192-Iridium HDR boost in breast cancer treatment - experience from 644 patients (1984-1995)

Josef Hammer, Christine Track, Dietmar Seewald, Johann Zoidl

Department of Radiation Oncology, Barmherzige Schwestern Hospital, Linz, Austria

Purpose. *Since 1984, HDR Iridium-192 brachytherapy has been used to deliver an interstitial boost to the primary tumor site in conservative breast cancer treatment. The authors present the survival data and cosmetic results of a prospective treatment method and demonstrate the safe use of Ir-192 high dose rate (HDR) implantations.*

Patients and methods. *From 1984 to 1995, 644 patients with 649 tumors have been treated (T1: 432, T2: 217, N+: 180, N-: 469). The treatment method included external beam radiotherapy (EBRT) of 45 to 50 Gy to the breast (parallel opposing portals) followed by one interstitial 10 Gy boost to the tumor bed. Adjuvant systemic therapy was given to all node-positive patients. Premenopausal patients were given six cycles of CMF (2 to 3 cycles of CMF were administered before radiotherapy and 3 to 4 cycles were continued afterwards), and postmenopausal estrogen receptor positive patients were treated with Tamoxifen. Mean follow-up of survivors was 77 months (25 to 158). Cosmetic appearance after surgery was evaluated in the first 216 patients using a 4 grade scoring. The clinical and cosmetic results were evaluated according to tumor location (medial and central: „m/c", lateral: „lat").*

Results. *Five-year actuarial data (10-yr. data in brackets): Overall survival: 89.6 % (75.0 %), local control: 96.5 % (92.0 %), disease free survival: 85.5 % (77.5 %), and disease specific survival: 92.9 % (82.2 %). The lowest local failure rate is given in ER positive patients with 1.4 % after 5 yr., and 5.5 % after 10 yr. Comparing m/c and lat, the survival parameters were highly significant in favour of the lateral tumors (p-values: OS 0.0011, DSS 0.009, DFS 0.0001, LC 0.051). There were no severe complications, except in 1 patient with periostitis and neuralgia. To exclude the influence of surgery to the cosmetic results, the mean value of 1.74 (=before RT) was normalized to 1.00. This postoperative result was compared to the cosmetic result 2 and 5 years after radiotherapy using a similar scoring: The relative value changed to 1.12 after 2 years and to 1.15 after 5 years. The rate of good to excellent results before radiation therapy was 84%, and after 5 years 74%. Normalized to 100 to exclude the influence of surgery, these results represent in 88% the changes in cosmetic appearance due to RT alone. Medial and central tumor locations result in a worse cosmesis compared to lateral tumors: The mean scores after surgery were 1.65 in lat and 2.15 in m/c ($p<0.005$). These values had not changed 5 years after RT with 1.69 and 2.13 respectively ($p<0.025$).*

Conclusion. *Our experience over more than 10 years proves the safety of the use of HDR implantations as a boost of 10 Gy in 1 fraction, delivered with careful attention to the source position for treatment, to the distance of the needles from the skin, and to the treated volume. The 5-year local relapse rate of 3.5 % (10-yr.: 8.0 %) and survival data are very similar to those reported in literature. The medial and central tumor location in the breast is associated with significant lower survival rates and significant unfavorable cosmetic results.*

Correspondence to: Josef Hammer, M.D., Barmherzige Schwestern Hospital, Department of Radiation Oncology, Seilerstaette 4, A-4010 Linz, Austria. Phone: +43732 76 77 7320; Fax: 43732 76 77 7506; E-mail: josef.hammer@bhs.at