UVEDBA AVTOMATSKE ANALIZE CT SLIK PRI IZVEDBI PROTOKOLA ZA MOŽGANSKO KAP: VIDIK RADIOLOŠKEGA INŽENIRJA

INTRODUCTION OF AUTOMATIC CT IMAGE ANALYSIS IN THE IMPLEMENTATION OF THE STROKE PROTOCOL: ASPECT OF THE RADIOLOGICAL ENGINEER

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IZVLEČEK

Uvod: V Splošni bolnišnici Celje smo se v mesecu novembru pridružili izvajanju pilotnega projekta, kjer se vsem pacientom ob sumu na ishemično možgansko kap izvede računalniška obdelava CT slik s pomočjo programa E-Stroke® . V projekt sta poleg Splošne bolnišnice Celje vključeni še Splošna bolnišnica Izola in Nevrološka klinika Univerzitetnega kliničnega centra Ljubljana. E-Stroke® Suite (Brainomix, Oxford, Združeno Kraljestvo) je računalniško orodje za avtomatiziran proces zgodnjega odkrivanja in ocenjevanja obsega možganske kapi.

Namen: Namen je predstavitev procesa uporabe programa E-Stroke® z vidika radiološkega inženirja.

Metode: Samodejna programska analiza podatkov pridobljenih pri slikanju protokola za možgansko kap; CT glave brez kontrasta, CTA aorto cervikalna in CT perfuzija možganov.

Rezultati in razprava: Med rezultati, ki so pregledani v časovnem obdobju od 10. 11. 2021 do 5. 2. 2022 smo izbrali najzanimivejši primer. Program nam omogoča oceno točkovne lestvice za oceno ishemičnih volumnov možganov ASPECTS (angl. Alberta stroke programme early CT score), avtomatično iskanje večjih zapor glavnih in obsega obvodnih žil ter izračun jedra (e-CTA), penumbre in razmerja neusklajenosti s pomočjo prikaza perfuzijskih map (e-CTP).

Zaključek: Programska oprema E-Stroke® temeljito ne spremeni postopka delovnega procesa preiskave z vidika radiološkega inženirja kot izvajalca preiskave, saj moramo dodatno narediti MIP in VRT rekonstrukcije žil. Poglavitna prednost uporabe programa je hitrejša obdelava in konzultacija s strani napotnega zdravnika in odgovornega zdravnika v referenčnem centru.

Ključne besede: možganska kap, Brainomix, računalniška tomografija, perfuzija, angiografija

ABSTRACT

Introduction: In November, we participated in the implementation of a pilot project at the Celje General Hospital, where all patients with suspected ischemic stroke underwent the computer processing of CT images with the help of the E-Stroke® program. In addition to the Celje General Hospital, the project also includes the Izola General Hospital and the Neurological Clinic at the University Medical Centre Ljubljana. The E-Stroke® Suite (Brainomix, Oxford, UK) is a computer tool for the automated early detection and evaluation of stroke area.

Purpose: The purpose is to present the use of the E-Stroke® program from the point of view of a radiological engineer.

Methods: Automatic software analysis of data obtained from stroke protocol imaging; CT head non-contrast, CTA aorta cervical and CT brain perfusion.

Results and discussion: Among the results reviewed in the period from 10 November 2021 to 5 February 2022, we chose the most interesting case. The program enables the evaluation of ASPECTS (Alberta stroke program early CT score) scoring scales for evaluating ischemic brain volumes, automatic search of acute arterial occlusion, collateral blood vessels and calculation of the nucleus (e-CTA), penumbra and mismatch by displaying perfusion maps (e-CTP).

Conclusion: E-Stroke® software does not fundamentally change the procedure of the investigation workflow from the point of view of the radiological engineer as the investigator. After all, we need to perform the additional MIP and VRT reconstruction of blood vessels. The main advantage of using the program is faster processing and consultation by the referring physician and the responsible physician in the reference centre.

Keywords: Stroke, Brainomix, computed tomography, perfusion, angiography

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