Contribution ID: **38** Type: **not specified**

Status of Proton Therapy using Conventional Proton Sources

Thursday, 7 July 2016 09:10 (30 minutes)

Proton radiation therapy for patients started in 1954. Until today more than 150000 patients have been treated. First decades of proton therapy were focused on treatments of skull base and (para)spinal tumors, e.g. chordomas, chondrosarcomas and sarcomas. Choroidal melanomas and prostate cancer built the largest groups of entities during the past 20 years.
Nowadays proton radiation therapy is now widely accepted as the best radiation treatment in the management of rare complex tumors as well as in pediatric oncology with curative intent if available.

Since technology and IT capacity rapidly developed in photon radiation therapy also proton therapy progressed.
New tools in proton therapy as gantry rooms, pencil beam scanning, intensity-modulated proton radiotherapy, multileaf collimators, fast re-scanning etc. and an increasing number of running new facilities mainly at leading cancer centers in the world will offer new opportunities in the future treatment of tumor patients. Roughly 100 centers will be in operation in 2020.

That promises innovative scientific work. Especially in the U.S.A. several studies are being designed for new indications. Recruiting of patients has started. So far more than 200 trials are registered for nearly all kinds of oncologic entities incl. pediatric oncology (23 prospective clinical trials). Higher treatment capacity offers studies of thoracic (48) and abdominal/ pelvic tumors (75) as well as head and neck (22) and CNS tumors (28). Results will be evaluated in the next couple of years.
Questions of quality of life, hypofractionation and cost-effectiveness, combinations of protons and systemic treatments are in the focus of interest. Comparisons of protons vs carbon ions as well as re-irradiation and palliative radiotherapy will be evaluated.

In early proton radiation times mostly single institution study results were published. Nowadays multicenter studies are fortunately increasing. This will result in comparable high numbers of evaluated patients in analogy to photon radiation trials. Evidence based medicine with particles will not any longer be a hypothesis.

It is only a question of time when proton radiation therapy will be proven for all accepted indications in photon radiation therapy as well as in brachytherapy.
With regards to economic limitations and a low number of facilities (multicenter), trials will help to define future indications for particles in comparison to modern highly conformal photon irradiation.
It might be too early to state a shift from photons to protons. Nevertheless this will be the next logic step with regards to the evolution in radiation oncology, if cost-effectiveness will be reached and if one believes in the advantage of 60% lower integral doses to the patient.

Primary author: Dr SCHNEIDER, Ralf (Center for Proton Therapy at Paul Scherrer Institut (PSI), Switzerland)

Presenter: Dr SCHNEIDER, Ralf (Center for Proton Therapy at Paul Scherrer Institut (PSI), Switzerland)

Session Classification: Protontherapy & Nuclear Pharmacology