Intracavitary Irradiation of Carcinoma of the Nasopharynx

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A simple intracavitary irradiation of carcinoma of the nasopharynx has been found useful as a supplementary radiation boost to the primary site, and as a method of re-irradiation for recurrence in the nasopharynx. Hopefully, local tumor control can be enhanced by employing this technique.

Key Words: Afterloading technique, Intracavitary radiation, Nasopharyngeal Ca.

INTRODUCTION

A simple afterloading technique for intracavitary irradiation has been found useful and applicable to most patients with carcinoma of nasopharynx, either as a supplementary boost to tumor site as a portion of total treatment, or as a main source of re-irradiation for recurrence in nasopharynx.[1,2] Intracavitary irradiation of nasopharynx was introduced by Wang[1] et al and has been found to reduce the incidence of local recurrence.

Authors also applied the intracavitary irradiation of the patients with carcinoma of the nasopharynx, and describe the technique and clinical usefulness of this technique.

CASES AND PROCEDURES

1. Case 1

A 54-year-old male patient with recurrent nasopharyngeal undifferentiated cell carcinoma of stage, $T_3N_0M_0$, received Co^{60} external irradiation, 4500 rads for 5 weeks. Two weeks after, an intracavitary irradiation of nasopharynx is applied with the applicator consists of a pair of cuffed pediatric endotracheal tubes.

The inflatable cuffs at the distal end of the tube can accommodate 5 ml of water. Cesium 137 tubes are used. The physical and active length of each tubes are 20 mm and 14 mm, respectively. With a loading of two 20, 25 mg radium-equivalent tubes in each applicator, the dose rate at 5 mm below the mucosal surface is approximately 102 rads/hour, and the total dose of 4300 rads is delivered with single application. The applicator and isodose curves are shown in Fig. 1.

2. Case 2

A 70-year-old male patient with nasopharyngeal squamous cell carcinoma of stage, $T_4N_3M_0$, received external irradiation to primary site total 7000 rads. CT scan after completion of external radiotherapy shows residual mass at the left posterior nasopharyngeal wall (Fig. 2A). Intracavitary irradiation is applied using the remote control high dose rate afterloading system (Ralstron, Shimadzu), using the polyethelene tandem applicator and Co^{60} point sources (Fig. 2B). The total dose delivered to 5 mm below the mucosal surface is 700 rads as single application.

DISCUSSION

Afterloading intracavitary irradiation with Cesium-137 sources to the nasopharynx using the pediatric endotracheal tubes has been described by Wang[1] et al. Wang[2] report the significant improved local control rate of the carcinoma of the nasopharynx with the intracavitary implant boost, and

report the higher local control with intracavitary Cesium-137 boost than by the external radiation therapy alone with three-year NED rate of 83%, and 51% respectively.

When a primary tumor fails to disappear three months after the completion of a full course of radiation therapy or earlier when it begins to grow again, intracavitary irradiation is required. According to Ho,[3] if the tumor is eccentric, a catheter is introduced into the nasopharynx through ipsilateral nasal passage, and for a midline tumor bilateral application is recommended. Each application is planned to deliver approximately 700 to 1200 rad to a point 0.5cm beneath the surface of a tumor.

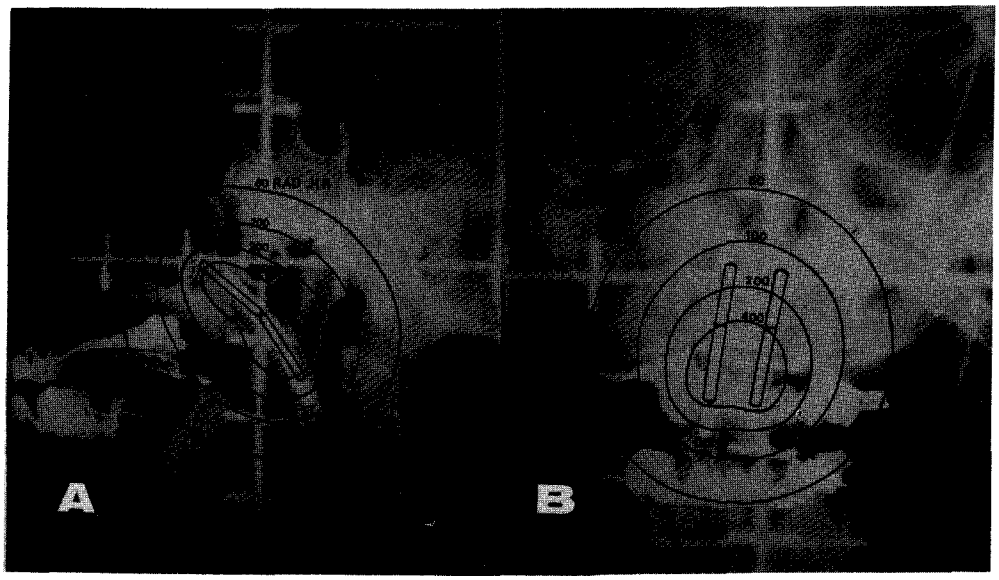

Fig. 1. Lateral (A) and anterior (B) views of applicator and isodose curves.

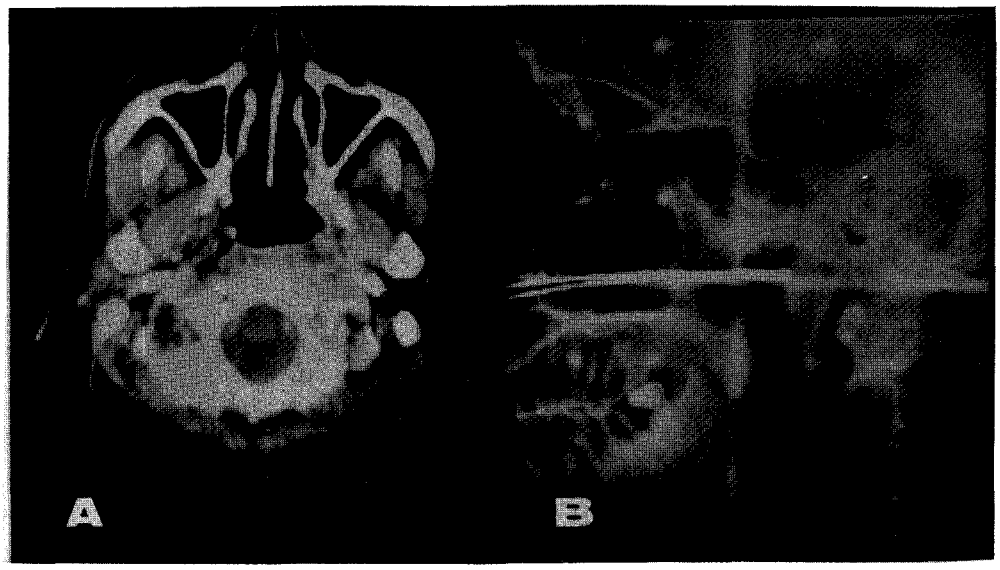

Fig. 2. CT scan (A) shows residual tumor of the left posterior nasopharynx after 7000 rad external radiotherapy. Lateral view of applicator in nasopharynx (B).

Carcinoma of the nasopharynx is one of the few malignancies in the head and neck in which re-irradiation can be carried out through careful technique, ie, combination of external radiation and intracavitary irradiation.[4] For a small tumor recurring during the first year after treatment, Ho[3] also recommended intracavitary irradiation to delivery total 3000 rad (three times, weekly).

The separation of the sources from the nasopharyngeal wall has been found to be reliably and consistently maintained by the inflated cuffs of endotracheal tubes, thus the risk of overdosing or underdosing the adjacent structure can be minimized. Intracavitary irradiation of the nasopharyngeal cancer is generally well tolerated and can be conveniently carried out in the simulator-treatment room, and useful technique to increase the local control rate as a boost and re-irradiation method for recurrence in nasopharnygeal carcinoma.

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=국문초록=

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박 찬 일

비인강암의 강내조사법은 외부조사후 추가조사법으로서, 또한 재발병소에 비교적 용이하게 재조사할 수 있는 장점이 있으며 비인강암의 국소치유율을 상승시킬 수 있다. 저자는 비인강암 환자에게 추가조사법으로서 또한 재발된 예에서 비인강암의 강내조사를 시행하여 보고하는 바이다.