



ROLE OF SIALENDOSCOPY IN OBSTRUCTIVE SALIVARY GLAND DISEASES

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ABSTRACT

Sialendoscopy is a relatively new procedure introduced for the treatment of chronic obstructive diseases of the salivary glands. Traditional approach consists of excision of salivary gland for a pathology in the duct. Sialendoscopy involves visualisation of the lumen of the affected salivary duct with help of miniature semi rigid 0 degree telescope. Interventional sialendoscopy preserves gland function and relieves the obstruction resolving symptoms in these patients. We conducted a prospective study of 30 patients suffering from obstructive salivary gland diseases to assess advantages, intraoperative findings and complications of sialendoscopy. Conclusion: Sialendoscopy should be the first line of treatment for patients with obstructive salivary gland diseases. It is safe, effective and has low risk of complications. The high cost of equipment and paucity in training centres are the deterrents to this procedure being performed more commonly.

Keywords :- Sialendoscopy, Salivary gland, Obstructive salivary gland disease, Advantages, Complications.

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INTRODUCTION

Sialendoscopy is direct visualization of the lumen of the salivary duct with a mini semi-rigid 0 degree telescope. It is minimally invasive and gives direct and detailed view of the salivary ductal system. Traditional approach of salivary gland excision for obstructive salivary gland conditions causes permanent decrease in salivary function and is associated with risks of nerve damage and morbidity of undergoing a major surgical procedure. The constant technical developments in fibreoptic telescopes, materials and miniaturization

have opened up therapeutic options for interventional sialendoscopy

AIMS AND OBJECTIVES:

To study the role of sialendoscopy in patients with obstructive salivary gland diseases.

MATERIALS AND METHODS:

30 patients diagnosed with obstructive salivary gland disease on ultrasonography and diagnostic sialendoscopy were studied. Patients underwent therapeutic sialendoscopy and were followed up for 6 months. Ethics committee clearance was taken for this research. Features seen on Diagnostic Sialendoscopy in the salivary duct that were diagnostic of obstruction were

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presence of calculi [sialoliths] in the duct, stenosis of segment of duct, generalized narrowing of the duct, proteinaceous material in the lumen of the duct, stenosis at the ostia of duct and adhesions seen in the duct. Any patient with sialendoscopy features not suggestive of obstruction as described above was excluded from this study.

Patients were classified into chronic sialadenitis with sialolithiasis or chronic obstructive sialadenitis without sialolithiasis. This second group of patients were diagnosed with stenosis of the duct, proteinaceous material in the lumen of the duct, stenosis at the ostia and adhesions. Sialoliths were either fragmented with hand held burrs and removed, or retrieved with basket or forceps. In case of stenosis and adhesions, dilatation was done with balloon catheters and stent was kept. Proteinaceous material was flushed out with irrigating solution. Procedure was done under general anaesthesia, topical anaesthesia with lignocaine viscous gargles or local infiltration with 2% lignocaine with adrenaline solution, based on patient preference and cooperation.

SURGICAL TECHNIQUE

1. Written informed valid consent is taken for the procedure
 2. Patient is taken under general or topical anaesthesia
 3. Operating microscope is used to visualize the ostium of Wharton's or Stenson's duct
 4. Serial dilatation of ostium is performed using conic dilator and serial dilators alternately
 5. Guide wire 0.4 mm is passed
 6. 1.2 mm diagnostic channel is threaded over the guide wire
 7. Guide wire removed
 8. Marshal's semi-rigid sialendoscope is introduced and sialendoscopy done under continuous irrigation with steroid solution
 9. If therapeutic intervention is required, 1.2mm * 1.7mm working channel is introduced
 10. Basket/ burr / forceps/balloon introduced through the working channel as required
 11. Sialendoscope removed
 12. Stent is kept in duct if required
 13. Hydrocortisone injected into the duct
- All patients received postoperative course of oral antibiotics, steroids and vitamin C [sialagogue]

OBSERVATIONS AND RESULTS:

Out of the total 30 cases, 18 patients were males and 12 patients were females. The youngest patient was 3 years and 6months old and the oldest patient was 72 years. The age and sex distribution of patient in this study is as follows –

16 patients had involvement of parotid gland and 14 patients had involvement of submandibular gland. Of the 16 patients with parotid gland involvement, 10 patients

had left parotid gland involvement and 6 had bilateral involvement. Of the 14 patients with submandibular gland involvement, 5 had involvement of the right submandibular gland and 9 had involvement of the left submandibular gland. 13 Patients with parotid involvement and 3 with submandibular involvement were diagnosed with chronic obstructive sialadenitis without sialolithiasis. 3 patients with parotid involvement and 11 with submandibular gland involvement had sialolithiasis. The diagnosis was on the basis of ultrasonography and confirmed with findings of diagnostic sialendoscopy.

All patients complained of swelling of one major salivary gland. 28 out of 30 patients experienced pain associated with this swelling. 12 patients with parotid swelling experienced increase in size of swelling with meals. 13 patients with submandibular swelling experienced increase in size of swelling with meals. 9 patients with parotid swelling and 12 with submandibular swelling were relieved of pain and swelling on massage of the respective area. All 16 patients with parotid swelling and 3 patients with submandibular swelling had history of repeated attacks of acute sialadenitis. 4 patients with submandibular swelling and one with parotid swelling had history of passing stone in saliva. 2 patients of submandibular involvement complained of passing pus discharge in saliva.

In 29 out of the 30 patients in our study, the affected major salivary gland was palpable. In one patient with bilateral parotid gland involvement the gland was not palpable on clinical examination. In 7 patients with submandibular sialolithiasis, the sialolith was palpable. Parotid duct sialoliths were not palpable on clinical examination in this study. On intra-oral examination, ostium of the affected salivary gland was prominent in 7 patients with parotid sialadenitis and 11 patients with submandibular sialadenitis. There was pus discharge seen at the ostium of the affected duct on applying external pressure over the gland in 4 patients.

Thirty percent of patients had symptoms of between 6 months – 1 year and another thirty percent had symptoms lasting from 1 – 5 years. 26.67% patients had symptoms lasting less than 6 months. 10% and 1% patients had symptoms lasting for 5-10 years and more than 10 years respectively. 2 patients were suffering from submucous fibrosis. 2 Patients were diabetic and 3 were suffering from hypertension. One patient was suffering from hypothyroidism, one from myoclonic seizures, one from angina, one from peptic ulcer disease, one from febrile convulsions and one patient had bilateral moderate sensorineural hearing loss. All 30 patients underwent an ultrasonography of the neck prior to Sialendoscopy.

INTRA-OPERATIVE FINDINGS

Proteinaceous material was seen to fill the entire length of the duct in 10 patients with parotid sialadenitis and 4 patients with submandibular sialadenitis. 7 patients

with submandibular sialadenitis had calculi in the duct visualised during sialendoscopy. one patient with parotid sialadenitis and one patient with submandibular sialadenitis had stricture in the duct. 2 patients with parotid sialadenitis and one patient with submandibular sialadenitis had stenosis of the duct at the ostia. 3 patients with parotid sialadenitis had generalised narrowing of the duct. One patient with submandibular sialadenitis had adhesions in submandibular duct. In 5 patients, submandibular duct ostia were slit before sialendoscopy was performed. In 3 patients, the ostia were stenosed at punctum and the procedure was abandoned. All patients had post-operative swelling of the gland that lasted for a

day. 4 patients had pain in the post-operative period. The most common complication seen post-operatively was swelling of the involved gland lasting for more than a day. This usually settled down in 24 hours and only 6 patients had significant swelling after 24 hours. 6 patients had recurrence of symptoms after sialendoscopy. In our series, no patient had duct extirpation and no patient required emergency gland removal.

2 patients with submandibular gland involvement and 3 with parotid gland involvement underwent repeat sialendoscopy.

Table 1. Patient distribution

Age Distribution (yrs)	Number of Patients	Percentage
0 – 10	1	3%
11 – 20	5	17%
21 – 30	9	30%
31 – 40	4	13.5%
41 – 50	6	20%
51 – 60	4	13.5%
61 – 70	0	0%
71 – 80	1	3%

Table 2. Disease status

	Parotid	%	Submandibular	%
Chronic Obstructive Sialadenitis without Sialolithiasis	13	43.33	3	10
Sialolithiasis	3	10	11	36.67

Table 3. Symptoms

Symptoms	Parotid	%	Submandibular	%
Gland Swelling	16	53.33	14	46.67
Pain	15	50	13	43.33
Increase with meals	12	40	13	43.33
Relief with massage	9	30	12	40
Recurrent attacks of acute sialadenitis	16	53.33	3	10
Passage of stone/gritty material	1	3.33	4	13.33
Pus discharge in saliva	0	0	2	6.67







Table 4. Clinical Findings

Clinical Findings	Parotid	Percentage	Submandibular	Percentage
Gland palpable	15	50	14	46.67
Stone palpable	0	0	7	23.33
Ostia prominent	7	23.33	11	36.67
Pus discharge	1	3.33	3	10

Table 5. Complications

Complications	Parotid	Submandibular	Total
Swelling >24 hrs	4	2	6
False passage	2	0	2
Duct extirpation	0	0	0
Emergency gland removal	0	0	0
Recurrence of symptoms	4	2	6

INTRAOPERATIVE IMAGES

Fig 1 A- normal duct B – normal branching of duct	
 A	 B
Fig 2– sialolith in basket 	Fig 3 – stone in basket after extraction 
Fig 4–post-op duct slitting with sialendoscopy for extraction of right submandibular sialolith 	Fig no 20- submandibular sialolith 

DISCUSSION:

Our study of 30 cases shows a variety of obstructive salivary gland diseases. Sialendoscopy is a relatively new technique and a number of studies are now emerging from various centres throughout the world. The once routine salivary gland excision is now obsolete and is now recommended only when Sialendoscopy has failed to benefit the patient. This is according to algorithms of treatment of salivary gland obstructions given by Koch et al [1].

The most common age of presentation was the 3rd decade of life. 60% of patients were male and 40 % female. The most common group of obstructive disease was chronic parotid sialadenitis without sialolithiasis with 13 patients. The next most common was submandibular sialolithiasis with 11 patients.

Overall, studies by P. Capaccio et al and M.Andretta et al [2,3] state that Sialolithiasis is the most common cause of chronic sialadenitis. The reason for our difference could be that patients referred to our tertiary care centre were mainly cases of chronic sialadenitis where the treating physician could not find a cause. Patients diagnosed with sialolithiasis were often managed by traditional methods of stone excision or gland excision. Submandibular duct is the most common site of sialolith in our study. This correlates to findings of P. Capaccio et al and M.Andretta et al [2,3]. The only contraindication to sialendoscopy is acute sialadenitis due

to risk of false passage. All of our patients underwent an ultrasonography of the salivary glands after chewing vitamin C tablet. Using a sialagogue like vitamin C during the ultrasonography helps in identifying and localising cause of obstruction [3,4]. The advent of Diagnostic Sialendoscopy has decreased the need for other radiological investigations in patients with obstructive salivary gland diseases [5].

Diagnostic sialendoscopy can accurately diagnose pathologies of the ductal system. The primary, secondary branching up to the terminal branching of the Stenson's and Wharton's duct is completely visualized. Sialendoscopy both diagnostic and therapeutic can be safely performed under topical anaesthesia with lignocaine viscous gargles. In apprehensive adults and children, general anaesthesia was preferred. Local infiltration of 2% lignocaine with 1:1 lakh adrenaline in floor of mouth was done for one patient during duct slitting procedure as patient complained of discomfort and pain. Proteinaceous material in the lumen of the duct was the most common intra-operative finding causing duct obstruction. In patients with proteinaceous material and mucous plugs, the continuous irrigation during the procedure flushes out all the debris present in the duct. The irrigation also causes dilatation of the duct relieving the patient of obstructive symptoms [6]. In these patients no further intervention was required. In patients with sialolithiasis calculus or sialolith was fragmented when

necessary with the help of burr. Baskets and forceps specially designed for sialendoscopy were used to retrieve the stone in toto or piecemeal. 5 out of 7 patients required slitting of the submandibular duct before the calculus could be removed. This was because the stone was located too close to the ostia and the sialendoscope could not be passed in to retrieve the stone safely. After removal of stone by duct slitting, sialendoscope was introduced and smaller stones lying distal in the duct were then removed. A similar combined approach technique has been described by Walwekar et al [7].

2 patients diagnosed with stenosis, 3 patients with generalized narrowing of the duct and one patient with adhesions in submandibular duct underwent balloon dilatation with stenting. 3 patients had stenosis of the ostia. The ostia were too narrow even after dilatation and the sialendoscope could not be passed. The procedure was abandoned, however the patients improved symptomatically with the dilatation of the punctum. There is continuous irrigation of steroid solution during the procedure. This causes post-operative swelling of the enlarged gland and pain as sequelae seen in all patients. The swelling usually settles down in the 24 hours due to natural flow out of the salivary duct with saliva. 6 of our patients had significant swelling beyond the first 24 hours. This was in the initial cases due to overzealous irrigation by the assisting surgeon which was corrected later on. In 2 patients' false passage was suspected intra-operatively and the procedure abandoned. 6 patients had recurrence of symptoms after sialendoscopy. Of these patients, 5 patients underwent check sialendoscopy. One patient refused repeat procedure. Repeat sialendoscopy was done 6 months after the first procedure. Residual stones were removed and in case of stricture repeat dilatation was performed. The recurrence rate is high when compared to Nahleili et al [16] who reported a failure of 6%, however considering the recent introduction of this technique and the relative novelty of the procedure, better results can be expected with progress of time.

Sialendoscopy has low morbidity. There is no extensive surgery involved, no blood loss and external incisions are taken. The risk of neurological damage of facial nerve associated with traditional approaches to major salivary glands is not seen making it a safe procedure. The major complication with sialendoscopy is stripping of the duct – duct extirpation which needs emergency excision of the gland. We did not come across this complication in our study. The patients need lesser hospital stay diagnostic procedures and interventional procedures under topical anaesthesia can be managed as day care procedures. The main disadvantages faced in the management of obstructive salivary gland diseases today is the lack of facilities for training ENT surgeons in Sialendoscopy. There are few teaching centers where the facility of Sialendoscopy is available. Surgeons not

trained in this technique will continue to approach the patients with traditional gland-removing surgery. The equipment used in Sialendoscopy is very specific and expensive and there is significant cost in setting up a sialendoscopy centre. There is a high recurring cost due to disposable equipment like balloon dilators, guide wires and baskets required for each individual procedure. In spite of these limitations, sialendoscopy when accessible and affordable should be considered as the first line of management of patients with obstructive salivary gland diseases.

Sialendoscopy is useful as a diagnostic tool and therapeutic intervention. A patient presenting with salivary gland swelling associated with worsening of symptoms with meals should undergo a thorough salivary gland evaluation. All patients should undergo an ultrasonography of the salivary glands prior to sialendoscopy. Diagnostic sialendoscopy is essential to confirm diagnosis of obstruction in the salivary ductal system. Direct visualization of complete ductal system up to terminal branching is possible and any pathology in the ductal lumen can be accurately diagnosed. Sialendoscopy can be performed safely under topical as well as general anaesthesia. Intervention for sialolithiasis includes use of burr, baskets and forceps for stones and balloon dilatation for strictures followed by stenting for 2 weeks. The sequelae of sialendoscopy include swelling of the involved gland and pain for a day. There is a risk of false passage. The serious complication of duct extirpation is rare but may require emergency gland removal. It is important to inform the patient about this potential complication prior to the procedure. Patients may have recurrence of symptoms after the procedure. In case of recurrence, it is safe to repeat sialendoscopy. The limitations include lack of training facilities, high cost of starting a sialendoscopy centre and the recurring cost per procedure in terms of disposables like baskets and balloon catheters. In the modern era of endoscopy, salivary gland excision should no longer be considered as the initial treatment of obstructive salivary gland diseases. It is only considered when sialendoscopy has failed to offer any benefit and the patient has significant disturbing symptoms due to obstruction.

CONCLUSION:

Sialendoscopy should be the first line of treatment for patients with obstructive salivary gland diseases. It is safe, effective and has low risk of complications. The high cost of equipment and paucity in training centres are the deterrents to this procedure being performed more commonly.

COMPETING INTERESTS:

The authors declare that they have no competing interests.

AUTHORS' CONTRIBUTIONS:

MN drafted the manuscript, SR performed the literature review & BK assisted with writing the paper.

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