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Extracapsular dissection in the parapharyngeal space: benefits and potential pitfalls

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Abstract

The aim of this study was to investigate the benefits and potential pitfalls of transcervical extracapsular dissection in the treatment of parotid gland tumours in the parapharyngeal space. We retrospectively evaluated the records of all patients with parapharyngeal parotid gland lesions treated between 2000 and 2015 by transcervical extracapsular dissection. Patients having revision operations and patients whose records were not complete were excluded, leaving 49 patients in the study. We found acceptable oncological and functional outcomes throughout. Special attention should be paid in cases with multilobular growth of the tumour on magnetic resonance imaging, satellite tumours of pleomorphic adenomas, tumours in broad contact with the inner surface of the deep lobe, and lesions suspected of malignancy. Extracapsular dissection in the parapharyngeal region is associated with acceptable oncological and functional outcomes. These outcomes can be expected only after a thorough assessment of patient's history and preoperative imaging.

Keywords: Parotid Gland; Extracapsular dissection; Parapharyngeal space; Facial nerve; Pleomorphic adenoma

Introduction

From an anatomical point of view the pharyngeal extension of the deep lobe of the parotid gland occupies the prestyloid compartment of the parapharyngeal space, and tumours of parotid origin account for almost half the lesions in the parapharyngeal space.[1] Several surgical techniques for the management of parapharyngeal lesions have been proposed, and traditional invasive techniques with a mandibulotomy have gradually given way to the transoral and transparotid approaches, with or without superficial parotidectomy. In the era of minimally invasive surgery, endoscopic approaches (transoral, transnasal or transcervical), and extracapsular dissection by a transcervical approach, have acceptable oncological outcomes and reduced morbidity.

Extracapsular dissection was first described by Gleave almost 20 years ago.[2] This technique has been defined as resection of a tumour with removal of a cuff of healthy tissue, without exposing the main trunk or the branches of the facial nerve.[3] In our department this operation is done for single mobile lesions within the lateral lobe of the parotid gland as well as (through an extended submandibular incision) for tumours that arise from the pharyngeal extension of the parotid gland and are in the deep parapharyngeal space.[3–6]

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We aimed to evaluate our experience with recurrence and postoperative complications after transcervical extracapsular dissection in the parapharyngeal space. We also present some carefully selected case reports to illustrate the possible pitfalls, and suggest potential contraindications to minimally invasive surgery in this demanding region.

Material and methods

This retrospective study was made at a tertiary referral centre that specialises in diseases of the salivary glands. We evaluated the records (from 2000 and 2015) of all patients with parotid gland tumours that primarily involved the parapharyngeal space and were treated by transcervical extracapsular dissection with extended submandibular incision. Patients for whose records were incomplete or who had histological findings other than a parotid gland tumour, or who had had revision of operations done elsewhere, were excluded. The study was approved by the Institutional Review Board of the University of Erlangen-Nuremberg.

All patients were evaluated preoperatively by clinical examination, ultrasonography, and magnetic resonance imaging (MRI) of the head and neck, during which particular attention was paid to the parotid gland and the parapharyngeal space. The function of the facial nerve was assessed preoperatively using the House-Brackmann scale.[7] Information was extracted about the histological type, postoperative complications (facial nerve palsy, Frey syndrome, first bite syndrome, Horner syndrome, or trigeminal neuralgia), and recurrences.

Surgical technique

A horizontal submandibular cervical incision is made about 3 cm (2-3 fingers horizontally) from the mandible, and a skin flap raised in the subplatysmal plane to preserve the marginal mandibular branch of the facial nerve. The inferior pole of the parotid gland, the dorsal margin of the submandibular gland, the anterior margin of the sternocleidomastoid muscle, and the posterior belly of the digastric muscle are identified. The caudal pole of the parotid gland is retracted posteriorly and superiorly, and the submandibular gland anteriorly. In most cases, transection of the posterior belly of the digastric muscle, the stylohyoid muscle, and the stylomandibular ligament (together with ligation of the facial vein and artery, and resection of the styloid process) are useful to improve access to the parapharyngeal space and avoid damaging the capsule of the tumour. At this point, extracapsular resection with blunt dissection of the tumour is possible, with preservation of any vessels and nerves near the lesion. A drain is placed in the wound, which is then closed in two layers.

In all cases, we used neuromonitoring to identify the marginal mandibular branch of the facial nerve. This consists of an electrical stimulation probe and an electrode to conduct the action potentials of the orbicularis oris muscle. To begin with we stimulate the muscle with a maximum current of 4 mA. If the marginal mandibular branch of the facial nerve is identified by stimulation, the current is reduced to 1 mA.

Results

We initially identified a total of 96 patients. Those who had tumours that did not originate in the parotid gland (such as schwannomas and paragangliomas) and who had had revisions of operations that had been carried out elsewhere were excluded from further analysis. Our final sample consisted of 49 patients (16 men, 33 women; male:female ratio 0.48:1, mean (range) age 59 (30-87) years). Forty-five of the tumours were benign and four were malignant, and no tumour had recurred (mean (SD) follow-up: 7 (3.1) years). Postoperative complications included permanent facial palsy (House-Brackmann II) (n = 2), first bite syndrome (n = 2), and trigeminal neuralgia (n = 3). There were no cases of Frey's syndrome, Horner's syndrome, haemorrhage, or disordered wound healing.

Discussion

First it is important to distinguish between tumours of the deep lobe of the parotid gland and parapharyngeal parotid tumours; only lesions located medially to the mandibular ramus, angle or body can be defined as parapharyngeal tumours.[8] Because of the loose consistency of the connective tissue in the parapharyngeal space, tumours tend to grow slowly without showing any symptoms, and are usually incidental findings on computed tomography (CT) or MRI imaging studies. As tumours in the parapharyngeal space are benign it is particularly important that the technique chosen should carry the least possible morbidity.[9]

When we discuss extracapsular dissection in the parapharyngeal space, there are several aspects to be taken into consideration. About 80% of the glandular tissue lies lateral to the facial nerve and roughly 90% of parotid tumours occur in this "superficial lobe" of the gland. Only a tiny part of the remaining 20% of the gland parenchyma is within the space medial to the mandible. This sparse parenchymal tissue and the surrounding loose connective tissue mean that extracapsular dissection of a parapharyngeal tumour consists of a blind, somewhat blunt, dissection along the capsule of the tumour, and resection with a blunt instrument (peanut swab holding forceps) or even with the surgeon's finger.

Transcervical surgical excision of a parapharyngeal tumour, therefore, is more of a "capsular" dissection, without wide resection margins. The loose connective tissue,[10] and the thicker and stronger capsules of pleomorphic adenomas in the parapharyngeal space,[11] allow blunt dissection without excessive risk of operative injury to the capsule of the tumour or other sensitive vascular or nerve structures that are

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