Journal of Cranio-Maxillo-Facial Surgery 43 (2015) 1650–1654

Contents lists available at ScienceDirect

Journal of Cranio-Maxillo-Facial Surgery

journal homepage: www.jcmfs.com

Endoscopic-assisted gland preserving therapy for the management of parotid gland sialolithiasis: Our preliminary experience

LingYan Zheng, LiSong Xie, ZhiJun Wang, Huan Shi, NingNing Cao, ChuangQi Yu*

Department of Oral and Maxillofacial Surgery, Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai Key Laboratory of Stomatology, Shanghai, China

ARTICLE INFO

Article history:
Paper received 26 December 2014
Accepted 20 July 2015
Available online 29 July 2015

Keywords:
Parotid gland sialolithiasis
Sialendoscopic-transcutaneous
Sialendoscopic-transoral

ABSTRACT

Objective: To analyze the efficacy and safety of sialendoscopy and a combined transoral or transcutaneous and sialendoscopic approach in the removal of parotid gland sialoliths.
Methods: This retrospective study included 29 patients diagnosed with parotid gland sialolithiasis who required endoscopic-assisted gland preserving therapy. Ultrasonography and computed tomography were used to diagnose parotid sialolithiasis. The use of interventional sialendoscopy, sialendoscopic-transoral, or sialendoscopic-transcutaneous procedures was determined by the characteristics of the parotid gland stones.
Results: The stones were extracted by interventional sialendoscopy in nine patients. The transoral procedure was performed in 15 patients with large stones which were impacted in the ductal wall. The remaining five patients were managed through an external approach via a local incision under sialendoscopy. No postoperative complications occurred. The parotid glands were functioning normally after the procedures.
Conclusion: The combined sialendoscopic-transoral and sialendoscopic-transcutaneous operation appears to be a good alternative for parotid gland sialolithiasis in the absence of lithotripsy devices. This type of therapy can, therefore, decrease the rate of parotidectomy.

1. Introduction

Sialolithiasis has been claimed as the major cause of salivary obstructive diseases and comprises more than 60–70% of all salivary duct obstructions (Harrison, 2009). The most common area of origin is the submandibular gland (87%), followed by the parotid gland (10%) and the sublingual gland (3%) (Rice, 1999). Typically symptoms are recurrent pain and swelling of the gland, often with a purulent drainage from the opening of the duct (Singh et al., 2012). Traditionally, superficial parotidectomy is the surgical method of treating sialolithiasis, but the postoperative complications can be facial nerve injury (6–7%), facial hollowing and Frey's syndrome (Overton et al., 2012). However, the introduction of various minimally invasive surgical procedures has significantly reduced the number of parotidectomies. Therefore, salivary gland endoscopy is increasingly common and playing an important role in treating sialolithiasis. Sialendoscopy is increasingly used as an option in both diagnosis and treatment. (Marchal and Dulguerov, 2003; Katz, 2004; McGurk et al., 2005; Iro et al., 2006, 2009; Koch et al., 2008; Iro et al., 2009; Nahlieli et al., 2010).

One of the limitations of the endoscopic approach is the size of a stone. According to Marchal and Dulguerov (2003), although small stones generally can be removed with simple forceps or basket retrieval without additional fragmentation techniques, stones larger than 4 mm in the submandibular duct, or 3 mm in the parotid duct, necessitate fragmentation prior to attempts at retrieval. This aroused interest in applying extracorporeal shockwave lithotripsy (ESWL) and intracorporeal laser-assisted lithotripsy in sialolithiasis. Endoscopic removal of the stones after lithotripsy was easier and less complicated (Nahlieli et al., 2010). The use of lithotripsy and endoscopy together provided favorable outcomes with minimal adverse events (Phillips and Withrow, 2014; Sionis et al., 2014).

* Corresponding author. Department of Oral and Maxillofacial Surgery, Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai Key Laboratory of Stomatology, Zhizaoju Road 639, Shanghai 200011, China. Tel.: +86 2163138341x5388, +86 2134310161 (home); fax: +86 2153072423.
E-mail address: zhenglingyan73@163.com (C. Yu).

http://dx.doi.org/10.1016/j.jcms.2015.07.016
1010-5182/

Despite notable technological progress, 5–10% of patients with parotid gland sialolithiasis cannot be successfully treated with sialendoscopy. The main reason may be the large size of the stones associated with a long history of recurrent inflammation, which leads to impaction of the stones in the wall of the efferent duct (Singh et al., 2012). The combined sialendoscopic-transoral and sialendoscopic-transcutaneous operation described in this paper may be a good alternative for parotid gland sialolithiasis in the absence of lithotripsy devices.

The aim of this study was to report our clinical experience with endoscopic-assisted gland preserving therapy for the management of parotid gland sialolithiasis in the absence of lithotripsy devices.

2. Materials and methods

2.1. Patients

Since 2011, twenty-nine patients (19 male, 10 female; aged 10–85 years) were enrolled in this study of endoscopic-assisted gland preserving therapy for the management of parotid gland sialolithiasis. The inclusion criteria were as follows: 1) a stone in the parotid gland was located in the anterior or middle of Stensen's duct, regardless of the stone size; 2) a stone in the posterior of the main duct was small ($\leq$3 mm). The exclusion criteria were: 1) a stone in the posterior of the Stensen's duct larger than 3 mm; 2) the presence of a hilar or intraglandular stone.

Written consent was obtained from all patients and the study received ethical clearance from the institution's ethical board.

2.2. Diagnosis

The primary diagnostic procedures for all cases were ultrasonography and computed tomography (CT). These procedures provided precise information regarding of the number, size and position of the ductal stones.

2.3. Surgical technique

All operations were performed under local anesthesia. Diagnostic sialendoscopy (Karl Storz GmbH, Tuttlingen, Germany) was carried out first to confirm the size and position of the stone as well as to assess if the stone was movable. If a movable stone could be extracted by sialendoscopy, then interventional sialendoscopy (Karl Storz GmbH, Tuttlingen, Germany) was used, along with the 0.4 mm diameter wire basket and forceps. The basic technique used in our hospital had been described previously (Zheng et al., 2013).

If the stone was larger than 3 mm or impacted into the ductal wall and could not be extracted by an interventional sialendoscopy, a transoral procedure would be used. A semicircular mucosal incision (approximately 2 cm long) was created 1 cm anterior to the ostium and centered around it (Foletti et al., 2011) (Fig. 1). The duct was incised longitudinally, and the stone was removed through this incision, with the saliva flushed outside the duct. After the stone was extracted, a sialendoscopic control of the whole ductal tree was performed to verify that the duct was empty. Then, a polyethylene stent was inserted into the duct intraorally.

If interventional sialendoscopy and transoral procedures failed, the exact location on the outer skin would be marked with the aid of transillumination by the sialendoscope. A 1-cm incision according to the facial lines was performed (Nahlieli et al., 2002). After stone extraction, a sialendoscopic control of the whole ductal tree was performed to verify that the duct was empty. Then, a stent was inserted into the duct intraorally and fixed to the oral buccal mucosa.

Fig. 1. The picture indicates the incision of transoral approach for Stensen's duct salivary stones. The semicircular mucosal incision is created 1 cm in front of ostium.

2.4. Postoperative follow-up and measurement of outcome

The treatment was considered to be successful when the patient had no postoperative complaints, no residual stones were detectable, and the parotid gland showed recovery of its function. Complete stone removal was confirmed by sialendoscopy. Recovery of gland function was demonstrated by the appearance of abundant clear secretion from the orifice of the duct after massaging the gland.

3. Results

Of the 19 men and 10 women who underwent endoscopic-assisted gland preserving therapy for the management of parotid gland sialolithiasis, the mean age at operation was 49.55 years (range 10–58 years). The mean follow-up period was 2.3 years (range: 6 months to 3 years).

Out of 29 patients with parotid gland sialolithiasis, stones were removed endoscopically in 9 patients (31%). The remaining 20 patients were endoscopically diagnosed as having large stones, impacted into the duct wall, thus, they could not be removed by interventional sialendoscopy. These patients were referred for transoral removal, and in 15 patients (52%) the calculi were retrieved using this method (Figs. 2 and 3). However, stones persisted in five patients (17%). For this group of patients, an external approach procedure, with a local incision was performed (Fig. 4). Following stone removal, a control sialendoscopic examination of the whole ductal tree was performed to verify that the duct was empty. To avoid ductal stenosis, a stent was inserted into the duct for 14 days after the surgical procedures.

After the procedure, the diameters of the stones were measured. The average diameter of the stones was 5.8 mm (range 2.1–10.7 mm). The follow-up period after the procedure ranged from 6 months to 3 years. No postoperative complications such as facial nerve paralysis or fistulae occurred in any of the patients. Additionally, there was no ductal stenosis (prevented by stent insertion). Postoperatively, parotid gland function returned to normal in all patients. No patients needed a parotidectomy after the procedures.