

A new combined approach to the nasopharynx in head and neck plastic surgery: technique and application

J R SAVAGE, H A SALEH, P M CLARKE

Abstract

This article presents a combined approach to the nasopharynx, which has not been previously described. The technique is applicable to cases of recurrent nasopharyngeal carcinoma which exhibit lateral extension. We describe the technique and report a case in which it was used. A review is presented of all other techniques currently described. The authors would not advocate the use of a combined approach to the nasopharynx in all cases, but there certainly appears to be a place for this technique.

Key words: Nasopharynx; Carcinoma, Squamous Cell; Nasopharyngeal Neoplasms; Surgical Procedures, Operative

Introduction

The treatment of nasopharyngeal carcinoma remains primarily radiotherapy, possibly with adjuvant chemotherapy. Surgery in general still plays a relatively minor role in initial management, apart from biopsying the postnasal space to establish a diagnosis.¹ However, in cases in which tumour recurrence occurs, salvage surgery is possible, with or without adjuvant brachytherapy.² In fact, this is thought to offer an advantage over additional irradiation in patients with early stage recurrences.³ It can be difficult to obtain access to the postnasal space and surrounding structures in order to achieve adequate removal of tumour whilst keeping morbidity to a minimum, and many approaches have been described in the literature.^{1,4–9}

Charing Cross Hospital is a tertiary referral centre for head and neck surgery. As such, cases in which radiotherapy of nasopharyngeal carcinoma have failed are referred from various regional centres for salvage surgery. Various approaches to the postnasal space for surgical removal of these tumours have been used, mainly determined by the stage and exact location of the tumour.

Operative technique

The initial approach was a standard lateral rhinotomy skin incision.⁹ A bony block, comprising lateral nasal wall with anterior and posterior maxillary antral walls, was removed. The sphenopalatine and maxillary arteries were identified, controlled and divided. The pterygoid plates were exposed and drilled away to reveal the postnasal space and to provide maximal exposure of the tumour anteriorly. This was then dissected from the skull base and longus colli, extending the dissection laterally with a cuff of normal tissue surrounding the tumour.

At this stage, a second incision was made, comprising the lower half of a standard superficial parotidectomy approach. This exposed the inferior aspect of the parotid gland, the posterior belly of the digastric and the anterior

border of the sternocleidomastoid. The sternocleidomastoid was then dissected from its attachment to the mastoid and reflected posteriorly to increase the exposure of the infratemporal fossa between the posterior belly of the digastric and the mandible. The internal carotid artery was then identified along with cranial nerves X, XI and XII, which were preserved. The posterior belly of the digastric was then divided at the mastoid and reflected anteriorly to further increase the exposure of the infratemporal fossa in order to allow the internal carotid artery to be followed upwards to the skull base, where cranial nerve IX was identified and preserved (Figure 1). The tumour was identified at the skull base and a plane was developed between the artery and the tumour, with full control and direct vision of the internal carotid artery. The tumour was then dissected free and sent for histopathological analysis in order to confirm safe removal.

Radioactive gold grains were then inserted into the nasopharynx, in conjunction with a nasal ribbon gauze pack soaked in paint of iodoform compound. A suction drain was left in the neck and closure was with a polyglactic acid suture and then a polypropylene suture to the rhinotomy incision and staples to the neck.

Case presentation

A 68-year-old man was referred to Charing Cross Hospital after radiotherapy failure as primary treatment of his nasopharyngeal carcinoma.

The patient had initially presented 10 years previously with left serous otitis media; over the years, he had had numerous negative postnasal space biopsies and grommet insertions, with his condition subsequently being treated as eustachian tube dysfunction. A magnetic resonance imaging (MRI) scan had eventually revealed a nasopharyngeal tumour, which was treated with radiotherapy, but the patient had re-presented to the department with occipital headaches and hence had undergone a further MRI. This

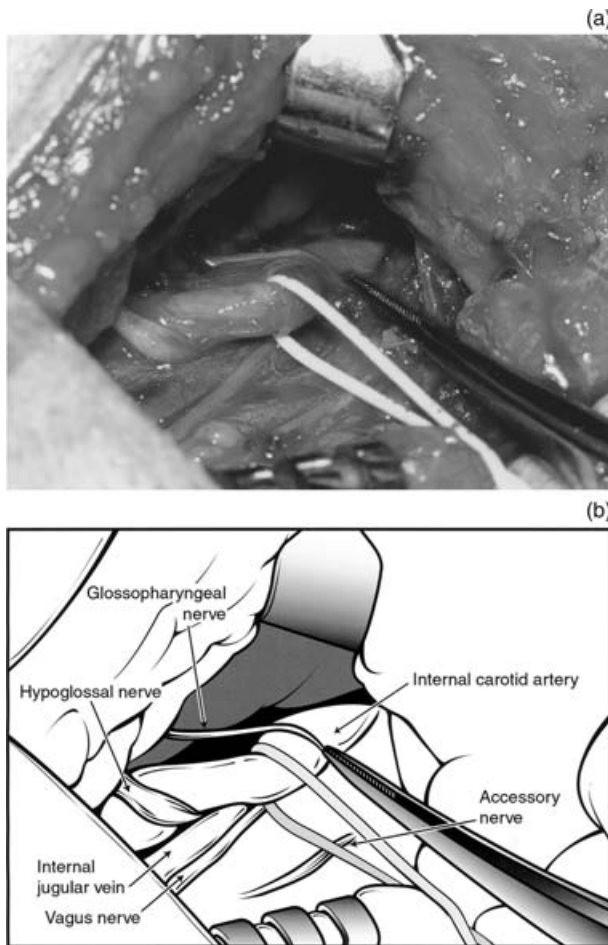


FIG. 1

(a) Clinical photograph showing cervical approach to the infratemporal fossa. (b) Line drawing of (a) showing relevant structures.

had shown recurrent tumour on the left which, although extended into the parapharyngeal space, abutted, without surrounding, the internal carotid artery on that side (Figure 2).

At this point, the patient was referred to Charing Cross Hospital for salvage surgery. However, two problems existed. Firstly, the tumour extended laterally to the internal carotid artery; an exclusively trans-maxillary approach would therefore result in inadequate exposure and control of the internal carotid artery. Secondly, although the tumour appeared not to involve the internal carotid artery, the resection margin would remain very close at this point.

The solution to these problems was to utilize a combined approach via a lateral rhinotomy and the infratemporal fossa, with implantation of radioactive gold grains around the internal carotid artery.

The patient underwent the procedure with no peri-operative complications. Histologically, the tumour was a poorly differentiated adenocarcinoma, with perivascular invasion. All frozen sections sent peri-operatively were clear of tumour. However, the margins of clearance were predicted to be small in the skull base and around the carotid, so adjunctive brachytherapy was utilized to treat any microscopic disease and to reduce the risk of any further recurrence. Apart from post-operative nausea and vomiting, the patient had a relatively uncomplicated

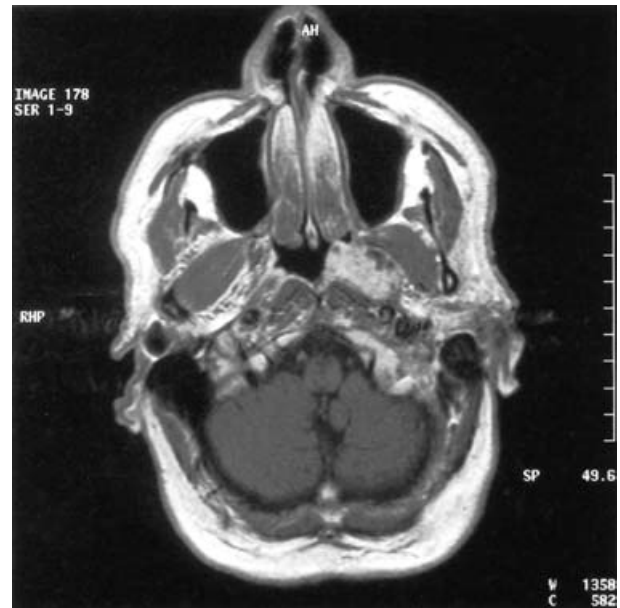


FIG. 2

Axial magnetic resonance imaging scan showing the tumour in the left postnasal space, abutting onto the left internal carotid artery.

recovery, and the gold grains were removed just over two weeks later.

The patient remained well nearly 18 months after surgery. At the time of writing, he remained under close follow up but was so far recovering well, having experienced no complications thus far.

Discussion

The surgical approach discussed above has not been previously described. We chose this access as the tumour in the nasopharynx extended laterally to abut the internal carotid artery on the left; other approaches would thus not have provided adequate or safe exposure.

The advantage of this approach was the relatively low morbidity that accompanied it. Certainly, other lateral approaches have well documented complications. The standard approach via the infratemporal fossa, described by Fisch,⁵ involves sacrifice of the middle ear on that side as well as transection of the mandibular division of the trigeminal nerve and middle meningeal arteries. It can also be difficult to dissect the medial and inferior surfaces of the tumour using this approach alone.⁷ Facial translocation is another lateral approach.¹ This technique requires a mandibular split and neck dissection and sometimes requires prior external carotid to internal carotid bypass surgery as the internal carotid is frequently tied off. There is also associated morbidity, not only due to the carotid arterial manipulation but also due to the approach itself, most notably the transection of both the maxillary and mandibular branches of the trigeminal nerve.¹

The transmandibular transpterygoid approach⁷ allows good access to the nasopharynx and surrounding structures but does involve mandibulotomy and possible trismus. Temporary tracheostomy is also necessary in the initial post-operative period to protect the airway.

Wei *et al.* described the maxillary swing approach.⁶ This offers wide exposure of the nasopharynx and parapharyngeal space, although there is mention of one case in which the downward extension of tumour in the parapharyngeal space warranted a concomitant mandibular swing

for complete exposure and removal of the tumour. It is also stated that this antero-lateral approach allows palpation of the internal carotid artery so that inadvertent injury can be repaired under direct vision. However, Morton stated that inadvertent injury to the vessel in the first place is less likely with the infero-lateral approach.⁸

Trans-nasal, trans-antral, trans-cervical or trans-palatal approaches all have benefits but are all of limited use when the tumour extends into the lateral tissues.¹

Conclusion

This article presents a new combined approach to the nasopharynx that has been successfully employed on a patient with tumour extending laterally to abut the internal carotid artery. Although there is as yet no series of patients, the associated, relatively low morbidity is promising. We do not advocate that this combined technique be used to the exclusion of other methods, as smaller, more central tumours could be excised with just one approach. However, there is certainly a place for this technique.

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Address for correspondence:

Mr J Savage,
11 Curie Mews,
Wellingtonia Park,
St Leonards,
Exeter EX2 4TB.

E-mail: jenjules@blueyonder.co.uk

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