Sialendoscopy - An Investigative and Therapeutic Approach to Obstructive Salivary Gland Pathology

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ABSTRACT

The major salivary glands are most commonly affected by inflammatory and obstructive conditions. Sialadenitis secondary to non-neoplastic obstructive pathologies including sialoliths, strictures, stenosis, mucous plugs and ductal polyps, remains the most common disorder of the salivary gland. Among the major salivary glands, submandibular salivary gland is commonly affected by obstructive pathologies like sialoliths, due to the torturous course of Wharton's duct, the higher calcium, phosphate levels and the increased mucoid nature of the secretion contained within the dependent position of the submandibular glands. Sialendoscopy is a relatively new technique that allows endoscopic intraluminal visualization and instrumentation of the salivary ductal system. Thus, sialendoscopy has a dual role of diagnosis and therapeutics. This technique provides an alternative to traditional surgical approaches that require the excision of a salivary gland for the treatment of common nonneoplastic pathologies. Sialendoscopy is complementary to diagnostic techniques such as plain X-ray films, ultrasound, computed tomography (CT) scan, magnetic resonance sialography, and conventional sialography, which are usually advised for evaluating the salivary ductal system. Thus, this paper aims to provide an overview of Sialendoscopy, as an investigative and therapeutic approach to obstructive salivary gland pathology.

Keywords: Salivary glands, Sialadenitis, Sialendoscopy, Sialoliths.

INTRODUCTION

Major salivary gland infection and obstructive diseases present a diagnostic and therapeutic challenge.[1] Obstructive sialadenitis with or without sialolithiasis represents the main inflammatory disorders of salivary glands.[2] Conservative treatment is the first line of therapy in such cases. However, conservative therapy fails in up to 40% of people with sialadenitis; in which case the recommended treatment is excision of the involved salivary gland.[3] Sialendoscopy is a recently developed technique allowing diagnosis and treatment during the same procedure. It was described for the first time in the early 1990s by Katz. Sialendoscopy uses semi-rigid or rigid miniaturized endoscopes with optical fibers providing high-quality images to explore the parotid and submandibular salivary ducts. For diagnostic purposes, sialendoscopy is superior to imaging for obstructive pathologies. The uncalcified stones, stenosis, polyps, mucosal plugs and foreign bodies often missed by imaging methods, can be visualized by this technique. When used for therapeutic purposes, sialendoscopy is a minimally invasive and non-traumatic surgical technique enabling endoscopic stone removal, stricture dilatation and salivary gland lavage.[4]

Indications:[5]

- Non-neoplastic obstructions such as sialoliths, stenosis, mucous plugs, strictures and ductal polyps.
- Sialendoscopy can be effective in patients with radioiodine-induced sialadenitis.
- Patients with refractory symptoms from any pathology, not responding to conservative management may benefit from interventional sialendoscopy.

Contraindications:[3]

- Sialendoscopy is contraindicated during acute infections. The use of endoscope during such conditions, increases the risk of ductal perforation and potential spread of infection into the head and neck soft tissues.
- Relative contraindications include, patients with microstomia or trismus.

Advantages of sialendoscopy:[5]

- Performed as an ambulatory out-patient procedure in one visit.
- High cure rate.
- Avoids facial nerve damage.
- Lower morbidity.
- No radiation exposure.
- No scar formation.

Disadvantages of sialendoscopy:[6]

- Mobility of the endoscope is limited at the distal end of the gland.
- Convoluted portions of the salivary duct are impassable with a rigid endoscope.

Technique of sialendoscopy

Instrument: Sialendoscope

Sialendoscope can be rigid, semi rigid or flexible. However, semi rigid endoscope is commonly used. They are available as both diagnostic and therapeutic scopes. Sialendoscopes are available in diameters ranging from 0.9 to 1.6 mm. (Fig 1) Additionally, a number of miniature instruments such as wire baskets, balloon dilators, grasping forceps, micro drills, biopsy forceps, and guide wires are available for therapeutic purposes.[7] (Fig. 2, 3, 4 and 5)

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Procedure

Diagnostic sialendoscopy is usually performed under local anaesthesia. About 20–30 min before starting the procedure, a sterile gauze piece soaked in lignocaine, is placed over the floor of mouth in submandibular gland sialendoscopy or along the upper gingivobuccal sulcus in parotid sialendoscopy. Therapeutic procedures like removal of duct calculus, dilatation and stenting of the ductal strictures are preferably done under general anaesthesia. However, local anaesthesia may be considered in selected cooperative subjects and in patients who are unfit for general anaesthesia. Patient is placed supine with head fixed on a head rest and turned towards the surgeon.[7] The patient's mouth is kept open either with a retractor, bite block, or a dental splint. Identification of the papilla is facilitated by the use of magnification with a microscope or surgical loupes. In addition, massage of the gland to express saliva allows the localization of the papilla.[5] Once identified, the orifice of the duct is progressively dilated with dilatation probes to match the diameter of the endoscope. For Wharton's duct, the papilla is lifted from the frenulum with dissecting forceps, for Stenon's canal, the cheek is retracted anteriorly to pass the curvature above the masseter muscle. The endoscope is then introduced within a fine diagnostic sheath with an operator channel connected to a foot-controlled automatic irrigation system to dilate and washout the gland. The ductal system is explored as far as possible. If an anomaly is encountered, the diagnostic sheath is replaced by a therapeutic sheath with two operator channels, one connected to the irrigation system and the other for instruments. Sialoliths are removed with a Dormia basket or grasping forceps. Large sialoliths are broken down with hand-held micro bur. Laser fibers can be used as well through the interventional channels for intraductal laser fragmentation of stones. Flushing or lavage of the gland is done to expel mucous plugs. Strictures within the main duct are dilated with dilatation probes, while those within the duct ramifications are dilated with a balloon probe. Stenoses are treated with metallic dilators or with balloon catheters[6] Sialendoscopy with irrigation of the duct with or without injection steroids has been shown to be effective in treating Juvenile recurrent parotitis.[3] At the end of the procedure, the entire ductal system is reexamined. A 0.75 mm diameter catheter will then be inserted to prevent retractile strictures during the healing process.[4] Although, sialendoscopy pose substantial benefits, it has a few minor complications. Gland swelling post-operatively is expected and usually resolves in approximately 24-48 hours. This is particularly important to consider in submandibular procedures, as swelling could cause airway compromise.[8] Consequently, when performing bilateral submandibular gland procedures, it is important to examine the gland and oral cavity after completing one side and determine whether it is safe for the patient to proceed with the contralateral gland. One of the more serious iatrogenic complications is avulsion of the duct. This complication can be prevented by avoiding excessive traction on the stone while it is engaged in the wire basket. If duct avulsion or a major ductal tear occurs, subsequent gland excision could be necessary.[5] Lingual nerve paresthesia can occur in up to 15% of patients undergoing transoral combined procedures in the immediate post-operative period and resolves with time.[9] The development of a post-operative stricture has been reported.[10] Taking care not to cause trauma to the duct or papilla during the procedure minimizes the risk of this complication. In addition, in the event the duct is traumatized, placement of a salivary stent for up to 2 weeks can help prevention of subsequent ductal or papillary stenosis. Salivary fistulas, sialoceles, minor ductal tears, development traumatic ranulas, minor bleeding, and infection have been reported.[11]

Figure-1: Sialendoscope with dilator probes

Figure-2: Wire basket

Figure-3: Balloon catheters

Figure-4: Tissue graspers

Figure-5: Micro bur

CONCLUSION

The clinical application of sialendoscopy is a breakthrough in management of salivary gland disorders, as it has a dual role in diagnosis and treatment of salivary gland ductal obstructions. It is an organ preserving technique which proves to be safe and effective and should be considered as treatment of choice for patients with obstructive pathology. Sialendoscopy is technically challenging and requires sequential learning. Availability of new miniaturised instruments for therapeutic purposes and enhanced optical resolution would increase the efficacy and precision of sialendoscopy in the management of salivary gland pathology.

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