



Contribution ID: 42

Type: Poster

High dose rate surface Brachytherapy for skin with Flap applicator. Technique and discussion of a case

Tuesday 20 June 2017 15:30 (5 minutes)

Introduction of the study:

The Freiburg Flap from ELEKTA is a flexible mesh still surface mould for skin or intraoperative surface treatment. The mould can be easily adapted to any shape. It ensures a constant distance of the treatment catheter to the skin of 5mm for reproducible dosimetry, treatment channels are set 10 mm apart from each other. Cutter, flexible implant tubes are introduced in the Flap. The mould provides an excellent alternative for orthovoltage or electron beams treatment in case of superficial macroscopic tumor irradiation depth ≤ 1 cm or in case of microscopic disease with marginal limits.

Methodology:

We describe the technique of irradiation in one case treated in the department of Radiotherapy at the National Institute of Oncology in Rabat. This is a patient aged 66 years, operated for a T3 well-differentiated squamous cell carcinoma of the scalp. The resection was marginal at 1mm from the deep plan; hence the indication of adjuvant therapy with brachytherapy is retained.

The tumor bed was delineated with ink on the surface with 0.5cm margin and radio-opaque wire is applied. The Flap applicator is fixed over an aquaplast base frame and shielding is used to make better contact. The target volume is delineated on the CT images and intended dose is prescribed to an approximate depth of 3mm from the skin surface.

Treatment planning (reconstruction of catheters, prescription of the dose, activation of dwell positions and optimization to create conformal plan) is done on CT images with Treatment Planning System of ONCENTRA BRACHY. The plan is validated on 3D views and DVH tables.

We used for treatment nine Cutter flexible implant tubes. A procedure of Quality Control has been followed for each tube before clinical use. It consists on checking the first dwell position with the source position simulator set, this value is the indexer that should be introduced on the TPS and this first dwell position must be checked with gafchromic films.

The patient is treated with 6 fractions of 5Gy each, twice a week over two weeks.

Results

Low acute dermal reactions were noted, the patient will be followed 15 days after brachytherapy, 1 month and then every 3 months during 2 years.

Conclusion

Our initial experience with 3 dimensional topographic applicator skin brachytherapy is especially encouraging with an easier and safety use, an adaptative application for each fraction, feasibility for all sites and excellent dosimetric conformity.

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Session Classification: Tuesday afternoon - Poster Presentations - Screen1

Track Classification: Clinical Radiation Oncology