



Title	The role of elective neck dissection during surgical salvage for recurrent nasopharyngeal carcinoma
Author(s)	Chan, JYW; Wong, STS; Wei, WI
Citation	Journal of Nasopharyngeal Carcinoma, 2014, v. 1 n. 4, article no. e4
Issued Date	2014
URL	http://hdl.handle.net/10722/200967
Rights	Creative Commons: Attribution 3.0 Hong Kong License

Review

The Role of Elective Neck Dissection during Surgical Salvage for Recurrent Nasopharyngeal Carcinoma

Jimmy Yu Wai Chan, Stanley Thian Sze Wong, William Ignace Wei

Division of Head and Neck Surgery, Department of Surgery, University of Hong Kong Li Ka Shing Faculty of Medicine, Queen Mary Hospital

Corresponding author: Jimmy Yu Wai Chan; E-mail: chanjyw@gmail.com

Citation: Chan JYW, Wong STS, Wei WI. The role of elective neck dissection during surgical salvage for recurrent nasopharyngeal carcinoma. *J Nasopharyng Carcinoma*, 2014, 1(4): e4. doi:10.15383/jnpc.4.

Funding: This work is supported by the Hong Kong UGC Area of Excellence (AoE) scheme.

Competing interests: The authors have declared that no competing interests exist.

Conflict of interest: None.

Copyright: ©2014 By the Editorial Department of Journal of Nasopharyngeal Carcinoma. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Background: To study the incidence of microscopic tumour deposit in the neck in patients with recurrent nasopharyngeal carcinoma (NPC) and hence, the role of routine elective neck dissection during nasopharyngectomy.

Methods: Retrospective review of the pathology report of the selective neck dissection specimens in patients with recurrent NPC and clinically N0 status.

Results: Between 2000 and 2012, 38 patients presented with recurrent NPC requiring maxillary swing nasopharyngectomy and free flap reconstruction. The initial T-classification of the tumour was T1, 15.8%; T2, 52.6%; and T3, 31.6%, and the N-classification was N0, 26.3%; N1, 47.4%, N2, 15.8%; and N3, 10.5%. Concurrent chemoradiation was given in 57.9% of the subjects. All patients in the series had complete response after the initial treatment, and the mean time to develop local tumour recurrence was 22.3 months. Among these patients, only 1 (2.6%) demonstrated microscopic tumour metastasis in 1 lymph node removed during selective neck dissection.

Conclusions: Given the low incidence of microscopic tumour metastasis in patients with recurrent NPC and clinically N0 status, routine elective neck dissection may not be indicated. Further large scale investigation is indicated to address the issue.

Keywords: recurrent nasopharyngeal carcinoma; maxillary swing; elective neck dissection; microscopic tumour deposit

Introduction

Nasopharyngeal carcinoma (NPC) differs from other head and neck malignancies in its epidemiology, pathology and treatment outcome^{1,2}. It is endemic in southern China and Southeast Asia,

affecting 10 to 50 per 100,000 populations per year³. The primary treatment is radiotherapy or chemoradiotherapy depending on the stage of disease on presentation⁴⁻⁷, while surgery is reserved for persistent or recurrent tumours after the combined therapy⁸.

NPC has the highest preponderance for regional lymph node metastasis among other head and neck malignancies⁹. As a result, the entire neck is empirically irradiated regardless of the stage of disease on presentation¹⁰⁻¹¹. While radical neck dissection is often the treatment of choice in regional failures, the need to attend the neck in patients with local tumour recurrence in the nasopharynx is not studied previously. The current investigation will address the role of elective selective neck dissection in locally recurrent NPC.

Patients and Methods

The study was approved by the Institutional Review Board. Between 2000 and 2012, patients with recurrent NPC, who required nasopharyngectomy and free flap coverage of the parapharyngeal space and skull base, were included in the study. Preoperative investigations included nasoendoscopy and biopsy for histological confirmation and determination of Epstein-Barr virus encoded ribonucleic acid (EBER) status, ultrasound examination of bilateral neck and fine needle aspiration of suspicious lymphadenopathy, and contrast magnetic resonance imaging (MRI) of the nasopharynx and the neck to delineate the local extent of disease and the presence of enlarged lymph nodes in the neck. Patients with cytologically proven metastatic disease in the neck would receive salvage neck dissection at the time of nasopharyngectomy, and they were excluded from the study.

All the recruited patients had large recurrent tumour in the nasopharynx with parapharyngeal extension. They had subsequent nasopharyngectomy performed via the maxillary swing approach. The procedure had been described previously¹², with a few modifications over the years¹³. Through a Weber-Ferguson-Longmire incision, osteotomies were made on the anterior wall of maxilla and zygoma and the hard palate. Maxillary tuberosity was separated from the pterygoid plate using a curved osteotome. The maxilla ipsilateral to the tumour was then swung out to gain access to the tumour.

The nasopharyngeal tumour was then resected en-bloc with the pterygoid muscles and the underlying pharyngobasilar fascia to

ensure clear margins on the surface of petrosal internal carotid artery. The exposed artery was covered with the free vastus lateralis muscle flap in order to prevent dreaded complications such as carotid blowout. Selective neck dissection, with the removal of ipsilateral level I to III and Va lymph nodes, was performed for all the patients, and suitable recipient vessels were prepared for subsequent microvascular anastomosis. The sternocleidomastoid muscle, the internal jugular vein and the accessory nerve were safeguarded. The maxillary osteocutaneous unit was then returned and the osteotomy sites were fixed with titanium mini plates and screws. A pre-fabricated dental obturator was fitted to ensure accurate dental positioning.

The selective neck dissection specimens were separated into different levels and they were sent separately to the Department of Pathology for histological examination. The specimens were formalin fixed and embedded in paraffin blocks. All the lymph nodes in the selective neck dissection specimens were stained with hematoxylin and eosin (H&E) for each tissue block and subjected to continuous pathological section. In addition, the detection of tumour was enhanced by in situ hybridization of EBER by Novocastra NCL-EBV-K ISH Kit (Novocastra Laboratories Limited, Balliol Business Park West, Benton Lane, Newcastle, UK). The presence of microscopic tumour deposits were noted and recorded.

All data were entered into the Head and Neck database file and analyzed with Statistical package for social sciences version 18.0 (SPSS, Inc., Chicago IL). A *p*-value of 0.05 or less was considered as significant.

Results

During the study period, 38 patients were included in the study. Majority (73.7%) of the patients were male. The median age was 52 years (range 24-62 years). The initial T-classification of the tumour on presentation was T1, 15.8%; T2, 52.6%; and T3, 31.6%, and the N-classification was N0, 26.3%; N1, 47.4%, N2, 15.8%; and N3, 10.5%. Concurrent chemoradiation was given in 57.9% of the subjects. All patients in the series had complete res

ponse after the initial treatment, and the mean time to develop local tumor recurrence was 22.3 months. All the tumors had invaded the parapharyngeal space at the time of recurrence.

Pre-operative tumour biopsy yielded undifferentiated carcinoma in all patients. The mean number of lymph nodes removed during selective neck dissection was 24.8 (range, 18 – 30) per neck. Microscopic tumour deposits were identified in only 1 lymph node removed, which was located in the level II. The rest of the lymph nodes examined were negative for malignancy.

Discussion

The treatment outcome for primary nasopharyngeal carcinoma is improved with the use of intensity-modulated radiotherapy¹⁴ and concurrent chemoradiation⁵⁻⁷. When tumour persists or recurs after the initial therapy, surgery offers better local tumour control and survival¹⁵⁻¹⁸ as well as less post-treatment morbidities than re-irradiation.

Treatment of recurrent metastatic nodal disease in nasopharyngeal carcinoma requires radical neck dissection¹⁹. In patients with extensive regional recurrence and extra-capsular spread of cancer cells, extended radical neck dissection with simultaneous insertion of afterloading tubes for early post-operative brachytherapy is effective in improving the treatment outcome²⁰. Management of recurrent retropharyngeal lymph node metastasis is more challenging in the diagnosis and treatment, and it can be resected via the maxillary swing approach²¹. The role of prophylactic elective treatment of the neck in patients with locally recurrent NPC, however, is not investigated before. Our previous study on patients with squamous cell carcinoma of the oral cavity showed that selective neck dissection is an effective diagnostic procedure in the staging of N0 neck²². It significantly reduces the regional recurrence rate and increases the 5-year disease-free survival²³. The chance of harboring microscopic tumour deposits in the selective neck dissection specimens of cN0 patients of carcinoma of the tongue was 22%²⁴.

NPC has the highest preponderance for regional lymph node metastasis among other head and neck malignancies. Studies showed that 85% of patients with NPC presented with

lymphadenopathy²⁵, and the most commonly involved regions included retropharyngeal (69%) and level II lymph nodes (70%). The outcome of salvage surgery for recurrent nodal disease after radiotherapy, however, has not been satisfactory. The 5-year overall survival and disease-free survival is reported to be as low as 26.03% and 22.65%, respectively²⁶. Therefore, it may be advantageous to better stage the nodal status in at-risk patients who have local tumour recurrence in the nasopharynx, and hopefully, better treatment results can be achieved as observation alone may be dangerous for the irradiated neck. We have previously shown that clinical assessment and fine needle aspiration cytology is insufficient to allow early diagnosis of recurrent nodal metastasis in NPC after irradiation²⁷. Therefore, in the current study, we have investigated the incidence of recurrent microscopic nodal metastasis in a group of patients with recurrent NPC who had selective neck dissection performed for the preparation of recipient vessels for microvascular free flap reconstruction after maxillary swing nasopharyngectomy. Our subjects represented a mixed group of patients with various tumour staging before the initial radiotherapy. Majority of them had cervical nodal metastasis at the time of presentation (N1, 47.4%, N2, 15.8%; and N3, 10.5%). All of them had complete response after concurrent chemoradiation, only presenting after a mean of 22.3 months with locally advanced tumour recurrence in the nasopharynx invading the parapharyngeal space. By studying the specimen from the selective neck dissection performed in these patients, we showed that the chance of the neck harboring microscopic tumour deposits in patients with cN0 status at the time of salvage for local failures is only 2.6%. In experienced hands, pre-operative ultrasound and MRI is accurate enough to stage the neck in patients with recurrent NPC after previous radiation. The proposed advantage of limited morbidity after selective neck dissection in patients with squamous cell carcinoma of the head and neck region may not apply in patients with NPC, who have previous routine radical radiotherapy to the bilateral neck with radiation boost to those with regionally advanced disease. Selective neck dissection in these patients may induce further fibrosis and neck stiffness after the procedure, and the functional

outcome of the spinal accessory nerve may be worse, particularly when removing level IIB lymphatics is mandatory in NPC patients.

However, the limitations of the current investigation, including the retrospective nature of the study design and the small number of subjects recruited, must be taken into account before drawing a definitive conclusion. Further large-scale study is indicated to address the issue adequately.

Conclusions

Given the low incidence of microscopic tumour deposit in the neck in patients with recurrent NPC and clinically N0 status, routine elective selective neck dissection during nasopharyngectomy may not be justified. Pre-operative assessment by ultrasound and MRI is adequate for accurate staging of the neck in these patients.

Funding Source

This work is supported by the Hong Kong UGC Area of Excellence (AoE) scheme.

Conflict Of Interest Disclosures

The authors made no disclosures.

References:

1. Marks JE, Phillips JL, Menck HR. The National Cancer Data Base report on the relationship of race and national origin to the histology of nasopharyngeal carcinoma. *Cancer* 1998; 83(3): 582-588.
2. Wei WI, Sham JS. Nasopharyngeal carcinoma. *Lancet* 2005; 365(9476): 2041-2054.
3. Luo J, Chia KS, Chia SE, et al. Secular trends of nasopharyngeal carcinoma incidence in Singapore, Hong Kong and Los Angeles Chinese population, 1973-1997. *Eur J Epidemiol* 2007; 22: 513-521.
4. Chua DT, Sham JS, Wei WI, et al. The predictive value of the 1997 American Joint Committee on Cancer stage classification determining failure patterns in nasopharyngeal carcinoma. *Cancer*

2001; 92:2845-2855.

5. Agulnik M, Siu LL. State-of-the-art management of nasopharyngeal carcinoma: current and future directions. *Br J Cancer* 2005; 92:799-806.
6. Al-Sarraf M, LeBlanc M, Giri PG, et al. Chemoradiotherapy versus radiotherapy in patients with advanced nasopharyngeal cancer: phase III randomized Intergroup study 0099. *J Clin Oncol* 1998; 16: 1310-1317.
7. Lin JC, Jan JS, Hsu CY, et al. Phase III study of concurrent chemoradiotherapy versus radiotherapy alone for advanced nasopharyngeal carcinoma: positive effect on overall and progression-free survival. *J Clin Oncol* 2003; 21:631-637
8. Wei WI, Chan YW, Ng WM, et al. Surgical salvage of persistent or recurrent nasopharyngeal carcinoma with maxillary swing approach-critical appraisal after 2 decades. *Head Neck* 2010; 1-8.
9. Sham JS, Choy D, Wei WI. Nasopharyngeal carcinoma: orderly neck node spread. *Int J Radiat Oncol Biol Phys* 1990; 19(4): 929-933.
10. Lee AW, Sham JS, Poon YF, Ho JH. Treatment of stage I nasopharyngeal carcinoma: analysis of the patterns of relapse and the results of withholding elective neck irradiation. *Int J Radiat Oncol Biol Phys* 1989; 17(6): 1183-1190.
11. CA P. Nasopharynx. In: *Principles and Practice of Radiation Oncology*. 3rd ed. Philadelphia: JB Lippincott; 1998.
12. Wei WI. Cancer of the nasopharynx: functional surgical salvage. *World J Surg* 2003; 27:844-848.
13. Ng RW, Wei WI. Elimination of palatal fistula after the maxillary swing procedure. *Head Neck* 2005; 27:608-612.
14. Lee N, Xia P, Quivey JM, et al. Intensity-modulated radiotherapy in the treatment of nasopharyngeal carcinoma: an update of the UCSF experience. *Int J Radiat Oncol Biol Phys* 2002; 53: 12-22.
15. Teo PM, Kwan WH, Chan AT, et al. How successful is high-dose (> or = 60 Gy) re-irradiation using mainly external beams in salvaging local failures of nasopharyngeal carcinoma? *Int J Radiat Oncol Biol Phys* 1998; 40:897-913.
16. Fee WE, Robertson JB, GoYnet DR, et al. Long-term survival

- after surgical resection for recurrent nasopharyngeal cancer after radiotherapy failure. *Arch Otolaryngol Head Neck Surg* 1991; 117:1233-1236.
17. Fee W Jr, Moir M, Choi EC, et al. Nasopharyngectomy for recurrent nasopharyngeal cancer: a 2- to 17-year follow-up. *Arch Otolaryngol Head Neck Surg* 2002; 128: 280-284.
18. To EW, Lai EC, Cheng JH, et al. Nasopharyngectomy for recurrent nasopharyngeal carcinoma: a review of 31 patients and prognostic factors. *Laryngoscope* 2002; 112: 1877-882.
19. Wei WI, Mok VW. The management of neck metastases in nasopharyngeal cancer. *Curr Opin Otolaryngol Head Neck Surg* 2007; 15(2): 99-102.
20. Chan YW, Lee VH, Chow VL, To VS, Wei WI. Extracapsular lymph node spread in recurrent nasopharyngeal carcinoma. *Laryngoscope* 2011; 121(12): 2576-2580.
21. Chan JY, Chow VL, Wong ST, Wei WI. Surgical salvage for recurrent retropharyngeal lymph node metastasis in nasopharyngeal carcinoma. *Head Neck*. 2013 Mar 6. doi: 10.1002/hed.23214.
22. Yuen AP, Lam KY, Chan AC, Wei WI, Lam LK, Ho WK, Ho CM. Clinicopathological analysis of elective neck dissection for N0 neck of early oral tongue carcinoma. *Am J Surg* 1999; 177(1):90-92.
23. Yuen AP, Wei WI, Wong YM, Tang KC. Elective neck dissection versus observation in the treatment of early oral tongue carcinoma. *Head Neck* 1997; 19(7): 583-588.
24. Yuen AP, Ho CM, Chow TL, et al. Prospective randomized study of selective neck dissection versus observation for N0 neck of early tongue carcinoma. *Head Neck* 2009; 31(6): 765-772.
25. Ho FC, Tham IW, Earnest A, Lee KM, Lu JJ. Patterns of regional lymph node metastasis of nasopharyngeal carcinoma: a meta-analysis of clinical evidence. *BMC Cancer* 2012; 12: 98-110.
26. Zhang L, Zhu YX, Wang Y, Huang CP, Wu Y, Ji QH. Salvage surgery for neck residue or recurrence of nasopharyngeal carcinoma: a 10-year experience. *Ann Surg Oncol* 2011; 18: 233-238.
27. Chan JY, Chan RC, Chow VL, To VS, Wei WI. Efficacy of fine-needle aspiration in diagnosing cervical nodal metastasis from nasopharyngeal carcinoma after radiotherapy. *Laryngoscope* 2013; 123(1):134-139.