Endoscopic Nasopharyngectomy: The Sarawak Experience

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SUMMARY

Shifting the paradigm of treatment of a locally recurrent nasopharyngeal carcinoma (NPC) from the non-surgical management to a surgical modality has always been a challenge. However, many studies on endoscopic nasopharyngectomy have proven it to be a reliable form of treatment with an excellent outcome. Since 2007, in Sarawak General Hospital, six cases of endoscopic nasopharyngectomy for locally recurrent NPC have been performed with encouraging results.

KEY WORDS:
Endoscopic nasopharyngectomy, Nasopharyngeal tumours, Recurrent nasopharyngeal carcinoma

INTRODUCTION

Nasopharyngeal carcinoma (NPC) is one of the commonest cancers in Malaysia[1, 2]. It tops the list of common male malignancies in Sarawak[3, 4]. Approximately 80% of the cases are diagnosed in the Otorhinolaryngology Department of Sarawak General Hospital (SGH) and a majority of the patients came from Kuching and Serian region[5].

For primary NPC, the mainstay of treatment is radiation therapy with or without concurrent chemotherapy[6]. Most of the recurrent cases are diagnosed within 2 years[9]. Yan *et al*, in a study of 46 patients, reported 5-year survival rates of 19% after irradiation for local recurrence alone and 11% after retreatment of recurrent disease in the primary site and neck[9]. Approximately 19% to 56% of patient developed recurrent disease 5 years after their primary treatment[8].

Surgery plays a minor role in the treatment of NPC. It is limited to radical neck dissection in controlling radio-resistant nodes and post-radiation cervical metastases and, in selected cases, nasopharyngectomy as salvage surgery for recurrence in the nasopharynx[10].

Nasopharyngectomy has emerged as a well-established alternative treatment for local recurrence and residual NPC[8, 11]. It avoids the complications of repeat irradiation which include osteoradionecrosis, encephalopathy, radiation-induced myelitis, hypopituitarism and severe trismus[8].

Previous approaches to nasopharyngectomy include transpalatal, Le Fort 1 osteotomy, maxillary swing. However, the endoscopic approach is gaining acceptance among ear, nose and throat surgeons as they become proficient with endoscopic sinus surgery. Endoscopic nasopharyngectomy involves the removal of nasopharyngeal mucosa, torus tubarius and the Eustachian tube with a curative intention of the locally recurrent NPC. This approach has been proven to reduce tissue damage, improve cosmetic appearance, and is associated with fewer wound-related complications[14].

Surgical Technique

In our series, we employ the endoscopic approach for the nasopharyngectomy. Endoscopic nasopharyngectomy was started in Sarawak General Hospital on 26th of November 2007. To date, a total of six surgeries had been performed for recurrent NPC.

The posterior half of the nasal septum is removed to gain access to the contralateral Rosenmuller fossa. After injection of topical bupivacaine-adrenaline to the nasal septal mucosa, both sides of the mucosa are incised and elevated from the perpendicular plate of the ethmoid bone and the vomer. The bony part of the septum is removed using a Ewing-Moore forcep or osteotome as in nasal septoplasty. Care is taken not to expose or create a mucosal perforation on both sides of the nasal septum.

Then, the septal mucosa is widely dissected, creating a inferiorly-based pedicled septal flap (Hadad-Bassagasteguy flap)[16]. After resection of the posterior half of the nasal septum, the manoeuverability of endoscopes and instruments are increased considerably. Occasionally, the removal of the inferior turbinates is warranted to provide better access.

The Curved-blade Harmonic scalpel (Ethicon-Endo Surgery, Ultracision Harmonic Scalpel -Generator 300) is utilized to achieve a bloodless mucosal incision on the nasopharynx, and for a wide resection of tumor. Margins taken for histopathological confirmation. First, superior mucosal incision. Then, the lateral wall, including the cartilaginous portion of the eustachian tube, the roof of the nasopharynx and the inferior margins, are resected. Some difficulties are usually encountered in peeling the mucosa and periosteum from the bony nasopharynx.

Covering the exposed bony surface with flaps is compulsory to prevent infection or osteoradionecrosis in irradiated patients. Rotational flaps used are harvested from septum or inferior turbinate. These flaps are held in place with tissue glue and packs. Packs are removed after 24-48 hours. The patients can be discharged home within two to three days after the surgery.

Patients are reviewed one week after surgery and a nasal toilet is carried out. Regular monthly follow up is carried out till three months, then six weekly following that.

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MATERIALS AND METHODS

The patients who presented with nasopharyngeal masses in the ORL Department, SGH would undergo mandatory biopsies to confirm the nature of the mass.

Once the malignancy was confirmed, all the patients subsequently underwent computed tomography (CT) scan of base of skull, nasopharynx, neck, thorax and abdomen. A bone scan was also performed to exclude bone metastasis. The disease stage was determined based on the 2003 American Joint Committee on Cancer (AJCC) staging system[13].

Exclusion criteria for endoscopic nasopharyngectomy were strictly observed. They include cranial nerves involvement, intracranial invasion, destruction of skull base or upper cervical spine, distant metastasis, invasion of carotid sheath and its contents, and concurrent neck metastasis.

All the recurrent NPC patients were restaged rT1N0M0. The patients' age ranges from 37 to 61 years and they consist of three males and three females. Soon after the initial diagnosis of primary NPC, these patients had received 70 Gy of external beam radiotherapy (EBRT). Tumour recurrence (Fig. 1) in the nasopharynx occurred between 20-75 months after the completion of primary irradiation.

RESULTS

All patients tolerated the surgical resection without immediate complications and had a mean hospital stay of three days. Herein, we summarise our result in Table I.

All six patients have negative margins. There was no surgical mortality and the morbidity was 50% (3/6). Two had flap necrosis at 3-5 week post surgery with delayed healing of the operative site and another had flap necrosis at four week with subsequent osteoradionecrosis (ORN) noted at about 41 weeks after the surgery (September 2008) and was treated with Ciprofloxacin 500mg twice a day to date. The antibiotic will be given until six months duration (Fig. 2).

The remaining three patients recovered uneventfully (Fig. 3). Locally recurrent NPC patients with negative margins were kept on close surveillance follow-up. All the patients remain on follow-up till today. Nasopharyngeal biopsies would be repeated when and where there were suspicious lesions in the operative site. The repeat biopsies have been negative to date.

DISCUSSION

The nasopharynx is a cubic hollow structure located deep in the head, so the operative field is deep and narrow[12]. Compared to open surgical approaches, endoscopic nasopharyngectomy is advantageous because of it is relatively easier technically, less invasive and does not require facial incisions.

Table I: Patients with NPC, stage of disease, margin, outcome and complications

Patient number	Patient Sex/Age (years)	Stage*	Margins	Outcome (months)	Complications
1	M/37	rT1N0M0	Negative	14/ADF	No
2	F/55	rT1N0M0	Negative	14/ADF	Flap necrosis & osteoradio necrosis
3	F/45	rT1N0M0	Negative	6/ADF	No
4	F/44	rT1N0M0	Negative	4/ADF	No
5	M/61	rT1N0M0	Negative	3/ADF	Flap necrosis
6	M/56	rT1N0M0	Negative	3/ADF	Flap necrosis

*Restaging, AJCC 2003
**ADF = alive and disease free

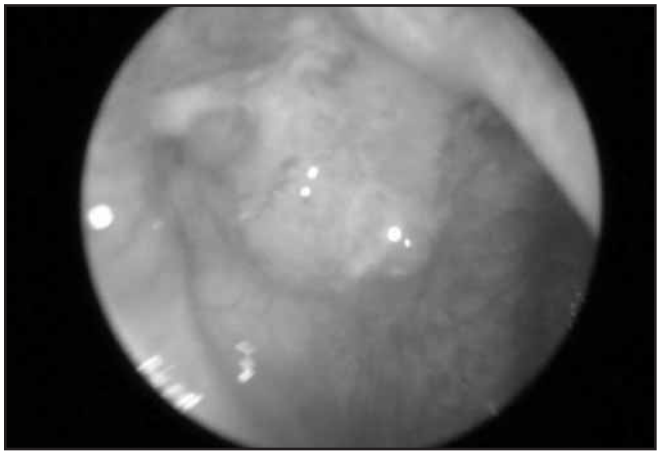

Fig. 1: Endoscopic view from right nasal cavity shows tumor recurrence pre-operatively

Fig. 2: Endoscopic view from left nasal cavity shows osteoradionecrosis but no tumor recurrence (Patient 2)

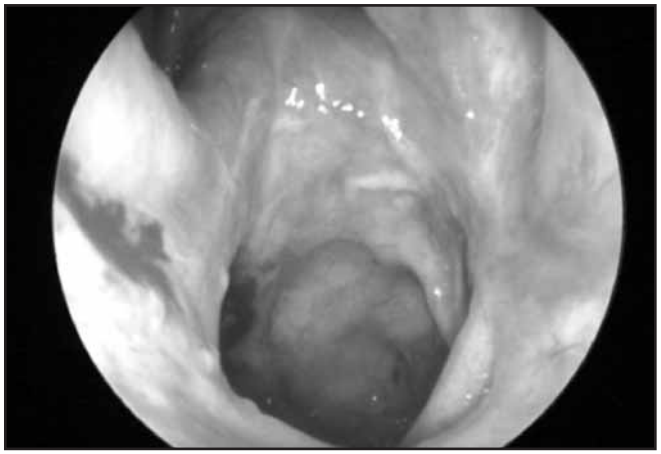

Fig. 3: Endoscopic view from left nasal cavity shows no tumor recurrence (Patient 4)

Six cases of NPC rT1N0M0 were treated in this study. All the tumors were successfully resected endoscopically with negative margins. This technique is therefore effective against tumor located in the nasopharynx. However, tumors extending too far beyond the reachable range of the instruments cannot be successfully resected and resection is always restricted by surrounding vital structures. The anatomic limit for safe resection would be the clivus superoposteriorly, the pharyngobasilar fascia laterally and anterior border of the inferior turbinate anteriorly[11].

This method is contraindicated in cases with exposure of carotid artery. Rupture of the carotid artery may result in death. Postoperative complications are bleeding, nasal congestion, crusting, neck stiffness, and wound infection. Hemostasis can be achieved by post nasal packing. Compared to our result, Shu *et al* in 2000 reported 14.3% (4/28) complications which includes saddle nose, osteonecrosis and internal carotid blow out, but no documented flap necrosis[12]. In 2002, Hao *et al* reported 22% (4/18) morbidity includes cerebrospinal fluid rhinorrhea (one), flap necrosis (one), osteoradionecrosis (one) and one patient with mild epiphora[7].

Chen *et al* indicates that minimally invasive endoscopic nasopharyngectomy is an effective salvage treatment modality for locally recurrent T1-2a NPC and the early survival outcome appears to be comparable with other salvage treatment[14].

The prognosis of rT3 and rT4 cases is poor when operated on with conventional nasopharygectomy indicating that endoscopic nasopharyngectomy would not be helpful for patients with advanced rT stage[8, 11, 12]. In 2002, To *et al* concluded locally recurrence NPC carries poor prognosis when associated with high recurrent T stage with 100% disease free survival rate in T1, 61.5% in T2 and 33.3% in T4[8].

However, with the development of new surgical approaches and technology of stereotactic navigation guidance, surgical treatment for low stage local recurrent or residual carcinoma has become safer with less morbidity and has made surgery a more attractive option in the salvage of appropriately selected cases of nasopharyngeal lesion[8].

CONCLUSION

Our preliminary result for endoscopic nasopharyngectomy is very encouraging and comparable with other regional studies. It is an effective treatment modality for recurrent NPC and nasopharyngeal lesion. The main advantages of this procedure are less destruction of surrounding tissues, and invisible scar and reduced complications. Although it is very feasible, it needs more clinical experiences and longer follow-up to validate our result and fully address the role of exclusive endoscopic nasopharyngectomy.

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