

Review

Recent advances in the management of salivary gland disease

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Abstract

The management of salivary gland disease forms a considerable part of the work done by oral and maxillofacial surgeons. Fast track and one-stop head and neck lump clinics allow for early diagnosis of salivary gland tumours in most units, the emphasis being on outcome after operation for benign disease. There have been limited advances in salivary gland surgery in recent years. Most recent publications have compared outcome of new methods of treatment with conventional techniques. This article reviews papers related to diseases of the salivary glands published in the British Journal of Oral and Maxillofacial Surgery (BJOMS) over a two-year period (2007–2008), and includes other relevant articles to bring readers up to date about salivary gland disease.

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Introduction

Diseases of the salivary glands often present as lumps in the head and neck region. In over 80% of cases it is benign in the major salivary glands and malignant in the minor salivary glands. In general, the benign nature of diseases of the major salivary glands requires the surgeon to preserve key anatomical structures to give optimum functional outcomes. As a result the decision to do lumpectomy (usually an extracapsular dissection) or superficial parotidectomy for benign parotid lumps is controversial. There is also controversy about whether stones in the submandibular gland should be removed by conventional open surgery or by the use of other techniques such as lithotripsy, sialoendoscopy, or basket retrieval. We discuss all papers related to the salivary glands published in the British Journal of Oral and Maxillofacial Surgery (BJOMS) over the last two years, and include other relevant studies from related journals.

Facial nerve studies

For many surgeons, superficial parotidectomy remains the mainstay for the management of benign lumps within the superficial lobe of the gland for which preservation of full facial nerve function is an important marker of outcome. Efforts to minimise damage to the facial nerve has encouraged the development of alternative surgical techniques. Conventional teaching about access to the facial nerve has been to identify the main trunk at its exit before entry into the parotid gland. Retrograde identification of the nerve is technically more difficult and prolongs operating time. Anjum et al. presented a modification of the retrograde dissection of the facial nerve in which they recommend retrograde dissection to the main trunk after identification of the buccal branch 4 cm anterior to the tragus along the alatragal line.¹ Dissection then follows the conventional antegrade technique. They found no difference in complications between these two techniques.

Identification of the main trunk may also be difficult in obese patients and in those with recurrent tumours. O'Regan et al. did a cross-specialty survey of head and neck surgeons and the techniques used for dissection of the facial nerve.²

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Of 294 replies to their postal survey of 300 oral and maxillofacial, and 300 ear, nose and throat surgeons (57% and 41% rates of response, respectively) 209 surgeons (87%) used the antegrade technique while only 9 (4%) used the retrograde technique alone during primary operation. The retrograde technique increased to 9% in revision parotidectomy and 12% for injuries to the facial nerve. Most surgeons used a combined technique in revision surgery and injuries to the facial nerve, emphasising that personal preference is an important factor in choice of approach.

O'Regan et al. published a 10-year prospective observational study on morbidity of the facial nerve after retrograde dissection of the nerve for benign parotid disease in 136 patients.³ Outcome was based on the House–Brackmann grading system, with one patient having permanent facial weakness after surgery in their series. They advocated the routine use of retrograde dissection for all parotid tumours, advantages of which are that selective exposure of branches of the nerve may obviate the need for dissection along the main trunk,⁴ and that dissection may be easier.⁵ Furthermore, access to the main trunk can be more difficult in both large and dumb-bell-shaped tumours where it may even be displaced.⁶ Colella et al. studied parotid function after selective deep lobe parotidectomy and found transient weakness in 7 of 14 patients, but no long term complications such as fistula, Frey syndrome, or recurrence.⁷

To achieve better outcome with fewer complications some authors advocate a conservative surgical approach to benign parotid tumours such as extracapsular lumpectomy.⁸ This is probably practised at least in part by most surgeons who do superficial parotidectomy, as when the tumour lies adjacent to the facial nerve (and there is no cuff of normal parotid tissue), it inadvertently necessitates an extracapsular lumpectomy. But is the technique safe, and what would happen if a clinically benign tumour was found to be malignant after resection? McGurk et al. showed that there was no difference in recurrence or cancer specific survival after initial extracapsular dissection for patients with malignant tumours.⁹ Ghosh et al.¹⁰ and Witt¹¹ suggested limited superficial parotidectomy with favourable results across all outcome data in studies with follow up of more than 10 years, indicating a greater acceptance of a more conservative approach to parotid tumours.

Salivary stones and obstructive sialadenitis

Stones in the salivary glands occur most commonly in the submandibular gland and the surgical approach to retrieve them is based on anatomical site. Stones that occur in the distal part of the duct are often retrieved by an intraoral approach, but this risks damage to the lingual nerve that crosses over the duct in a submucosal plane. Chronic obstructive symptoms from stones in the hilum and the gland itself are conventionally treated by excision of the submandibular gland.

Advances in endoscopic surgery have made a non-surgical approach possible for the removal of stones. Limitations of

this technique, which include adhesions of the stone to the wall of the duct, narrow ducts, strictures, anatomical acute angles, very large stones, and stones within the parenchyma, have been published by McGurk et al.¹² In cases where the stone could not be retrieved, subsequent excision of the gland has been recommended. Kawaguchi et al.¹³ described a technique for removing stones from the hilum that preserved the gland itself. They advised sialodochoplasty with microsurgical repair by an extraoral approach, but the benefit of this technique is questionable as it has all the potential complications associated with excision of the gland itself. There is also a risk of postoperative stricture of the gland leading to obstructive symptoms.

Yu et al. created a therapeutic algorithm for the management of obstructive sialadenitis. In a series of 68 patients they used interventional sialoendoscopy for both diagnosis and treatment.¹⁴ They recommended its use for diagnosis in all cases where a stone was not visualised radiologically. It was also useful for balloon dilation of ductal strictures, basket retrieval of stones, and washing out of mucosal plugs. In the UK the use of salivary endoscopy is restricted to a few regional centres, but as minimally invasive surgery becomes cheaper and more widely available with shorter hospital stays and faster recovery, it may be the way forward in the management of these conditions.

Surgical incisions for parotidectomy

The incisions for access to the parotid gland usually have cervical, postauricular and preauricular components. Various modifications to these incisions have been advocated to achieve a better aesthetic outcome. There is little doubt that a face-lift incision with an endaural, and a cervical component within the hairline gives the best cosmetic outcome. Residual hollowing at the angle of the mandible has been addressed with sternomastoid platysmal flaps, and fat grafts. Foustanos and Zavrides combined a face-lift approach with a superficial musculoaponeurotic system advancement flap to achieve an optimum aesthetic result.¹⁵ Avery et al. advocated the preservation of the superficial lobe of the parotid gland when removing tumours of the deep lobe.¹⁶ In their short series of 4 patients they found that aesthetic results were good and did not compromise oncological principles of resection. Anand et al. recommended the use of nasal intubation to facilitate access to the retromandibular area, thereby making dissection in this region easier.¹⁷ When a conventional oral tube is used, the mouth is open, and the resulting rotation of the mandible reduces this retromandibular space.

Complications of salivary gland surgery

Most studies on outcome seem to concentrate on facial nerve weakness after parotid surgery, with few reports about the incidence of Frey syndrome (gustatory sweating). Some sur-

geons think that a degree of gustatory sweating occurs in most patients after parotid surgery where no interpositional graft has been used.^{18,19} A quantitative measurement of this can be made using the starch iodine test. To avoid the complication various interpositional grafts have been used including the sternomastoid muscle flap, temporalis myofascial flaps, femoral fascia, porcine grafts, autologous adipose tissue, and the superficial muscular aponeurotic system (SMAS) layer.

Adequate thickness of skin flap during operation reduces the risk of Frey syndrome, but in superficial tumours it risks compromise of the tumour or rupture of the capsule. Ye et al. presented a preliminary report on the use of allogenic acellular dermal matrix (ADM) for the prevention of Frey syndrome in 64 patients compared with 104 controls.¹⁸ In the ADM group only one patient (2%) had Frey syndrome compared with 63 (61%) in the control group. Objective testing using starch iodine tests on 30 randomly selected patients from each group confirmed Frey syndrome in 2% of the ADM group and 24% of the control group. The authors also discussed in detail the advantages of ADM over local flaps and botulinum toxin. They recommended the routine use of ADM for the prevention of Frey syndrome and also as a filler to avoid poor aesthetic results secondary to a depression in the residual defect. The interested reader is referred to a thorough review of the management Frey syndrome, which also includes the use of botulinum toxin A in its treatment.²⁰

Sialosis or sialocele

Sialosis is defined as a chronic, bilateral, diffuse, non-inflammatory, non-neoplastic painless swelling of the parotid gland.²¹ While it is not uncommon, few patients present with it as a primary complaint. It is secondary to autoimmune neuropathy, and changes in salivary aquaporin water channels.²² Histologically the acinic cells are hypertrophic. Scully et al. comprehensively reviewed 35 cases of sialosis,²¹ and found that diabetes mellitus, misuse of alcohol, and liver disease were the most common causes. Other causes such as misuse of drugs and bulimia are uncommon. Clinically, patients present with a loss of the groove between the mastoid and the posterior border of the ramus. Scully et al. emphasised the pathophysiology of the disease and recommended magnetic resonance imaging (MRI) to assist in diagnosis, and to exclude other inflammatory conditions and deposits.

Short communications

Many interesting cases of unusual disease have been published in the journal over the last two years. Jayasuriya et al. reported a rare complication of sialocele after fractures of the zygomatic complex, secondary to the fracture impinging on the parotid tissue.²³ Capaccio et al. described a submandibular sialocele that was treated successfully with botulinum

toxin.²⁴ Knepl and Fabbroni reported a case of necrotising fasciitis secondary to acute parotitis caused by *Streptococcus milleri* infection.²⁵ This was treated with radical debridement and broad spectrum IV antibiotics (clindamycin, benzylpenicillin, and metronidazole), and it highlights the need to be vigilant for clinical and radiological signs of the condition.

Parente et al. reported an usual presentation of sialolipoma occurring in the submandibular gland, and discussed the pathogenesis and histology of this benign tumour.²⁶ Sabesan et al. discussed the pathogenesis and mechanism for metastatic behaviour in benign pleomorphic adenoma.²⁷ Surgical manipulation may allow disrupted tumour cells to be seeded through the vascular channels. Common sites for metastasis of salivary gland tumours are the bones and lungs, and metastasis to liver, kidney, central nervous system, and skin have also been reported. Adams et al. reinforced the importance of a thorough history and clinical examination.²⁸ Infratemporal fossa and pharyngeal tumours often present with bizarre symptoms that may mimic symptoms such as facial arthromyalgia, atypical facial pain, and difficulty in swallowing. In their case the patient presented with symptoms of obstructive sleep apnoea that resolved after operation.

Several other interesting short communications about the salivary glands were also published in 2007–2008.^{29–33}

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