

INTRACAVITY BRACHYTHERAPY FOR NASOPHARYNGEAL CARCINOMA WITH ROTTERDAM NASOPHARYNGEAL APPLICATOR

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Purpose : To use Rotterdam nasopharyngeal applicator to examine its results on radiation dose distribution and investigate the possible indications for the treatment of nasopharyngeal tumor.

Materials and Methods : We compared three types of HDR nasopharyngeal brachytherapy applicators that were used in Chang Gung Memorial Hospital - Linkou. The three types of applicators were: single metal tandem, balloon applicator and Rotterdam applicator. Three types of applicators were tested in one patient with AJCC stage T1 nasopharyngeal cancer. We further selected five patients with different tumor extension as representative to compare the radiation dose distribution. The five representative case included T2o: tumor extended to oropharynx, T2n: tumor to nasal cavity, T2b: tumor to parapharynx space, T3: tumor to skull base and T4: tumor to brain. We use MRI to define the tumor, CT scan and commercial software to calculate the radiation dose. The feasibility, reproducibility and patients' comfort were also be evaluated.

Results : We found that Rotterdam applicator was more reproducible and best radiation dose distribution to nasopharyngeal mucosa or submucosa tumor area compared to the other 2 applicators. The Rotterdam applicator can deliver prescribed dose to the lesion area without too much hot spot in the treatment of T1-T2a NPC. However, when Rotterdam applicator was placed to the nasopharynx for few days during the treatment, patients would feel much discomfort. It therefore needed intravenous medication or fluid to relieve patients' discomfort. Besides, Rotterdam applicator also has the limitation in coverage of tumor with huge parapharyngeal space extension or to intracranial area. For the treatment of advanced NPC, it may still be at the price of very high radiation hot spot and face the risk of severe necrosis or bone perforation.

Conclusion : With the treatment of small nasopharyngeal tumor, we will suggest Rotterdam applicator to be the choice as an aid of brachytherapy boost. However, there will be a great potential to improve the shape of the Rotterdam applicator to fit better in our patients in order to be common use for the improvement of the radiation dose distribution to the nasopharyngeal area.

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Key words: Nasopharyngeal carcinoma, Brachytherapy, Rotterdam applicator