



PRESS RELEASE

**New Radiotherapy Method for Treating Nasopharyngeal Carcinoma
Substantially Reduces Oral Side Effects**

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Introduction

Nasopharyngeal cancer is one of the common cancers in Hong Kong. There are over 1,000 newly diagnosed cases every year, and about 350 patients die of the disease annually. Nasopharyngeal carcinoma (NPC) is located at the centre of the head, behind the nose and above the throat. The usual treatment is radiotherapy because the tumour is very sensitive to radiation and surgical access is difficult.

Conventional Radiotherapy

Until recently, conventional radiotherapy has been the routine treatment and results in a good cure rate especially for early disease. Planning for conventional radiotherapy is 2 dimensional using X-ray films. The tumor is irradiated by large fields which cover the area of the tumour. Radiation usually comes from both sides of the head and any structures in between the radiation beams are uniformly irradiated to a high dose. Therefore, the field of irradiation is large and cannot give a differential dose to the tumor and surrounding normal tissues. Some normal tissues are irradiated not because they are involved by tumor but because they stand in the path of radiation.

A joint study conducted by Oral Rehabilitation, Faculty of Dentistry and the Department of Clinical Oncology, Faculty of Medicine at HKU in 2000 studied the extent of oral complications of conventional radiotherapy and their impact on quality of life in a group of Hong Kong Chinese who were disease free survivors of NPC (38 disease-free NPC survivors, 40 people diagnosed with NPC, prior to treatment, 31 healthy people as control group). It was found that patients suffered from the following oral complications after receiving radiotherapy:

- Permanent damage of salivary glands. Saliva flow was found to be 20 times less than normal;
- The oral tissues were profoundly dry (xerostomia) resulting in speech problems, eating and swallowing difficulties, a severe form of tooth decay around the roots of teeth, yeast infections;
- Very limited mouth opening and have difficulty wearing dentures.

The impairment in quality of life was substantial and long-term. Even with frequent dental checkups and careful homecare, the complications of dry mouth could not be avoided. Therefore, it is urgent and essential to develop a new form of radiotherapy to reduce oral complications of NPC patient after treatment.

Recent Advancement for NPC Radiotherapy – Intensity-Modulated Radiotherapy (IMRT)

Fortunately, a new type of radiotherapy (intensity-modulated radiotherapy- IMRT) was introduced at Queen Mary Hospital, the University of Hong Kong in 2000.

IMRT can achieve high radiation dose to the tumor while keeping down radiation dose to normal tissues, and thus has the potential to reduce radiotherapy side effects while maintaining good tumor control. IMRT uses 3 dimensional planning as well as CT and MRI scans to construct 3-dimensional images of the tumor and surrounding normal structures. An optimal radiation plan is then generated by computer. This results in radiation in the form of numerous pencil beams coming from many different directions. The intensity of each pencil beam is fine-tuned to give a precise dose to its target. **Thus, using IMRT, radiation dose can be well-controlled. Curative dose can be given to the tumor while normal structures like the salivary glands can be spared high dose radiation.**

Research Findings

Oral Rehabilitation, Faculty of Dentistry and the Department of Clinical Oncology, Faculty of Medicine at HKU jointly conducted a study from June 2000 to December 2002 in 70 patients with early stage NPC. The objective was to assess the effectiveness of IMRT as compared to conventional radiotherapy on disease control and whether radiation complications could be reduced with IMRT. 50 patients were treated with IMRT while the other 20 were treated with conventional radiotherapy.

Research Results

Preliminary results confirmed the safety and effectiveness of IMRT. At the time of analysis, all 50 patients had disease control locally at the tumor site. One patient had a recurrence further a field. Among 20 patients treated with conventional radiotherapy for early NPC during the same period, one has already had a relapse at the original tumor site. Thus, local tumor control with IMRT is at least as good as if not better than conventional radiotherapy. It can also significantly reduce the unpleasant oral side effects. These findings will be presented at the American Society for Therapeutic Radiology and Oncology meeting in Salt Lake City, USA in October, 2003.

A clinical trial is ongoing at the Faculty of Dentistry, HKU to investigate how saliva flow is affected by IMRT compared with the conventional radiotherapy method and its impact on quality of life. Preliminary results are very encouraging and suggest that with IMRT, radiation dose to the saliva glands can be reduced, resulting in less reduction in saliva flow and also recovery of saliva flow that has not been seen with conventional radiotherapy. The impact on quality of life appears to be less severe and also improves over time after treatment. These findings have been presented at the International Association for Dental Research conference in Gothenburg, Sweden in June 2003.

Conclusions

We do not really appreciate the value of saliva in our mouth until it is gone. In general, meticulous oral hygiene including the use of fluoride mouth rinses and regular professional dental care does limit some of the more severe oral side effects. There are a number of ways of dealing with lack of saliva such as using saliva substitutes and sipping water regularly but these are very short acting. Drugs such as *Pilocarpine* are available but side-effects including an increased heart rate are often very unpleasant and limit their use.

Hence, the introduction of IMRT not only can significantly reduce the oral side effects of NPC patients after receiving radiotherapy, but also improve their quality of life to a large extent.

Please visit the website <http://www.hku.hk/facmed/press/> for press photos and supplementary information.

Should you have any questions, please feel free to contact Ms Janet Yeung of Faculty of Medicine, The University of Hong Kong at 2819-5505 or 9107-1676.

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