The Journal of Laryngology & Otology (2010), ***124***, *1100–1102*.

doi:10.1017/S0022215110000563

Short Communication

Extra-oral approach to removal of parotid duct stones

E Macassey, F Ahsan, R Allison

Abstract

There are many different management strategies for salivary calculi within the parotid ducts. Commonly, the stones can be extracted via an intra-oral approach. Stones that are farther from the papillae require more complex management. This article describes a technique for extra-oral excision of palpable salivary calculi using known external facial landmarks and dissection. Two cases are discussed and illustrations shown, and a brief discussion of other techniques for the management of salivary stones is included.

Key words: Salivary Duct Calculi; Parotid Gland

Introduction

Salivary calculi can form within the parotid glands and ducts, because of stasis or other local factors such as trauma and infection.[1] Calculi are more commonly found in the submandibular (Wharton's) ducts, because of gravity countering flow and salivary composition. The parotid (Stensen's) duct is shorter and less tortuous; calculi in the parotid duct account for 19 per cent of total salivary calculi.[1] Calculi have been reported to range in size from 1 to 30 mm.[2] Typical symptoms of partial or complete obstruction are colicky postprandial pain and gland swelling.[1]

Management strategies for parotid duct stones include lithotripsy, basket retrieval using endoscopy, fluoroscopy or ultrasonography, and surgical techniques.

We discuss an extra-oral approach to parotid stones that cannot be approached intra-orally, and we discuss two cases managed in recent years at our centre. Brief descriptions of other management options are also given.

Technique

The parotid stone is marked externally while the masseter muscle is clenched. A 3-cm incision is made using skin crease lines. Using surgical loupes, the tissues are dissected down to the duct, working parallel to the branches of the facial nerve to avoid damage. Any branches of the facial nerve can be confirmed using a facial nerve monitor. The duct is identified (Figure 1). A transverse incision is made and the stone is removed (Figures 2 and 3). The proximal and distal ends of the duct are probed to exclude any further stones. The duct is closed using interrupted 6-0 nylon sutures (Figure 4), and the skin wound is closed appropriately (Figure 5). Stents are not generally used if no stricture is present.

Case histories

Case one

A 45-year-old man presented with a mass in his right cheek and a recurrent foul taste in his mouth. He had no history of parotid gland swelling or pain.

Ultrasonography confirmed a 5-mm stone in the parotid duct.

The patient consented to surgery, which was carried out as described above.

There were no residual symptoms at post-operative follow up.

Case two

A 61-year-old woman presented with a two-year history of recurrent left parotid pain and swelling.

She had a palpable stone anterior to the parotid gland, confirmed on computed tomography scanning.

The patient consented to excision.

Post-operatively, she had a transient salivary fistula, which closed spontaneously with avoidance of spicy foods.

At the time of writing, the patient had been well throughout two years' follow up.

Discussion

Salivary duct calculi were traditionally managed surgically. In the late 1980s, however, endoscopy of the salivary ducts began to be performed, using a 0.8-mm endoscope; subsequently, techniques such as basket retrieval and dye laser lithotripsy were used.[3] The use of Endoscopic technique is limited in the presence of: unavailability of the equipment and/or expertise; ductal stenosis or tortuosity; sialadenitis; or when stones are too big or too 'soft' for lithotripsy.[3] One series quoted an 82 per cent treatment success rate.[4] Some ductal techniques such as intracorporeal lithotripsy may cause ductal damage and stenosis.[3]

After the success of extracorporeal shockwave lithotripsy on renal stones, its use was explored with salivary stones. One trial treated 52 stones judged not amenable to endoscopic removal, and had a 46 per cent success rate for removing the stone; a further 31 per cent of patients were left with concrements smaller than 2 mm.[5]

Surgery often involves an intra-oral approach, as the stone is generally located close to the papilla.[1] Many reported surgical techniques involve incision of the duct

From the Department of Otolaryngology, Head and Neck Surgery, Christchurch Public Hospital, New Zealand.
Accepted for publication: 4 January 2010. First published online 25 June 2010.

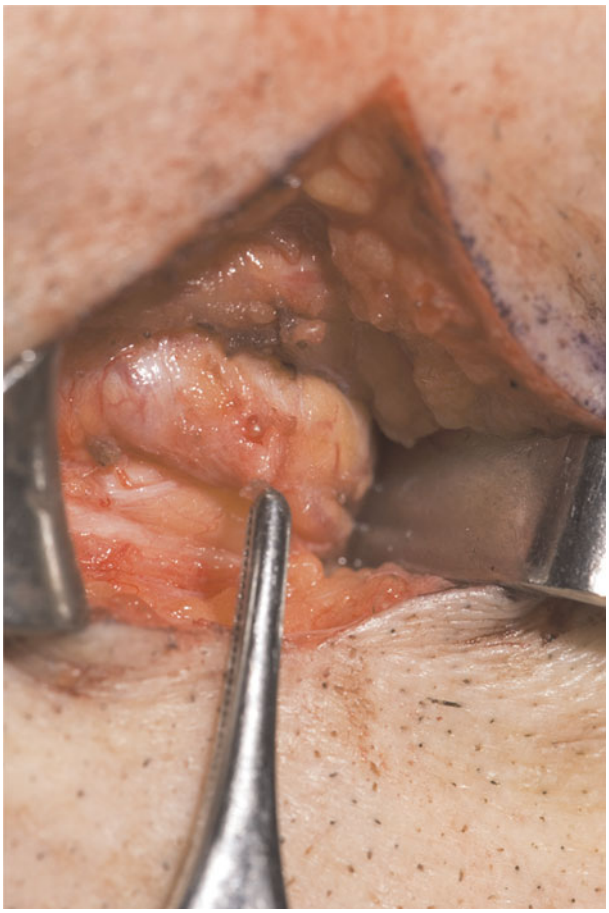

FIG. 1
Identification of the parotid duct.

FIG. 3
A 4-mm parotid duct stone.

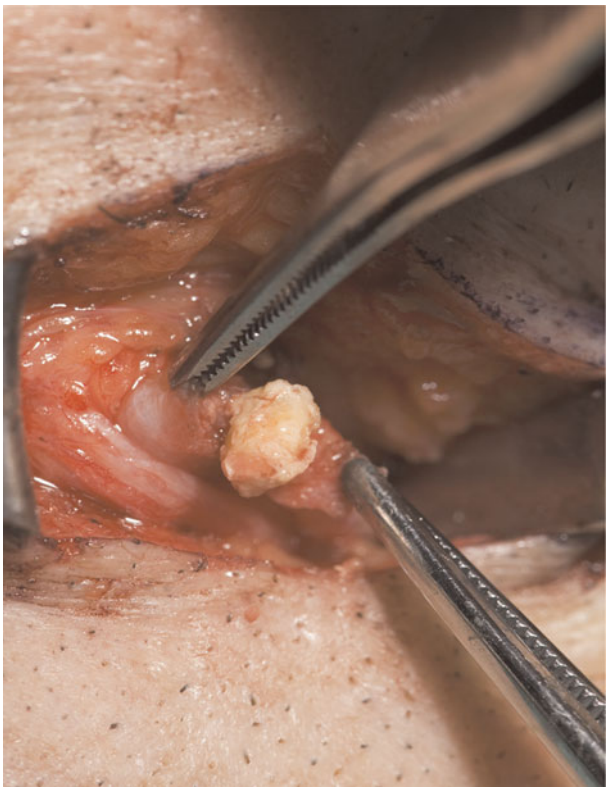

FIG. 2
Removal of the parotid duct stone.

at the papilla and extraction of the stone(s).[1] However, ductal stenosis can occur as a complication of such techniques.

However, in some cases the calculus cannot be felt intra-orally. Surgical removal of the parotid gland itself carries an approximately 3–7 per cent risk of facial nerve injury.[6] A previously described technique involves a combined endoscopic and external approach, using a parotidectomy incision, involving location of all branches of the facial nerve and then the parotid duct.[7] Walvekar *et al.* published

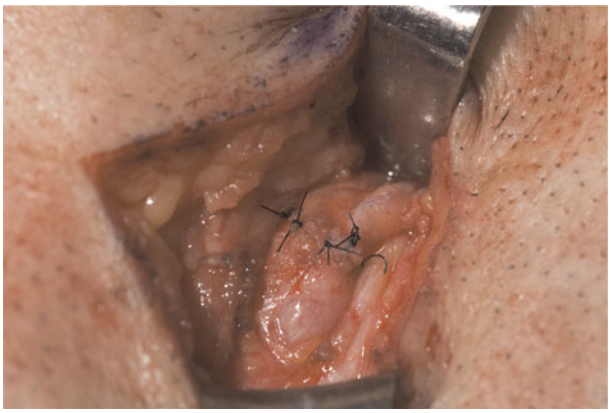

FIG. 4
Sutures to close the ductal incision.

https://doi.org/10.1017/S0022215110000563 Published online by Cambridge University Press

FIG. 5
Closure of the skin incision.

TABLE I
RELEVANT PAROTID DUCT ANATOMY

(1) Stensen's duct passes anteriorly across the masseter muscle. Several external landmarks have been described:[9]
  – Midpoint between the lower border of the zygoma and the lower border of the mandible
  – One finger's width below the zygomatic arch
  – At the level of the earlobe
(2) It then dives medially and pierces the buccinator muscle to enter the oral cavity at its papilla, opposite the 2nd upper molar tooth
(3) The transverse facial artery and vein pass parallel but superior to the duct
(4) The buccal branch of the facial nerve exits the anterior border of the parotid gland and heads forward across the masseter muscle it is usually below the parotid duct but can arise as double or above the parotid duct.[10]

a case series of seven such combined procedures, but the average operating time was 103 minutes.[8] Baurmash and Dechiara have also described one case involving an extra-oral technique with pre-operative radiological imaging.[9]

The anatomy of the facial nerve and parotid duct is fairly constant as regards external landmarks (see Table I). We present a technique for targeted removal of parotid duct stones, using anatomical landmarks, and we describe two cases and present intra-operative photographs. This technique is suitable for palpable stones that cannot be reached using an intra-oral approach. This technique, in the hands of an experienced head and neck surgeon, is a relatively simple and effective procedure with few cosmetic issues.

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Address for correspondence:
Dr Emily Macassey,
Registrar, Otolaryngology,
Christchurch Public Hospital,
2 Riccarton Avenue,
Christchurch, New Zealand.

E-mail: Emily.macassey@cdhb.govt.nz
Fax: 006433640273

Dr E Macassey takes responsibility for the integrity of the content of the paper.
Competing interests: None declared