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Recent Advances in Head and Neck
Cancer Surgery

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Current Status of Surgical Treatment of
Hypopharyngeal Carcinoma

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Hypopharyngeal carcinoma is associated with a poor prognosis. In advanced cases, adequate surgical ablation followed by radiotherapy is curcial for survival.

Reconstruction of the hypopharyngeal defect is also important for quality of life.

In the Department of Surgery, The University of Hong Kong at Queen Mary Hospital, before 1980, pharyngolaryngo-oesophagectomy and pharyngogastric anastomosis were carried out in all patient who had carcinoma involving the hypopharynx. In recent years, with the development of myocutaneous flaps and free flaps, more options of reconstruction are available. Currently, the extent of pathology in the hypopharynx determines the size and type of defect and hence the appropriate reconstructive procedure.

When the tumour involves upper lateral aspect of the hypopharynx, total laryngectomy and partial is still a bridge of full thickness pharyngeal wall lying between the oropharynx and cervical oesophagus.

This partial pharyngeal defect could be closed with a patch pectoralis major myocutaneous flap.

Alternatively, when the tumour involves apex of the pyriform fossa, or the postcricoid region, resection should include the whole circumference of hypopharynx. The circumferential defect between the oropharynx above and cervical oesophagus below could be reconstructed either with a tubed pectoralis major myocutaneous flap or with a free jejunal graft.

When the tumour affects the lower hypopharynx or cervical oesophagus, the oesophagus needs to be removed for tumour clearance. This long defect gastric pull-up procedure.

From 1984 to 1992 we have managed a total of 129 patients with hypopharyngeal tumours.

1) Forty-eight patients had partial pharyngeal defects and reconstruction was performed using the pectoralis major myocutaneous flaps. Two patients in this group died in hospital and eight patients had minor leakages at the pharyngeal closure.

2) Thirty-three patients had circumferential defects ; tubed pectoralis major myocutaneous flap was used to repair the defect in 23, whereas free jejunal graft was used in the remaining 10 patients. Four patients in this group died in hospital and the leakage rate of the pectoralis major myocutaneous flap was 30%. Two patients in the free jejunal graft group lost their grafts but of them were successfully salvaged.

3) Forty-eight patients underwent pharyngolaryngo-oesophagectomy and pharyngogastric anastomosis. Six patients in this group died in hospital. The hospital mortality of 12% was lower than that previously reported. From 1966 to 1979, we carried out gastric pull-up operation for 157 patients and the hospital mortality was 31%. From 1980 to 1983, we performed 91 gastric pull-up procedures and the hospital mortality was 18%. There was no anastomo-

tic leakage in the present series. All the mediastinal complications reported previously could be avoided using the appropriate surgical techniques.

Mortality and morbidity associated with surgical treatment of hypopharyngeal carcinoma increases with the complexity of the operative procedure. The reconstruction should therefore be selected with reference to the type of defect and extent of tumour.

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Hyperthermia for Head and Neck Cancer ; Current Status

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1. Biological Basis of Hyperthermia

Heat kills cells in a predictable and repeatable way. Survival curves for cells exposed for various periods of time to a range of temperature from 41.5°C to 46.5°C shows temperature dependent cell killing.

The age response function for heat complement that for selectively killed and radiosensitized by heat. On this basis, cycling tumor cells should be killed selectively by hyperthermia compared with the slowly turning over normal tissue responsible for late effects.

Cells that are nutrient deficient and/or at low PH are more sensitive to killing by heat. These are likely to be hypoxic tumor cells, which may well be out of cell cycle. It might be possible to amplify this effect in tumor in vivo by glucose infusion.

2. Aim of Hyperthermia for Head and Neck Tumors

The curative role of head and neck tumors is limited to small tumors, while advanced T3-T4 tumors frequently fail to respond to conventional RT alone. Present management of advanced tumor consists of

pre- or post-operative RT plus surgical resection or combined sequential or simultaneous RT-CHT. However, loco-regional recurrence is a common observation even after achieving a CR ; the failure rate in advanced tumors ranges between 25 – 50 %. Local control of fixed, large and widely necrotic cervical neck nodes metastases is extremely difficult to achieve with conventional RT combined with either surgery and/or chemotherapy. The clinical data from the literature suggests that nodes with >5cm diameter require RT doses of at least 85 Gy to achieve at least a 50 % CR rate. Thus, additional HT may well support the management of these tumors, since they are likely to possess a large portion of hypoxic cells and cells at low PH, which are rarely susceptible to RT alone.

3. Results of Hyperthermia for Head and Neck Tumors

Prospective and retrospective trials demonstrate that combined HT-RT has higher potential to control neck node than RT alone. Clinical experience with HT alone for head and neck tumors has been rather disappointing, which is in contrast to combined HT-RT trials. Only a few randomized studies has compared combined HT-RT versus RT alone involving both primary and recurrent head and neck cancers as well as neck node metastases. These studies show an isodose TER >1, and by comparison of dose-response data an isoeffect TER value of 1.6 was established.

4. Hyperthermia Equipment Used for Superficial Tumors

1) BSD-1000 system (BSD Medical Corporation, USA)

The BSD-1000 system was developed in 1976 at BSD Medical Corporation of the United States. A horn-type applicator (MA-201) was used for exceeding 5cm in thickness. This device is driven at frequency of 80-90 MHz.