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Sialendoscopy and sialendoscopically-assisted operations in the treatment of lithiasis of the submandibular and parotid glands: our experience of 239 cases

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Abstract

We present the results of treatment of sialolithiasis of the submandibular and parotid glands using sialendoscopy and sialendoscopy-assisted surgery. Between 2009-2013, 397 consecutive patients (mean (range) age 48 (18-76) years) were treated for obstructive diseases of the major salivary glands (sialolithiasis n = 239, 175 submandibular and 64 parotid). In a total of 175 patients with 191 stones in the submandibular gland treated by endoscopic retrieval or surgical release, 149 patients (85%) were rendered free of stones (by sialendoscopy alone n = 82, and sialendoscopy with operation n = 67) Twenty patients (11%) had residual stones and 6 patients (4%) required excisionof the gland. Sixty-four patients had 71 stones removed from the parotid gland by endoscopic retrieval or surgical release and 43 (67%) were free of stones (by sialendoscopy alone n = 25, and sialendoscopy with operation n = 18). Twenty patients (31%) had residual stones and one (2%) required removal of the gland. In the group of patients whose stones were removed endoscopically, the effectiveness of sialendoscopy was 87% and 85%, respectively. We confirm that sialendoscopy and sialendoscopy-assisted removal is the current treatment of choice for stones in the submandibular and parotid glands. The indications for excision of the gland are becoming less common as first-line treatment, although it is still indispensable in some cases.

Keywords: Chronic sialadenitis; Lithiasis; Sialendoscopy; Open surgery

Introduction

Chronic sialadenitis can cause salivary hypofunction, and correct diagnosis and management is essential. Its classification has changed during the past decade and has been revised and modified as new diagnostic methods (high resolution ultrasonography, and computed tomographic (CT) and magnetic resonance imaging (MRI) sialography and sonoelastography) and treatments (sialoendoscopy) have been introduced. [1] Sialolithiasis is the most common cause of inflammatory disease of the large salivary glands, and its quoted prevalence is 1.2%, as stated in Rauch's monograph from 1949 (quoted by [2,3]). According to Harrison [4] these authors found 23 clinical cases of sialolithiasis among 20 000 patients during 18 years of stomatological practice, so their incidence of sialolithiasis was in fact 0.1%.[4]

A more recent attempt to estimate the prevalence of sialolithiasis in the general population was made by Escudier and McGurk, [5] who stated that symptomatic lithiasis in England occurs in about 0.45% of the population. Stones are more common in the submandibular gland (87%) then in the parotid (13%) or the sublingual (7%) glands. Salivary gland

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stones can be single or multiple, located distally or proximally in the efferent duct, are rare within the parenchyma, and may be of various shapes and sizes. The annual increase in size of a salivary stone is estimated to be 1 mm, so the duration of the history is crucial when planning treatment.[6]

Stones of up to 4-5 mm in diameter can nowadays be successfully removed by sialendoscopy, particularly mobile stones that lie freely in the lumen of the duct, and these stones can be extracted under endoscopic control in more than 80% of cases.[2,6,7] Larger sialoliths may, however, be fragmented in the lumen of the duct, either mechanically or with a laser beam. Lithotripsy (ESWL) is another possible way to fragment large sialoliths of any size and at any location, although up to three sessions may be required.

The introduction of sialendoscopy has therefore significantly reduced the number of submandibular glands that have had to be removed for sialolithiasis.[2,6–9] The use of lithotripsy is effective in 75%, and allows for the complete retrieval of stones in half of all cases.[9–13] However, lithotripsy is clearly less successful as the diameter of the stone increases. Despite technological progress, 5%-10% of patients with sialolithiasis cannot be treated successfully using minimally invasive techniques, [14] if a stone is too large and there is a history of recurrent inflammation that leads to impaction into the wall of the efferent duct. In these cases, complete removal of the submandibular or parotid gland is essential.

The aim of this study was to analyse our results of treatment of symptomatic submandibular and parotid sialolithiasis between 2009-2013, with a special focus on sialendoscopy.

Patients and methods

This is a prospective study of 397 consecutive patients who were treated for obstructive diseases of major salivary glands (239 stones and 158 stenoses) at a tertiary university centre (Otolaryngology, Head and Neck Surgery Department, Poznań Medical University) by 470 sialendoscopies and sialendoscopy-assisted procedures. Details of patients are given in Table 1. The protocol was approved by the Bioethics Committee of the hospital.

We used real-time B-mode ultrasonography for preoperative diagnosis in all patients, but CT was required for 16. Interventional sialendoscopy was done with 1.3 and 1.6 mm diameter endoscopes (Karl Storz Tutlingen, Germany). Stones were removed with the help of the basket and forceps, which were introduced through the working canal.

The sialoendoscopic procedure was done under local anaesthesia after premedication with midazolam 7.5 mg. Once the size of the stone in the submandibular hilum had been calculated to be larger than 6-7 mm and endoscopic removal was impossible, we changed to the combined approach. In the case of the submandibular gland the combined approach consisted of incision of the floor of the mouth at the level of the submandibular hilum and sialendoscopy, also under local anaesthesia. In the case of the parotid gland, when the stone were located in the proximal and middle part of the duct, its diameter was more than 6-7 mm, and it was incorporated into the wall of the duct, the combined approach comprised general anaesthesia with facial nerve monitoring leads from the area of the marginal branch around the mouth, incision of Stensen's duct, and sialendoscopy. When the stone was primarily in the parenchyma, we decided whether to use ESWL or to remove the gland (mostly in the submandibular, rare in the parotid).

Table 1
Details of patients.

Variable	Submandibular	Parotid
Diagnosis:		
Sialothiasis alone	175	64
Ductal stenosis alone	66	99
Both	15	7
Mean (range) age (years)	48, 8 (24–67)	49, 2 (21–69)
Sex:		
Male	84	28
Female	91	36
Mean (range) history (years)	4 years (3 months–11 years)	4, 5 years (5 months–13 years)

Statistical analysis

Data of were exported to Microsoft Excel. Results were analysed using STATISTICA 7 (StatSoft Inc., Tulsa, OK, USA). Student's *t* test was used to analyse the significance of differences between groups, and the chi square test to analyse potential correlations, as appropriate. Probabilities of less than 0.05 were accepted as significant.

Results

Details of the patients are shown in Table 1, and of the procedures in Table 2. There were no significant differences in age or duration of complaints in either group. Coexisting conditions were not associated with rates of sialendoscopic removal of stones. Mean (range) follow-up in both groups was 20 (6-48) months. Endoscopic removal of stones was significantly dependent on the duration of complaints in both

Table 2
Treatments for patients with lithiasis of the submandibular and parotid glands.

Treatment	**Submandibular gland (n = 155)**	**Parotid gland (n = 44)**
Endoscopic removal	**82**	**25**
Double approach	**67**	**18**
Excision	6	1