

Sialendoscopy

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ABSTRACT

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Sialendoscopy is one of the most fascinating innovations introduced in the last few years in the field of otolaryngology, head and neck surgery. Sialendoscope consists of a semi-rigid scope that contains two channels; a rinsing and a working channel, with an external diameter of 1.3 mm. Now advances in technology have made possible newer designs of Sialendoscopy with outer diameter ranging from 0.75 to 1.3 mm. For use with the endoscope, instruments have been designed like wires, baskets, drills, forceps, graspers, stents, drains, balloons and suction. Various lasers have been used for intracorporeal lithotripsy,

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Keywords: Salivary gland, Sialendoscopy, lithiasis, Procedure, Indications.

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INTRODUCTION

Salivary gland diseases were first described in ancient times by Hippocrates, 460-370 BC. Ever since the knowledge of salivary gland diseases, the treatment protocol has changed over the years. The 'endoscopic revolution' triggered by Philip Bozzini and Desmereaux has made dramatic changes in almost all the surgical specialties. The endoscopic approach has not spared salivary gland pathology. In the early 1990s, endoscopy of salivary gland emerged and has caused a drastic change in the treatment protocol of salivary gland diseases. Sialendoscopy is one of the most fascinating innovations introduced in the last few years in the field of otolaryngology, head and neck surgery.

OVERVIEW

The last 15 years have seen rapid development of non-surgical and minimally invasive techniques for diagnosing and treating salivary gland duct obstructions. The conventional treatment has shifted from open surgical or gland resection procedures to endoscopic and gland preservation techniques. The goal of treatment now is to leave a physiologically intact gland for the patient. Extracorporeal shock wave lithotriptors, endoscopes, mini-instruments, and corresponding surgical techniques and approaches all have become focused on and tailored to salivary duct and gland pathologies. Originally developed to treat salivary duct stones, progress in equipment designs and surgical

techniques has allowed for precise diagnosis and treatment of previously unrecognized nuances of duct pathology. Worldwide, researchers' and physicians' understanding, experience, and skills have accumulated rapidly. Multiple medical specialties have contributed to the present clinical algorithms, which have brought marked improvements in patient care to produce the best diagnostic and treatment possibilities.

Sialolithiasis and sialadenitis are the most frequently presenting disorders of the salivary glands. The diagnosis is most frequently confirmed by radiology. Treatment of sialolithiasis ranges from the use of surgery – intra-oral extraction or external lithotripsy, and the more frequent performance of external excision of the gland. Sialendoscopy uses minimal invasive surgical techniques which allows for optical exploration of the salivary ductal system and extraction of the stones under endoscopic view. This technique of sialendoscopy incorporates diagnostic with therapeutic procedures, as the clinical findings dictates.¹

Sialendoscopy

In patients considered with sialolithiasis, involving the submandibular or parotid glands, the diagnosis of the condition may include the use of ultrasound, sialography or an MR-sialogram. Ultrasound when used is a non-invasive and cheap diagnostic technique, which has limits on its diagnostic abilities, and detects stones that are greater than 3 mm in size. The technique is very user dependent and thus has additional

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limitations. Sialography, which has been considered the “gold-standard” for diagnosis of sialolithiasis, is being used less frequently, because its interpretation and correlation with pathology does not have a good correlation to patient’s symptoms. The MR-sialography allows for reconstruction of the salivary ductal system without the use of the need for Contrast or dye injection. This technique has also got disadvantages and may not be performed on all suitable patients. Sialendoscopy has improved by research and now has improved optics and instrumentation so that it has now become standard and routine for the investigation of all patients that present with symptoms of salivary gland diseases and disorders.

Instrumentation

Sialendoscope consists of a semi-rigid scope that contains two channels; a rinsing and a working channel, with an external diameter of 1.3 mm. Now advances in technology has made possible newer designs of sialendoscope with outer diameter ranging from 0.75 to 1.3 mm. For use with the endoscope, instruments have been designed like wires, baskets, drills, forceps, graspers, stents, drains, balloons and suction. Various lasers have been used for intracorporeal lithotripsy, among them are the Xe Cl excimer, flash-lamp pulsed dye, the Ho:YAG, and the erbium:YAG laser.²

Procedure

Sialendoscopy is performed routinely and ambulatory, with patients seated or lying down supine. After the application of local anaesthetic to the duct papillae, it is dilated so that it can accommodate the endoscope without causing trauma to the duct or cause pain to the patient. The endoscopy is performed by the use of a rinsing anaesthetic solution. This technique allows for anaesthesia of the ductal system, the ability of fluid to clear of the stones or concretions identified within the ducts, and also for rinsing the scope. The ductal system can be explored from the primary ducts to the secondary and even tertiary ducts, and allows for the identification of stones and ductal stenosis.³ Other pathologies may be identified using this technique and include polyps, and stenoses which cannot be detected by the previously described diagnostic tests. According to F. Marchal and P. Dulguerov, sialendoscopy has been possible in 98% of cases performed on 450 cases studied. The procedure lasts between 12 – 40 minutes, and the difficulties are usually associated with small ductal systems or small angle ramifications. They report no significant complication such as perforation or excessive bleeding which required additional

therapeutic interventions.⁴

Indication⁵

Diagnostic indication

- suspicion of obstructive salivary disease (diagnostic endoscopy)

Therapeutic indications

- treatment of salivary stones (including fragmentation, removal, and stone localization for external approaches)
- dilatation of strictures and localization of strictures for external approaches
- management of chronic sialadenitis by irrigation
- management of recurrent juvenile sialadenitis.

Contraindication

Sometimes acute sialadenitis is named as an absolute contraindication because the swollen duct wall is more vulnerable to perforation. Additionally, the endoscopic view is hampered by mucopurulent debris. Uncommonly, conservative treatment including intravenous antibiotics did not show sufficient effect to avoid a sonographically proved imminent abscess. In these uncommon cases, diagnostic sialendoscopy was then carefully performed to confirm that a sonographically controlled ductal procedure on the stone was possible and curative. Acute sialadenitis is probably a relative contraindication.

Side Effects

Reported side effects and complications include the following⁶

- Temporary swelling caused by irrigation (2–3 hours, 100%)
- Wire-basket blockages (6%)
- Canal wall perforations (0.3%–6%)
- Recurrence of symptoms (1%–6%)
- Temporal lingual nerve paresthesia (0.5%)
- Ranula (1%)
- Postoperative infection (2%)
- Ductal strictures (0.3%–3.5%)

Uses

1. Treatment of salivary stones

Sialolithiasis is the most frequent reason for salivary duct obstruction. The aim of treatment is to completely remove the stone. Various approaches exist and

endoscopic techniques are only one part of the whole spectrum of possibilities. It can be advantageous to combine different approaches (multimodal therapy). It has been suggested that a stone's maximum diameter should not be larger than 150% of the anterior ducts and that the absolute diameters should not exceed 3 to 5 mm for Stensen duct and 4 to 7 mm for Wharton duct if it is to be removed without fragmentation. It is sometimes possible, however, to remove stones with even larger maximum diameters if their form is streamlined (eg, if they are highly ellipsoid)^{6,7}

2. Dilatation of strictures and localization of strictures

Endoscopically controlled procedures are especially helpful for short, membrane-like stenoses or where stenoses begin at duct branchings. The latter ones can be very difficult to treat with fluoroscopically or sonographically controlled procedures; filiform-like openings might not be identified by these methods.^{8,9}

3. Management of chronic sialadenitis by irrigation

Sialendoscopy has been used successfully to treat adult chronic sialadenitis. The mechanism is probably clearance of mucous plugs and dilatation of the duct by irrigation and might be the same as for chronic juvenile parotitis. A less invasive procedure may be performed by just irrigating the duct with a catheter without endoscopy.¹⁰

4. Management of recurrent juvenile sialadenitis

Recurrent juvenile parotitis can be treated successfully as with adult chronic sialadenitis using sialendoscopy.¹¹

Consideration for sialendoscopy in clinical scenario⁵

The most relevant aspects regarding planning of treatment, to which plain sonography is of limited use, are the following:

1. The distinction between a nonechogenic stone and a stricture (qualitative assessment): In the case of a suspected stricture a nonechogenic stone should be excluded using other methods (eg, sialendoscopy).
2. The quantitative assessment of the obstruction using sonography: It is often difficult to measure the three-dimensional size of a stone or to assess the length and number of stenotic areas.
3. The state of the distal duct system in the event that an intraductal approach is planned: It may be useful to assess the duct and its diameter distal of

the obstruction to ensure that the duct is wide and straight enough for the instruments, to which plain sonography is poorly suited.

These considerations are also important in determining whether the fragments produced by extracorporeal shock wave lithotripsy are easily washed out by the saliva from the duct system. For sonographically controlled procedures it is also important to know if there are kinks and branchings that might complicate approaching the obstruction. Both sialendoscopy and sialography (sialogram) can be used to ascertain the three aspects listed previously. Sialography gives a better overview of the whole duct system and can give information about areas not reachable by sialendoscopy (eg, behind extreme kinks and strictures). Disadvantages are radiation exposure and false-positive stone detections because of air bubbles. Sialendoscopy allows visualizing the pathology directly. Both, sialendoscopy and fluoroscopy can also be used to control therapeutic interventions so that it is possible to switch from diagnostics to treatment within the same session.

SUMMARY

Sialoendoscopy is a novel minimally invasive technique to explore the salivary duct system and to treat obstructive salivary disease. The use of endoscopes in otology, laryngology and rhinology and the performance of microsurgical procedures are common place in ENT practice for decades, now with the introduce of endoscopy for salivary glands has allowed for clinicians to consider the possibly to increasing their ability to improve quality care for their patients who resent with salivary gland symptoms and disorders. There is no doubt that diagnostic and interventional sialendoscopy of salivary glands will soon be included in the repertoire of all clinicians and be considered as a standard of practice within a short period of time.

END NOTE

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