slika 1).

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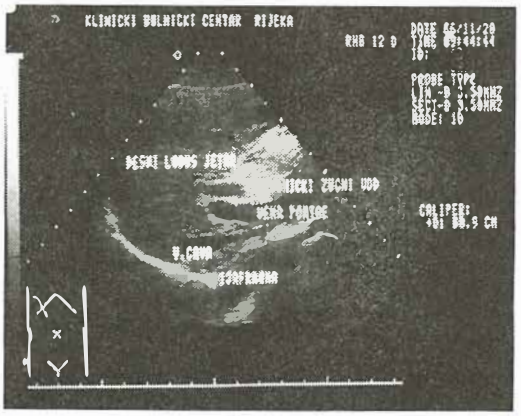

Slika 1. Ultrazvuk jetre i zajedničkog žučnog voda

Figure 1. Ultrasonography of the liver and ductus choledocus

Slika 2. Intravenozna kolangiografija
a) proširen zajednički žučni vod

Figure 2. Intravenous cholangiography
a) Enlarged ductus choledocus

Intravenozna kolangiografija: hepatikokoledokus se prikazuje već nakon 30 minuta od davanja kontrasta. Širina koledokusa je u najširem dijelu od 0,9 do 1 cm (umjereno proširenje). Ni na jednoj od učinjenih snimki nije prikazan žučni mjerhur (slika 2). Endoskopska retrogradna kolangiopankreatografija nije uspjela. Ezofagogastroduodenoskopija: niz duguljastih erozija u području antruma.

Na osnovi učinjenih nalaza i akutnih želučanih erozija, započeta je dijeta uz terapiju antacidima. Smetnje brzo nestaju. Vjerojatni je uzrok bio akutni erozivni gastritis, ali se i smetnje koje se opisuju kod nedostatka žučnog mjehura ne mogu isključiti. Djevojka je bez smetnji slijedeće dvije godine.

Rasprava – Kongenitalni nedostatak žučnog mjehura veoma je rijetka malformacija koja se otkriva tek u odrasloj dobi, a iznimno u djece. Ovu je anomaliju prvi opisao Lemery 1701. godine (9). Vanderpool sa suradnicima (10) ukazuje da je već Aristotel poznavao ovu anomaliju u čovjeka i u nekih životinja. Životinje s tim nedostatkom smatrao je biljožderima, a one sa žučnim mjehurom primarnim mesožderima. Incidencija KNŽM iznosi oko 1:3400 do 1:7500 (8,11). Smatra se da je i viša s obzirom da većina ljudi s ovom anomalijom nema nikakvih smetnji. Asimptomatski slučajevi su 2 puta češći i otkrivaju se kao slučajni nalaz autopsijom (11). U bolesnika u kojih je KNŽM otkrivena za života 33% do 60% ih je bilo bez simptoma, a 25% do 50% imalo je simptome koledokoletijaze (1, 2, 3). Ova anomalija dijagnosticirana autopsijom, dakle asimptomatska, jednako je zastupana u oba spola (11), dok su simptomatski slučajevi češći u žena u odnosu 3:1 (1, 9).

KNŽM se često susreće uz neke druge malformacije gastrointestinalnog, kardiovaskularnog i genitourinarnog sistema, te uz anomalije skeleta i lica (1, 2, 8). U šestine bolesnika s bilijarnom atrezijom postoji i KNŽM (12). Prisutna je i u VATER asocijaciji (13) i uz trizomiju 18 (8). Spominje se mogućnost nasljeđivanja KNŽM kao autozomno dominantno sa slabom penetracijom (14), ili spolno vezana recesivno u sklopu tzv. G sindroma (15). Očita je povezanost s nizom različitih malformacija. Način nasljeđivanja, i da li postoji, još je uvijek nepoznanica. Stoga se preporuča učiniti ultrazvuk žučnog mjehura u prvih srodnika bolesnika, kako bi se na taj način otkrio mogući nasljedni faktor (1). U čnaše bolesnice uz KNŽM nalazimo defekt skeleta u vidu deformiteta grudnog koša.

Simptomatologija KNŽM odgovara simptomima kroničnog kolangitisa odnosno koledokolitijaze (1, 4, 5, 6, 7). Najčešće je prisutno i proširenje koledokusa, što je nađeno i u naše bolesnice (2, 3, 4, 5, 6). 48% do 58% svih bolesnika ima ikterus, a 26% do 50% ih ima kamenac u zajedničkom žučnom vodu (5). Pankreatitis kao posljedica koledokolitijaze javlja se u 6% bolesnika s KNŽM (16). Interesantan ali i nejasan je uzrok ovih smetnji u bolesnika koji nemaju holedokolelitijazu (5). To je bilo i u naše bolesnice, iako se u nje bolovi mogu objasniti i pojavom akutnih erozija želuca. Mogući uzrok smetnjama koju bolesnici s KNŽM osjećaju jest i smanjena sekrecija žučnih kiselina uočena u ovih bolesnika (1).

Dijagnostika KNŽM do nedavno je bila moguća jedino operativnim putem, laparatomijom (4, 5, 6). Peroralna kolecistografija, intravenozna kolangiografija kao ni scintigrafski prikaz žučnog mjehura i žučnih puteva nisu zbog mogućih lažno pozitivnih i lažno negativnih nalaza od odlučujućeg značaja za postavljanje dijagnoze (11, 17). Ultrazvuk žučnog mjehura i žučnih puteva ima prednost pred navedenim pretragama jer daje sigurnije podatke. Ovom pretragom moguća je dijagnoza KNŽM i bez laparotomije (4, 7). Dijagnostika KNŽM je važna da se ne učini operacija zbog »lažnih simptoma kolelitijaze« (1, 4). Na ovu anomaliju treba pomisliti i u nizu drugih malformacija koje smo ranije naveli (5, 8, 12, 14, 15). U njih je ona najčešće »nijema« malformacija do odrasle dobi, ali nas može iznenaditi simptomima kolelitijaze.

Sažetak

Prikazali smo četrnaestgodišnju djevojčicu s kongenitalnim nedostatkom žučnog mjehura. Radi se o rijetkoj anomaliji koja se najčešće dijagnosticira operativnim putem u odrasloj dobi zbog simptoma koledokolelitijaze. U naše je bolesnice prezentirajući simptom bio bol u trbuhu, a dijagnoza je postavljena na osnovi ultrazvuka abdomena i intravenozne kolangiografije. Od pratećih malformacija u naše je bolesnice prisutna skeletna deformacija grudnog koša.

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COMPLICATIONS IN CARDIAC CATHETERIZATION AND ANGIOCARDIOGRAPHY IN INFANTS AND CHILDREN – PROSPECTIVE STUDY

Robida A

Abstract – Prospective study of complications in cardiac catheterization and angiocardiography comprised 411 infants and children consecutively entered into the study protocol in the period from January 1, 1987 to October 30, 1989. The patients were observed for 48 hours after an invasive procedure and complications were recorded for each patient. There were 46 complications noted in 40 patients. Overall complication rate was 11.2%. However, if only diagnostic procedures were examined their overall rate was 7.5% which compared favorably with other studies. Major complications were more frequent in high-risk group than in low-risk group of patients ($P < 0.01$). There were 3 deaths (0.78%), but only one death could be attributed directly to catheterization procedure. The most frequent complications were arrhythmias (58.6% of all complications); these were encountered more often in infants than in older children ($P \geq 0.01$). Each laboratory should keep a continuous record of their activities and complication rates because the introduction of newer procedures, especially in the field of interventional catheterization, might increase the complications and alert the physician to change, improve or even abandon the procedure.

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Key words: heart catheterization–adverse effects, angiocardiography–adverse effects, child

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Introduction – Retrospective review of the complications in 1074 infants and children catheterized in our hospital from January 1, 1981 to December 31, 1985 revealed the overall complication rate of 5.2% (1). The major drawback of that retrospective study might be inaccurate data collection and even possible loss of some cases.

The aim of the present report is to present data of the cardiac investigation with the advantage of more exact data collection.

Materials and methods – In the period of January 1, 1987 to November 30, 1989 we performed 411 cardiac catheterizations. The infants were sedated with the mixture of chlorpromazine, promethazine, and pethidine. Ketamine was used in older children as reported in a previous paper (1). Percutaneous technique of catheter entry into the femoral vein was used in 315 cases, cut down of great saphenous vein was performed in 66 cases, of femoral vein in 13 cases, and of cubital vein in 4. The umbilical vein was entered in 5 infants. The Femoral artery was punctured in 74 patients, and the axillary artery in 4. The way of entry was chosen by preference of different the investigator, but cut down was also sometimes performed if puncture of the vein failed. 100 U/kg of heparin was administered intravenously immediately after the introduction of sheath or catheter into the artery. All patients received solution of heparin 5 U/ml of of 5% glucose for flushing the catheter.

The modification of classification of the severity of illness described by Stanger and associates was used in the same way as in the retrospective study (2):

A. Asymptomatic patients – without distress, cyanosis, hypoxemia, and congestive heart failure.

B. Slightly ill patients – without distress, noncyanotic, mildly hypoxemic (pO2 > mmHg), or with controlled heart faillure.

C. Moderately ill patients – hypoxemic (pO2 < 25 mmHg), but without acidosis, or with severe congestive heart failure that is only partly controlled with digitalis and diuretics.

D. Critically ill patients – with one or more of the following:

- ventilatory assistance
- acidemia
- poor peripheral perfusion and cardiogenic shock.

Apart from this classification, high and low risk groups were identified prior to catheterization according to previous experience with the rate of

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complications in the retrospective study (1). Patients were allocated to high-risk group if younger than 4 months and/or moderately or critically ill.

All the infants and children were observed for the complications during the invasive procedure and were routinely examined immediately, 1, 4-6, 24 and 48 hours after the procedure.

Detailed data on each invasive procedure were entered into the patient file. Partiuclar attention was paid to age, clinical status prior to catheterization, medications, site of entry of the catheter, type and size of the catheter, route of the catheter, and volume, rate, and site of injection of contrast medium. Final diagnosis was recorded after reviewing of all the noninvasive and invasive data. The nature, time of appearance, clinical outcome and therapy employed were described for each complication. Table 1 shows age distribution and clinical status of patients prior to catheterization.

was 11.2%. Table 2 shows major and minor complications. Percantage of all complications related to cardiac diagnosis is presented in Table 3.

Interventional procedures were performed in 37 infants and children which represented 9% of all the invasive investigations which represented a major increase in comparison with the retrograde study where only 1.5% of such procedures were performed. It was interesting to note that 32% of all complications occurred during the interventional procedures, and thus their rate was significantly higher than in diagnostic catheterizations ($P < 0.01$). If only complications in diagnostic procedures were examined their rate was e 7.5%.

Almost all complications related to the procedure itself occurred during the invasive investigation and the prolongation of observation to 48 hours did not increase the number of complications.

Table 1 – Age distribution and clinical status of patients

Age groups	Number of patients A	B	C	D	Total
< 1 week	3	10	1	0	14
1 week to 1 month	2	8	9	3	22
	2	8	9	3	22
1 month to 2 months	2	4	2	0	8
2 months to 4 months	6	8	2	0	16
4 month to 1 year	75	22	4	3	104
1 year to 4 years	99	10	0	0	109
4 years to 15 years	116	7	0	0	123
> 15 years	14	1	0	0	15
Total	317	70	18	6	411

A = asymptomatic, B = mildly ill, C = moderately ill, D = critically ill

For the sake of comparison, major and minor complications were divided in categories used by Stanger and associates (2), Cohn and associates (3), and in the retrospective study (1).

Chi – square test was used to test the difference between the age groups, high and low risk groups, and diagnostic and interventional catheterizations.

Results – Among 411 patients 40 suffered from 46 complications. Overall complication rate

Major complications – 60.9% of all complications. The rate of major complications was highest in the age group 1 week 1 month (Table 4). It dropped sharply after 4 months of age ($P < 0.01$). They were also more frequent in the high risk group ($P < 0.05$).

Death within 48 hours of catheterization occurred in 3 patients (0.73%). The first patient was an 11-month-old girl with complete form of atrioventricular septal defect and pulmonary hyper-

Table 2 – Major and minor complications

Major complications	Minor complications
1. Death within 48 hours – 3	1. Arrhythmias not requiring treatment or termination of catheterization – 9
2. Arrhythmias: any arrhythmia reguiring treatment or termination of catheterization – 18	a. Supraventricular tachycardia – 4
a. Cardiac standstill – 0	b. Sinus bradycardia – 3
b. Ventricular fibrilation – 1	c. 3 AV block – 2
c. Ventricular tachycardia – 0	2. Burst of Rashkind balloon catheter – 3
d. Supraventricular tachycardia – 4	3. Arterial problems – 1
e. Atrial fibrilation or flutter – 2	4. Allergic urticaria – 1
f. Sinus bradycardia – 7	5. Myocardial staining – 1
g. 2 AV block – 0	6. Bleeding without transfusion – 2
h. 3 AV block – 4	7. Burst of balloon during dilation of aortic recoarctation – 1
3. Profound hypotension – 0	
4. Arterial problems – 1	Total 18
5. Perforation of the heart or vessel – 1	
6. Catheter problems – 0	
7. Serious infection – 0	
8. Serious allergic reaction – 0	
9. Embolism – 0	
10. Cardiac complications	
a. Myocardial infarction – 0	
b. Pulmonary edema – 0	
c. Hypoxic spells requiring morphine, bicarbonate or oxygen – 1	
11. Serious bleeding – 3	
a. Surgical intervention – 1	
b. Transfusion – 2	
12. Pneumothorax – 0	
13. Other – 0	
a. Respiratory arrest – 1	
Total – 30	

2 AV = second degree atrioventricular block; 3 AV = third degree atrioventricular block

Table 3 – Major and minor complications

Age groups	Number of patients	% of major	% of minor
< 1 week	14	21.4	28.5
1 week to 1 month	22	40.9	4.5
1 month to 2 months	8	12.4	37.4
2 months to 4 months	16	18.6	6.3
4 months to 1 year	104	7.7	2.9
1 year to 4 years	109	0.9	2.7
4 years to 15 years	123	2.4	1.6
> 15 years	15	0.0	6.7

tension. At the time of catheterization the right iliac artery was perforated with the wire and dilator. Signs of hypovolemic shock developed due to bleeding which was confirmed by ultrasound examination of the abdomen. Surgical reconstruction of the iliac artery failed and the infant died 10 hours after catheterization. The second death occurred in a 1-month-old infant with transposition of the great arteries and pulmonary stenosis, who was referred to our hospital in critical condition. There were signs of heart failure and he was in severe acidosis prior to catheterization. During the attempt to pass Rashkind atrioseptostomy catheter into the left atrium complete atrioventricular block developed which reverted spontaneously into the sinus rhythm. The atrioseptostomy failed because the catheter could not be introduced into the left atrium. Surgical septectomy was planned but the child died 12 hours after the invasive procedure. This death was considered to be the consequence of the disease itself and of the failure to do Ras-

Table 4 – Percantage of complications and cardiac diagnosis

Diagnosis	Number of patients	%
Ventricular septal defect	70	4.2
Tetralogy of Fallot	53	11.3
Atrial septal defect	27	3.7
Coarctation of the aorta	26	15.3
Transposiltion of the great arteries	49	36.7
Patent ductus arteriosus	15	0.0
Pulmonary stenosis	21	0.9
Aortic stenosis	31	0.6
Univentricular heart	17	0.5
Atrioventricular septal defect	29	10.3
L-tranposition of the great arteries	5	0.0
Tricuspid atresia	10	1.0
Pulmonary atresia	5	0.0
Double outlet right ventrticle	12	0.8
Normal children	1	0.0
Postoperative catheterization	14	0.7
Aortopulmonary window	2	50.0
Total anomalous pulmonary drainage	4	25.0
Miscellaneous	20	0.5

hkind atrioseptostomy. The last death occurred in a 9-month-old infant 48 hours after the invasive procedure. The infant was in heart failure and had severe valvular aortic stenosis and mitral regurgitation. The death and the invasive procedure were probably not directly interconnected.

Perforation of the heart during an attempt of balloon valvuloplasty of critical pulmonary valvular stenosis in a 19-day-old infant was without serious consequence, and valvuloplasty was successfully accomplished a week later (4).

Hypoxic spell in an infant with tetralogy of Fallot resolved after administration of bicarbonate and morphine.

Serious bleeding from the femoral vein when cut down technique was used required blood transfusion in 2 infants with transposition of the great arteries.

A newborn infant 12 days of age with transposition of the great arteries and ventricular septal defect suffered from apnea immediately after intravenous injection of diazepam. He was intubated and ventilated and cardiac catheterization was than performed without further complications.

Arrhythmias were the most common complications (table 5) and they represented 58.6% of all complications. 75% of all arrhythmias occurred in infants, their number being significantly higher than in older children ($P < 0.01$). Therapy was necessary in 63% of arrhythmias and was always successful.

Minor complications – 39.1% – As in major complications, also here arrhythmias were encountered most frequently (table 5).

There was a loss of arterial pulsation for 6 hours in a 11-month-old girl weighing 7 kg after introduction of F5 pig-tail catheter into the right femoral vein.

Rupture of Rashking atrioseptostomy balloon catheter was noticed 3 times without embolization. In a 4-year-old boy with coarctation of the aorta the balloon of dilation catheter burst in a attempt of relieving the coarctation. The event entailed no consequences.

Two minor bleeding episodes from femoral vein cut down occurred not requiring blood transfusion.

Only one allergic reaction to contrast medium in the form of mild urticaria was noted.

Injection of contrast medium into the myocardium of the right ventricle with F6 NIH catheter in

Table 5 – Arrhythmias

Type	Number
Supraventricular tachycardia	8
Sinus bradycardia	10
Atrioventricular block 3 rd degrec	6
Atrial flutter	2
Ventricular fibrillation	1

a child with tetralogy of Fallot occurred and resolved after 5 minutes.

Discussion – At the time of this study the average number of catheterizations per year was f140 cases in comparison to 215 at the time of the retrospective study, which represented 35% reduction. This decrease was a consequence of the introduction of better echocardiographic equipment, and acceptance of some simple cases of congenital heart defects by a surgeon to operate on without prior invasive investigation. The complication rates of major and minor complications int his prospective study was hither than in the retrospective one ($P < 0.01$), but lower than in the report of Stanger and associates (1, 2). However, if only the rate of complications in diagnostic procedures were taken into account, their rates were comparable to the reports of others (2, 3, 5, 6). The reason for higher overall complication rates was thus a higher proportion of interventional procedures in the present study. This inctease could be ascribed the earlier referral of newborns with transposition of the great arteries for Rashkind atrioseptostomy, and the introduction of new techniques such as balloon pulmonary valvuloplasty, dilation of recoarctation of the aorta and Blalock-Taussig anastomosi, closure of Blalock-Taussig anastomosis and major aortopulmonary collateral arteries.

As in the retrospective study, higher rate was noted in high risk group. The arrhythmias again prevailed among the complications and they were more frequent in infants. The arrhythmias were quickly reverted to sinus rhythm by rather simple therapeutic interventions.

Three deaths occurred, but only one death with perforation of the external iliac artery could be attributed to the catheterization procedure itself. Both other infants died because of the severity of cardiac anomaly and the cases could be judged as pseudocomplications (7).

Conclusion – Complication rates of diagnostic catheterization procedures compare favorably with previous reports. However, the introduction of therapeutic procedures has increased the overall rate of complications. Standards for individual cathetrerization laboratory need to be continuously re-evaluated. The new procedures must be taken into account. The evaluation should focus on the type of procedure performed and the age and clinical status of patients.

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Izvleček

ZAPLETI SRČNE KATETERIZACIJE IN ANGIOKARDIOGRAFIJE PRI NOVOROJENČKIH, DOJENČKIH IN OTROCIH – PROSPEKTIVNA ŠTUDIJA

Pri 411 bolnikih smo opazovali pojav zapletov pri srčni kateterizaciji in angiokardiografiji s prospektivno študijo v času od 1. 1. 1987 do 30. 11. 1989. Opazovali smo jih 48 ur in zaplete vpisovali za vsakega otroka. Naleteli smo na 46 zapletov pri 40 otrocih. Vseh zapletov je bilo 11.2%. Če smo upoštevali le diagnostične kateterizacije je bilo zapletov 7.5%, kar se dobro sklada z drugimi študijami. Večjih zapletov je bilo več pri visoko rizični kot pri nizko rizični skupini ($P < 0.01$). Trije otroci so umrli (0.78%), vendar bi le eno smrt lahko neposredno pripisali sami kateterizaciji. Najpogostejši zapleti so bile aritmije (58.6% vseh zapletov). Nanje smo naleteli pogosteje pri dojenčkih kot pri večjih otrocih ($P < 0.01$).

Vsak kateterizacijski laboratorij naj bi stalno spremljal število zapletov, ker uvedba novih preiskav posebno še na področju intervencijskih kateterizacij, lahko poveča število zapletov. To lahko opozori zdravnika, da spremeni, izboljša ali celo opusti kakšno preiskavo.

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PERCUTANEOUS TRANSLUMINAL RENAL ANGIOPLASTY – A MULTICENTRE STUDY OF THE LONG TERM RESULTS

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Abstract – To assess the long-term clinical effect of percutaneous transluminal angioplasty of the renal artery (PTRA), patients with clinical examinations and laboratory tests performed before PTRA and within a minimum of 3 months following the investigation were considered eligible for inclusion. Patients with fibromuscular disease of the main and/or branch renal arteries were the most suitable candidates for PTRA, because two thirds of them showed a blood pressure benefit at 5-year follow up. These results are similar to those achieved in the group of patients with atheromatous disease. Authors discuss the clinical and laboratory characteristics and radiočlogic aspects of PTRA, the technical standard of the procedure, complications and number of redilatations.

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Introduction – Percutaneous renal angioplasty (PTRA) has become an established interventional method used in the treatment of renal artery stenosis. While in stenoses caused by fibromuscular dysplasia, it is the method of first choice, there has not been unanimity redgarding its superiority in cases of stenoses of atherosclerotic origin. Substantial improvement of renovascular hypertension following PTRA has been reported in fibromuscular stenoses rather than in atherosclerotic stenoses.

Doubtless, any further piece of experience, especially that gained in a large group of patinets followed up for a rather long period of time after PTRA, helps to build the body of hard evidence available. It was for this reason that we decided to conduct a multicentre study designed to assess retrospectively the long-term effect of PTRA on blood pressure in atherosclerotic, fibromuscular and other types of lesions, and to suggest whether the long-term effect can be predicted on the basis of the angiographic finding obtained immediately after PTRA.

Patients and methods – The project was joined by the following centres:

1. Department of Radiology; Institute for Clinical and Experimental Medicine (A. Belan), Prague, Czechoslovakia
2. All-Union Scientific Centre of Surgery; Academy of Medical Sciences (I. Kh. Rabkin), Moscow, Soviet Union
3. Institute of Rentgenology University Medical Center (D. Pavčnik), Ljubljana, Yugoslavia
4. Municipal Hospital Friedrichshein, Department of Cardiovascular Diagnosis (J. H. A. Muller), Berlin, German Democratic Republic
5. Clinic of Radiology (L. Horvath), Pecs, Hungary
6. Institute of Cardiovascular Surgery of A. N. Bakulev (I. Petrosyan), Moscow, Soviet Union

The study was coordinated by the Department of Radiology of the Institute for Clinical and Experimental medicine in Prague where a questionnaire for retrospective data collection was drawn and distributed to each participating centre. The questionnaire was to be filled for each patient undergoing PTRA before 31 December, 1987. The contribution of each centre to the basic group of patients is shown in Table 1.

Twenty-three patients after PTA of the renal graft artery were excluded from the study in order to be assesed separately. The remaining

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Table 1 – Contribution of each centre to the basic group

of the renal artery	No. of all pts after PTA entire group	Percentage of the of the renal graft artery	No. of pts after PTA
1. Prague	134	30.5	18
2. Moscow R.	118	26.9	1
3. Ljubljana	91	20.7	3
4. Berlin	34	7.7	1
5. Pecs	32	7.3	0
6. Moscow P.	30	6.8	0
Total	439		23

416 patients were divided into three groups by the etiology of the stenosis:

I. ATHERO (atherosclerosis), n = 261,
II. FMD (fibromuscular dysplasia), n = 109,
III. OTHERS (mostly vascular lesions in arteritis and other systemic diseases), n = 46.

In some cases, the etiology of stenosis was established by histological examination of the artery after its surgical reconstruction, nephrectomy, or at autopsy.

The clinical and laboratory characteristics of the patient group before PTRA are shown in Table 2.

Table 2 – Clinico-laboratory characteristics of the group of patients before PTRA

		I. ATHERO n = 261		II. FMD n = 109		III. OTHERS n = 46	
Mean age (years)		n = 260 50.4±7.5		n = 107 34.5±9.9		n = 45 32.7±11.3	
Sex male		196	75.1%	38	34.9%	28	60.9%
female		65	24.9%	71	65.1%	18	39.1%
Extrarenal manifestations of atherosclerosis		131	50%	10	10%	5	11%
Primary renal disease		38	14.5%	19	18%	7	15.5%
Systemic disease (incl. diabetes mellitus)		19	7%	2	2%	5	11%
WHO class of hypertension	I	27	10.8%	32	29.6%	15	32%
	II	192	77.1%	68	63%	29	64%
	III	30	12%	8	7.4%	2	4%
Plasma creatinine (umol/l)		n = 199 127.2±75.6 (40–764)		n = 94 91.8±26.0 (46–198)		n = 27 110.6±20.1 (88–190)	
Blood pressure (mmHg)	systole	n = 255 197±31		n = 108 182±30		n = 45 190±29	
	diastole	114±17		113±15		114±16	
	mean	142±20		136±19		140±18	
Antihypertensive therapy							
– none		11	4.4%	4	3.8%	5	11.1%
– 1–3 hypotensives		202	80.8%	92	86.8%	36	80.0%
– > 3 hypotensives		37	14.8%	10	9.4%	4	8.9%
Indications for PIRA							
– hypertension		223	87.7%	99	94.3%	41	89.1%
– hypertension with deteriorated function		31	12.2%	6	5.7%	5	10.9%

As expected, the mean age was markedly higher in Group I (ATHERO), with men prevailing and extrarenal complications (ischemic heart disease, atherosclerosis of the lower extremities, stroke) present more often than in the other groups. In Group II (FMD), women prevailed and the mean age was lower. There was no difference between the groups as to other parameters (presence of primary renal disease, systemic disease, WHO classification of hypertension, plasma creatinine level, blood pressure before PTRA and the number of hypotensive drugs used). The higher incidence of systemic diseases in Group I was due to the more frequent incidence of diabetes.

The radiologic characteristics are given in Table 3.

Complications requiring surgery were found in 12 patients. Nephrectomy had to be performed in three cases and aortorenal bypass in nine.

The angiographic finding of the renal artery immediately after PTA was assessed as »normalized« in disappeared stenoses, »improved« in cases of stenoses smaller than before the procedure, and »not improved« in persisting stenoses of the same extent.

From the basic group (n = 416), a total of 154 patients (37%) undergoing successful PTRA without redilatation, with clinical examination and laboratory tests done before PTRA and followed up for a minimum of 90 days since dilatation, were selected to evaluate the effect of PTRA on blood pressure and renal function.

The following criteria were chosen:

Table 3 – Radiologic characteristics of the group

	I. ATHERO n = 261		II. FMD n = 109		III. OTHERS n = 46	
Side of stenosis						
* right	90	34.4	61	55.9	22	47.8
* left	125	47.9	37	33.9	12	26.1
* right + left	46	17.6	11	10.1	12	26.1
Number of dilated arteries one	207	79.6	96	89.7	32	69.6
two	50	19.2	10	9.3	14	30.4
three	3	1.2	1	1.0	0	
Technical failure	16	6.1	9	8.2	10	21.7
Complications of PTRA	23	8.8	17	15.6	5	10.9
Angiographic finding after PTRA						
* normalization	127	48.8	42	38.5	21	46.7
* improved	119	45.8	56	51.4	18	40.0
* unchanged	14	5.4	11	10.1	6	13.3
Number of redilations	27	10.3	12	11.0	1	2.2

Patients in Groups I and III showed more frequent bilateral stenosis. The number of dilated arteries in the ATHERO and OTHERS groups is likewise higher than in that with FMD stenoses. In atherosclerotic stenoses neither information on the type of stenosis nor records on the angiographic finding of the peripheral arterial bed are available.

Post-PTRA complications, regardless the etiology of stenosis, were observed in 10.8% of patients. Half of them were minor complications, i.e., renal artery spasm, and complications at the puncture site, with the remaining 50% of complications made up by dissections, embolization, perforation or rupture of the artery, occllusions and an immediate decrease in renal function.

Renal function was regarded as unchanged if plasma creatinine level had been within normal limits (i.e., up to 125 umol/l) also before PTRA, or when the change, in patients with initial levels over 125 umol/l, did not exceed 20% of the initial value after PTRA. Our definition of functional deterioration included cases with normal ilnitial creatinine levels and follow-up levels exceeding 125 umol/l, or a rise from values over 125 umol/l by more than 20%. An improvement in function was registered if creatinine decreased from levels over 125 umol/l to below 125 umol/l, or by more than 20% from levels initially higher than 125 umol/l.

Blood pressure was considered normal if the value of systolic pressure was lower than 165

mmHg, that of diastolic pressure lower than 95 mmHg, and the value of mean pressure below 110 mmHg. Our definition of improvement was a decrease of elevated values to normal level, or a decrease of elevated values by at least 15% of the initial value.

Results – The values of plasma creatinine and blood pressure before and after a minimum of 90 days following PTRA in our group of 154 patients are shown in Table 4.

Changes in renal function before and after PTRA were assessed by changes in plasma creatinine levels. In Group I (ATHERO) improvement and deterioration were noted in five cases each. There was no change in the remaining patients. Improvement and deterioration were observed in one case each in Group II (FMD)

Table 4 – Plasma creatinine and blood pressure values in a group of 154 patients examined before PTRA and after a minimum od 90 days later

	I. ATHERO n = 97		II. FMD n = 44		III. OTHERS n = 13	
	before	after	before	after	before	after
	n = 64	53	n = 39	35	n = 6	6
Plasma creatinine	121.9	123.3	93.9	91.8	129.1	106.2
(umol/l)	± 52.8	62.9	27.1	25.5	35.0	14.2
Blood pressure	n = 94		n = 44		n = 11	
systole	190.6	151.6	177.8	143.7	177.7	136.1
	± 33.4	19.8	33.9	15.6	38.3	41.4
diastole	110.1	93.3	108.9	91.7	107.5	92.7
	± 16.4	10.1	15.5	9.3	16.0	14.9
mean	136.9	113.0	131.9	109.0	133.0	110.6
	± 20.7	12.0	20.6	10.4	20.2	21.4

Table 5

1. Follow–up > months after PTRA (n = 149)

Mean BP	ATHERO		FMD		OTHERS		TOTAL	
	n	%	n	%	n	%	n	%
Improved	67	71.3	28	63.6	9	81.8	104	67.8
Not improved	27	27.7	16	36.4	2	18.2	45	30.2
Total	94		44		11		149	

2. Follow up > 12 months after PTRA (n = 99)

Mean BP	ATHERO		FMD		OTHERS		TOTAL	
	n	%	n	%	n	%	n	%
Improved	51	75.0	13	52.0	6	100.0	70	70.1
Not improved	17	25.0	12	48.0	0	0	29	29.3
Total	68		25		6		99	

3. Followûp > months after PTRA (n = 66)

Mean BP	ATHERO		FMD		OTHERS		TOTAL	
	n	%	n	%	n	%	n	%
Improved	30	69.8	9	53.0	6	100.0	45	68.2
Not improved	13	30.2	8	47.0	0	0	21	31.8
Total	43		17		6		66	

4. Followûp > 60 months after PTRA (n = 23)

Mean BP	ATHERO		FMD		OTHERS		TOTAL	
	n	%	n	%	n	%	n	%
Improved	14	82.4	3	75.0	2	100.0	19	82.6
Not improved	3	17.6	1	25.0	0	0	4	17.4
Total	17		4		2		23	

patients. Since plasma creatinine was determined in six patients of Group III (OTHERS) only, the changes were not assessed.

The long-term effect of PTRA on blood pressure was evaluated at three months (n = 149), at 12 months (n = 99), at 24 months (n= 66) and at 60 months (n = 23). The mean follow-up period (n = 154) was 31 ± 26.8 months (range, 3.3 – 92.8 months). Improvement of mean blood pressure is shown in Table 5.

The cumulative curves of improvement of blood pressure after PTRA according to the etiology of stenosis do not differ statistically over a five-year follow-up period (Fig. 1).

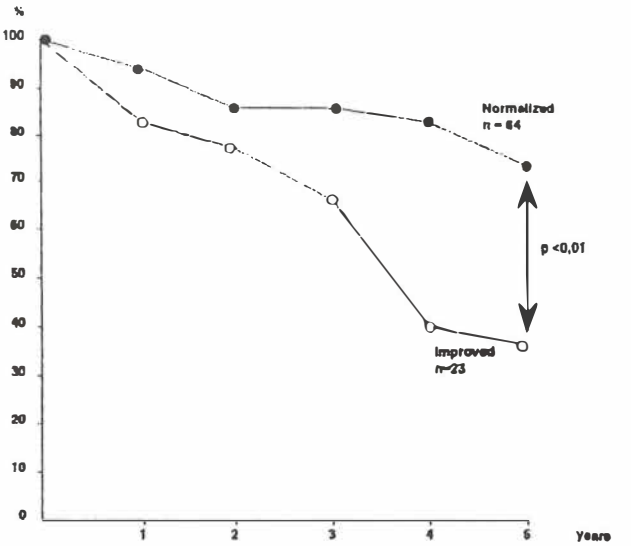

Fig. 1 – The cumulative curves of improvement of blood pressure after PTRA according to the etiology of the stenosis.

Three and more months after PTRA, mean blood pressure was improved in 104 patients (67.8%). The proportion of »improvement« in each group by the etiology of stenosis is shown in Table 6.

Both in the ATHERO and FMD groups, while the mean pressure of most patients was within normal values, they had to continue receiving hypotensives. The difference was Group II which comprised a substantially higher proportion of

Table 6 – Improvement of hypertension after PTRA

Blood pressure improvement > months after PTRA	ATHERO n = 67		FMD n = 28		OTHERS n = 9	
Improvement but mean BP > 110 mmHg thereafter	23	34.3%	3	10.7%	2	22.2%
Mean BP > mmHg with hypotensives	29	43.3%	14	50.0%	3	33.3%
Mean BP > 110 mmHg without hypotensives	15	22.4%	11	39.3%	4	44.5%

normotensives not taking hypotensive drugs (39.3% vs. 22.4%) and, on the contrary, the percentage of those remaining hypertensive following PTRA was considerably lower (10.7% vs. 34.3%). Group III could not be evaluated because of the small number of followed patients.

Comparison of patients who, while not taking hypotensive drugs, were normotensive at three months after PTRA (n = 30) with other patients on follow-up (n = 124) revealed that all the former had significantly lower mean blood pressure before PTRA (127 ± 10 vs. 137 ± 22 mmHG), and the WHO classification of their hypertension was likewise lower (Stage I hypertension in 57%, Stage III hypertension in 0%).

The therapeutic protocol in patients whose pressure remained unchanged three months after PTRA (n = 45, i.e., 30.2%) did not differ before and after PTRA, i. e., they received the same number of hypotensive drugs.

The correlation between the post – PTRA angiographic finding and the effect of the procedure is shown in Table 7. The options listed in the questionnaire regarding the post – PTRA angiographic finding on the renal artery comprised »normalized«, »improved« and »unchanged«.

The number of patinets with prolonged blood pressure improvement is substantially higher in the group with a »normalized« angiographic finding than in the group whose finding was »improved« only. The group with an »unchanged« angiographic finding was not evaluated owing to the small number of patients.

The cumulative curves of blood pressure improvement according to the post – PTRA angiographic finding of the artery irrespective of the etiology is shown in Fig. 2. The difference in the effect on blood pressure in normalized vs. improved findings is statistically significant.

Table 7

1. Follow–up at ≤ 3 months after PTRA (n = 149)

	Angiographic finding on the reanl artery after PTRA					
	Normalized		Improved		Not improved	
	n = 64	43.0%	n = 83	55.7%	n = 1	0.7%
Mean BP improved	54	84.5	49	59.0	1	50.0
Mean BP not improved	10	15.5	34	41.0	1	50.0

2. Follow-up at > 12 months after PTRA (n = 99)

	Angiographic finding on the renal artery after PTRA					
	Normalized		Improved		Not improved	
	n =42	42.4%	n = 56	56.6%	n = 1	1.0%
Mean BP improved	35	83.5	34	60.7	1	100.0
Mean BP not improved	7	16.5	22	39.3	0	0.0

3. Follow-up at > 24 months after PTRA (n = 66)

	Angiographic finding on the renal artery after PTRA					
	Normalized		Improved		Not improved	
	n = 27	40.9%	n = 38	57.6%	n = 1	1.5%
Mean BP improved	23	85.2	21	55.3	1	100.0
Mean BP not improved	4	14.8	17	44.7	0	0.8

4. Follow-up at > 60 months after PTRA (n = 23)

	Angiographic finding on the renal artery after PTRA					
	Normalized		Improved		Not improved	
	n = 14	60.9%	n = 8	34.8%	n = 1	23.0%
Mean BP improved	13	92.9	5	62.5	1	100.0
Mean BP not improved	1	7.1	3	37.5	0	0.0

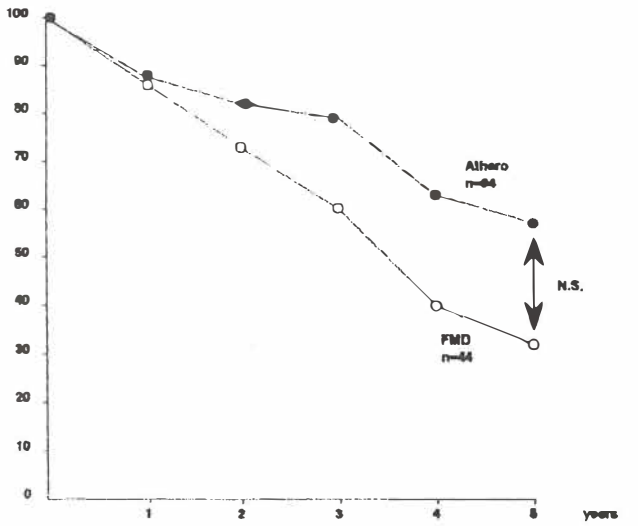

Fig. 2 – Cumulative curves of blood pressure improvement according to post–PTRA angiographe finding of the artery.

The long-term effect of redilatations could not be assessed in our group. Out of a total of 40 redilatation procedures, no data on blood pressure are available in 19 procedures and technical failures, i.e. renal graft recipient or an extremely short follow-up period, were involved in eight more cases. Of the remaining 13 redilatation procedures assessed at 3 months since the intervention, blood pressure was improved in six patients (all to normotension, one without the need for hypotensive drugs), and remained unaltered in seven subjects.

Discussion – Retrospective evaluation of PTRA and its long-term effect, especially if designed as a multicentric study, usually involves some pitfalls. The participating centres have different criteria for patient selection, a different technique of the procedure, assessment of complications and different regimens and methods of subsequent treatment and follow-up.

Regarding the clinical characteristics of our group (Table 2), we believe it is consistent with those reported in recent literature (1-7,8). Some data important for the evalulation of the long-term effect of PTRA, e.g., duration of hypertension before radiological procedure, more detailed specification and comparison of hypotensive therapy before and after PTRA, etc., are also missing in our case. It is a pity that as little as 37% of patients remained on long-term follow-up.

Radiological determination of the etiology of the stenosis may be likewise difficult. Considering the fact that the patient group was set up over a period of several years in six centres, it could not be assumed that the technique of PTRA in all patients was identical. That is why the initial success rate, which, in turn, as shown later, may play a major role in the evaluation of the long-term success rate, could not be analysed (1, 9). If we compare the initial success rate of PTRA (regardless the etiology) in our group with the summary published recently by Becker et al. (10), our group shows a very good initial technical success rate. Also the number of complications (approx. 10%), half of which represents minor complications, is consistent with data reported by other authors (3, 11, 12).

The indication for PTRA was hypertension in most of the patients enrolled into our study. Only a small proportion of Group I (ATHERO) patients (n = 31, i.e., 12.2%) and six patients (57%) in Group II (FMD) were considered for PTRA because of impaired renal function. One could not make any authoritative conclusions as to whether the cause of decreased renal function was invariably renal artery stenosis alone, or whether other factors were also involved (13). Moreover, the levels of plasma cratinine at the required intervals were not always available in this small

group either. The mean values of plasma creatinine before PTRA and at three months after PTRA were within normal limits in all three groups and did not change during follow-up.

Today, there is no doubt that PTRA has become an established technique for the treatment of renovascular hypertension and its results are comparable with those of surgical treatment (8, 14, 15, 16). The technique of PTRA and technology are being constantly refined (1, 17). Long term improvement of blood pressure and the percentage of cured patients (normotensives not requiring hypotensive therapy) are reportedly higher in Group II (FMD) (2-4, 6, 7, 8, 12, 14) than in group I (ATHERO). Significant imrpovement of systolic, diastolic and mean pressure after PTRA irrespective of the etiology of stenosis was found in 68% of our patients on long-term follow-up. Provided our criterion of clinical effect was a 15% decrease in mean blood pressure, or a decrease in mean blood pressure below 110 mmHg, the percentage of improved patients was higher in Group I (ATHERO), but the cumulative curves of improvement did not differ statistically (Table 5, Graph 1). However, the number of Group II (FMD) patients with pressure normalization was twice as high as that in Group I and, compared with Group I (ATHERO), only a third of FMD and, compared with Group I (ATHERO), only a third of FMD patients remained hypertensive, even though improved if assessed by our criteria (Table 6). We are not the first to make such an observation. Kuhlman et. al. (5) reported improvement in blood pressure at 21.6 months after PTRA in 48% of patients with atherosclerotic stenosis, and in as little as 32% of patients with fibromuscular stenosis, even though the percentage of normalized patients was higher in the FMD than in the ATHERO group (50.0 vs. 29.0%). It is implied that the etiology of stenosis, as established by angiography, is not neccessarily the basic factor determining the long-term effect of PTRA. Moreover, we are unable to make any conclusions regarding the duration of hypertension before PTRA, nor any other factors that might possibly play a major role. The results of our multicentric study in the ATHERO group were primarily attributable to the extremely good data obtained from the centres headed by Prof. Rabkin from Moscow and Dr. Horvat from Pecs.

The angiographic finding after PTRA has turned out to be a significant factor for the prediction of the long-term clinical effect of the procedure. Whereas in the case without residual stenosis (and a pressure gradient no longer persisted) the finding was assessed as »normalized«, patients with residual stenoses and residual pressure gradient were considered »improved«. Regardless the etiology of stenosis, the group with a »normalized« finding of the renal artery showed an effect »improved« finding, and the effect persisted for a long period of time (Table 7). The cumulative curve of blood pressure improvement is significantly better in the group of »normalized« stenoses (Fig. 2). Since no angiographic follow-up in patients after PTRA has been performed, we are unable to provide data on the incidence of restenoses neither can we assess the potential value of subsequent antiaggregation or anticoagulation therapy.

PTRA is an effective method for the treatment of renovascular hypertension. It is associated with a high technical success rate and a low rate of serious complications.

While, almost as a rule, the improvement of blood pressure in atherosclerotic stenoses is only partial and it is usually necessary to continue hypotensive therapy, in fibromuscular stenoses, normotension is rather often attained without further drug administration. A decrease in blood pressure found at three months after PTRA suggests permanent improvement in most cases.

The etiology of the stenosis, as established by angiography is not necessarily the main factor determining the long-term clinical effect. Another important predictor of long-term improvement seems to be the angiographic finding of the renal artery immediately after angioplasty.

Povzetek

MULTICENTIRIČNA ŠTUDIJA PERKUTANE TRANSLUMINALNE ANGIOPLASTIKE

Da bi ovrednotili dolgotrajne klinične učinke PTA renalnih arterij, smo pri bolnikih opravili klinični pregled in laboratorijske preiskave pred PTA in tekom (najmanj) treh mesecev po posegu. Najprimernejši bolniki za PTRA so tisti s fibromuskularno boleznijo glavne in katere od vej renalne arterije, saj je bil pri dveh tretjinah bolnikov, 5 let po posegu, učinek na krvni pritisk dober. Podobno velja tudi za bolnike z arteriosklerotično zožitvijo renalne arterije kot tudi za radiološke vidike PTA, tehnične standarde posega, komplikacije ter število ponovnih dilatacij.

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SELF EXPANDING METALLIC STENTS

Pavčnik D, Šurlan M

Abstract – Between September and December 1989 four patients with stenosis of the tracheobronchial tree and obstruction of vena cava superior were treated with self expanding metallic stent. Stents were successfully placed in each patient.
Alle are clasified as cured. For venography before and after stent placement Iohexol 350 was used.

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Key words: tracheal stenosis, superior vena cava syndrome, metallic stents

Case report

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Introduction – In 1969, Charles Dotter first publiched data demonstrating long term patency of intravascular stents in dogs (1, 2). Since Dotter's initial success, others have reported long term patency without significant luminal narrowing in a variety of stents placed in several tubular structures (3, 4, 5, 6, 8, 9, 10, 11, 12). In our patients we used the expandable metallic stent created by one of the pioneers of Interventional Radiology, Cesare Gianturco. His devices have been responsible for opening the door to Interventional Radiology. Among his inventions are the embolic coils, the self–expanding stainless steel stents, the bird's nest vena cava filters, the U-inverted-U balloon assisted stents, patent ductus occluders and septal defect occluders.

Materials and methods – In three patients with stenosis of the tracheobronchial tree and in one patients with vena cava superior (VCS) obstruction due to sarcoidosis Gianturco stents were placed. The procedure was performed percutaneously in patients with vena cava superior obstruction and transendoscopically in other patients. In all four cases stenosis was first dilated with a PTA balloon catheter to allow passage of the guiding sheath. The stents opened the stricture segment in all cases.

The expandable metallic stent is constructed of stainless steel wire bent in a zig-zag pattern and encircled to form a cylilnder (5). The stent is compressed and introduced through a Teflon catheter of 10-12 F caliber. The stent is advanced until it reaches the tip of the catheter by using a pusher catheter. It is released from the catheter by withdrawing the catheter while holding the pusher catheter against the stent. Upon release, the stent expands or attempts to expand to its original diameter creating the expansile force to allow the expansion of the vessel against the extrinsic, stenotic force (12).

Results – Clinical trials of the Gianturco expandable metallic stent have been conducted also in our institution in Ljubljana. The stent has been evaluated in the tracheobronchial tree and vena cava. To date, the stents opened stenosis in all cases and after at least 3 months, they have remained patent without migration or other complications.

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Case report (1) – A 41-year old patient developed superior vena cava obstruction secondary to compression by fibrosis due to sarcoidosis. Clinical findings were facial swelling, distention of the veins of the neck and headache. On phlebography, a contrast medium (Iohexol 350) injection into the vena cava superior led to immediate filling of the vena azygos with reversed flow direction. Flebogram showed the superior vena cava obstruction (Fig. 1). The procedure

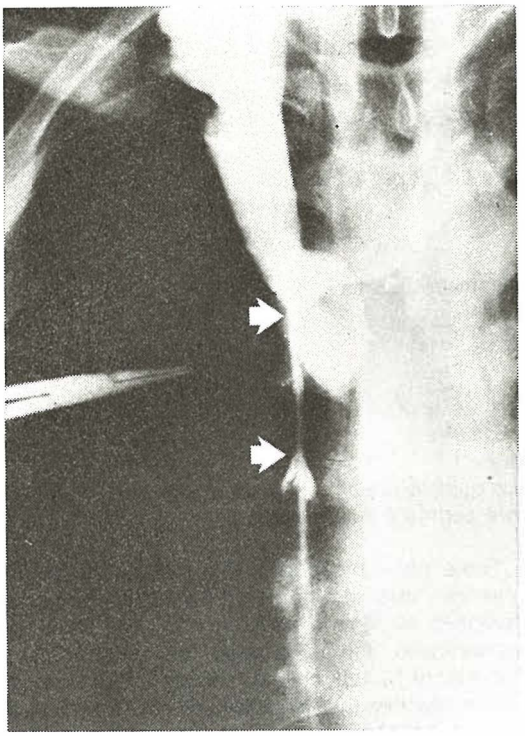

Fig. 1 – Vena cava superior obstruction (arrows)

was performed percutaneously through the right femoral vein. First an introducer sheath was inserted into the femoral vein. For crosing the tight stenosis of vena cava superior we used 0,035 inch. movable core straight guidewire and straight 5 F catheter. Once the diagnostic catheter had crossed the obstruction, the catheter was exchanged for dilatation balloon catheter (6 mm diameter).

Before PTA, 5000 units of Heparin was injected through the sheath side arm. After PTA, the balloon catheter was wtihdrawn while the guidewire was kept in place. Then a longer 20 mm balloon was introduced, and after the second inflation the result was satisfactory. A double stent was placed (Fig. 2) and immediate clinical

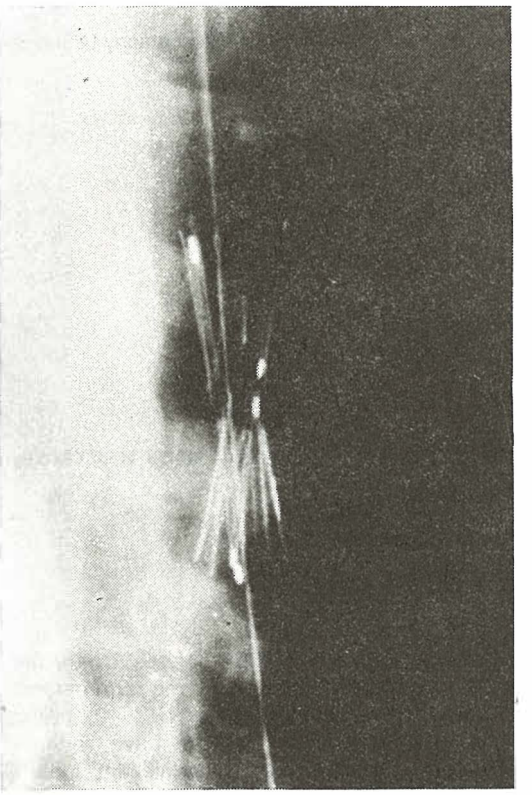

Fig. 2 – Double self expandable stent in vena cava superior

improvement was accomplished. Aspirin and persantine have been given for three months. To date, stent provides good patency of VCS (Fig. 3).

Case report (2) – A 58-year old patient developed stenosios of the right bronchus which resulted from fibrosis due to surgery. To overcome this problem we used PTA balloon catheter and two self-expanding stents. This patient has been followed for 4 months. Follow up exams indicate that stents conform to the luminal surface, are stable, and remain patent. The patient is asymptomatic and this indicates that stent can effectively dilate the bronchus.

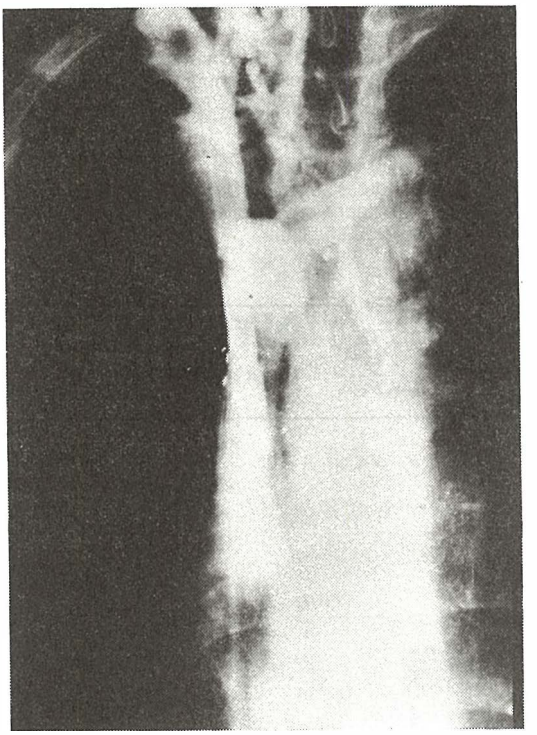

Fig. 3 – Patent stent in vena cava superior

Disscusion – Gianturco self expandable metallic stent has been evaluated in several tubular structures including the arteries and aorta (12), the veins and vena cava, the tracheobranchial tree (11), the bile ducts (5), and the ureter (4). In the blood vessels, local expansion with neointimal proliferation covering the stents was observed. The stent was incorporated in the wall of the blood vessel. In stenotic veins and vena cava, the stents dilated the vessels and decreased the pressure gradient across the stenoses (3). The stent was also placed in the intrahepatic segment of the vena cava inferior in a patient with Budd-Chiarri syndrome (4). When placed in the tracheobronchial three the stent created focal dilatation and inflammation with mucosal secretion covering the stent. There was no obstruction or peforation of the trachea (11).

Percutaneous biliar drainage is the usual form of biliary decompression in patients with obstructive jaundice secondary to neoplastic involvement of the bile ducts. However, there are many comlications associated with currently used decompression techniques. Catheter drainage system whether external or internal-external may migrate, be associated with infection, or become blocked. The use of indwelling endoprosthesis has not overcome all the problems, and removal of malfunctioning prostheses may be impossible.

Self expandable stents placed in common bile duct opened the strictured segment and remained patent without migration or other complications up to one year (4, 5).

Placement of the stent in the ureter resulted in mucosol proliferation which caused obstruction of the ureter in some cases.

Conclusion – Interventional radiology has provided a promising nonsurgical treatment of vascular and bronchotracheal strictures with Gianturco self expandable metallic stents. The work of many investigators (3, 5, 6, 11, 12) as well as our own results demonstrate that these newly developed self expandable stents will improve the treatment of strictures in several tubular structures.

Povzetek

SAMORAZTEGLJIVE KOVINSKE PROTEZE

V času od septembra do decembra 1989 smo zdravili štiri bolnike, ki so imeli zožitev traheobronhialnega vejevja in obstrukcijo vene cave sup, s samoraztegljivim kovinskim stentom. Pri vseh bolnikih je bila vstavitev uspešna.

Vse bolnike smo opredelili kot ozdravljene. pri venografiji, opravljeni pred in po vstavitvi stenta smo uporabili Iohexol 350.

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TSH RECEPTOR ANTIBODIES IN FOLLOW-UP OF PATIENTS WITH GRAVES' DISEASE DURING ANTITHYROID DRUG THERAPY

Đaković N, Kusić Z, Lukinac Lj, Lukač J, Nöthig-Hus D, Labar Ž, Smičiklas-Franić N, Spaventi Š

Abstract: In serum of 35 patients, suffering from Graves'disease, TSH receptor autoantibodies (THYBIA assay) were measured during Methimazole (mercapto – 2 – methil – imidasol) therapy. In the group of hyperthyroid patients TSH receptors antibodies were positive (F > 15%) in 27 out of 35 (77%) patients. Out of 27 patients with positive tests who became euthyroid during therapy 24 (89%) of them became THYBIA assay negative. Our results suggest that measurement of antibodies to TSH receptor could be useful parametar in follow-up of patients with Graves'disease during antithyroid drug therapy.

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Key words: Graves' disease-drug therapy, methimazole, receptors thyrotropin

Orig sci paper

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Introduction – In Graves'disease, a control of thyroid function by the feedback control system breaks down due to the formation of autoantibodies to the TSH RECEPTOR (TRAb – TSH receptor antibodies) (7). The binding of these autoantibodies with an antigen of the thyroid cell membrane (TSH receptor) causes an uncontrolled stimulation of thyroid hormone synthesis. TSH receptor assay studes indicate that TRAb are essentially found only in the serum of patients with Graves' disease and a proportion of patients with hypothyroidism due to autoimmune thyroidits (4, 6).

The aim of the study was to evaluate the clinical significance of determination of TSH receptor antibodies in patients with graves' disease, during the antithyroid drug therapy.

Materials and methods – In serum of 35 patients, suffering from Grave's disease, TSH receptor autoantibodies were measured by usnig THYBIA assay (Byk Sangtec Diagnostica). The investigation was carried out during therapy with Methymazole (Favistan; mercapto – 2 – methil – imidasol). TSH receptor antibodies were measured twice: when the patients were hyperthyroid (prior or during Methimazole therapy) and after one to six months, when the patients became euthyroid (during or after Methimazole therapy).

Results – In the group of hyperthyroid patients TSH receptor antibodies were positive (F > 15%) in 27 out of 35 (77%) (Table 1).

Table 1 – Follow-up of TSH receptor antibodies during antithyroid drug therapy (N = 35).

HORMONES	TSH RECEPTOR ANTIBODIES					
	POSITIVE		NEGATIVE		TOTAL	
	n	%	n	%	n	%
INCREASED	27	77	8	23	35	100
NORMAL	3	11	24	89	27	100

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Out of 27 patients with positive tests who became euthyroid during therapy 24 (89%) of them became THYBIA assay negative. In three patinets with several measurements the euthyroid condition was achiaved one to two months before antibodies became negative.

Although in three patients antibodies remained postive, despite euthyroid condition, the titers decreased significantly.

Two patinets with a very high titers had severe clinical course of disease, so that radioiodine and surgical treatment was necessary.

In one patient with several measurements, thyroid hormones concetrations correlated with levels of antibodies titres.

Discussion – In patients suffering from clinically overt and untreated Grave's disease, TSH receptor antibodies values were found ellevated in about 80% of all cases. During antithyroid drug therapy the number of positive titers decreased. The level of thyroid hormones in our study correlated with the TSH receptor antibodies titres in most cases. This observation is in support of the results reported by Paunković et al. (5).

Our patients with very high titers in untreated thyrotoxicosis had a very severe course of disease indicating the early need for ablative therapy. This is in agreement with observations of other authors (1, 3). Budihna and Pavlin also found that patients with constantly increased titres of antibodies during antithyroid drug therapy had a more severe form of hyperthyroidism (2, 3).

Our results suggest that measurement of antibodies to the TSH receptor could be useful parametar in the follow-up of patients with Grave's disease during antithyroid drug therapy.

Sažetak

ANTITIJELA TSH RECEPTORA U PRAĆENJU LIJEČENJA BOLESNIKA S GRAVESOVOM BOLESTI

Određivana su antitijela TSH receptora (Thybia assay) u 35 bolesnika s Gravesovom bolesti tokom liječenja Favistanom (mercapto – 2 – methil – imidasol). Antitijela TSH receptora bila su povišena (F > 15%) u 27 od 35 (77%) bolesnika s povišenim hormonima štitnjače. Od 27 bolesnika u kojih su se hormoni tokom liječenja normalizirali u 24 (89%) je došlo i do normalizacije antitijela TSH receptora. Dobiveni rezultati ukazuju da određivanje antitijela TSH receptora može poslužiti kao parametar u praćenju bolesnika s Gravesovom bolesti tokom tireostatske terapije.

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SKELETNE PROMENE U POREMEĆAJIMA ŠTITATSTE ŽLEZDE
SKELETAL CHANGES IN THYROID DISORDERS

Babić Lj, Ćurić N, Segedi B, Đilas Lj

Abstract – To investigate the pathogenesis of metabolic bone disease in thyroid disorders, we determined values of PTH, bone GLA-protein (BGP), Ca, P, AP, hydroxyproline (Hy-p) along with morphofunctional (scintigraphic) and morphologic studies (bone mineral content) in patients with different thyroid diseases.
Our findings sugest that in hyperthyroidism increased bone resorption and bone formation exists due to high level of thyroid hormones. Increased bone turnover was evaluated with whole body scintigraphic study. Bone mineral content decreased in some of the hyperthyroid patients, in some it was unchanged compared with euthyroid, because of the new balance between resorption and bone formation at the »higher« level.

UDC: 616.441-06:616.71-007.15

Key words: thyroid diseases, bone diseases, metabolic

Orig sci paper

Radiol Iugosl 1990; 24: 153-7.

Uvod – U održavanju homeostaze kosti sem tri osnovna kalcitropna hormona (PTH, D hormon i kalcitonin) učestvuju i brojni drugi sistemski hormoni i lokalni činioci rasta čije međusobno sadejstvo rezultuje krajnjim efektom na metabolizam kosti (1, 2, 3). Iako su efekti tireoidnih hormona na metabolizam kosti uočeni klinički i laboratorijski već duži period vremena, tačan mehanizam delovanja nije još uvek u potpunosti razjašnjen; ostvaruju li oni svoj uticaj direktno ili posredstvom PTH koji je glavni regulatorni činilac homeostaze kosti (4, 5, 6, 7, 8, 9). Savremene dijagnostičke procedure, metaboličke studije pomoću radioaktivnog kalcijuma, izučavanje metabolizma kolagena, otkrivanje novih pokazatelja osteoblastne aktivnosti (10, 11, 12, 13, 14) verifikacija distribucije kostne lezije scintigrafijom skeleta celog tela (15, 16, 17) i egzaktno određivanje mineralne mase kosti (18, 19, 20) omogućile su i egzaktniju evalulaciju promena metabolizma kosti u različitim poremećajima.

Cilj rada je da se istovremenim praćenjem hormonskih, biohemijskih pokazatelja metabolizma kosti i morfofunkcijskim i morfološkim ispitivanjima skeleta u različitim poremećajima štitaste šlezde utvrdi mehanizam delovanja tireoidnih hormona na metabolizam kosti, međusobne odnose tireoidnih hormona i PTH, te patofiziološka zbivanja na nivou kosti.

Materijal i metode – Obrađena je grupa od 59 bolesnika sa različiti poremećajima štitaste žlezde. Svi bolesnici su detaljno klinički i laboratorijski obrađeni; određivane su vrednosti tireoidnih hormona T_3T_4 i tirotropina (TSH IRMA) u bazalnim uslovima ili u toku RTH testa. Od pokazatelja relevantnih za metabolizam kosti praćene su vrednosti parathormona (PTH), osteokalcina (BGP), kalcija (Ca), fosforja (P), alkalna fosfataza (AP), hidroksiprolina (Hy-p). Vrednosti hormona određivane su radioimunološkim postupkom primenom gotovih pribora firmi »INEP« (T_3, T_4), »Hoechst« (PTH, TSH IRMA), »CIS« (osteokalcin). Biohemijski pokazatelji određivani su standardnim biohemijskim procedurama.

Scintigrafija skeleta celog tela rađena je na gama kameri uz primenu računara PDP 11, 2 h nakon davanja »Teceos« 99 Tc. Na ciljanim snimcima lumbalne kičme, karlice, butnih kostiju u odgovarajućim regijama od interesa izračunavan je odnos aktiviteta kost/meko tkivo. Regije od interesa (ROI) postavljane su: u lumbalnoj kičmi od L2–L4, za osnovnu aktivnost paralum-

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balno levo da se izbegnu bubrezi, za sakroilijačne zglobove u PA poziciji uz isti bekgraund (BG) kao za kičmu, za zglobove kuka u AP poziciji, a ROI za BG lateralno levo i desno uz zglobove, za butne kosti ROI je uziman u donjoj trećini butnih kostiju, a BG unutrašnja strana donje trećine butine obostrano.

Mineralni denzitet lumbalne kičme (BMD) određivan je dvostrukom fotonskom apsorpciometrijom primenom aparata BMC Lab 23 (SCAN DETECRONIC) i izražavan kao srednja vrednost od L2, L3 i L4 kičmena pršljena.

Statistička obrada podataka uključila je izračunavanje srednjih vrednosti i SD merenih pokazatelja. Značajnost razlika srednjih vrednosti izračunavana je primenom Student-ovog t testa za nejednak i neparan broj uzoraka.

Rezultati rada – Rezultati rada prikazani su na tabelama 1, 2 i 3 i slici br. 1. Utvrđena je značajna razlika vrednosti PTH između hiper u odnosu na eu- i hipotireoidne bolesnike ($p < 0,05$). Vrednosti specifičnog pokazatelja osteoblastne aktivnosti, BGP bile su značajno više u hipertireoidnih osoba u odnosu na eu- i hipotireoidne (sve $p < 0,01$), a značajna razlika postojala je u vrednosti ovog pokazatelja u hipotireoidnih u odnosu na eu- i lečene hipotireoidne bolesnike ($U < 0,05$). Značajne razlike u vrednostima alkalne fosfataze nađene između eu-hiper i hipotireoidnih osoba ($p < 0,01$ i $< 0,05$). Vrednosti hidroksiprolina određivane su samo u hipertireoidnih osoba i bile su značajno više u odnosu na normalne ($80,5 \pm 20,2$ umol/m^2/d, $p < 0,05$). Nije nađena značajna razlika srednjih vrednosti Ca u ispitivanim grupama, dok je ona bila značajna između srednjih vrednosti P u hiper-eu-i hipotireoidnih bolesnika.

Nađena je značajna korelacija vrednosti tireoidnih hormona sa BGP (T4/BGP, T3/BGP $p < 0,05$) u hipertireoidnih bolesnika, kao i značajna korelacija BGP/Hy p ($< 0,05$) i BGP/AP ($p < 0,01$), BGP/Ca ($p < 0,05$). Nije nađena korelacija vrednosti PTH/BGP.

Tabela 1 – Kliničke karakteristike ispitanika
Table 1 – Clinical characteristics of the patients

	n	starost bolesnika age X ± SD		trajanje bolesti duration years	T-4 nmol/1 X ± SD		T-3 nmol/1 X ± SD		TSH IRMA mJ/ml X ± SD	
Eutireoidna struma Euthyroid gland	14	41,8	14,2	1-10 g.	119,9	16,0	2,3	0,9	1,31	0,99
Hipertireoidizam Hyperthyroidism	29	38,0	9,0	1-9	305,7	90,2	7,7	4,1	0,08	0,06
Hipotireoidizam Hypothyreoidism	6	50,0	6,0	1-2	32,4	12,1	1,3	0,6	38,0	12,6
Lečeni hipotireoidizam Treated hypothyroidism	10	55,8	9,3	1-10	106,7	24,9	1,9	1,1	11,0	4,7

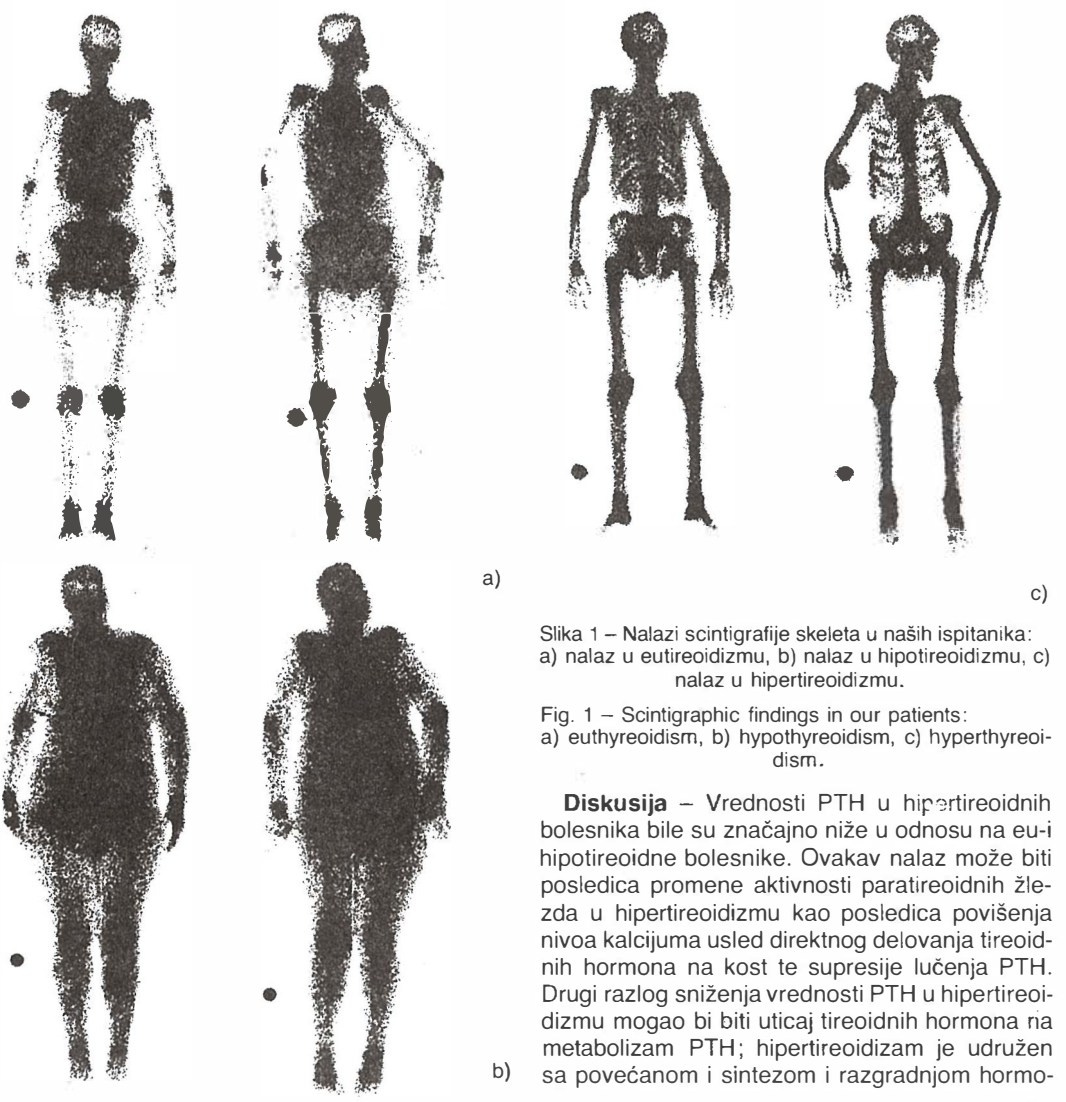
Tabela 2 – Hormonski i biohemijski pokazatelji u ispitanika
Table 2 – Hormonal and biochemical parameters of the patients

	PTH ng/1		BGP ng/ml X ± SD		Ca mmol/l X ± SD		P mmol/l X ± SD		AP IU/1 X ± SD		Hy-p umol/m^2/d X ± SD		BMD gBA(N)cm^2 X ± SD	
Eutireoidna struma Euthyroid gland	147,0	49,3	5,7	2,3	2,41	0,10	1,17	0,18	51,0	14,6	–		1,082	0,173
Hipertireoidizam Hyperthyroidism	117,3	36,4	15,7	4,5	2,46	0,19	1,39	0,28	153,5	65	219,8	129	1,055	0,137
Hipotireoidizam Hypothyreoidism	164,5	53,5	2,88	0,56	2,39	0,17	1,20	0,12	31,0	12,0	–		2,587	(1)
Lečeni hipotireoidizam Treated hypothyroidism	136,2	42,0	6,1	2,7	2,35	0,21	1,12	0,18	57,8	19,5	–		1,169	0,406

Tabela 3 – Pokazatelji kvantitativne scintigrafije skeleta
Table 3 – Parameters of quantitative skeletal scintigraphy

	n	K/BG X ± SD		F/BG X ± SD		CO/BG X ± SD		SI/BG X ± SD	
Eutireoidni Euthyreoidism	13	4,78	1,70	2,55	0,39	4,61	1,22	7,46	1,22
Hipertireoidni Hyperthyreoidism	9	7,14	1,31	4,26	1,16	8,64	3,63	10,49	4,65
Hipotireoidni Hypothyreoidism	2	2,76	1,51	1,53	0,17	2,52	0,42	3,47	1,49

skraćenice: abbreviations:	K/BG kičma/bekgraund spine/background	F/BG femur/bekgraund femur/background	CO/BG coxa/bekgraund coxa/background	SI/BG sacroiliac/bekgr. sacroiliac/backg.



a) b) c)

Slika 1 – Nalazi scintigrafije skeleta u naših ispitanika: a) nalaz u eutireoidizmu, b) nalaz u hipotireoidizmu, c) nalaz u hipertireoidizmu.

Fig. 1 – Scintigraphic findings in our patients: a) euthyreoidism, b) hypothyreoidism, c) hyperthyreoidism.

Diskusija – Vrednosti PTH u hipertireoidnih bolesnika bile su značajno niže u odnosu na eu-i hipotireoidne bolesnike. Ovakav nalaz može biti posledica promene aktivnosti paratireoidnih žlezda u hipertireoidizmu kao posledica povišenja nivoa kalcijuma usled direktnog delovanja tireoidnih hormona na kost te supresije lučenja PTH. Drugi razlog sniženja vrednosti PTH u hipertireoidizmu mogao bi biti uticaj tireoidnih hormona na metabolizam PTH; hipertireoidizam je udružen sa povećanom i sintezom i razgradnjom hormo-

na, pa i samih tireoidnih hormona. U manjeg broja bolesnika sa hipertireoidizmom određivane su i vrednosti 25 (OH) D vitamina (podaci nisu navedeni) koje su takođe bile nešto niže od istih u zdravih osoba. Literaturni podaci o vrednostima PTH u hipertireoidizmu i funkciji paratireoidnih žlezda u različitim poremećajima štitaste žlezde su različiti (4, 5, 6, 7, 8, 9). Dobijene su i normalne i povišene i snižene vrednosti PTH u hipertireoidizmu. Verovatno je jedan od razloga za takve nalaze različita osetljivost eseja za PTH koji mere različite delove molekula PTH, biološki aktivne ili i neaktivne fragmente, te se može desiti da ne detektuje sniženje nivoa PTH u hipertireoidizmu što su našli i drugi autori (4, 9).

I pored značajno nižih vrednosti PTH u hipertireoidnih bolesnika vrednosti pokazatelja metabolizma kosti, hidroksiprolina, alkalne fosfataze i osteokalcina bile su značajno više u odnosu na eu-i hipotireoidne osobe što govori u prilog direktne uloge tireoidnih hormona na metabolizam kosti. Višak tireoidnih hormona udružen je sa povećanom resorpcijom kosti (19, 20,21) u prilog čega govori značajna korelacija vrednosti tireoidnih hormona sa hidroksiprolinom u naših bolesnika sa hipertireoidizmom. Ova resorpcija podrazumeva ne samo odstranjenje matriksa nego i minerala, Ca i P. Promene vrednosti Ca u hipertireoidnih bolesnika kretale su se od hipero normokalcemijskih tako da se srednja vrednost ne razlikuje značajno u pojedinim grupama, promene fosfora bile su značajne u hipertireoidnih osoba. Za kompletan uvid u promene metabolizma Ca i P u hipertireoidizmu bilo bi potrebno određivati Ca i P u mokraći; poznato je da u hipertireoidizmu često postoji hiperkalciurija i povećan gubitak Ca stolicom (5, 8) iako se tačan mehanizam ne zna u potpunosti. Nađen je i smanjeni klirens fosfora i njegovo povišenje u serumu (4, 5, 8) što se slaže sa našim nalazima viših vrednosti P u serumu.

Na pojačanu destrukciju kosti u hipertireoidizmu skelet odgovara pojačanom osteoblastnom aktivnošću, depozicijom nove kosti. U naših bolesnika sa hipertireoidizmom nađene više vrednosti alkalne fosfataze, kao i osteokalcina (BGP) specifičnog pokazatelja osteoblastne aktivnosti, u odnosu na eu-i hpotireoidne bolesnike govore u prilog kompenzatorno povećane osteoblastne aktivnosti u hipertireoidnih bolesnika. Značajne korelacije BGP sa tireodnim hormonima i sa Hy-p u hipertireoidizmu kao i sa AP, a odsustvo korelacija sa PTH govore o direktnoj ulozi tireoidnih hormona na metabolizam kosti u kome su procesi resorpcije i formiranja tesno povezani (BGP/Hy-p, korelacija, $p < 0,05$).

Mineralni denzitet lumbalne kičme u hipertireoidnih bolesnika kretao se od sniženog do normalnog, identičnih vrednosti kao u zdravih osoba, prosečna vrednost se ne razlikuje značajno u odnosu na zdrave osobe, eutireodine osobe. Zapaženo je da u osoba kod kojih bolest traje kraće BMD je snižen, u onih kojih je bolest duže trajala vrednost je bliža granici normale, što opet nije pravilo. Može se objašnjenje tražiti u činjenici da u početku bolesti postoji negativan bilans kosti sa predominacijom resorpcije, kasnije se kompenzatorno razvija povećano formiranje kosti da bi se uspotavila neka nova ravnoteža ali na višem nivou (povećana i resorpcija i formiranje kosti) kao posledica čega postoji nepromenjena vrednost BMD. Visoke vrednosti BGP ukazuju na način kako se ta ravnoteža održava, povećanjem ukupnog turnovera kosti. Postojanje povećanog metabolizma kosti dokazali smo i scintigrafijom skeleta celog tela. U hipertireoidnih bolesnika jasno se uočava povećana metabolička aktivnost perifernog skeleta, kostiju ekstremiteta, butnih kostiju, podkolenica i stopala kao i nadlaktica, podlaktica i šaka, najčešći nalaz.

Pojačana metabolička aktivnost kostiju karlice i kičme takođe je uočena i registrovana i kvantitavnim pokazateljima odnosa kost/meko tkivo. Minimum radioaktivnosti u mekom tkivu u hipertireoidnih osoba i velika količina radioaktivnosti u mekom tkivu u hipotireoidnih bolesnika posledica je ne samo promena minutnog volumena, perfuzije, nego i povećanog aviditeta kosti za vezivanje radiofarmaka (15, 16, 17) odnosno povećane metaboličke atkivnosti kosti u hipertireoidnih bolesnika. U ovih osoba na scintigramu kosti vidi se »ogoleo« skelet celog tela, a u hipotireoidnih osoba se skelet samo nazire zbog smanjene metaboličke atkivnosti kosti u njih. Lečena hipotireoza dovodi do normalizacije distribucije radioaktivnosti u skeletu i mekim tkivima.

Istovremenim praćenjem hormonskih, biohemijskih pokazatelja metabolizma kosti, kao i morfofunkcijskim i morfološkim ispitivanjem stanja skeleta u bolesnika sa poremećajem funkcije štitaste zlezde moguće je dobiti uvid u stanje metabolizma kosti i kompleksne patofiziološke promene koje se dešavaju na nivou kosti u ovih bolesnika.

Zaključak

1. Bolesnici sa hipertireoidizmom imali su značajno niže vrednosti PTH u odnosu na eutireoidne i hipotireoidne osobe.
2. Vrednosti osteokalcina, alkalne fosfataze i hidroksiprolina bile su značajno više u hipertireoidnih u

odnosu na eutireoidne bolesnike, odnosno hipotireoidne.

3. Nađena je značajna korelacija tireoidnih hormona sa vrednostima osteokalcina, hidroksiprolina, kao i značajne korelacije osteokalcina sa alkalnom fosfatazom, Ca i hidroksiprolinom.

4. Sniženje vrednosti PTH u hipertireoidnih bolesnika, značajno povišeni pokazatelji resorpcije i formiranje kosti koji korelišu značajno sa tireoidnim hormonima govore u prilog direktnog efekta ovih hormona na povećani metabolizam kosti u hipertireoidizmu.

5. Vizuelnim prikazom skeleta celog tela uočava se difuzno pojačana metabolička aktivnost kostiju, posebno ispoljena u području dugih kostiju donjih ekstremiteta, karlici i kičmi bolesnika sa hipertireoidizmom u odnosu na eutireoidne osobe u prilog čega govore i kvantitativni pokazatelji odnosa radioaktivnosti kost/meko tkivo.

6. Mineralni denzitet lumbalne kičme bio je samo u nekih bolesnika sa hipertireoidizmom značajno niži u odnosu na eutireoidne osobe verovatno zbog ponovnog uspostavljanja ravnoteže između procesa resorpcije i formiranje kosti na nekom »višem« nivou.

Sažetak

Da bismo istražili patogenezu metaboličkih bolesti kosti u poremećajima rada štitaste žlezde određivali smo vrednosti PTH, osteokalcina (BGP), Ca, P, alkalne fosfataze, hidroksiprolina uporedo sa morfofunkcijskim (scintigrafijom skeleta) i morfološkim (mineralni denzitet kosti) ispitivanjima u pacijenata sa različitim bolestima štitaste žlezde.

Naši nalazi govore za povećanu resorpciju i formiranje kosti u hipertireoidnih bolesnika uzrokovanu visokim vrednostima tireoidnih hormona. Povećani turnover u kostima evaluisali smo i scintigrafijom skeleta celog tela. Mineralni denzitet kosti lumbalne kičme bio je snižen samo u nekih bolesnika sa hipertireoidizmom u odnosu na eutireoidne, u nekih je bio nepromenjen, verovatno zbog ponovnog uspostavljanja ravnoteže između procesa resorpcije i formiranja kosti na nekom »višem« nivou.

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ZAVOD ZA NUKLEARNU MEDICINU
MEDICINSKOG FAKULTETA I KLINIČKOG BOLNIČKOG CENTRA
ZAGREB

Specijalizirani tečaj:

MEDICINSKI POSTUPCI U SLUČAJU NUKLEARNOG AKCIDENTA

Zagreb, 19 - 23. 11. 1990.

SADRŽAJ Tečaj će obuhvatiti medicinske aspekte organizacije pripravnosti u slučaju nuklearnog akcidenta te dijagnostičke postupke i liječenje prekomjerno ozračenih i kontaminiranih osoba. Za pojedine teme, osim prezentacije u obliku predavanja, organizirat će se praktične vježbe i prikazati nastavni filmovi koje preporučuju IAEA i REAC/TS Oak Ridge. U sklopu tečaja predviđen je poludnevni posjet Nuklearnoj elektrani Krško. Poželjno je da u toku tečaja učesnici iznesu eventualna svoja iskustva u zbirnjavanju prekomjerno ozračenih, što će im biti omogućeno organizacijom tečaja.

KOME JE TEČAJ NAMIJENJEN? Tečaj je namijenjen liječnicima, fizičarima, kemičarima i drugom osoblju visoke stručne spreme koje može biti zainteresirano za tu tematiku.

TROŠKOVI TEČAJA: Din 1000 po učesniku. – Podliježe revalorizaciji u slučaju veće inflacije ili devalvacije dinara.

ROK ZA PRIJAVU: 1. 5. 1990. godine.

ORGANIZACIJSKI ODBOR TEČAJA N.A.
Zavod za nuklearnu medicinu – Rebro
Kišpatićeva 12
41000 Zagreb

ZAVOD ZA NUKLEARNU MEDICINU I INTERNA KLINIKA MEDICINSKOG FAKULTETA U ZAGREBU

NAŠA ISKUSTVA U DIJAGNOSTICI TUMORA POMOĆ ^{67}Ga-CITRATA

OUR EXPERIENCE IN TUMOR DIAGNOSTICS WITH ^{67}Ga-CITRATE

Jurašinović Ž, Aralica M, Kalauz M, Poropat M, Dodig D, Labar B

Abstract – ^{67}Ga-citrate scintigraphy was performed in 78 patients with malignant tumor (32 Mb. Hodgkin, 17 non-Hodgkin lymphoma, 13 melanoma, 9 lung carcinoma and 17 hepatoma). The intention of the study was to compare the sensitivity of the method in our group of patients with the results of other authors. Positive ^{67}Ga citrate scan was found in 81% of patients with Mb. Hodgkin, in 58% of patients with non-Hodgkin lymphoma, in 66% of patients with melanoma, in 44% of patients with lung carcinoma and in 85% of patients with hepatoma. Comparison of our results with results of other authors is in agreement in the groups of patients with Mb. Hodgkin and hepatoma. In other groups of patients the percentage of positive results was different from the results of other authors. That can be explained by the fact that a great number of our patients received therapy, and the number of patients in some groups wasn't sufficient for precise statistical analysis.

UDC: 616-006.6-07:539.163

Key words: neoplasms-radionuclide imaging, gallium radioisotopes

Orig sci paper

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Uvod – Prvi izvještaj o ^{67}Ga citrata kao tumorskom agensu objavili su Edwards i Hayes 1969. godine (1). Nakon toga niz je autora (2, 3, 4) objavilo radove koje su ukazivali na korisnost scintigrafije pomoću ^{67}Ga citrata u dijagnostici tumora. Utvrđeno je da se s ^{67}Ga citrat ne akumulira jednako u svakom tumorskom tkivu. Mehanizam akumulacije ^{67}Ga citrata bazira se na vezanju ^{67}Ga na transferin, a potom se taj kompleks veže na transferinske receptore na membranama tumorskih stanica. Nakon toga može se inkorporirati i u samu tumorsku stanicu. Drugi je mehanizam akumulacije da se ^{67}Ga citrat veže na laktoferin pa dolazi do akumulacije u tumorima bogatim s laktoferinom. Kako je laktoferin glavni konstituent leukocita ^{67}Ga citrat naći ćemo i na mjestima upala. Zbog toga ^{67}Ga citrat nije specifičan tumorski marker nego se nakuplja i na mjestima upalne reakcije.

Hoffer je 1980. g. (5) evaluirao vrijednost ^{67}Ga citrata u dijagnostici pojedinih tumora. Utvrđeno je da je scintigrafija pomoću ^{67}Ga citrata najkorisnija u detekciji Hodgkin limfoma, histiocitnog limfoma, Burkittovog limfoma, hepatoma, melanoma i lokalnih leukemijskih infiltrata. U dijagnostici non-Hodgkin limfoma, karcinoma testisa, mezotelioma i plućnih karcinoma manje je korištan. Željeli smo utvrditi vrijednost scintigrafije s ^{67}Ga u našoj populaciji, pa smo obradili skupinu bolesnika s različitim tumorima.

Material i metoda rada – Obradili smo skupinu od 78 ispitanika u dobi od 17 do 63 godine. od tog je broja bilo 42 žene i 36 muškarca. Od 78 bolesnika 32 su imali M. Hodgkin, 17 non-Hodgkin limfom, 13 melanom, 9 rak pluća i 17 hepatom. Od ukupnog broja bolesnika u 66 bolesnika dijagnoza malignoma je postavljena drugim dijagnostičkim postupcima, a scintigrafijom se željelo utvrditi proširenost ili rjeđe potvrditi dijagnozu. Dvanaest je bolesnika upućeno zbog suspektne maligne bolesti koju je trebalo dijagnosticirati scintigrafijom pomoću ^{67}Ga citrata.

Scintigrafiju smo vršili 48 i 72 sata nakon intravenske aplikacije 74 MBq ^{67}Ga citrata pomoću gama kamere velikog vidnog polja s paralelnim kolimatorom visoke rezolucije za visoke energije. Prilikom snimanja koristili smo energije ^{67}Ga od 93,184 i 296 keV. Ukupan broj impulsa za pojedinu regiju tijela iznosio je 400.000 impulsa. Gama kamera je bila povezana s računalom PDP 34/40, pa smo na taj način mogli scintigrame pohraniti u računalo i pomoću programa analizirati i obrađivati pojedine scintigrame.

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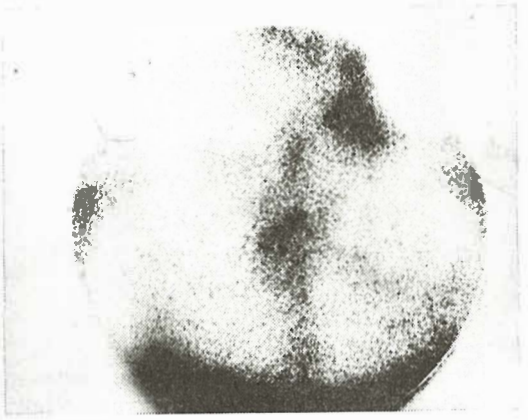
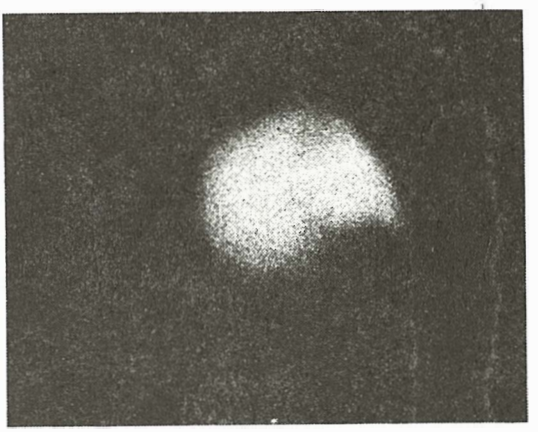
Rezultati – Od 32 bolesnika s Mb. Hodgkin u njih 26 (81%) nalaz scintigrafije s ^{67}Ga citratom bio je pozitivan (slika 1). Od 17 bolesnika s non-Hodgkin limfomom u 10 bolesnika našli smo pozitivan scintigrafski nalaz (58%). U 13 bolesnika s melanomom scintigrafski nalaz bio je pozitivan u 9 bolesnika (66%), u 9 bolesnika s karcinomom pluća scintigrafski nalaz bio je pozitivan u 4 slučaja (44%), a u bolesnika s hepatomom od njih 7 šestorica su imalaj pozitivan scintigrafski nalaz s ^{67}Ga citratom (85%) (slika 2a i b). Od 12 bolesnika koji su imali suspektnu malignu bolest u njih 9 scintigrafski nalaz pomoću ^{67}Ga bio je pozitivan (65%). (tabela 1)



Slika 1 – Pozitivan scintigrafski nalaz ^{67}Ga u bolesnika s Mb. Hodgkin (patološko nakupljanje ^{67}Ga-citrata u limfnim čvorovima vrata lijevo u medijastinumu)

Fig. 1 – Positive ^{67}Ga scan in the patient with Mb. Hodgkin (Pathologic accumulation of ^{67}Ga in neck and mediastinal lymph nodes)

Diskusija – Osjetljivost dijagnostičke metode pomoću ^{67}Ga citrata pri detekciji Hodgkinove bolesti u ovom ispitivanju iznosi 81% što ulazi u raspon vrijednosti koje se susreću kod drugih autora, a iznose 70-80% (6). Ta osjetljivost za ostale maligne limfome ponešto zaostaje za onom u literaturi koja se kreće između 68 i 78%. U slučaju melanoma dijagnoza je potvrđena u 66% slučaja, a u svijetu ta brojka iznosi oko 50% (7). Za karcinom pluća svjetski podaci govore o 75 do 86% (5) osjetljivosti, dok na našem materijalu scintigrafski nalaz bio je pozitivan u 44% slučajeva. Raspon osjetljivosti za primarni karcinom jetre u do sada objavljenim radovima iznosi od 70-100% što dobro korelira s postotkom pozitivnih nalaza u našim ispitanika (8).



Slika 2a – Scintigram jetre u bolesnika s hepatomom učinjen s ^{99m}Tc Sn koloidom (desna lateralna projekcija) »hladna zona« u gornjem polu desnog režnja.

Fig. 2a – Liver scan in a patient with hepatoma performad with ^{99}Tc-Sn colloid (I. dex. projection) »Cold« lession in the upper part of right lobe

Slika 2b – Scintigram jetre učinjen s ^{67}Ga u istog bolesnika (arteriorna i desnalateralna projekcija) »vruća« zona u gornjem polu desnog režnja

Fig. 2b – Liver scan with ^{67}Ga in the same patient (anterior I. dex. projection) »Hot« lession in the upper part of right lobe

Naši se rezultati podudaraju s rezultatima drugih autora u skupini bolesnika s Mb. Hodgkin i hepatomom. Razlog nepodudarnosti u drugim skupinama možemo objasniti činjenicom da je u našoj skupini bilo dosta bolesnika koji su scintigrafirani u toku terapijskog postupka, a također je broj ispitanika s pojedinim vrstama tumora bio premalen za detaljnu obradu.

U grupu tumora kod kojih je scintigrafsko snimanje galijem nedvojbeno koristno, u prvom

Tabela 1 – Rezultati scintigrama učinjenih pomoću ^{67}Ga u bolesnika s malginim tumorom

Table 1 – Results of ^{67}Ga scan in patients with malignant tumours

	MB. Hodgkin	Non-Hodgkin limfom non-Hodgkin lymphoma	Melanom Melanoma	Rak pluća Lung carcin.	Hepatom Hepatoma	Ukupno Total
^{67}Ga poz. pos.	26 (81%)	10 (58%)	9 (66%)	4 (44%)	6 85%)	55 70%)
^{67}Ga neg. neg.	6 (19%)	7 (42%)	4 (34%)	5 (56%)	1 (15%)	23 (30%)
Ukupno Total	32 (100%)	17 (100%)	13 (100%)	9 (100%)	7 (100%)	78 (100%)

redu nalazi Mb. Hodgkin i to posebice histološke slike nodularne skleroze mješovite celularnosti i limfocitne deplecije, dok je u slučaju limfocitne dominacije korist nešto manja. U detekciji malignih limfoma osim histiocitnog, karcinoma testisa osim embrionalnog i karcinoma pluća primjena scintigrafije galijem nije se do sada našla toliko dobrom kao ranije navedenih tumora. Posebna vrijednost metode je u procjeni uspješnosti terapije a s time i u donošenju prognoze. Glavni nedostatak ovog dijagnostičkog postupka je u interferenciji s upalnim procesima što rezultira većim ili manjim sniženje specifičnosti testa. Metodu je potrebno kombinirati s ostalim metodama, prije svega patohistološkom verifikacijom. Uspoređujući naše rezultate s podacima iz svjetske literature vidljivo je da se ti podaci podudaraju ukoliko se radi o bolestima kod kojih su rezultati metode općenito dobri, dok u slučaju bolesti kod kojih je primjena ove metode i u svijetu dala slabije rezultate naši rezultati u nekoliko zaostaju.

Sažetak

NAŠA ISKUSTVA U DIJAGNOSTICI TUMORA POMOĆU ^{67}Ga-CITRATA

Scintigrafija pomoću ^{67}Ga citrata bila je urađena kod 78 bolesnika sa malignim tumorom (32 Mb. Hodgkin, 17 ne-Hodgkinov limfom, 13 melanoma, 9 karcinom pluća, 17 hepatom).

Rezultate naše studije smo uspoređivali sa rezultatima drugih autora. Pozitivni ^{67}Ga citrate sken smo dokazali kod 81% bolesnika sa Hodgkinovim limfomom, kod 58% bolesnika sa ne-Hodgkinovim limfomom, kod 66% bolesnika sa melanomom, 44% bolesnika sa plućnim karcinomom i kod 85% bolesnika sa hepatomom.

Naši rezultati su u skladu sa rezultatima drugih autora kod malignog Hodgkinovog limfoma i kod hepatoma. Kod ostalih bolesnika sa drugim malignim bolestima naši rezultati razlikuju se od rezultata drugih autora. Moguće objašnjenje za to je činjenica da je većina naših bolesnika imala terapiju i da je broj bolesnika u različitim grupama bio suviše mali za preciznije statističke analize.

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V. JUGOSLOVENSKI KONGRES NUKLEARNE MEDICINE

Sarajevo, oktobar 1990

Organizator:
Udruženje za nuklearnu medicinu Jugoslavije – UNMJ

TEME:

SPECT IN VIVO DIJAGNOSTIKA
I PROCESNE TEHNIKE RADIO
I DRUGI IMUNOESEJI

SLOBODNE TEME

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ONKOLOŠKI INŠTITUT LJUBLJANA[1]
UNIVERZITETNA KLINIKA ZA OTORINOLARINGOLOGIJO IN CERVIKOFACIALNO KIRURGIJO, LJUBLJANA[2]

ZDRAVLJENJE MALIGNOMOV ČELJUSTNE VOTLINE NA ONKOLOŠKEM INŠTITUTU V LJUBLJANI V LETIH 1979 DO 1984

Budihna M[1], Šmid L[2], Žargi M[2], Zakotnik B[1], Šoba E[1], Kurent Z[2]

Abstract – Between 1979-1984 39 patients with malignant tumors of the maxillary sinus were treated. Ten of them were free of disease more than 5 years after the treatment.
In the group of patients with squamous cell carcinoma 2 out of 22 were cured with radiotherapy alone (one of them had concommitant chemotherapy), 6 out of 11 patients were cured with surgery followed by radiotherapy. The difference in cure rate was statistically significant ($p < 0.05$).

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Key words: maxillary sinus neoplasms–therapy

Orig sci paper

Radiol Iugosl 1990; 24: 163-5

Uvod – Zdravljenje malignih tumorjev maksilarnega sinusa, ki so med malignomi obnosnih votlin daleč najpogostejši, predstavlja za terapevta poseben izziv, saj lahko zaradi anatomskih razmer v tem področju tako z operacijo kot tudi z obsevanjem resno prizadenemo nekatere za življenje izredno pomembne organe.

Ker so začetna bolezenska znamenja raka v čeljustni votlini neznačilna in je bolezen sorazmerno redka, jo ponavadi odkrijemo pozno, ko se je že razširila v okolico.

Bolniki in zdravljenje – V letih 1979 do 1984 smo na Onkološkem inštitutu v Ljubljani zdravili 42 bolnikov z malignomi maksilarnega sinusa. V študijo smo zajeli le 39 bolnikov, ker dokumentacija preostalih treh ni bila dosegljiva. Med bolniki je bilo 21 žensk in 18 moških v starosti od 43 do 87 let. Po histološki sliki je bilo 33 ploščatoceličnih karcinomov (8 dobro diferenciranih, 20 slabo ali nediferenciranih, pri 5 pa stopnja diferenciacije ni bila opredeljena), 3 adenoidnocistični karcinomi, 1 adenokarcinom in 2 limfoma.

Tabela 1 – Razporeditev primerov karcinoma čeljustne votline zdravljenih v letih 1979 – 1984 po stadijih

Table 1 – The distribution of cases of the maxillary sinus carcinoma treated in the year 1979 – 1984 according to the stage

	N_0	N_1	N_2	N_3	Total
T_1			1		1
T_2	3				3
T_3	10		1		11
T_4	20	2			22
Total	33	2	2		37

T = tumor N = področne bezgavke
T = tumor N = regional lymph nodes

Tabela 1 prikazuje razširjenost karcinomov po TNM sistemu (UICC 1987); izvzeta sta bolnika z limfomom.

Od 39 bolnikov je bilo 24 zdravljenih le z obsevanjem, 14 je bilo operiranih in pooperativno obsevanih, eden pa je bil samo operiran. Vsi bolniki so bili obsevani na Onkološkem inštitutu v Ljubljani z megavoltnimi žarki, v obsevalno

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polje je bilo zajeto vse obolelo področje. Dnevna doza je bila 1,8 Gy ali 2 Gy, petkrat tedensko, do skupne doze 60 do 78 Gy na tumor oziroma 60 do 72 Gy na pooperativno področje. V obsevalno področje smo zajeli retrofaringalne bezgavke v vseh primerih, ostala bezgavčna področja pa le, če so bile metastaze citološko ali histološko dokazane. Bolniki so bili operirani v različnih ustanovah naše republike. V operativno zdravljenje karcinoma maksilarnega sinusa smo šteli parcialno maksilektomijo z etmoidektomijo ali brez nje ali pa totalno maksilektomijo. Vse manjše operativne posege smo uvrstili med diagnostične postopke.

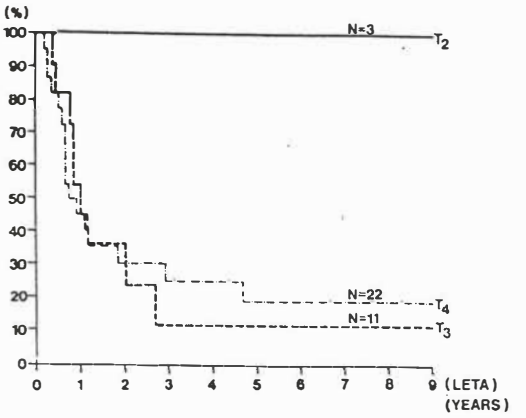
Citostatika smo uporabili le pri 7 bolnikih: v treh primerih (2 karcinoma in 1 limfom) je bila kemoterapija sestavni del kurativnega zdravljenja, pri 4 pa je služila le za paliacijo recidiva, napredujočega residuuma ali oddaljenih metastaz. Od citostatikov, ki smo jih v vseh primerih dajali sistemsko in ne intraarterialno, smo uporabljali Vinblastin, Methotrexat, Bleomycin, 5-fluorouracil, Endoxan, Onkovin, Adriamycin in Platinol v različnih kombinacijah.

Preživetje smo računali od začetka zdravljenja.

Rezultati – Od 39 zdravljenih bolnikov jih je 10 (26%) preživelo več kot 5 let brez znakov bolezni.

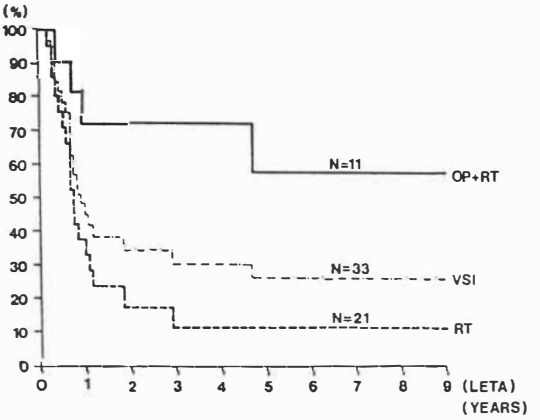
Bolnik s stadijem T_1N_{2b} ploščatoceličnega karcinoma je umrl po 13 mesecih. Preživetje ostalih bolnikov s karcinomom v T_2, T_3 in T_4 stadiju kaže slika 1. Bolnik s planocelularnim karcinomom, ki je bil samo operiran (T_3N_{2a}), je umrl po 10 mesecih. Rezultate glede na način zdravljenje kaže slika 2. Razlilka v preživetju med bolniki, zdravljenimi z operacijo in obsevanjem ter tolniki, zdravljenimi samo z obsevanjem, je statistično signifikantna ($p < 0,05$). Od 3 bolnikov z adenoidnocističnim karcinomom sta dva umrla zaradi bolezni po 23 oziroma 33 mesecih, eden pa je po devetih letih še zdrav. Edina bolnica z adenokarcinomom je umrla po 13 mesecih. Bolnica z malignim limfomom je zdrava več kot 7 let.

Pri 29 umrlih bolnih je bil karcinom samo lokalno prisoten pri 23, lokalno in regionalno pri 5 bolnikih, bolnica z adenoidnocističnim karcinomom pa je umrla brez lokoregionalnega recidiva zaradi oddaljlenih metastaz v pljučih in jetrih.



Slika 1 – Preživetje bolnikov s kacrinomom čeljustne votline po štadijih 1979 – 1984*. N = število primerov
* Izvzet je edini bolnik s karcinomom v T_1 štadiju

Fig. 1 – Survival rates for patients with maxillary sinus carcinoma in years after the beginning of treatment*, 1979 – 1984 N = number of cases
* Patint with T_1 carcinoma is not included



Slika 2 – preživetje bolnikov s ploščatoceličnim karcinomom čeljustne votline po načinu zdravljenja, 1979 – 1984*. OP = operacija, RT = radioterapija, N = število primerov
* Izvzet je bolnik, ki je bil samo operiran

Fig. 2 – Survival rates for patients with maxillary sinus sqamous cell carcinoma according to treatment methods in years after the beginning of tratment, 1979. 1984. OP = operation, RT = radiotherapy, N = number of cases
* Patient treated by surgery alone is not include

Razprava – Pri izbiri zdravljenja karcinoma maksilarnega sinusa moramo upoštevati, da samo obsevanje ne nudi zadovoljivih rezultatov (1), podobno velja tudi za kirurško zdravljenje (2). Čeprav je bila prva uspešna maksilektomija narejena že leta 1828 (3), je bilo preživetje bolnikov, zdralvjenih zgolj kirurško, zelo skrom-

no, taklo da je Bloodgood (4) 1919. leta zapisal, da pri karcinomih maksilarnega sinusa zgolj kirurško zdravljenje ne nudi nikakršnih možnosti za ozdravitev. Kot je to že običajno ob uvajanju nove vrste terapije, je šlo kasneje zdravljenje pretirano v smeri radioterapije, tako da je leta 1930 Quick (5) trdil, da je vloga kirurgije zgolj v tem, da pripravi tumorsko področje pristopnejše za radioterapijo. Schuknecht (6) je bil leta 1951 eden prvih, ki je zagovarjal radikalno »en block« resekcijo in nato radioterapijo. Pri pooperativnem obsevanju lahko apliciramo polno tumorsko dozo, ne da bi tvegali večje zaplete ali slabo celjenje. Operacija omogoča v večini primrov natančno določitev razsežnosti malignoma, kar je posebno pomembno, kadar tumorja ni mogoče odstraniti v celoti. Dobro sodelovanje med kirurgom in radioterapevtom je torej nujno za natačno opredelitev področja, ki ga moramo obsevati in mest, kjer je zaradi ostanka potrebna višja doza. Niti pomen kemoterapije, niti najprimernejši način njenega vključevanja v multimodalno zdravljenje tumorjev glave in vratu še nista povsem razčiščena v literaturi (7). Intraarterialna kemoterapija s 5-fluorouracilom v kombinaciji z radioterapijo ni izboljšala rezultatov zdravljenja, povečala je le akutno in kronično toksičnost (8). Trimodalno kombinirano zdravljenje z intraarterialno kemoterapijo, redukcijo tumorja skozi antrostomo in obsevanjem, je po mnenju nekaterih japonskih autorjev (9) izboljšalo preživetje in znižalo število sicer potrebnih mutilantnih operacij. V evropskem prostoru se je posrečilo do neke mere ponoviti uspeh takega zdravljenja le Knegtu (10).

Rezultati našega zdravljenja so podobni tistim, ki jih navajajo drugi avtorji (1). Samo z obsevanjem (ki je bilo v dveh primerih združeno s kemoterapijo) smo ozdravili le 10% bolnikov s karcinomom maksilarnega sinusa. Vedeti pa je treba, da so bili v tej skupini bolniki, pri katerih operacija ni bila mogoča zaradi prevelike razširjenosti tumorja ali slabega splošnega stanja.

Kombinirano zdravljenje – operacija s pooperativnim obsevanjem – je bilo bistveno uspješnejše, saj je bilo ozdravljenih 55% taklo zdravljenih bolnikov. Majhno število bolnikov, ki so bili samo operirani ali pa so dobivali kemoterapijo kot del kurativnega zdravljenja, ne omogoča presoje teh načinov zdravljenja.

Zdravljenje karcinomov čeljustne votline je zelo zahteven proces, katerega uspešnost pogojuje ne nazadnje tudi dobro sodelovanje onkologov različnih panog.

Povzetek

V letih 1979 do uključno 1984 smo na Onkološkem inštitutu v Ljubljani ovrednotili 39 bolnikov z malignomi maksilarnega sinusa, od katerih jih je 10 (26%) preživelo več kot 5 let brez bolezni. Razlika v preživetju med bolniki s planocelularnim karcinomom maksilarnega sinusa, ki so bili zdravljeni z operacijo in obsevanjem ter tistimi, zdravljenimi brez operacije, je statistično signifikantna ($p < 0,05$).

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Naslov avtorja: Budihna M., Onkološki inštitut v Ljubljani, Zaloška c. 2c

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UNIVERZITETNA KLINIKA ZA OTORINOLARINGOLOGIJO IN CERVIKOFACIALNO KIRURGIJO, LJUBLJANA[1]

ONKOLOŠKI INŠTITUT, LJUBLJANA[2]

OPERATIVNO ZDRALVJENJE RAKA OBNOSNIH VOTLIN NA UNIVERZITETNI KLINIKI ZA OTORINOLARINGOLOGIJO IN CERVIKOFACIALNO KIRURGIJO V LJUBLJANI V OBDOBJU 1976 – 1985

SURGICAL TREATMENT OF MALIGNANT TUMORS OF THE PARANASAL SINUSES AT THE UNIVERSITY ENT DEPARTMENT IN LJUBLJANA IN THE PERIOD 11976–1985

Žargi M[1], Šmid L[1], Budihna M[2]

Abstract – In the period 1976 – 1985 34 patients with cancer of the paranasal sinuses were treated at the University ENT Department in Ljubljana, most of them in addvanced stages of disease. Among them 18 patients were operated, surgery was followed by radiotherapy in all cases. The rest of the patients was irradiated only. Ten of 18 operated patients were free of disease at least 4 years after the treatment. Radicality of surgical procedure positively correlates with the cure rate.

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Key words: paranasal sinus neoplasms–surgery

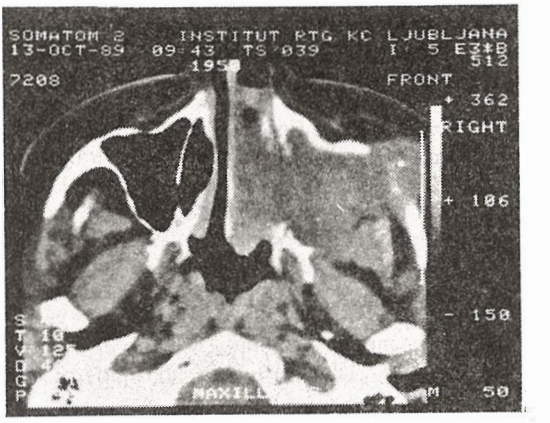
Orig sci paper

Radiol Iugosl 1990; 24: 167-70

Uvod – Pri obravnavanju bolnikov z malignomi obnosnih votlin se moramo dobro zavedati nekaterih posebnosti teh tumorejv ter problemov, ki so tesno povezani s diagnozo in zdravljenjem.

Zaradi same redkosti teh malignomov imajo terapevti, pa tudi posamične ustanove pomanjkljive izkušnje na tem področju. To je razumljivo, če upoštevamo, da zajemajo maligni tumorji obnosnih votlin le 0,2 – 0,8% vseh malignomov oziroma 3% vseh karcinomov zgornjih dihalnih in prebavnih poti (1). To in pa zelo neznačilna začetna znamenja so vzrok, da jih odkrijemo večinoma kasno, v napredovalih stadijih bolezni (kot je primer na sliki 1). K temu pripomorejo tudi nekateri anatomski dejavniki, predvsem tesna medsebojna povezava posameznih obnosnih votlin, ki je vzrok, da imamo le redko opravka z omejenostjo malilgnoma zgolj na en sam sinus. Tudi neposredna bližina življenjsko pomembnih struktur, ki jih tumor dostikrat zajame že zelo zgodaj (2), je odločilnega pomena, ko načrtujemo zdravljenje.

Naši bolniki – Na Univerzitetni kliniki za otorinolaringologijo in cervikofacialno kirurgijo v Ljubljani smo v letih 1976 do 1985 obravnavali 34 bolnikov z malignomi obnosnih votlin. Bolniki so bili stari od dveh do devetdeset let, skoraj devet



Slika 1 – Tumor razžira medialno, sprednjo in zadnjo steno maksilarnega sinusa

Fig. 1 – Tumor destroys medial, anterior and posterior walls of the maxillary sinus

desetin je bilo starih nad petdeset let. Ženske in moški so bili zastopani v enakem številu (po 17). Po histološki sliki je prevladaval karcinom, zvečine slabo oziroma nediferenciran (tabela 1).

Pri dvajsetih bolnikih je malignom izviral v maksilarnem sinusu, v trinajstih primerih v etmoi-

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Tabela 1 – Histološka slika malignomov obosnih votlin zdravljenih v obdobju 1976–1985

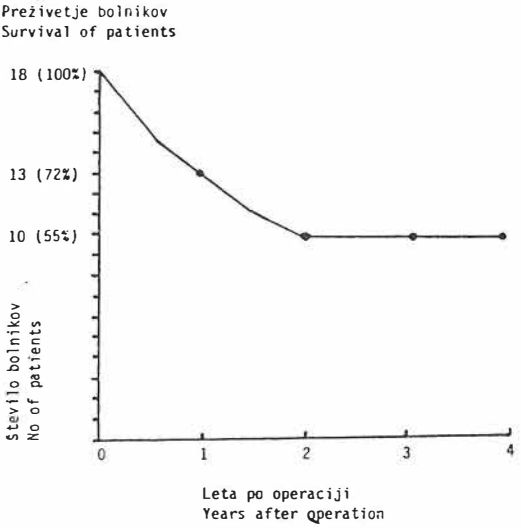
Table 1 – Histology of malignant tumors of the paranasal sinuses treated in the period 1976–1985

Karcinom Carcinoma	28	dobro diferenciran well differentiated	4
		slabo ali nediferenciran poorly or undifferentiated	22
		nedoločen not determined	2
Limfom Lymphoma	3		
Olfaktorni nevroblastom Olfactorius neuroblastoma	2		
Fibrosarkom Fibrosarcoma	1		

du, enkrat pa v frontalnem sinusu. Tumor je bil pri večini bolnikov lokalno zelo razširjen, področne zasevke pa smo ugotovili le pri enem. Kar pri 17 od 18 bolnikov s karcinomom maksilarnega sinusa je tumor vraščal v okolne strukture, po TNM klasifikaciji (UICC 1987) smo jih 16 uvrstili v T_3 oziroma T_4 stopnjo. V nekoliko manjši meri je bilo temu tako pri tistih bolnikih, kjer je malignom izviral v etmoidu: le pri enem bolniku jer bil tumor omejen na etmoidni sinus, pri osmih se je širil v maksilarni sinus, nos ali orbito in kar pri štirih segal intrakranialno oziroma v sfenoidni sinus.

Načrtovanje zdravljenja je bilo v letih, ko še nismo imeli na voljo računalniške tomografije (do srede 1980. leta), bistveno težje kot je danes. Načeloma pa smo se tudi tedaj odločali, kjer je bilo to le mogoče, za primarno operativno zdravljenje, ki smo ga praviloma dopolnili s pooperativnim obsevanjem. Od 34 bolnikov smo jih 18 operirali, pri 16 pa smo se po histološki potrditvi bolezni odločili za obsevanje. Pri slednjih smo v sedmih primerih ocenili proces kot inoperabilen, pri petih bolnikih je bil razlog za obsevanje visoka starost oziroma slabo splošno stanje, pri treh je bil histološko ugotovljen limfom in operativno zdravljenje zato ni bilo indicirano, en bolnik pa je operacijo odklonil.

Pri karcinomu maksilarnega sinusa smo se odločali za maksilektomijo ali za parcialno maksilektomijo z ali brez etmoidektomije. Pri tumorjih etmoida smo etmoidektomijo delali večinoma skupaj s parcialno maksilektomijo. Kraniofacialni pristop (skupaj z nevrokirurgom) smo v teh letih uporabili enkrat. Tudi za sočasno izpraznitev orbite smo se odločili le pri dveh bolnikih.



Slika 2 – Preživetje bolnikov z malignomi obnosnih votlin primarno operiranih v obdobju 1976 – 1985

Fig. 2 – Survival of patients with malignant tumors of the paranasal sinuses primarily treated by surgery in the period 1976 – 1985

Rezultati – Od 18 operiranih bolnikov jih je 10 preživelo brez bolezni najmanj 4 leta po zaključenem zdravljenju, 8 pa jih je umrlo v prvih dveh letih (slika 2). Med preživelimi je bilo 6 od 9 z etmoidalnim malignomom in 4 od 9 z maksilarnim maligomom, torej so bili uspehi zdravljenja pri malignomih etmoida boljšti kot pri tumojrih, ki so izvirali iz maksilarnega sinusa. Od 8 bolnikov, ki jih nismo uspeli ozdraviti, šo 4 umrli zaradi lokalnega recidiva, 2 zaradi odddaljenih metastaz v pljučih in«ali kosteh, eden zaradi področnih metastaz, en pacient z obsežnim tumorjem et-

moida pa je umrl deseti dan po operaciji zaradi intrakranialnih zapletov.

Tudi radikalnost operativnega posega je bistveno vplivala na rezultate zdravljenja. V skupini bolnikov, kjer smo ocenili, da operacija ni bila radikalna, oziroma je bila radikalnost vprašljiva, so bili ozdravljeni le trije od desetih. Nasprotno pa je v skupini radikalno operiranih bolnikov preživelo več kot 4 leta kar sedem od osmih bolnikov (tabela 2).

ter histološke slike, kjer je pri naših bolnikih prevladoval slabo diferenciran oziroma visoko maligen tumor s praviloma difuzno raščo, je razumljivo, da smo na izhodiščno mesto pri načrtovanju kirurškega zdravljenja postavili maksilektomijo. Kljub napredku preoperativne diagnostike – predvsem določanja razširjenosti tumorja, ki ga je prineslka računalniška tomografija, je bil intraoperativni izvid in določanje razsežnosti tumorske rašče s histološko preiskavo ex tem-

Tabela 2 – Vpliv radikalnosti operacij na izid zdravljenja bolnikov z malignomi obnosnih votlin primarno operiranih v obdobju 1976 – 1985

Table 2 – Influence of radicality of surgical procedures on cure rates in patients with malignant tumors of the paranasal sinuses primarily treated by surgery in the period 1976 – 1985

	Število bolnikov No of patients	Lokalizacija Site	Število bolnikov No of patients	Obseg Extent	Število bolnikov No of patients
		maksilarni sinus maxillary sinus	7	T_4N_O	
Operacija neradikalna Operation non radical	10				
		etmoidni sinus ethmoid sinus	3	širjenje v orbito extension to the orbita	1
Preživeli 4 leta Surviving 4 years	3			širjenje v sfenoidni sinus in/ali intrakranialno extension to the sphenoid sinus and/or intracranially	2
		maksilarni sinus maxillary sinus	2	T_2N_O, T_1N_{2b}	
Operacija radikalna Operation radical	8				
		etmoidni sinus ethmoid sinus	6	omejen na etmoid limited to the ethmoid	1
Preživeli 4 leta Surviving 4 years	7			širjenje v maksilarni sinus in/ali v nos extension to the maxillary sinus and/or nasal cavity	3
				širjenje v orbito extension to the orbit	2

Razprava – Pri izbiri zdravljenja karcinoma obnosnih votlin je v zadnjih treh desetletjih prevladal kombiniran pristop, to je kirurški z radioterapijo, saj zgolj en sam način zdravljenja nudi le zelo skromno petletno preživetje, v povprečju do 20% (3). Vloga kemoterapije v sklopu kombiniranega zdravljenja še ni opredeljena. Zaenkrat lahko rečemo, da naj bi bila uporaba kemoterapije omejena na prospektivne študije pri bolnikih z napredovalimi tumorji (4). Operacija je torej na prvem mestu v sklopu zdravljenja malignomov obnosnih votlin (izjema so limfomi). Zaradi večinoma visokega stadija bolezni ob času diagnoze pore še vedno tisto, kar je odločalo o končnem obsegu operacije. Za parcialno maksilektomijo večjega ali manjšega obsega smo se načeloma odločali, ko je bil tumor omejen na infra in mezostrukturo, oziroma ni segal iznad Öhngrenove črte (5). Pri karcinomih etmoida in razširjenih karcinomih etmoidomaksilarnega masiva se bomo morali v bodeče vsekakor pogosteje kot doslej odločati za kombiniran kraniofacialni pristop. Najpomembnejša pri odločanju za tovrstno ekstezivno kirurgijo pa mora vseeno ostati celovita presoja razširjenosti in narave tumorja, pri čemer moramo poleg perioperativnega tveganja

in prognoze bolezni upoštevati tudi vse morebitne za bolnika nesprejemljive posledice take operacije. Še posebej je treba poudariti ključno točko, kjer smo nekajkrat bolj ali manj zavestno odstopili od radikalnosti operacije, to je sočasna izpraznitev oribre. Temu vsekakor ni bil vzrok kirurško-tehnični problem, temveč še vedno močno deljena mnenja o indikaicjah za eksenteracijo, predvsem v mejnih primerih, ko tumorska rašča prodre zgolj do periosta orbite ali v njega (6, 7).

Pogostnost zasevanja karcinoma obnosnih votlin v področne bezgavke je v povprečju do 25% (8), zato smo se pri naših bolnikih odločali za kurativne disekcije, ne pa za elektivne – v N_0 stadiju, saj je den izmed pomembnih dodatnih razlogov za pooperativno obsevanje tudi elektivna radioterapija kirurško nedostopnega retrofaringalnega bezgavčnega področja.

Pri vrednotenju rezultatov je bilo zaradi sorazmerno majhnega števila operiranih bolnikov težko ocenjevati dejavnike, ki so vplivali na izid zidravljenja. To velja tako za histomorfologijo kot tudi za razširjenost tumorja, čeprav se boljše preživetje bolnikov z malignomi v področju etmoida v primerjavi s tistimi v maksilarnem sinusu ujema z dejstvom, da je bilo v skupini bolnikov z rakom v etmoidu več takih z nižjim stadijem bolezni kot pri bolnikih z malignomi v maksilarnem sinusu.

Radikalnost operativnega posega pri zdravljenju malignomov obnosnih votlin je izredno pomembna (9), kar kažejo tudi naši rezultati.

Zaradi redkosti malignomov obnosnih votlin, njihove napredovalosti v času diagnoze, celovitosti diagnostičnega postopka, doslednejšega uvajanja kombiniranih pristopov (kraniofacialne kirugije), čimprejšnje in dokončne ne samo protetične rehabilitacije ter ciljane pooperativne radioterapije (ki je možna le ob tesnem sodelovanju med kirurgom in radioterapevtom) bi bila v Sloveniji smislena in potrebna diagnostična in terapevtska obravnava teh bolnikov na enem mestu, torej koncentracija teh bolnikov. Le na ta način bi lahko čez čas prav ocenili lastne izkušnje na temelju sodobnega kirurškega zdravljenja in, kar je seveda najbolj pomembno, tudi izboljšali zdravljenja.

Povzetek

Na Univerzitetni otorinolaringološki kliniki v Ljubljani smo od 1976. do vključno 1985. leta obravnavali 34 bolnikov z malignomi obnosnih votlin, večinoma v napredovalem štadiju bolezni. Od 34 bolnikov smo se pri 18 odločili za operativno zdravljenje, ki mu je v vseh primerih sledilo obsevanje. Ostalih 16 bolnikov je bilo zdravljenih le z obsevanjem. Od 18 operiranih bolnikov jih je 10 preživelo brez bolezni najmanj 4 leta po zaključenem zdralvjenju (55%), pri čemer je bila radikalnost kiruškega posega v pozitivni zvezi z izidom zdravljenja.

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THE INSTITUTE OF ONCOLOGY, LJUBLJANA

TRIPLE CARCINOMA IN A PATIENT WITH PRIMARY BREAST CANCER

Čufer T, Cerar O

Abstract – The case of a patient with triple malignoma is reported. On surgery for primary breast carcinoma the pathohistologic examination of the removed axillary lymph nodes revealed the presence of non-Hodgkin lymphoma of low-grade malignancy. Further clinical, laboratory and diagnostic investigations confirmed that, apart from breast cancer, the patient also had a non-Hodgkin lymphoma of KLL type, stage IV A. Two years later, an invasive transitional cell carcinoma of the pyelon of the right kidney was diagnosed as well. The incidence of multiple primary neoplasms in patients with primary breast cancer is discussed.

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Key words: breast neoplasms, neoplasms multiple primary, lymphoma non-Hodgkin's, kidney neoplasms

Case report

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introduction – It has been exactly a hundred years since Billroth in 1889 first described a patient with multilple primary neoplasms (MPN). In 1932, Warren and Gates first reported on a large number of such cases, and proved that cancer patients were at greater risk of developing a second or even a third neoplasm sometime in their life. The authors also set the criteria for MPN diagnosis which have later become generally accepted: 1) each of the tumors must present a definite picture of malignancy; 2) each must be distinct; and 3) the probability that one was a metastatic lesion from the other must be excluded. In studying MPN, Moertel distinguished multiple primary neoplasms according to the site of origin, i.e. those appearing multicentrically in one and the same organ, and others originating in different organs (Table 1). He was convinced that the patients with a particular epithelial neoplasm are at much greater risk of developing a second or even third neplasm ih the same organ or tissue (multiple carcinomas of the aerodigestive and urogenital tracts). As to the appearnce of MPN in different organs, Moertel was, however, sceptical about their presumably greater incidence in cancer patients (1). In 1977; Schoenberg published his findings on the incidence of MPN in Connecticut and Denmark (2) which inequivocally proved that cancer patients were at 31% increased risk of developing another primary malignoma in the same tissue, whereas their risk of developing a second primary malignoma in a different organ was increased by 23%., many studies on MPN in breast cancer patients publiched since the 60's have proved that breast cancer patients run higher risk of developing a second or even third primary malignoma (3, 4, 5, 6, 7, 8), among these ovarian, uterine and colonic carcinomas are believed to be most frequent.

Table 1 – Classification of Multiple Primary Malignant Neoplasms

I.	Multiple primary malignant neoplasms of multicentric origin
	A. The same tissue and organ
	B. A common contiguous tissue shared by different organs
	C. The same tissue in bilaterally paired organs
II.	Multiple primary malignant neoplasms of different tissues or organs
III.	Multiple primary malignant neoplasms of multicentric origin plus a lesion(s) of a different tissue or organ

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Case report – A 71-year old housewife, who had been free of any major health problems so far, noted a lump in her left breast, which proved to be a breast carcinoma on cytology. Based on the clinical status as well as the findings of examinations for evaluating the extent of disease (blood count and chemistry indlucing liver tests, chest X-ray and bone scintiscan) a breast cancer in clinical stage $T_2N_OM_O$ was diagnosed. The patient underwent a modified radical mastectomy. Pathologic examination of breast tissue revealed an invasive ductal carcinoma, G II. The axillary lymph nodes were not involved by carcinoma though all the examined lymph node specimens contained cells of non-Hodgkin lymphoma of KLL type. No adjuvant treatment for breast cancer was indicated. Later on, some additional examinations for staging of NHL were performed. Peripheral lymph nodes were not enlarged, and the remaining clinical findings were within normal limits. On CT of the abdomen, however, enlarged left iliacal lymph nodes were found. Further biopsy of the bone marrow revealed the presence on NHL cells in the bone marrow. The findings of peripheral blood examination were wihtin the limits of normal values. A NHL of KLL type, stage IV A was; diagnosed, which required no treatment. Twenty months later the patient presented with pain in the left shoulder and the left upper extremity. Bone scintiscan revealed a pathologic uptake in the left humerus and the lumbar vertebrae. X-ray of the affected region showed the presence of osteolitic metastases. No metastases in the soft tissue or viseral organs could be established. Hormonal therapy with tamoxifen and irradiation of the left humerus were aplied. This treatment resulted in a partial regression of bone metastases. Three months later the patient presented with massive hematuria. Apart from the enlarged iliac lymph nodes, the abdominal CT performed at that time revealed a tumor in the region of the right kidney, which required nephroureterectomy with lymphadenectomy. On histopathologic examination, the renal tumor was found to be an infiltrative transitional cell carcinoma of the pyelon, G III, whereas the hilar and paraaortic lymph nodes contained NHL infiltrates of KLL type. An additional treatment for this carcinoma was not indicated. During the following two years the patient was receiving continuous hormonal treatment and was subject to regular follow up. The bone metastases were in remission, but enlarged neck and bilateral inguinal lymph nodes appeared. The findings of aspiration biopsy suggested a NHL-KLL type involvement of the lymph nodes, which, however, did not seem to cause any difficulty to the patient; as the findings of blood examinations were all the time within the limits of normal values, no treatment for NHL was considered necessary. In December 1989, i. e. four years after the diagnosis of primary brfeast cancer and NHL, 2 years from the appearance of carcinoma of the right renal pyelon, and 30 month after the confirmation of skeletal metastases, the patient presented with clinically and radiologically evident progress of osteolitic skeletal metastases. CT of the abdomen, performed to explain pain in the lumbar region, showed enlarged iliacal lymph nodes as well as a tumorous mass in the apical part of the left kidney. Angiography of the left kidney imaged an irregular vascularization of the apical part of the left kidney, which was not of hypernephrotic type. Angiographic findings indicated a very high probability of a tumor of the left renal pyelon. Based on the investigations performed so far, in our patient with proven triple malignoma, the appearance of a fourth neoplasm has been suspected, which is most probably another malignoma of multicentric origin in the uropoietic system. Extirpation of the tumor and histologic verification of the process in the left kidney were not indicated because of the patients' advanced age and her poor general condition due to the progress of bone metastases. Encouraged by the favorable effect of first-line hormonal treatment on skeletal metastases, we introduced a second-line hormonal therapy and palliative irradiation for alleviation of skeletal pain as the only treatment.

Discussion – Results of the studies performed on a large number of breast cancer patients during the past few years have confirmed that breast cancer patients are at an increased risk of being affected by other neoplasms as well (6, 7, 8). The largest study carried out in Finland comprised 26 000 patients with breast cancer (Table 2). All the results published so far uniformly confirm the exposure of breast cancer patients to an increased risk of developing a new primary carcinoma in the contralateral breast (1, 2, 3, 6, 7, 8). As to the appearance of new malignomas in other organs, breast cancer patients are believed to be more frequently affected by carcinoma of the genital organs, i. e. ovarian, endometrial and cervical carcinomas (3, 4, 7, 8). The studies analysing the appearance of a secondary malignoma of the genital organs according to the patient's age at breast cancer diagnosis have pointed out that younger women, parti-

Table 2 – Subsequent multiple primary malignant tumors in patients with cancer of the breast (No = 26 617 females) in Finland in 1953-79

Cancer designation	Observed	SIR
Site of first cancer: Breast		
Site or type of new cancer		
Any site (excluding breast)	720	1.17*
Esophagus	16	0.78
Stomach	107	1.11
Colon	62	1.36*
Rectum	33	0.97
Gallbladder, bile ducts	8	0.43*
Lung	46	1.67*
Cervix uteri	33	0.95
Corpus uteri	62	1.33*
Ovary	64	1.73*
Bladder	20	1.65*
Thyroid gland	22	1.95*
Leukemia	36	1.91*

$P < 0.05$
SIR = ratio of observed to expected number of cases

cularly those less than 45 years of age at the time of breast cancer diagnosis, are at greater risk of developing a second malignoma in the ovary (6). A secondary malignoma of the uterus more often appears in women older than 60 years at the time of breast cancer diagnosis (6, 7). Many studies (7, 8) though not all (6) give evidence of an increased risk of breast cancer patients for developing a second primary carcinoma in the colon. Some authors claim that in breast cancer patients the observed morbidity for other neoplasms such as carcinoma of the lung, bladder and thyroid as well as soft tissue sarcomas exceed the expected numbers (7, 8) whereas the reports of other authors do not support this belief (6). The risk of developing a second primary neoplasm increases by observation years. The younger the patient at the time of breast cancer diagnosis is, the greater the risk she runs of developing a new primary carcinoma. The causes for the appearance of multiple primary neoplasms in a person could be ascribed to environmental and genetic factors which are presumably responsible for the rise of multiple neoplasms of different origin. Thus a simultaneous appearance of breast carcinoma and endometrial carcinoma could be ascribed to excessive body weight in these patients as well as to their typical hormonal milieu (9). Familial and hereditary factors are believed to be responsible for a simultaneous rise of breast cancer and ovarian carcinoma, particularly in young patients. As to the frequently reported simultaneous appearance of breast carcinoma and colonic carcinoma, several authors ascribe this phenomenon to particular nutritional habits, as well as to the high socio-economic status of these patients (10).

Considering the differing results and opinions of several prominent authors, it is still questionable whether the observed number of other primary neoplasms in breast cancer patients is actually greater than expected, or it is just a consequence of a more accurate medical follow up of these patients, as it has been presumed by Moertel (1). Also in our patient the second malignoma (NHL of KLL type) was diagnosed on the pathohistologic examination of the lymph nodes removed on surgery for breast cancer. More effective treatment methods result in a prolonged overall survival of cancer patients, and so also of breast cancer patients, which on the other hand represents a greater possibility of appearance and detection of a second or even third neoplasm some time in their life. According to the results of recent studies (6, 7, 8) it can be concluded that at least certain age groups of breast cancer patients are undoubtedly exposed to a greater risk of being affected by particular malignomas. Thus, women with breast cancer have 3–4 times greater possibility of developing another carcinoma in the contralateral breast. Younger breast cancer patients are more frequently affected by ovarian carcinoma, whereas women having breast cancer detected in their older age are more likely to develop endometrial carcinoma. The mentioned correlations are, at presently known facts, the only ones that could justify preventive diagnostic examinations performed in search of a second malignoma. All other possible correlations between breast carcinoma and other neoplasms have not been supported by incontestable and convincing enough evidence so as to allow for any preventive diagnostic measures to be taken in this respect. It is of essential importance, however, that the possibility of a new primary malignoma in breast cancer patients is taken into account, and any possible appearance of new tumorous masses is not automatically regarded as a metastatic spread from breast cancer. Particular attention is required with solitary tumorous lesions in the organs that do not represent a common site of breast cancer metastatic involvement. In such cases histologic verification of the lesions is recommended in individual cases the relevant findings can esentially influence the treatment and prognosis of these patients. Apart from several epidemiologic stu-

dies which prove and confirm an increased risk of MPN in breast cancer patients, the available literature still lacks data on the influence of a second or even third primary malignoma on the treatment and survival of these patients.

Conclusion – In comparison with other women, breast cancer patients are at greater risk of acquiring new primary malignomas some time in their life. In breast cancer patients, the incidence of another primary carcinoma in the contralateral breast is five times greater than in other women. These patients are also more frequently affected by ovarian and endometrial carcinomas. Opinion on other cancer types that are presumed to appear more frequently in breast cancer patients are still differing. It is important, however, that the possibility of second malignoma in breast cancer is taken into account. The appearance of a new tumorous mass must not invariably be interpreted as a metastasis from the primary malignoma. Histologic verification of the tumorous mass can significantly influence the course of treatment and patient's prognosis.

Povzetek

TROJNI KARCINOM PRI BOLNICI S PRIMARNIM KARCINOMOM DOJKE

V članku poročava o bolnici s trojnim malignomom. Ob operaciji primarnega karcinoma dojke je bil s patohistološkim pregledom pazdušnih bezgavk odstranjenih ob operaciji karcinoma dojke ugotovljen ne-Hodgkinov limfom nizke malignostne stopnje v le teh. Nadaljnje klinične, laboratorijske in diagnostične preiskave so pokazale, da ima bolnica poleg karcinoma dojke še ne-Hodgkinov limfom tipa KLL stadij IV A. Dve leti kasneje je bil pri bonici ugotovljen invazivni tranzicicelularni karcilnom pielona desne ledvice. V diskusiji razpravljava o pojavnosti (incidenci) multiplih primarnih neoplazem pri primarnem karcinomu dojke.

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ONKOLOŠKI INŠTITUT, LJUBLJANA

OBSEVALNO ZDRAVLJENJE BOLNIC Z RAKOM DOJKE Z IMPLANTACIJO Pt – ^{192}Ir Pt–^{192}Ir

IRRADIATION THERAPY FOR BREAST CANCER USING Pt–^{192}Ir WIRE NET IMPLANTS

Kuhelj J

Abstract – The technique of radiotherapy with Pt-Ir implants in breast cancer patients is described. Pt-Ir alloy (Ir^{192}) wire with the diameter of 0.2 mm was activated in the nuclear reactor in Podgorica, inserted in plastic tubes and afterwards loaded into 15 cm long needles. These were pierced into the tumor site through two parallel perforated plates with geometrically regular hole distribution. Such implantation technique ensures an optimal dispersion of activity in the tumor. Isodose distribution is calcullated and graphically presented using a special computer program. The treatment was assessed as favourable. In 7-24 month period, neither a local recurrence nor marked esthetic sequellae or metastases could be observed in an of the 5 implanted patients. The method is associated with the following problems: 1) clinical localization of the tumor site in an anatomically alterated breast pressed between two parallel plates, and 2) radiation exposure of the staff during preparation of applicators, manual afterloading and patients care.

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Key words: breast neoplasms-radiotherapy, brachytherapy, platinum, iridium radioisotopes

Orig sci paper

Radiol Iugosl 1990; 24: 175-7

Uvod – Zdravljenje bolnic z rakom dojke z implantacijo radijskih igel je opisal že Finci (1).

Na Onkološkem inštitutu v Ljubljani je tak način zdravljenja uporabljal občasno Šavnik. Erjavec je uvedel v implantacijo tumorjev dojke zlata zrna ter trajne in začasne iridijeve implantate. Podobne metode je uporabljal tudi Fras (2, 3, 4). O tehniki implantacije raka dojke s pomočjo posebnih plošč za vodila sta poročala Benulič in Zwitter 1980 (5).

Uporaba elektronov v teleterapiji raka dojke in zanemarljivo število radikalno obsevanih bolnic je pri nas zanimanje za implantacijo raka dojk močno zmanjšalo. Ker pa so se pojavila v literaturi poročila o dobrih uspehih implantacije dojk, tako pri radikalnem obsevanju kot pri postoperativnem obsevanju (6, 7, 8, 9, 10), smo tudil pri nas pričeli leta 1987 ponovno z implantacijami tumorjev dojk.

V članku želimo opisati našo tehniko in metodo implantacije ter prikazati zgodnje rezultate zdravljenja tumorja dojk z implantacijo in komplikacije takega zdravljenja.

Material in metode – Leta 1987 do 1989 smo zdravili z implantacijo Ir žic v tumor s posebnim apliktorjem pet bolnic z rakom dojke (tabela 1).

Pri eni bolnici smo zdravili recidivo, eno bolnico smo obsevali po tumorektomiji in odstranitvi pazdušnih bezgavk, pri ostalih pa je bila implantacija v sklopu radikalnega obsevalnega zdravljenja raka dojke.

Tumor je bil pri vseh bolnicah citološko ali histološko potrjen. Pri eni bolnici je bil stadij pT_1N_{1b}, pri eni $T_{4b}N_O$, pri dveh T_{4b},N_{1b}, pri eni bolnici pa je bil stadij $T_{4d}N_{1b}$.

Vse bolnice so bile pred implantacijo tudi perkutano obsevane. Srednja tumorska doza je bila 58 Gy.

Pri implantaciji smo uporabljali Pt-Ir žice (^{192}Ir. Žice smo kupili pri podjetju Johnson-Matthey, nato smo jih v reaktorju Podgorica aktivirali. Specifična aktivnost žic, primernih za implantacijo, je znašala 37 MBq/cm – 74 MBq/cm (1 do 2 mCi/cm) žice. Žica je bila debeline 0,2 mm. Aktivno žico smo pred uporabo vstavili v plastično cevko z notranjim premerom 0,5 mm, zunanji premer je znašal 0,9 mm. Kot vodila za tako pripravljene Pt-Ir žice smo uporabili kovinske igle, dolžine 15 cm, ki so bile na enem koncu stožčasto zašiljene in zaprte, na drugi strani pa so imele odprtino, premera 1,2 mm. Zunanji premer uporabljenilh igel je znašal 1,6 mm.

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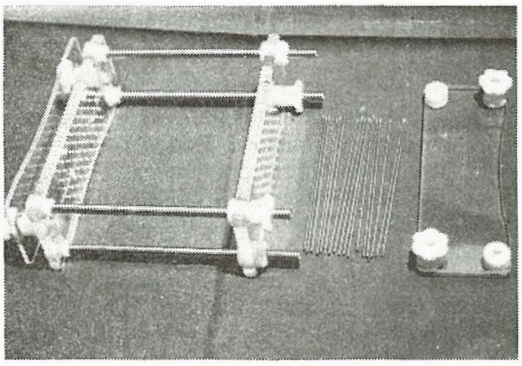
Tabela 1 – bolnice z rakom dojke, zdravljene tudi z implantacijo Pt-Ir žice (^{192}Ir) v mreži
Table 1 – Breast cancer patients treated with Pt-Ir (^{192}Ir) wire net implants

Stadij Stage	Starost (leta) Age (yrs)	Citl./ali histol. verifikacija Cytol.or/histol. verification tumor tumour	bezgavke lymphnodes	Perkutano obsevanje TD (Gy) Percutane. irrad TD(Gy)	Implantacija Implantation TD	MD	ChT	HT	Čas opazov. po začetku RT (mesec) (Follow up since RT start (mos)	Lokalno Local	Oddaljene metastaze Distant metastases
p T_1N_{1b}	45	+	+	50	15.2	26.8	CMF	–	21	CR	–
$T_{4b}N_0$	43	+	–	64	21.9	45.6	–	–	10	CR	–
$T_{4b}N_{1b}$	80	+	–	48	28	40	–	Nolvadex	24	CR	–
$T_{4b}N_{1b}$	55	susp.	–	42 + 20	33.6	43	CMF	Nolvadex	16	CR	–
$T_{4d}N_{1b}$	48	+	–	56 + 10	20	35	CMF	–	7	CR	–

Legenda – Legend:

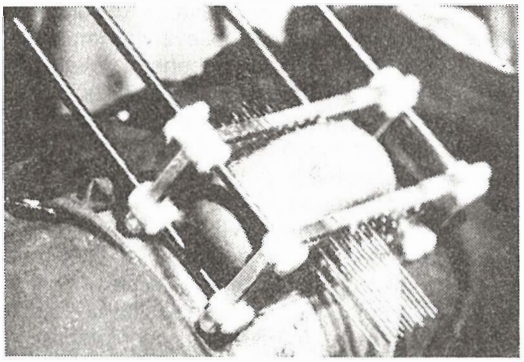
RT – radioterapija radiotherapy
Cht – kemoterapija chemotherapy
HT – hormonska terapija hormonal therapy
TD – tumorska doza tumor dose
MD – maksimalna doza maximum dose
CMF– ciklofosfamid / cyclophosphamide metotrexat / methotrexate 5-FU
CR – popolna remisija complete remission

Vodili za igle pa sta bili dve vzporedni perforirani plastični plošči. Vsaka je imela debelino 1 cm in kvadratno razporejene luknjice – premera 2 mm – v medsebojni odddaljenosti 1 cm. Štiri posebna vodila v vogalih obeh plošč so omogočila vzporedno spreminjanje oddaljenosti plošč od 0 – 15 cm, pri čemer smo jih lahko s pomočjo posebnih vijakov učvrstili v vsaki poljubni oddaljenosti. En rob plošč je bil prilagojen obliki torakalne stene in je bil rahlo konkaven. Pripravo je izdelal TIK Kobarid v sodelovanju s strokovnjaki Onkološkega inštituta (slika 1).



Slika 1 – Aplikator za implantacijo dojk
Fig. 1 – Applicator for breast implantation

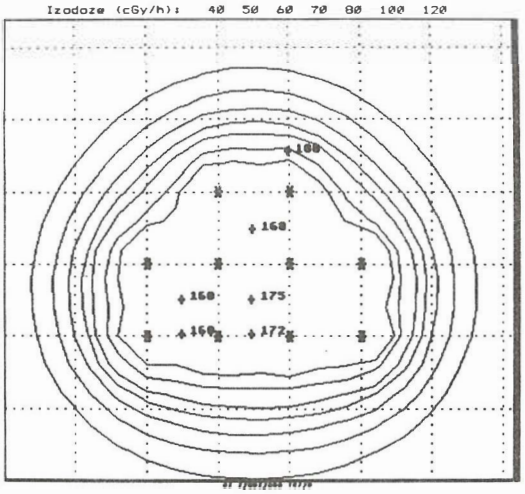
Implantacija je potekala v splošni anesteziji. Med vzporedni plastični plošči smo zajeli tkivo dojke, v kateri je bil karcinom. Nato smo plošči približali drugo drugi tako, da je bila dojka znotraj plošč stisnjena samo toliko, da se je razmak med ploščami s tkivom dojke enakomerno izpolnil. Tako stisnjeni plošči smo pričvrstili s posebnimi elastičnimi trakovi na torakalno steno, nato pa določili področje tumorja znotraj dojke, pri čemer smo si pomagali z mamografijo, po potrebi pa smo uporabili tudi radioopačne igle, ki smo jih vnesli v sam tumor. Ko smo imeli prikazano področje tumorja, smo pričelil ubadati prej opisane igle, ki so predstavljale nosilce za radioaktivne izvore. Dojko smo stisnili v sagitalni smeri. Igle smo uvajali iz lateralne v medialno smer. Razporedili smo jih tako, da smo pokrili celotno tumorsko področje, pri čemer sta vzporedno ležeči plošči z vzporednimi perforacijami omogočali točno razvrstitev igel v 1 cm mreži skozi področje tumorja. Pravilni razpored igel znotraj tumorja smo preverili z mamografsko sliko. Po potrebi smo ponovno razvrstili ubodene igle. Ko smo se prepričali, da je tumor v celoti zajet v implantat, smo bolnico odpeljali v bolniško sobo, kjer smo naknadno napolnili igle z aktivnim materialom (slika 2). Pred tem smo pripravili razvrstitev aktivnega materiala tako, da je bil aktivni del samo v predelu tumorja, ostali del aplikatorja pa je bil napolnjen z neaktivnim materialom, vloženim v plastično cevko. Ta cevka je na enem



Slika 2 – Implantirana dojka
Fig. 2 – Implanted breast

koncu primerno oblikovana za vtikanje v iglo, na drugem koncu pa je zataljena tako, da se lahko vnese v iglo samo na en način. Ko so bile vse igle napolnjene z aplikatorji, smo jih fiksirali s pomočjo posebne 0,5 cm debele plastične plošče, ki smo jo nataknili na štiri že omenjene vzporedne nosilce in z njimi pričvrstili igle in izvire v željeni položaj.

Dozo smo definirali z izodozno krivuljo, ki je bila 0,5 cm oddaljena od roba implantata. To smo naredili s pomočjo posebnega računalniškega programa (slika 3). Presek, v katerem smo izračunavali izodozno distribucijo, je tekel skozi središče tumorja. Za preračunavanje fizikalne doze v biološko dozo smo uporabljali korekcijo po Ellisu (11). Poleg doze, ki poteka 0,5 cm od roba implantata, smo izračunali tudi dozo v sečišču diagonal štirih sosednjih aplikatorjev. Tudi pri tako izračunani dozi smo ločili fizikalno dozo od biološkega ekvivalenta doze, z upoštevanjem korekcije po Ellisu. Pri bolnicah smo z dozimetrom izmerili dozo na površini kože in na ta način preverili računalniško izračunano dozo.



Slika 3 – Grafični prikaz izodozne razporeditve
+ 100 = izodoza, ki kaže 100% tumorsko dozo
+ 175 = maksimalna tumorska doza
* = mesta vbodov igel v tumor

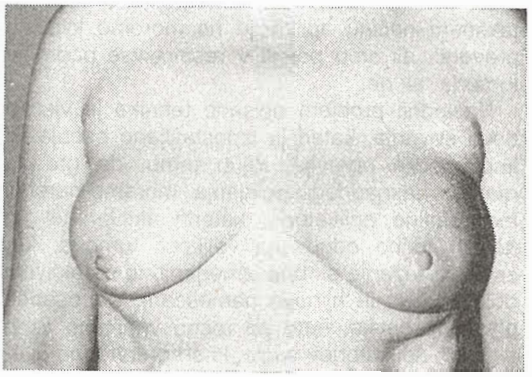
Fig. 3 – Graphic presentation of isodose distribution
+ 100 = isodose with 100% tumor dose
+ 175 = maximal dose (175% tumor dose)
* = localisations of needles, pierced into the tumor

Tumorska doza v implantatu je pri opazovanih bolnicah znašala 15,2 Gy do 33,6 Gy, v povprečju 23,74 Gy, maksimalna biološka doza v tumorju pa je znašala od 28,8 Gy do 45,6 Gy in v povprečju 38,8 Gy. Čas opazovanja naših bolnic je znašal od 7-24 mesecev, ena bolnica je bila opazovana 7 mesecev po implantaciji, ena bolnica 10 mesecev, ostale so bile opazovane več kot 12 mesecev.

Tri bolnice so dobivale skupaj z brahiterapijo še kemoterapijo, dve pa sta bili na hormonalni terapiji. Za kemoterapijo (Endoxan, Metotrexat in 5-FU) smo se odločili zaradi metastaz v pazdušnih bezgavkah, oziroma, zaradi vnetne oblike raka dojke. Nolvadex smo predpisali kot adjuvantno hormonsko terapijo 80-letni bolnici zaradi vraščanja raka dojke v kožo in drugi, postmenopavzalni imlantirani bolnici, zaradi lokalnega recidiva po predhodni radioterapiji.

Rezultati – Pri vseh implantiranih bolnicah smo v opazovalnem času ugotovili kompletno remisijo tumorja (tabela 1).

Na mestu tumorja je ostal fibrozni ostanek, ki klinično in mamografsko ni bil več suspekten. Lokalnega progresa pri nobeni bolnici v opazovalnem času nismo opazili. Tudi oddaljenih metastaz v opazovalnem času nismo našli.



Slika 4 – Dojka 1 leto po implantaciji
Fig. 4 – The breast one year after impiantation

Estetske posledice obsevanja so bile pri bolnicah minimalne (slika 4). Na mestu vboda in izstopa igel so ostale drobne brazgotinice. Pri dveh bolnicah so ostale na mestu na toraksu, kjer so pritiskale plastične plošče, temneje pigmentirane črte.

Diskusija – Naš način implantacije turmorjev dojke omogoča vnašanje igel in nato radioaktivnega materiala v geometrijsko pravilnem paralelnem sistemu v samo področje tumorja. To omogoča maksimalno obsevanje področja tumorja in minimalno obsevanje okolnega zdravega tkiva. Dozo, ki jo apliciramo na površino dojke, lahko ne samo izračunamo, ampak tudi izmerimo in se na ta način izognemo eventualnim prevelikim kožnim dozam. Bolnice med aplikacijo posebnih bolečin niso imele. Za umiritev bolečin med samo implantacijo, ki je trajala običajno približno 24 ur, so zadostovali analgetiki prvega reda. Pritisk paralelnih prozornih plastičnih plošč na kožo dojke in toraksa je pri dveh bolnicah povzročil preležanino, ki je kasneje imela za posledico trajno prekomerno obarvanost tega področja. Zato bo potrebno posebno pozornost posvečati tudi fiksaciji aplikatorja na toraks, da bi se izognili spremembi pigmentacije na mestu pritiska plastičnih plošč na toraks.

Da bi se izognili brazgotinicam po vbodu igel, bomo morali pričetil v bodoče uporabljati silikonizirane igle, ki bodo manj travmatizirale tkivo dojke.

Velik problem predstavlja dejstvo, da med paralelnima ploščama stisnjena dojka spremeni svojo anatomijo. Pri tem se spremeni tudi lega tumorja v dojki. Zato je pri taki aplikaciji klinično praktično nemogoče omejiti področje tumorja. Prepuščeni smo predhodno uvedenim markerjem, ki pa zaradi pritiska tudi spremenijo svojo lego, in pa kontrolnim mamografijam. Zato pri takšnem načinu aplikacije ne moremo klinično preveriti, ali smo pokrili v resnici vse področje tumorja, ali ne.

Naslednji problem opisane tehnike je visoka doza sevanja, kateri je izpostavljeno osebje, ki implantacijo opravlja. Kljub temu, da gre za metodo naknadnega polnjenja, moramo narediti individualne aplikatorje, katerih aktivni del po dolžini točno odgovarja velikosti tumorja, kar zahteva rezanje skrbno izmerjenih in že aktivnih dolžin Ir žic in njihovo nameščanje v posebne plastične cevke, nato pa ročno vnašanje vseh aktivnih aplikatorjev v igle, ki so predhodno uvedene v tumor.

Avtorji navajajo odlične estetske in kancericidne rezultate takega zdravljenja. Seitz (6) in Schmid (7) opisujeta eno lokalno recidivo pri bolnicah po tumorektomiji, obsevanih z implantacijo. Müller (9) ni našel nobenega lokalnega recidiva pri 69 radikalno obsevanih bolnicah, medtem ko Hammer (10) navaja lokalne recidive po implantacijah samo pri T_3 in T_4 tumorjih. Zato je v bodoče vsekakor potrebno misliti na večje število bolnic, bi bodo primerne za tako zdravljenje. To pa bo možno izivesti samo s tehniko daljinskega naknadnega polnjenja, po možnosti z visoko aktivnimi aplikatorji. Samo s takimi aprati se bomo lahko uspeli kar najbolje izogniti obsevanju osebja in skrajšati neprijetnosti in težave, ki jih imajo bolnice zaradi imlantata v dojki (10).

Zaključek – Implantacija omogoča obsevanje predvsem področja tumorja z dobro homogeno razporejeno dozo v področju samega tumorja in minimalnim obsevanjem zdravih okolnih struktur. Pri tem predstavlja težave dejstvo, da je področje tumorja možno kontrolirati samo mamografsko, medtem ko klinična kontrola ni možna. Ta metoda ima kot ročno naknadno polnjenje veliko pomanjkljivost, ker je osebje, ki pri pripravi in izvajanju implantacije pri opisanem ročnem naknadnem polnjenju sodeluje, izpostavljeno sevanju.

Menimo, da ima metoda možnost večje uporabe pri večjem številu bolnic samo z aparatom, ki bo omogočal daljinsko naknadno poljenje, in uporabo izvirov visoke aktivnosti.

Povzetek

Avtor opisuje tehniko in metodo implantacije bolnic z rakom dojke. Pri tem uporablja Pt-Ir zlitino (^{192}Ir) v žici premera 0,2 mm, ki je bila aktivirana v atomskem reaktorju v Podgorici, vložena v plastične cevke in nato vnešena v 15 cm dolge igle. Te igle ubada v tumorsko področje skozi vzporedni plošči, ki imata geometrijsko pravilno razporejene luknjice. Tak način implantacije omogoča ugodno razporeditev aktivnosti v tumorju. Izodozna razporeditev je izračunana in grafično prikazana s posebnim računalniškim programom.

Potek zdravljenja je bil ugoden. V obdobju od 7-24 mesecev pri 5 implantiranih bolnicah ni bilo lokalnega recidiva niti večjih estetskih sprememb, prav tako ne metastaz.

Problem predstavljata: (1) klinična omejitev področja tumorja pri anatomsko spremenjeni dojki, stisnjeni med vzporedni plošči ter (2) ekspozicija osebja pri pripravi aplikatorjev, ročnem naknadnem polnjenju in negi bolnic.

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SEKCIJA ZA RADIOLOGIJU ZBORA LIJEČNIKA HRVATSKE

MEDICINSKI CENTAR ZADAR
SLUŽBA ZA RADIOLOGIJU

DEVETI ZNANSTVENI SKUP RADIOLOGA SR HRVATSKE

Zadar, 26-29. rujna 1990. god.

Teme:

1. **Radiološka dijagnostika gastrointestinalnog trakta**
2. **Radiološka dijagnostika pluća i medijastinuma**
3. **Slobodne teme iz radiološke dijagnostike**

Prijave predavanja, uz kratke sažetke treba poslati do 5. svibnja 1990. godine na adresu: Medicinski centar, Služba za radiologiju 57000 Zadar I. G. Kovačića 5.
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COMPLICATIONS AT INTERSTITIAL RADIOTHERAPY OF GYNECOLOGICAL CARCINOMA

Kovač V, Kuhelj J.

Abstract – 36 patients with gynecological carcinoma, stages I-IV, were implanted. 18 of them had cervical carinoma, 5 endometrial, 6 vaginal and 7 ovarian carcinoma. Almost all patients had been intracavitarily and/or percutaneously irradiated on the pelvis to the tolerance dose on the point A 70 Gy. The implantation was indicated in cases of local recurrence *(20)*, regional metastases *(15)* and residual disease after primary treatment *(6)*, 5 patients had double indications.
Of 36 implantations, 16 were made by ^{198}Au grains and 20 were made by ^{192}wires. The reference dose at implanting was in the range of 26 to 120 Gy; the volume of the implanted area was from 3,9 to 70 cm^3.
Treatment-related complications were noted in 44% of patients. The mild complications were more frequent than the severe; there was a higher occurrence of acute complications.
The number of complications depended on the radiotherapeutic dose and on the volume of the implanted area. The statistical significance of these parameters, however, could not be evaluated.

UDC: 618.1:615.849.5

Key words: genital neoplasms, female-radiotherapy, brachytherapy, gold radioisotopes, iridium radioisotopes

Orig. sci paper

Radiol Iugosl 1990; 24: 181-5

Introduction – For radiation therapy in patients with gynecological carcinoma we are mostly combining external beam irradiation and intracavitary irradiation. Both methods allow a high percentage of total disease control (1, 2) and a relatively low rate of post-therapeutic complications (3, 4). In spite of this, the post-treatment analyses in some cases report residual disease or recurrence in the primary tumour area, metastasis in lymph nodes, hematogene metastasis in the vicinity of the primary area, or even distant metastasis, which all need additional treatment. Another of the possible radiation therapies is brachytherapy with implantation of ^{198}Au grailns or radioactive ^{192}Ir wires into the very tumour or metastasis.

The interstitial treatment is a sole means of administering a cancericidal radiation dose in patients who have already received radical radiation therapy. Here, the bladder and rectal doses should be considered. In the vicinity of the tumour, the dose of radiation sources is rapidly lowered, which avoids the complications (5).

According to Fletcher, the indications for the interstitial gamma-ray therapy are carcinoma of the vagina, carcinoma of the uterine cervix extending into the lower third of the vagina, and carcinoma of the stump or recurrent carcinoma after surgery. For the advanced carcinoma of the anterior vaginal wall and base of the bladder, the suprapubic cystotomy for the insertion of implantation needles can be performed (6).

The interstitial brachytherapy is also very applicable and effective in the primary tratment of carcinomas of the uterine cervix – in conjunction with other methods of radiation treatment – especially in cases of inadequate radium dosage as a result of the extent of the tumour or of the local advance of disease (7, 8), as well as in cases where the distorted anatomy prohibits the intracavitary irradiation (9). The aim of our retrospective analysis is to evaluate interstitial radiation, taking into consideration the indications, local response and complications.

Material and methods – In the years 1979-1986 36 patients with gynecological carcinoma were implanted. The diagnosis, FIGO stages at the beginning of the therapy, and the indications for implantations, are presented in Table 1.

The patients were 26 to 77 years old; the average age was 31,5 years. Most patients were in stage III of the disease.

14 patients had been surgically treated; 34 patients had been treated with external beam

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Table 1 – The patient distribution by diagnosis, stage and indication for interstitial implants

Diagnosis	Stage					Total	Residue	Local recurrence	Regional metastases
	I	II	III	IV	X				
Cervical carcinoma	2	9	7			18	2	10	9
Endometrial carcinoma	1	1	3			5		2	3
Vaginal carcinoma	3	1	2			6	4	3	1
Ovarian carcinoma			5	1	1	7		5	2
Total	6	11	17	1	1	36	6	20	15*

(*5 patients with double indications)

Table 2: Technique of interstitial irradiation and local response

Diagnosis	^{198}Au grains	^{192}Ir wires	CR	PR	Progress
Cervical carcinoma	10	8	8	8	2
Endometrial carcinoma	1	4	2	2	1
Vaginal carcinoma	2	4	2	4	
Ovarian carcinoma	3	4	3	3	1
Total	16	20	15	17	4

CR – complete response
PR – partial response

irradiation (tumour dose 50-60 Gy); 15 patients had been additionally intracavitarily irradiated on the point A 70 Gy. In 14 patients residuum, local recurrence as well as regional metastases had also been additionally treated with external beam irradiation. We used 8 MeV X-rays from a linear accelerator.

Of 36 implantations, 16 were made by ^{198}Au grains and 20 by ^{192}Ir wires (Table 2).

The activity of the ^{198}Au grains was estimated by 'dimension averaging', a method suggested by Cevc and Henschke (10), whereupon the dose was computer-calculated. On the basis of the computer data presentation a reference isodose was determined, considering the biological correction according to Ellis (11). The ^{198}Au grains were mostly utilized where tumours were not accessible enough to permit easy removal of souces. The ^{198}Au grains were applied by means of a special gun-applicator (Fig. 1 and Fig. 2), and remained permanent interstitial implants.

The dose of ^{192}Ir was determined by the isodose curve involving the whole tumour. The application was done by fork steel guide (Fig. 3). The ^{192}Ir wires were removable implants. The rectal dose was measured and the bladder dose calculated according to the distance determined by X-rays.

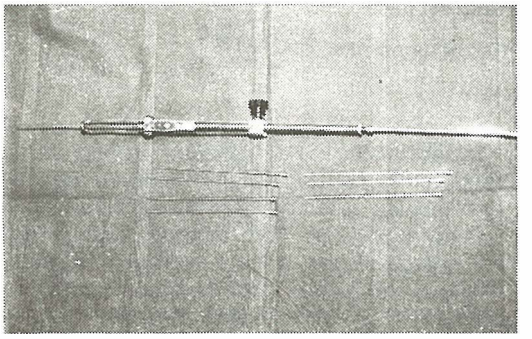

Fig. 1 – Gun-applicator for ^{198}Au grains

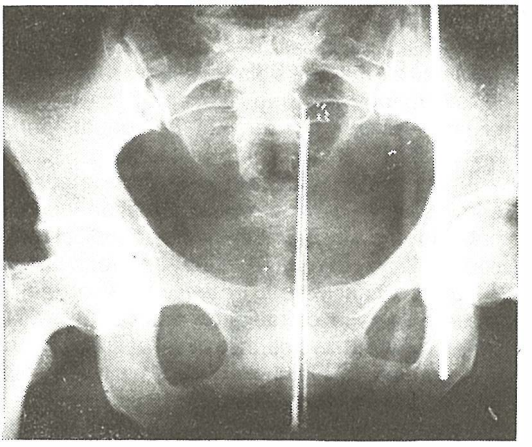

Fig. 2 – Application of ^{198}Au grains

Table 3 – Treatment-related complications

Complication	Acute			Late			Total	
Severity	1	2	3	1	2	3		
Cistitis	3	1		4	3		11	
Hydronephrosis			1				1	
Proctitis				1	1		2	
Paracolpitis		1					1	
colpitis	1						1	
Vaginal bleeding	1	1					2	
Phlebothrombosis		1					1	
Vesicovaginal fistula			2			1	3	
Rectovaginal fistula			1				1	
Total	4/36 11,1%	4/36 11,1%	4/36 11,1%	5/36 13,8%	4/36 11,1%	1/36 2,7%	23*/36	(16/36) (44,4%)

*Five patients had 2 post-therapeutic complications; one patient had 3 complications, whic lowered the total number of patients with complication to 16.

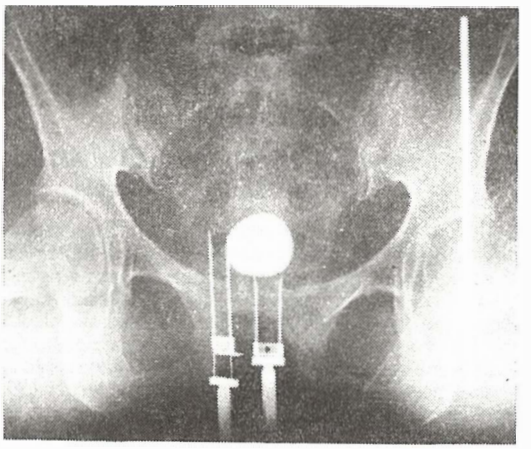

Fig. 3 – Application of ^{192}Ir wires by menas of fork steel guide

The reference dose at implanting was in the range of 20 to 120 Gy (average 45 Gy) and the volume of the implanted area was from 0,3 to 70 cm^3 (average 16.3 cm^3).

The severity of complications was graded as 1, 2 or 3. Grade 1 referred to minor symptoms which were self-limited or responded to outpatient management; grade 2 referred to major symptoms with repeated occurrences and requiring hospitalization for diagnosis and management; grade 3 required major surgery for correction.

Complications which appeared 0-6 months from implantation were considered acute and those after six months were considered late; the former occurred slightly more frequently.

Results – In 15 patients we received a complete response, in 17 patients a partial response, and in 2 patients we were unable to control the progress of disease (Table 2).

The median measured cumulative rectal dose was 70 Gy and the median calculated cumulative bladder dose was 68 Gy.

Table 3 lists therapy-related complications.

Five out of 36 (13,8%) patients experienced grade 3 complilcations. The total incidence of complications was 23 out of 36, with 5 patients having 2 complications and one patient having 3 complications, which lowered the total number of complicatilons to 16 (44%).

The frequency of complications was higher in those patients who at implantation received tumour doses over 45 Gy (52,6%), than in patients with tumour doses under 45 Gy (35,3%). The Chi-square test did not reveal a statistically significant difference ($p > 0,5$).

The incidence of complications in patients with the treated volume over or under 16 cm^3 did not vary. The frequency varied at the tumour volume 8 cm^3. The implantation of tumour volume under 8 cm^3 gave 12,5% sequelae, at larger tumour volumes the sequelae were 55,6%. The Chi-square test (with Yates correction), shows $p > 0,05$, which is also not statistically significant.

Discussion – Although the analysis included irradiated patients with a high cumulative irradiation dose, we were astonished at the relatively high rate of complications (44%). It should be pointed out, though, that some authors, reporting

low incidence of adverse irradiation side effects, counted as complication from treatment only those injuries where there was no trace of malignant lesion and the injury was of a severe character (1, 9). Others, reporting high incidence of complications, scored as a complication of treatment also milder injuries such as cystitis and proctitis – damages recorded by Ulmer and Frischbier (12) in the majority of irradiated patients.

Similar to the external beam irradiation of gynecological cancer, where subacute fibroses and complications of the urinary tract occurred as the most frequent post-irridation complications (2), the implantation gave the highest number of cistitis.

Hydronephrosis is a frequent complication in gynecological oncology (13). However, only a single case of hydronephrosis as a consequence of the ureteral damage was recorded, since the implantations involved only the distal regions of the genitary tract.

Rectal complications were substantially avoided due to the measurement of rectal dose (4, 14). The recommended maximal cumulative rectal dose on the anterior surface of the rectum should not exceed 60 Gy. Accordingly, the rectal doses already delivered with the external beam and intracavitary irradiation should be considered in dosimetric measurements in imlantation. Montana and Wesley report a significantly higher occurrence of proctitis in the group of patients with the mean rectal dose higher than 69 Gy, whereas the mean bladder dose for the group of patients with cystitis exceeded 66,6 Gy (15).

We intentionally risked a higher cumulative measured rectal dose and calculated bladder in order to attain the cancericidal dose, this being the only possible therapy for the observed patients. Nevertheless we concluded that 4 severe post-therapeutic complications (3 vesicovaginal fistulas, 1 rectovaginal fistula) were a consequence of the large tumour volume rather than of the exceeded tolerance dose. According to Fletcher, at least 90% of fistulas are developed at the invasion of carcinoma into vagina, or due to the bulky tumour lesion, respectively (6).

In our case, the incidence of complications was conditioned by the radiation dose at implantation and the tumour volume. However, this correlation was not statistically significant. This could be explailned *(a)* by the small number of patients, *(b)* by the strong relationship between rectal and bladder doses and the distance between the implant and both organs and *(c)* the fact that the sequelae of treatment observed on rectum and bladder also depend on the previous dose rate and previous surgical treatment.

Manual application of the implants highly increased the exposure to irradiation of the professional staff over that of the machine technique of after-loading the interstitial implant. Although the department staff at our institute is exposed to 5-20 times lower equivalent dose of the yearly recommended dose limit for professional staff, we wish to lower this dose to a minimum with the introduction of the after-loading technique.

In our gynecological patients, the implantation is a rather rarely applied therapy. We have a smaller number of patients with residual tumour, a larger number with regional metastasis and the largest number with local recurrence.

We estimate that in the future the trend will be for the application of the implantation technique at the completion of radiation therapy. Similar assessments have been reached by other authors as well (6, 7, 8, 9, 16, 17, 18).

Povzetek

KOMPLIKACIJE PO INTERSTICIALNI RADIOTERAPIJI GINEKOLOŠKEGA KARCINOMA

36 bolnic z rakom na rodilih, stadij I-IV, smo implantirali. 18 se jih je zdravilo zaradi raka vratu maternice, 5 zaradi endometričnega raka, 6 zaradi raka v nožnici in 7 zaradi raka na jajčnikih. Pred implantacijo so bile operirane in/ali perkutano obsevane, skoraj polovico od njih pa je prejelo tudi intrakavitarno radioterapijo. Obsevane so bile do tolerančne doze 70 Gy na točko A.

Indikacije za implantacijo so bile: lokalni recidiv (*20*), regionalne metastaze (*15*) in reziduum tumorja po primarnem zdravljenju *(6)*. 5 bolnic je imelo dvojno indikacijo.

Od 36 inplantacij smo naredili 16 z ^{198}Au zrni in 20 z ^{192}Ir žicami. Referenčna doza pri takem obsevanju je bila od 26 do 120 Gy; volumen inplantiranega področja pa od 3,9 do 70 cm^3.

Komplikacije smo ugotovili pri 44% bolnic. Bolj pogoste so bile blage in akutne, kot pa težje in kasne.

Komplikacije so bile odvisne od višine tumorske doze in velikosti obsevanega volumna pri implantaciji, vendar povezava ni bila statistično signifikantna, ampak se je le nakazovala.

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SREDIŠNJI INSTITUT ZA TUMORE I SLIČNE BOLESTI, ZAGREB
LABORATORIJ ZA EKSPERIMENTALNU KANCEROLOGIJU

THE IMPORTANCE OF SELENIUM IN ONCOLOGY

Huljev D

Abstract – Selenium levels in tumorous and congeneric normal human tissues were analyzed by the NAA method. As shown by the results of the experiments, many tumorous tissues contain selenium to a significantly lower extent as compared with identical but normal tissues. The following tumorous to identical normal tissue selenium ratios (dry weight) were obtained in men: larynx 0.07/0.7; cerivcal lymph nodes 0.2/0.8; lung 0.16/0.8; eyelid 0.5/4.0 ug/g (ppm). If there is a selenium surplus or shortage in the body (tissue), either can be a possible cause or consequence of a malignant process. This is why the daily diet should contain a specific quantity of selenium which can approximately be eliminated.

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Key words: neoplasms–analysis, selenium

Orig sci paper

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Introduction – The essential role of selenium in animal nutrition is well established. In humans it has been demonstrated that an endemic cardiomyopathy prevalent in certain areas of China is correlated with selenium deficiency. Selenium also has been claimed to prevent certain types of cancer (1, 2), to enhance immune responses, and to increase fertility in domestic animals.

Specific incorporation of selenium in biologically active macromolecules has provided some molecular basis for the nutritional role of selenium in mammals and bacteria. Of the eilght selenoenzymes that have been identified to date, seven are of bacterial origin. Glutathione peroxidase, which occurs in mammals and birds, has not been reported in prokaryotes. The chemical forms of selenium in the polypeptide chain of several of these enzymes is selenocysteine or, in two instances, selenomethionine.

It is well known that NAA can be used to advantage in analyzing trace elements in oncological cases (3). As shown by many analyses, tumorous tissues contain a significantly higher level of selenium and other trace elements as compared with their normal counterparts (4). Our first specimens produced identical data (5).

Some tumorigenic processes can also produce lower concentrations of selenium and other elements in tumorous tissues (6). Studies have also shown that one should distinguish trace element data for women and men because of significant differences (7). Interestingly enough, tumorous tissue age also affects its trace element composition (8). Experiments on mice have shown that some elements are excreted – during the tumorigenic process – from tumorous tissue into the blood and may be used as growth markers for the tumorigenic process in guestion (5, 9, 10). Very important studeis have resulted in the discovery of isotopes used in detecting tumor microsites (3). Selenium was selected for analysis, being a classic anticancerogenic element (11). It is found in an enzyme, glutathione peroxidase, which serves together with vitamin E as an antioxidative barrier in the cell (12, 123, 14, 15). Selenium supplemented diets reduce the incidence of cancer in variety of chemically induced experimental tumor systems (16).

This study was focused on obtaining data on selenium levels in tumorous tissues and their comparison with results obtained in identical but normal tissues. The principal goal was the use of such data in tumor diagnosis and therapy.

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Material and Methods – All the specimens obtained from the clinicians at the institute were pathohistologically analyzed. The same procedure was applied to both tumorous and normal tissues. Quartz and polyethylene vessels were used in order to avoid specimen contamination. Selenium was determined by nondestructive NAA in order to prevent additional specimen contamination. The analysis was described in detail on an earlier occasion (3).

Results – Table 1 lists only trace element data for tissues of humans living in a single geographical locality. This has been done in order to avoid the effects of the environment (soil, water and air) on trace element composition in the analyzed tissues. Only trace element data on tissues of persons of the same sex (men) have been compared.

Table 1 – Data obtained by Se analysis (NAA) in tumorous and normal tissues of people coming from the same geographical locality (Zagreb region) are shown in ug/g (ppm) of dry weight

Tissues	tumorous	normal	p(t-test)	Ratios tumorous normal
Larynx (15+15 camples)	0.07	0.7	0.001	1 : 10
Cervical lymph nodes (20+20 samples)	0.2	0.8	0.001	1 : 4
Eyelid (20+20 samples)	0.5	4.0	0.001	1 : 8
Lung (5+5 samples)	0.16	0.8	0.001	1 : 5

Discussion – Trace element/cancer studies should answer two very important questions: do trace element imbalances cause cancer? Does the tumorigenic process produce differences in tumorous as compared to normal or entirely healthy tissue? We have tried to answer these questions by tests carried out on experimental, genetically identical mice (8). The results showed the following: although the mice infected with tumorous cells lived identically as the control animals, the trace element composition of the tissue in which the tumor grew changed. This shows that the tumorous tissue of infected mice suffered from an imbalance (shortage or surplus) of trace elements although trace element supply was the same for both infected and noninfected animals. It may therefore be assumed that the tumorigenic process in the tissue of mice infected with tumorous cells causes an imbalance in trace element composition. Thus, the imbalance in breast tissue in women is probably due to the tumorigenic process, because of which tumorous tissue accumulates a number of elements as compared with identical, normal breast tissue (17). The excretion of some elements from tumorous cells into the blood stream is also due to tumorous cell growth. The excreted elements can serve as markers of tumorigenic process progression. Trace element analysis can be of help in detecting elements (isotopes) which specifically accumulate in the tumorous tissue of a given organ. All these experiments provide a small contribution to improving detection and localization of the tumorigenic process. Selenium can be considered as a marker of those tumorigenic processes which involve selenium elimination from tissue. Radioactive selenium can be used, in the form of isotopes or chelates, in searching for tumorigenic process microsites if they are characterized by selenium and selenium compound acumulation.

Sažetak

Analizirana je koncentracija selena u tumorskim i istovrsnim normalnim tkivima u ljudi metodom neutronske aktivacijske analize (NAA). Rezultati eksperimenata pokazuju da mnoga tumorska tkiva sadrže signifikantno manje selena nego identična ali normalna tkiva. Za odnos selena u tumorskom prema identičnom normalnom tkivu (suha težina) u muškaraca, dobiveni su slijedeći podaci: larinks 0.07/0.7; limfni čvorovi vrata 0.2/0.8; tkivo pluća 0.16/0.8; vjeđa oko 0.5/4.0 ug/g (ppm). Ako u organizmu (tkivu) ima višak ili manjak selena, oboje može biti jedan od mogućih uzroka ili posljedica malignog procesa. Zbog toga je važno, da dnevno putem hrane u organizam uđe sasvim određena količina selena, da bi približno ista mogla biti eliminirana.

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THE INSTITUTE OF ONCOLOGY, LJUBLJANA[1]
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THE INFLUENCE OF RADIOTHERAPY ON SPERMATOGENESIS IN PATIENTS WITH TESTICULAR SEMINOMA IN RELATION TO PROTECTION FROM SCATTERED RADIATION

Kovač V[1], Umek B[1], Marolt F[1], Škrk J[1], Reš P[2], Kuhelj J[1]

Abstract – In 40 patients with testicular seminoma that had been treated with unilateral orchiectomy and prophilactic irradiation of retroperitoneal lymph nodes, there was established the extent of impaired spermatogenesis and measured the gonadal dose during irradiation by means of TLD dosemeters. Before radiotherapy (RT) only 11 patients had adequate results of semen analysis. After RT in most cases the quality of semen deteriorated. In patients, whose testes were shielded from scattered radiation, the impairment of semen after RT was smaller than in patients that were not shielded, yet the difference was not statistically significant because of the small number of the patients studied. A comparison of the measured gonadal dose in 4 unprotected and 8 protected patients showed that by the use of shielding the gonadal dose was lower for about two thirds.

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Key words: testicular neoplasms, seminoma, radiotherapy–adverse effects, semen–analysis, spermatogenesis

Orig sci paper

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Introduction – Contemporary methods of treatment allow a longer disease-free survival or complete recovery for an increasing number of patients. Radiotherapy (RT) (in addition to chemotherapy and some surgical treatment) influences the functions of many organic systems, which may result in an impaired quality of life after a successful treatment (1).

Negative influence of ionizing radiation upon spermatogenesis in animals and humans has been reported by numerous authors (2, 3, 4). After irradiation there can be seen a decreased state of fertility, which is shown in an altered quality of ejaculate. The impairment depends on the applied dose, the manner of fractionation and upon the primary fertility of the patients (5, 6).

After RT has been completed, the function of testic: *(a)* completely recovers, *(b)* partially recovers, or *(c)* patients remain sterile. The speed and the extent of recovery is influenced by the above factors, therefore it cannot easily be foreseen. Hence semen cryopreservation before RT is of special importance (7, 8).

In clinical practice there are also treated young patients (in reproductive age) with seminoma who want to have children after their recovery. Therefore we were interested in finding out to which extent and for how long RT impaired the spermatogenesis of the remaining testis with respect to the gonadal dose of scattered radiation (9).

It was tried to improve the treatment by shielding the testes from scattered radiation, which was evaluated by measuring the gonadal dose and performing the controlling of semen quality.

Materials and methods – 40 patients with an average age 30 years (from 18 to 48 years) were treated with unilateral orchiectomy and prophilactic irradiation of retroperitoneal lymph nodes. All patients had a histologically confirmed diagnosis of testicular seminoma.

In the period 1981–1983 29 patients were treated without shielding the remaining testis from scattered radiation *(Group I)*. In 14 of these patients semen analysis was performed before *and* after RT, whereas in 15 patients it was performed either before *or* after RT. The gonadal dose was measured in 4 patients.

Later, in the years 1988–1989, a special lead shield was constructed to protect the testis from scattered radiation during treatment in supine position (Fig. 1). In prone position the testis was

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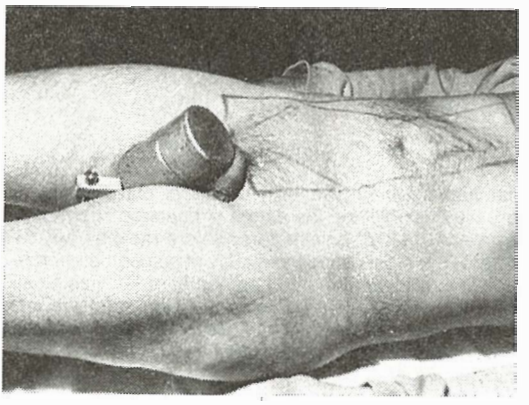

Fig. 1: Patient with contact gonadal shield during treatment with external beam irradiation

still unshielded. In this manner 11 patinets *(Group II)* were treated. In all patients the semen analysis before RT was made, whereas in 6 patients the semen analysis after RT was performed as well. The gonadal dose was measured in 8 patients.

The impairment of spermatogenesis in relation to the gonadal dose was statistically evaluated with Fisher's exact test and Chi-square test.

Both groups of patients were treated with two opposite fields, with 8 MeV X-rays from linear accelerator MEL SL 75/20, the tumour dose being 3000 cGy (20x150 cGy, in four weeks). The dose was measured by TLD dosemeters (LiF rods) that were attachet to the patient's testis. The dosemeters were thermally treated and read out in a TLD reader Toledo 654 (D. A. Pitman Inst.) (10).

Semen specimens were collected and analyzed before and after RT at the University Clinic of Gynecology in Ljubljana according to conventional methods (11). When the patients had their sperm analysed several times, the spermatogram showing the greatest impairment was taken into account except when the analyses were made in the course of the same month.

If the ejaculate before RT was adequate, semen cryoconservation was performed for possible artifical insemination. Thus, 11 patinets from Group I and 10 patients from Group II gave sperm for cryoconservation at the University Clinic of Gynecology in Ljubljana.

Results – The results of measuring the gonadal dose in patients with shielded and unshielded testis are shown in Table 1. It is evident therefrom that by the use of shielding the gonadal dose was decreased approximately by two thirds. Thereby there was achieved a gonadal dose of 1.5% of the applied tumour dose.

Table 1 – Gonadal dose at the end of the treatment

	Number of patients	Median dose (cGy)	Range (cGy)	% of tumour dose
Group I unshielded testis	4	127	124-156	4.2
Group II shielded testis	8	45	26-120	1.5

Table 2 – Results of semen analyses before and after RT in patients *without* gonadal shield during treatment *(Group I)*.

Before RT		After RT (in 0-38 months, median 10.5 months)				
		OAT II	OAT III	AZOO	NECRO	WSA
NORMAL	7	1	1	2		3
OATI	6		1	2		3
OAT II	4	*1**		2		1
OAT III	5		*2**	1		2
NECRO	2				*1**	1
WSA	5**		2	3		
TOTAL	29	2	6	10	1	10***

* No evidence of increased impairment
** Semen analysis was only made after RT, the fertility before RT was proven by the partner's pregnancy.
*** Semen analysis was made only before RT, patients declined further analysis or were lost from the follow-up

NORMAL normal spermatogram
OAT I oligoastenoteratozoospermia grade I
OAT II oligoastenoteratozoospermia grade II
OAT III oligoastenoteratozoospermia grade III
AZOO azoospermia
NECRO necrozoospermia
WSA without semen analysis

A semen analysis was made before and after RT. The analysis results in unshielded and shielded patients are shown in Tables 2 and 3. It is evident therefrom that the patients of Group II (with the shield) had lesser impairments of spermatogenesis than the patients of Group I (without the shield).

In order to exactly compare the effect of different doses upon spermatogenesis only patients with spermatograms before and after RT were considered, i. e. 14 patients from Group I and 6 patients from Group II (Table 4). In Group I, i.e.

those with unshielded testis, 10 patients had worse results of spermatoanalysis after RT and 4 patients had equal results, whereas in Group II, where the special gonadal shield was used, this ratio was 2:4. Because of the small sample we used Fisher's exact test, which shows $p = 0.16$, which means that the difference between the groups is not statistically significant though such conclusions are suggested.

As we wanted to have a more representative sample, Group I was supplemented by 5 patients who had children before RT, i.e. who were primarily fertile though this fertility was not established by a previous spermatogram. Chi-square (with Yates correction) shows $p = 0.11$, which is not statistically significant either.

Table 3 – Results of semen analyses before and after RT in patients with gonadal shield during treatment *(Group II)*

	Before RT	After RT (in 0-12 months, median 4 months) NORMAL	OAT II	WSA
NORMAL	4		1	3
OZ I	1	*1**		
ASZ I	1		1	
ATZ I	1			1
OAT II	3		*3**	
OAT III	1			1
TOTAL	11	1	5	5**

* No evidence of increased impairment.
** Semen analysis was made only before RT, patients have not been motivated for further analysis.

NORMAL normal spermatogram
OZI oligozoospermia grade I
ASZ I astenozoospermia grade I
ATZ I astenoteratozoospermia grade I
OAT II oligoastenoteratozoospermia grade II
OAT III oligoastenoteratozoospermia grade III
WSA without semen analysis

Table 4 – Comparison of semen analysis results of patients of both groups after RT (patients lacking an analysis either before or after RT have been eliminated)

	Number of patients with increased impairment	without increased impairment	Total
Group I unshielded testis	10	4	14
Group II shielded testis	2	4	6
Total	12	8	20

Discussion – It is evident from Table 1 that the range of the measured gonadal doses was very broad. This can be attributed mostly to the different distances between the testis and the edge of the treatment field, and also to the size of the treatment field.

Our results are close to other results in the literature. Smithers et al achieved by their protection that the gonadal dose amounted 1.5 to 2.5% of the nodal dose (12), Schlappack et al achieved 2.0% of the nodal dose (13), Fossa et al achieved 1 to 3% of the target dose (5) and Fraass et al reached the gonadal dose of less than 1% of the dose aplied (14).

The majority of seminoma patients already had impaired spermatogenesis before RT. This could be explained (a) by testicular histologic abnormalities that give rise to process of malignisation, (b) by surgical stress at orchiectomy, and (c) by anxiety about infertility and the success of the treatment.

Our semen analyses and measurements of the gonadal dose confirm the finding that in patients with testicular seminoma scattered radiation *additionaly* impairs spermatogenesis (2, 3, 5, 15).

By the contact shield of the testis during exposure to X-rays the gonadal dose was reduced from 4.2% to 1.5% of the applied tumour dose, which less impairs the spermatogenesis. A statistically more significant difference has been expected, the number of the patients, however, seems to have been too small for more significant results.

A detailed analysis of Tables 2 and 3 shows that the impairments of spermatogenesis in Group I were not only more frequent but also more intensive.

Most patients had spermatograms made several times after RT and it has been possible to establish the reversibility of the impairment in most cases. The exception were the patients who had severely impaired spermatogenesis even before RT.

In spite of the reversibility of the impairment, the state after RT cannot be anticipated with certainty, which is due to the above-mentioned different states of spermatogenesis before RT and to different intensiveness of the repair mechanism. Since scattered radiation during RT cannot be completely avoided, semen cryoconservation before the beginning of the treatment is still indicated.

It is the aim of our further research to achieve a higher degree of protection than we have reached so far. We also intend to follow up the

children of our patients that should be born after RT in order to establish any possible effects of scattered radiation upon the offspring and to be able to give advice to patients in the reproductive age. So far our results have been quite encouraging.

Povzetek

VPLIV RADIOTERAPIJE NA SPERMATOGENEZO PRI BOLNIKIH S SEMINOMOM TESTISA Z OZIROM NA ZAŠČITO PRED SIPANIM ŽARČENJEM

40 bolnikom s seminomom testisa, ki so bili zdravljeni z enostransko orhiektomijo in profilaktičnim obsevanjem retroperitonealnih bezgavk, smo ugotavljali stopnjo okvare spermatogeneze in med obsevanjem merili gondadno dozo s TLD dozimetri. Samo 11 bolnikov je imelo pred radioterapijo (RT) normalen spermatogram. Po RT smo ugotovili v večini primerov poslabšanje rezultatov semenske analize. Pri bolnikih, ki smo jim ščitili testise pred sipanim žarčenjem, je bila okvara speramatogeneze manjša kot pri tistih, kjer posebne zaščite še nismo uporabljali. Zaradi majhnega števila bolnikov razlika med skupinama ni bila statistično signifikantna, ampak se je le nakazovala. Merjenje gonadne doze 4 bolnikom, ki jim preostalega testisa nismo ščitili in 8 bolnikom z zaščitenim testisom je pokazalo, da smo z uporabo zaščite gonadno dozo zmanjšali za približno dve tretjini.

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FROM PRACTICE FOR PRACTICE

Answer:

Mammography of the Left Breast

Stellate lesion 8 mm in diameter, suspicious for carcinoma. Marcation with localization wire is required. /Radiol IUgosl 1986; 20 (1): 23–6/.

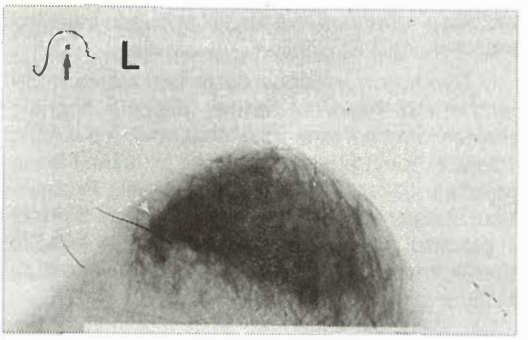

Fig. 3

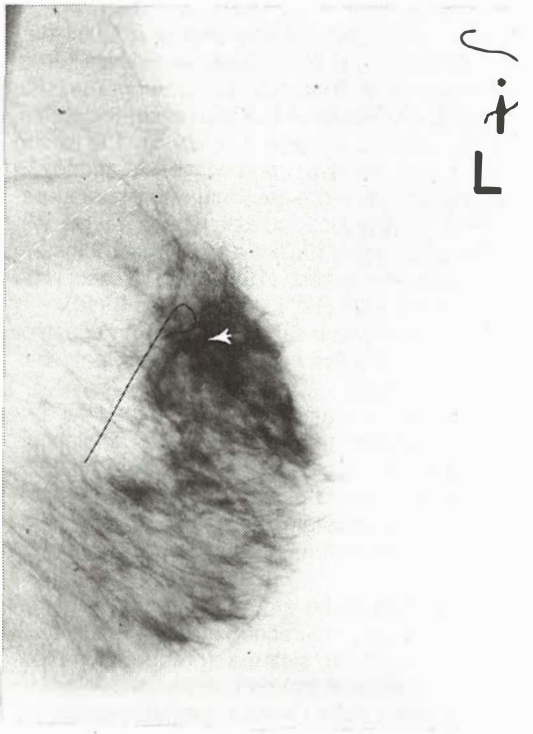

Fig. 4

Marcation of the lesion with localization wire. The wire is inserted in the immediate vicinity of the lesion.

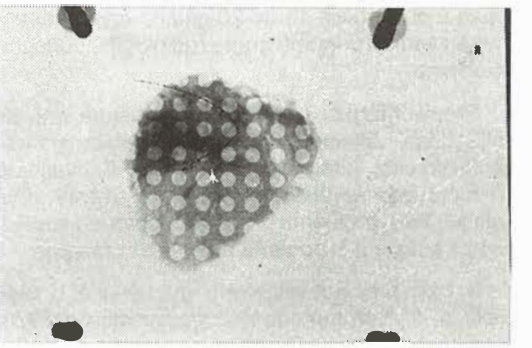

Fig. 5

Sample Mammography

The sample is fixed in the localization device. The suspicious areas for pathomorphologic sample taking are marked with a needle.

Pathomorphologic Findings

Frozen section: invasive carcinoma

Final histologic findings: intraductal and infiltrating tubular carcinoma of grade I malignancy – minimal disease; 7 mm diameter. None of the twenty examined lymph nodes shows evidence of metastases

Comment: Minimal cancer up to 10 mm of size has a fovourable prognosis, and is therefore regarded as curable. The final diagnosis of stellate lesions can be made only by histology.

High resolution of mammograms is achieved by cassette technique (cassettes with screens KODAK MinR Fast Screens, and high resolution film KODAK T Mat M II) and MAMMODIAGNOST UM-PHILIPS.

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VI JUGOSLAVENSKI SIMPOZIJ O INTERVENTNOJ RADIOLOGIJI U ONKOLOGIJI

Ljubljana, 15. – 17. juni, 1989. g.

Kao što je poznato, interventna radiologija (naziv je uveo Wallace, 1976.) je od procedura koje su u početku osporavane od kliničara, postala u posljednjih 15 do 20 godina opšte prihvaćena i veoma vrijedna grana radiologije, odnosno medicine.

Prema Obrezu I. (1986), decenijama najvažnija uloga radiologa – interpretacija radiograma i konsultacija, bitno se promijenila. Zahvaljujući razvoju interventne radiologije, rješavanje mnogih kliničkih problema prešlo je u potpunu nadležnost radiologa u pogledu dijagnoze i terapije.

U cilju praćenja svjetskih dostignuća u ovoj oblasti, čije se metode počinju uvoditi od 1978. godine u Ljubljani, Beogradu i Zagrebu, a 1981. i u Splitu, Sarajevu, Mariboru i Novom Sadu, organizuju se i skupovi ljekara koji se bave interventnom radiologijom.

Prvi takav skup, informativno-organizacionog karaktera, održan je 1979. u Ljubljani. Slijede četiri skupa u Zagrebu: »Okrugli stol o intervencijskoj radiologiji« – 1980., »Simpozij iz intervencijske radiologije« – 1981., »Simpozij o perkutanoj transluminalnoj angioplastici perifernih, renalnih i koronarnih arterija« s međunarodnim učešćem, – 1983. i »Simpozij intervencijske radiologije – perkutane drenaže organa i organskih sustava«, takođe sa međunarodnim učešćem – 1985. U međuvremenu je 1983. g. u Dubrovniku održan »Joint Meeting and Postgraduate Course«, u organizaciji Evropskog angiološkog koledža, Evropskog društva za kardiovaskularnu i interventnu radiologiju i Američkog društva za kardiovaskularnu radiologiju. U Sarajevu su zatim 1985. i 1986. g. održana dva skupa pod nazivom »Interventional Radiology and Newer Imaging Modalities« u organizaciji Instituta za radiologiju i onkologiju UMC-a Sarajevo i Department of Radiology and Division of Continuing Education Medical University of South Carolina, USA.

»IV Simpozij o intervencijskoj radiologiji« održan je 1986. u Splitu, a »V Simpozijum o interventnoj radiologiji« 1987. godine u Beogradu, takođe oba sa međunarodnim učešćem.

Početak rada Simpozijuma označen je podsjećanjem na život i rad nedavno preminulog prof. dr Ive Obreza uz riječi poštovanja i zahvalnosti za njegov doprinos radiologiji i posebno interventnoj radiologiji Slovenije i Jugoslavije.

U Uvodu je navedeno da je brzi razvoj interventne radiologije u zadnjoj deceniji doprinio uspješnijem otkrivanju i liječenju raka, a posebno u palijativnom tretmanu. Pri tome je nužna tijesna saradnja ljekara raznih specijalnosti. Promijenjeni status radiologa koji je sada aktivni učesnik u procesu liječenja zahtijeva dodatno kliničko znanje, manuelnu spretnost i osposobljenost za akciju u svakom trenutku.

Cilj Simpozijuma je, kao što je istaknuto, predstaviti mjesto interventne radiologije u otkrivanju i liječenju raka uz kratak pregled drugih načina u kombinaciji liječenja.

Na Simpozijumu su održana i štampana u Zborniku tri pozvana predavanja (2 iz Ljubljane i 1 iz Zagreba). Od 90 prijavljenih referata (34 iz Ljubljane, 16 iz Sarajeva, 10 iz Beograda, 9 iz Zagreba, 6 iz Rijeke, 4 iz Kragujevca, 3 iz Splita, 3 iz Hjustona, 2 iz Beča, 1 iz Graca, 1 iz Novog Sada i 1 iz Niša) u Zborniku je štampano 75 referata. Ukupno 90 prijavljenih referata raspoređeno je u slijedeće oblasti: Glava i vrat (7), grudni koš i dojka (9), jetra (15), bilijarni sistem (6), uropoetski sistem (10), mala zdjelica (10), kosti i meka tkiva (14) i slobodne teme (19).

Pored radiologa u radu Simpozijuma učestvovali su sa referatima i patolozi, citolozi, onkolozi, hirurzi i internisti.

Iznesena su vlastita iskustva i rezultati primjene slijedećih metoda interventne radiologije:

– Perkutane citološke (aspiracione) i hostološke biopsije tumora pluća, medijastinuma, jetre, dojke, kostiju, prostate, retroperitonealnih limfonoda, pod kontrolom dijaskopije, ultrazvuka ili CT-a;

– Transkateterske embolizacije meningeoma, tumora bubrega, mokraćnog mjehura, male zdjelice, lokomotornog sistema (preoperativna priprema ili palijativni tretman hipervaskulariziranih tumora mekih tkiva i kostiju, aneurizmatskih koštanih cista, koštanih tumora, metastaza kralježnice);

– Intraarterijska infuzijska kemoterapija tumora glave i vrata, male zdjelice, kosti (osteosarkoma), primarnih i sekundarnih tumora jetre (Lipiodol sa kemoterapeutikom pod kontrolom CT-a);

– Perkutana intratumorska aplikacija alkohola u terapiji jetrenih metastaza;

– Perkutana intraperikardijalna primjena citostatika kod metastatskog eksudativnog perikarditisa;

– Bilijarne drenaže i endoproteze u tretmanu maligne opstrukcije;

– Perkutana nefrostomija kod maligne opstrukcije urinarnih puteva;

– Sklerozacija bubrežnih cista alkoholom, perkutane drenaže apscesa i tečnih kolekcija, discektomija, litotripsija i

– Balon dilatacije suženja gastrointestinalnog, bilijarnog i uro trakta.

Ovaj simpozijum je vjerovatno pokazao aktuelne domete i opseg primjene metoda interventne radiologije u Jugoslaviji. Kao i ostali do sada i ovaj će sigurno doprinijeti njihovoj daljnjoj popularizaciji.

Garancija za to su i izneseni rezultati iz sve većeg broja i manjih centara kao i sve brojnije učešće mlađih radiologa. U tom smislu je i donesena odluka da se slijedeći skup održi u Nišu.

Doc. dr. sci. Faruk Dalagija

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Rad treba kucati sa duplim razmakom, 4 cm od gornjeg i levog ruba papira formata A4; tekst mora biti gramatički i stilistički ispravan. Prilikom upotrebe skraćenica, nužno je podati njihovo obrazloženje. Tehnički podaci u rukopisu moraju biti u skladu sa SI sistemom. Rukopis, uključujući i pregled literature, ne sme imati više od 8 kucanih stranica, dok broj slika i tabela ne sme biti veći od 4. Preporučujemo da rukopisi sadržavaju: Uvod, Material i metode, Rezultati, Diskusija, Sažetak. Iznimno, rezultati i diskusija mogu biti zajedno. Svako od gore navedenih poglavlja moraju početi na posebnom listu papira označenom arapskim brojem.

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1. Dent RG, Cole P. In vitro maturation of monocytes in squamous carcinoma of the lung. Br J Cancer 1981; 43: 486–95.
2. Chapman S, Nakielny R. A guide to radiological procedures. London: Bailliere Tindall, 1986.
3. Evans R, Alexander P. Mechanisms of extracellular kiling of nucleated mammalian cells by macrophages. In: Nelson DS ed. Immunobiology of macrophage. New York: Academic Press, 1976; 45–74.

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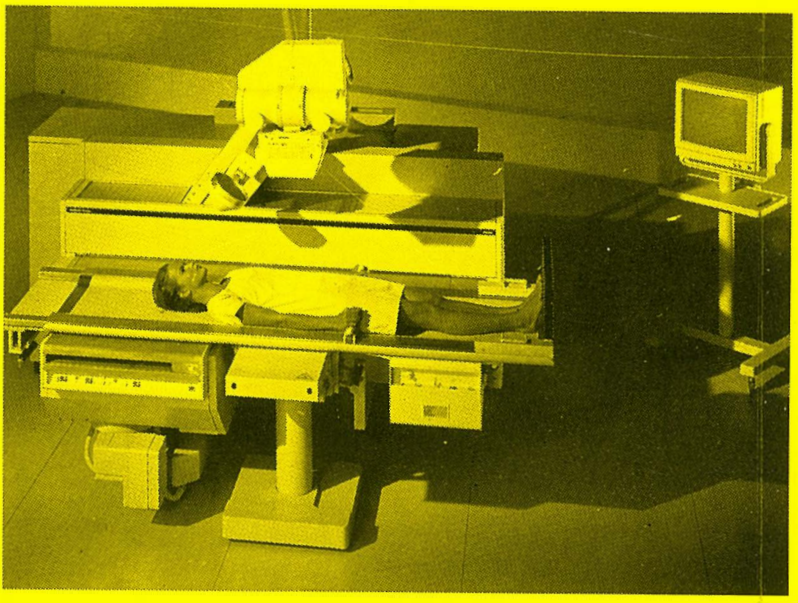

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