



## Sialoendoscopy: An Overview

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### Abstract

Sialoendoscopy is a recent advancement in the diagnosis and therapeutics of obstructive salivary gland pathologies. Despite of immense potential it renders, its applications in day to day practice is limited presently and this can be attributed to low awareness and training regarding this technique. The present paper briefly overviews the procedure and applications of sialoendoscopy with an aim to update the knowledge about it amongst the dental practitioners.

**Keywords:** Salivary Glands; Sialoendoscopy; Sialolith

### Introduction

Obstructive salivary gland pathologies often pose diagnostic and therapeutic challenge in front of oral physicians due to complex ductal anatomy of the salivary glands. Sialoendoscopy is one of the most fascinating innovations introduced in the last few decades in diagnosis and treatment of obstructive pathologies of major salivary glands. Salivary stones are one of the important causes of chronic sialadenitis which account for approximately 50% of major salivary gland pathologies. Most salivary calculi (80%-95%) occur in the submandibular gland, whereas 5%-20% are found in the parotid gland, while the sublingual gland and the minor salivary glands account for no more than 2% [1].

The application of endoscopy in salivary gland diseases has enabled combination of the diagnostic and therapeutic processes, with the micro-invasive nature of the procedure considerably unburdening the patients [2]. Sialoendoscopy allows for optical exploration of salivary ductal system and extraction of the stones by a basket under endoscopic view. The conventional treatment modalities of major salivary gland disease have shifted from open surgical procedures to endoscopic or endoscopic assisted techniques [1].

### History

Sialoendoscopy was first introduced in the treatment of sialolithiasis in 1991 by Katz. In 1994, Nahlieli, *et al.* reported on en-

doscopic assisted retrieval of stones using a hazel type of scope. In 1999 Nahlieli, Abraham M and Barachin MD used semirigid moderately flexible endoscope device specifically designed for salivary gland [3]. Zenk JC., *et al* in 2004 reported first clinical trials of an endoscope that is semirigid sialoendoscope which has an ideal outer diameter of 1.1mm, a working channel of 0.4mm, irrigation channel, rigidity and flexibility and quality of image 6000pixels. Recently manufactured endoscopes provide a minimum of 6000-30,000pixels. Currently microendoscopes have been made available with diameters between 0.9-1.2mm which facilitate their introduction into both the submandibular and parotid ductal architecture [3].

### Instruments and procedure

Three types of endoscopes have been introduced into the ductal system of the major salivary glands: rigid sialoendoscopes, flexible sialoendoscope and semi-rigid sialoendoscope

#### Rigid endoscope

They are less fragile and pose no difficulty in introduction into the ductal system. Papillotomy may be required in few cases to allow for the easy insertion of the endoscope. They are pure lens system with good optical properties and better resolution. They can be sterilized using autoclave [3].

#### Semi rigid endoscopes

They have properties between flexible and rigid endoscopes. Two types of semi-rigid endoscopes are made available i.e., compact and modular endoscopes.

Semi rigid compact endoscopes consist of a working channel, irrigation channel, fiber light transmission, fiber image transmission within one endoscope [2].

Because of very thin irrigation channels Compact endoscopes are difficult to clean.

Modular Semi rigid endoscopes use a single probe like component. This can be used in combination with different sheaths. They come with disadvantages such as difficulty in visualization and cleaning.

### Flexible endoscopes

Flexible endoscopes are thin enough to be introduced into the salivary gland ducts through their kinks and bends. They are atraumatic. Handling is more difficult compared to semi rigid endoscopes. They have short lifespan and it is not possible to autoclave them [3].

### Procedure

Sialoendoscopy can be done as an outpatient procedure with the patient sitting in a chair or partially recumbent. Anesthesia is purely local but occasionally general anesthesia may be required for some cases [4].

About 20-30 min before starting the procedure a 4 cm × 4 cm sterile gauze piece soaked in 4% lignocaine over the floor of mouth in submandibular gland sialoendoscopy or along the upper gingivobuccal sulcus in parotid sialoendoscopy. Irrigation solution is prepared by mixing 20 ml of 2% lignocaine in 20ml of normal saline.

Before starting diagnostic sialoendoscopy, sialogogues like lemon/ Vit. C tablet can be given to patient to augment the salivary secretion. This facilitates easy identification of duct opening and maneuvering of scope through ductal anatomy [5].

Saline can be used to dilate the ductal opening. After sialoendoscope is inserted into the ductal opening, internal anatomy of the duct is closely monitored [2].

The following techniques are usually performed

Sialolith removal: The four common techniques used to remove the sialolith are

1. Grasping technique-in this technique grasper with three prongs is used to hold the calculus from behind
2. Small wire basket retrieval system
3. Mechanical fragmentation is done by intracorporeal lithotripter and
4. Laser fragmentation

Treatment of strictures and adhesions

- For this procedure, dilatation is employed. Fogarty 3fr and lacricath fr. are the two most commonly used balloons.
- After anaesthetizing the duct and insertion of a dilator, the duct can be inflated upto 3mm.
- Pressure is created on inflation of dilator inside the duct which helps to dilate most strictures [2].

The procedure of sialoendoscopy usually takes approximately 60 min to complete.

Post operative care involve use of antibiotics for 5 days. Patient is advised soft, cold and bland diet and fluid is increased. Patient is again seen on 7th day and then after a month. If stents are placed they have to be removed after 2-3 weeks. Till date success rates of 85% have been noticed.[2]

### Indications

Current evidences validates the use of sialoendoscopy in treating non-neoplastic disorders of the major salivary glands, including Sialolithiasis.

The indications for sialoendoscopy are all salivary gland swellings of unknown origin [4].

Few other indications include recurrent unexplained swelling of the major salivary glands due to intraductal masses such as salivary polyps, strictures, mucus plugs, and foreign bodies and the swellings associated with meals and ductal stenosis.

Sialoendoscopy may benefit children with recurrent parotitis and patients which present with recurrent sialadenitis from autoimmune disorders such as Sjogrens syndrome [2].

### Contraindications

Sialoendoscopy should not be considered in cases of acute inflammation of the major salivary glands. It may increase the pain and swelling in an already inflamed gland. Trismus which result from temporomandibular joint pathology is another contraindication. It is also contraindicated in cases where it is difficult to enlarge the ductal lumen to 1.3mm and when calculi measure more than 10mm which are difficult to crush and remove. Also sialoendoscopy cannot be possible when the location of calculi is intraparenchymal.

There are very few complications reported such as swelling of salivary gland and laceration of duct, which are self resolving in nature.

## Challenges

Although sialoendoscopy is a new technique discovered in recent years it can be performed as a safe outpatient procedure without risking the patients.

However, it should be done with utmost care while maneuvering within the fine architecture of salivary ducts to prevent ductal perforation. Complications and side effects of Sialoendoscopy (both endoscopic and combined approach) are less, which in most cases can be managed easily and efficiently.

## Future prospects

Sialoendoscopy is technique sensitive and needs specialized training. This procedure puts the skill of the clinician and his knowledge of anatomy and physiology of major salivary glands at test. Training should be obtained Via hands-on courses and case observations before setting up the sialoendoscopy practice.

## Conclusion

Sialoendoscopy is a minimally invasive surgical procedure which allows the complete exploration of the salivary ductal anatomy. In future with advances in instrumentations and technique and its higher specificity it might replace sialography and other radiological studies. This technique has brought a paradigm shift in the management of obstructive pathologies of salivary glands from conventional open surgical procedures to endoscopic techniques.

Advances in the armamentarium with availability of miniaturised instruments are making this procedure more frequent and successful.

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