Combined Sialendoscopic and Transoral Approach for Large Submandibular Intraparenchymal Stones

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Abstract

Objective. The aim of this prospective and controlled study is to describe a combined sialendoscopic and transoral approach to remove large intraparenchymal submandibular sialoliths and to assess functional results after stone removal.

Methods. Eighteen consecutive patients with large submandibular hilar stones with intraparenchymal extension were enrolled. Sialoliths had a median diameter of 18 mm (range 9-22 mm) and the diagnosis was confirmed by ultrasound examination. In all cases a combined sialendoscopic and transoral approach was accomplished by performing a deep incision of the mouth floor at the submandibular hilus level after endoscopic visualization of the stone. Three months after surgery an ultrasound examination was re-run to detect the presence of residual sialoliths. Pre- and intraoperative findings, surgical times, follow-up data and functional results were analyzed.

Results. Intraparenchymal stones were successfully removed using the combined technique in all cases. Fifteen patients (83.5%) were symptom-free after 6 months of follow-up. Two out of 3 still-symptomatic patients showed residual sialolithiasis at post-operative ultrasonography.

Conclusion. The outcomes of this preliminary study suggest that combined sialendoscopic and transoral approach is an efficient technique for the removal of large intraparenchymal calculi, which may avoid resorting to sialoadenectomy and thus decreasing risk of nerve damage or salivary fistula.

Introduction

Sialolithiasis is responsible of 30% of all salivary pathologies. Submandibular gland is the most affected gland with a rate of 85% while parotid and sublingual gland have a rate of 10% and 5% respectively. Traditionally, management of intraparenchymal salivatory stones is sialoadenectomy. In the last years, with the increasing of intraductal salivary endoscopy, the treatment of this disease is changing. Conservative techniques have been developed for management of sialolithiasis, such as interventional radiology, operative sialendoscopy, extracorporeal shock wave lithotripsy, laser lithotripsy, transoral surgery. According to therapeutic flow chart, described by Marchal et al., large salivary stones (>8 mm) may be removed with combined sialendoscopic and transoral approach. In literature, to the best of our knowledge, there is only one paper about the treatment of large submandibular stones located in hylo-parenchymal gland.

The aim of this study is to describe surgical technique of parenchymal submandibular large stones removal and to assess the functional results after surgery.

Methods and Materials

This prospective and controlled trial study was conducted from April 2011 to June 2013 at the ENT University Unit of the “A. Fiorelli” General Hospital, “Sapienza” University of Rome. All patients with symptomatic submandibular sialoendoscopy were studied. All patients underwent clinical examination, ultrasound assessment of location and size of stone. In selected cases we required a CT scan in order to a better evaluation of stone. 18 patients (10 M: 8 F, average age of 55 years) with symptomatic submandibular hylo-parenchymal stones location, with a stone size > 9 mm, were enrolled. Exclusion criteria were: stone size < 9 mm, a significant limitation in mouth opening, ductal atresia, comorbidity with inability to undergo general anesthesia, patient’s refusal to surgery. The patients were followed-up after surgery for 12-18 months. We performed a postoperative US examination after 3 months to detect the presence of residual stones.

All patients underwent a combined sialendoscopic and transoral approach removal of stones under general anesthesia. Operating time, preoperative and intraoperative findings, postoperative outcomes and functional results were analyzed.

Surgical technique

The procedure was performed under general anesthesia. Mouth opening was ensured by mouth opener. Wharton’s duct was identified and cannulated using increasing diameter salivary probes. It was enlarged until placing sialendoscope. A traditional sialendoscopy was performed in order to view the stone. Exploiting sialendoscopic view, transillumination of the oral floor and bimanual palpation, the exact location of the stone was detected. Afterwards, the tongue was retracted antero-medially and the floor of mouth was infiltrated with a solution composed by anesthetic and vasocostrictor agent just on the site detected by transillumination. After sialendoscopy, a salivary probe was positionned inside the duct to allow the identification of the duct. Under endoscopic visualization, using a rigid sino-nasal endoscope, with 0 degree of viewing, a deep incision of the mouth floor was performed, from the tip of the probe to posterior area, corresponding to the distal third of Wharton’s duct and submandibular hilum. Blunt dissection was performed until the lingual nerve and Wharton’s duct were identified. At this level, lingual nerve appears as a white string located laterally to the Wharton duct. Furthermore, moving the probe inside the duct, we may control the exact location of Wharton’s duct in respect to the other anatomical structures. The lingual nerve was isolated and strayed from the duct, using a vascular loop. The glandular hilum was moved upward by an external finger pressure of submandibular gland. The surgeon proceeded with dissection until parenchymal gland viewing. In order to reach and remove the stone, an incision of glandular parenchyma was performed as much medial to the glandular hilum as possible. The dissection proceeded until the viewing of the stone site. The stone was removed using a curved suction tube. After stone removal, a second sialendoscopy was performed in order to check for any residual intraparenchymal calculi and to assess that other pathologies have not been overlooked. A sialostent was positioned under sialendoscopic viewing from the distal to the proximal portion of the duct and it was left in place for at least 3 weeks. Finally, the oral floor wound was sutured with resorbable stitch. All patients were discharged 1 day after surgery and received antibiotic therapy and steroid for 1 week.

Results

Stones removal was performed in all cases. The average size was 18 mm diameter, ranged between 9 and 22 mm. The stones were located in right submandibular gland in 7 cases and in left submandibular gland in 11 cases. Stones were removed in all cases. Lingual nerve was preserved in all cases. No intraoperative complications were observed. Early complications, consisting of transitory swelling (8 cases) and mouth floor edema (3 cases), were observed in 13 patients (72%). No infective complications were detected. The postoperative follow-up was conducted for 12-18 months (mean 15). No long-time complications occurred. Fifteen patients (83.5%) were symptom-free after 6 months of follow-up, except 3 patients that referred swallowing of the gland and painful 2 month after procedure. Three months after surgery all patients underwent US assessment. Two out of 3 still-symptomatic patients showed residual sialolithiasis. These patients underwent a sialendoscopic removal of the stone under local anesthesia. Mean surgical time was 73.5 minutes, ranged between 65.0 and 82.0 minutes.

Discussion

The development of conservative and gland-preserving techniques for treatment of salivary stones is increased in the last years. It has been shown that the risk of surgical failure increases with non palpable intraparenchymal stones, while palpable stones can be safely removed with sialendoscopic and transoral combined approach. Preoperative assessment is important for adequate evaluation of the size and location of the stone. Our results are in line with other outcomes. Recurrence of the stones is more frequent in patients previously undergone shock wave lithotripsy. Postoperative US showed a normal appearance of ductal system and gland parenchyma.

Conclusions

The outcomes of this preliminary study suggest that combined sialendoscopic and transoral approach is a feasible, safe and effective technique for treatment of large hiloparenchymal submandibular stones; it may performed as a one night hospital stay procedure. This approach may avoid sialoadenectomy and thus related risks of nerve injury. Future studies with longer follow-up will confirm the risk for recurrence of calculi.

References


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Figure 2. Left submandibular gland: intraparenchymal stone removal (UN-Lingual Nerve; P-Parenchyma; S-Stone)