

## Main Article

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# Management of obstructive pathology of the salivary glands in elderly patients: a preliminary study

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## Abstract

**Background.** Obstructive pathology is a benign condition of the salivary glands that can affect elderly and co-morbid people. Sialoendoscopy is a minimally invasive surgical procedure with a success rate comparable to standard sialoadenectomy and has the advantage that it can be performed under local anaesthesia.

**Methods.** This study aimed to assess sialoendoscopy benefits in elderly patients unfit for general anaesthesia. A group of elderly patients (aged 65 years or more) undergoing sialoendoscopy under local anaesthesia were evaluated. Age, co-morbidities, surgical time, hospital stay, and complication and recurrence rates were assessed.

**Results.** Nineteen sialoendoscopies were performed in 18 elderly patients with a mean age of  $69.7 \pm 5.6$  years, with some of them suffering from multiple co-morbidities. Surgery was successful in 16 patients, while surgery was unsuccessful in 2 patients because of intraglandular stones. The average surgical duration was  $54.5 \pm 30.1$  minutes, and all patients were discharged 2–3 hours after surgery. No post-operative complications were found and only one patient had recurrence during follow up.

**Conclusion.** Sialoendoscopy under local anaesthesia is a safe and effective procedure in elderly patients who are more prone to complications.

## Introduction

Obstructive pathology of the salivary glands is the most common non-neoplastic salivary gland disorder, mostly determined by the presence of sialolithiasis, although other causes can include mucus plugs, ductal stenosis and immunological disorders. It often arises as a painful swelling noticed during meals, and is sometimes associated with fever and purulent discharge from the ductal papilla.<sup>1</sup> Salivary stones are uncommon, causing clinical symptoms in only 0.45 per cent of the general population,<sup>2</sup> although the prevalence observed in post-mortem studies has been reported as 1.2 per cent.<sup>3</sup> The submandibular gland is more commonly affected, accounting for 80–90 per cent of cases. Obstruction, dehydration, reduced salivary secretion or alterations in salivary pH are known risk factors.<sup>1</sup>

Sialolithiasis predominantly affects males aged 30–60 years.<sup>4</sup> However, a recent study reported that the risk of salivary stones increased with age: prevalence was higher in individuals aged over 65 years than in those under 40 years, and the relative risk was higher in the elderly.<sup>5</sup>

Sialoendoscopy is a recently developed treatment that allows a minimally invasive approach and avoids gland excision.<sup>1</sup> It can be performed under general or local anaesthesia, according to patient compliance and technical difficulties.<sup>6</sup>

Elderly people, aged 65 years or older,<sup>7–9</sup> generally have a higher number of co-morbidities and therefore may be more prone to complications. Minimising surgical time and avoiding general anaesthesia would be beneficial in particularly frail patients. The literature on sialoendoscopy in a general population is well developed, but information about sialoendoscopy in older people is very limited. Therefore, we sought to evaluate the feasibility, safety and effectiveness of sialoendoscopy performed under local anaesthesia in an elderly cohort of patients, aimed at minimising morbidity, hospital stay and complications.

## Materials and methods

### Study population and ethics

This retrospective observational study recruited patients aged over 65 years who presented with obstructive pathology of the major salivary glands at the Otolaryngology Department

of San Raffaele Hospital (Milan, Italy) between 2014 and 2019. The only exclusion criterion was age younger than 65 years.

Informed consent was obtained from each patient for treatment and the use of clinical data for scientific research purposes. The local ethics committee was not involved because of the retrospective nature of the study, in which we performed a well-known procedure, conducted according to the ethical standards established in the 1964 Declaration of Helsinki and revised in 2008.<sup>10,11</sup>

### Pre-operative investigation

The pre-operative investigation involved a clinical evaluation and a salivary gland ultrasound; in some cases, a computed tomography scan without contrast medium was helpful. We used the Charlson Comorbidity Index to categorise the severity of co-morbidities. Thereafter, each patient underwent sialoendoscopy under local anaesthesia in the operating theatre. We evaluated surgery duration, length of hospital stay, and recurrence and complication rates.

### Surgical technique and follow up

Patients underwent sialoendoscopy under local anaesthesia (via mucosal contact and ductal instillation with 2 per cent mepivacaine). All procedures were performed by the same surgeon with a Storz sialoendoscope (Tuttlingen, Germany) or a PolyDiagnost sialoendoscope (Hallbergmoos, Germany).

After progressive ductal dilatation with a salivary probe and periodic ductal irrigation with saline solution (0.9 per cent sodium chloride), the entire ductal system was explored. Stones were removed with a basket, while mucus plugs were removed via abundant washing with saline solution. In selected cases, we performed a transoral duct incision; in cases of ductal stenosis, a balloon and, if necessary, salivary stent placement were used. After surgery, patients were treated with oral corticosteroids and in selected cases with oral antibiotics (e.g. cases of severe oedema and purulent secretion spill).

The patients attended regular follow-up consultations, with the first at one month after surgery (except for one patient who had a salivary stent, who was seen at two weeks to remove it), and a subsequent visit at four to six months after a required salivary gland ultrasound.

### Results

Nineteen sialoendoscopies were performed in 18 elderly patients under local anaesthesia. As described in Table 1, 11 patients (61.1 per cent) were male and 7 (38.9 per cent) were female, with ages ranging between 65 and 87 years (mean age of  $69.7 \pm 5.6$  years).

The Charlson Comorbidity Index (Table 1) score was 2 points or fewer in 9 patients (50 per cent) and more than 2 points in 9 patients (a score of 2 points corresponds to a 90 per cent chance of 10-year survival). Notably, the score was 4 points or more in 5 patients (4 points corresponds to a 53 per cent chance of 10-year survival).

None of the patients had acute sialoadenitis at the time of surgery. Seventeen patients had received a first diagnosis of obstructive pathology of the salivary glands, while one patient had a recurrence following a previous transoral ductal incision and lithotripsy. Twelve patients (66.7 per cent) had submandibular gland involvement, five patients (27.8 per cent) had

**Table 1.** Patients' characteristics

Characteristics	Patients (n (%))
Total patients	18 (100)
Age group	
– 65–74 years	15 (83.5)
– 75–84 years	2 (11.1)
– ≥85 years	1 (5.5)
Gender	
– Male	11 (61.1)
– Female	7 (38.9)
Affected gland	
<i>Parotid</i>	5 (27.8)
– Right	2
– Left	2
– Both	1
<i>Submandibular</i>	12 (66.7)
– Right	4
– Left	7
– Both	1
<i>Both</i>	1 (5.5)
Charlson Comorbidity Index score	
– <4 points	13 (72.2)
– ≥4 points	5 (27.8)

parotid gland involvement, and one patient (5.5 per cent) had left parotid and right submandibular gland contextual involvement (Table 1).

The surgery was successful in 16 patients (88.9 per cent) and unsuccessful in 2 patients (11.1 per cent). The two unsuccessful patients had right parotid sialolithiasis and left submandibular sialolithiasis respectively, with the presence of intraglandular stones (Table 2). The unsuccessful patient with right parotid sialolithiasis underwent a second successful sialoendoscopy under local anaesthesia; the unsuccessful patient with left submandibular sialolithiasis underwent submandibular sialoadenectomy under general anaesthesia.

Sialolithiasis was found during 11 procedures (57.9 per cent), mucus plugs in 9 (47.4 per cent), ductal stenosis in 2 (10.5 per cent), and both ductal stenosis and mucus plugs in 1 procedure (5.3 per cent). (Table 2). A salivary stent was placed at the end of the procedure in one patient with ductal stenosis, and was removed two weeks later. In seven patients (36.8 per cent), a transoral duct incision was needed.

The average duration of the procedure was  $54.5 \pm 30.1$  minutes. All patients were discharged after 2–3 hours. An oral corticosteroid was used to reduce post-operative oral swelling. In cases of purulent secretion, we also prescribed oral antibiotics (amoxicillin/clavulanate 1 g every 8 hours for 7 days, or clarithromycin 500 mg twice daily for 5 days in cases of penicillin allergy).

As anticipated, one patient in whom sialoendoscopy was unsuccessful was found to have symptom recurrence in the right parotid gland at the four-month follow-up consultation (Table 2); subsequently, he underwent a second sialoendoscopy under local anaesthesia, during which mucus plugs and a single stone were successfully found and removed.

**Table 2.** Surgical findings and results

Parameters	Patients (n (%))
Total procedures	19 (100)
Surgical time	
- ≥30 minutes	9 (47.4)
- <30 minutes	10 (52.6)
Findings during sialoendoscopy	
- Sialolithiasis	11 (57.9)
- Mucus plugs	9 (47.4)
- Ductal stenosis	2 (10.5)
Stone dimension (total sialolithiasis)	
- ≥10 mm	4 (40.0)
- <10 mm	6 (60.0)
Successful surgery	
- Yes	17 (89.5)
- No	2 (10.5)
Recurrence?	
- Yes	1 (5.3)
- No	18 (94.7)

Surgery was well tolerated by all patients, and patients were compliant to the procedure. The patients all reported mild post-operative oedema of the oral mucosa and temporary glandular swelling. After discharge, we always suggested that the patient avoid sour, spicy, or very salty or very sweet foods in the post-operative period. There were no immediate post-operative complications.

## Discussion

Obstructive pathology of the salivary glands was traditionally treated with sialoadenectomy. However, since its arrival, sialoendoscopy has become the first-line treatment, as preservation of the glands became a primary concern.<sup>12</sup> Although the role of sialoadenectomy in obstructive pathology has greatly decreased following the advent of sialoendoscopy, it is still preferred when the endoscopic approach alone is not appropriate given the stones' features, or other concurrent conditions such as massive fibrosis or chronic sialadenitis.<sup>6</sup> As sialoendoscopy is highly effective and associated with a lower risk of complications, its use should be more strongly considered in elderly patients.

The proportion of older people is gradually increasing; this population has different healthcare needs and outcomes after surgery and anaesthesia. Increased age carries a higher risk of a condition known as frailty, which increases the incidence of complications, resulting in prolonged hospital stays, the need for an assisted living facility and an increased risk of mortality.<sup>13–15</sup> Nonetheless, nowadays a high number of elderly patients are undergoing surgical interventions under general anaesthesia, with an overall increase in mortality (primarily for patients aged over 80 years) and a rise in the frequency of complications.<sup>13,16</sup>

Therefore, for this particular population, we preferred an endoscopic approach performed under local anaesthesia as a first-line therapy and considered gland excision as second-line definitive treatment, in order to avoid aggressive surgery and general anaesthesia exposure. This study assessed our

preliminary results, focusing on the feasibility, safety and effectiveness of the procedure.

In our group of patients, sialoendoscopy under local anaesthesia proved to be feasible, as all of our patients were compliant to the procedure, which was always well tolerated with just some degree of mild local discomfort. At the same time, the absence of post-operative complications demonstrates its safety for elderly patients. Post-operative glandular swelling should be considered a consequence of surgery rather than a real complication.<sup>6</sup>

Vila and colleagues reported a 0.2 per cent complication rate after sialoendoscopy in a study with a large sample (only three patients had complications, which consisted of local infection, haematoma and facial weakness), but the patients had an average age of 47.6 years.<sup>17</sup> However, a complication rate of 12 per cent was reported by Marchal and colleagues, who assessed 55 interventional parotid sialoendoscopies (with complications of wire basket blockages and ductal wall perforation).<sup>18</sup> The same authors reported an overall complication rate of 10 per cent in 110 interventional submandibular sialoendoscopies (with complications including ductal wall perforation and wire basket blockage).<sup>19</sup>

Sialoendoscopy under local anaesthesia was found to be effective in elderly patients, given our low recurrence rate (one patient; 6 per cent). This finding is consistent with similar data reported by Marchal and colleagues, who reported only 3 recurrences after 55 interventional parotid sialoendoscopies (5 per cent),<sup>18</sup> while Achim and colleagues reported a recurrence rate of 33 per cent.<sup>20</sup> Notably, in their series, more than one-third of patients who had a recurrence were aged 65–86 years.

To our knowledge, this is the first report on sialoendoscopy in the elderly; however, this should be considered a preliminary report, as our sample consisted of only 18 patients. Nevertheless, in our sample, the absence of surgical incision and drainage led to significant reductions in post-operative pain, length of hospital stay, use of analgesic drugs and risk of facial nerve stupor. Facial nerve injury can additionally lead to feeding difficulty, which is important given that feeding may already be compromised in elderly patients. Despite the mild oedema of the oral mucosa and temporary glandular swelling, we found no post-surgery interference in feeding in our subjects.

Marchal *et al.* reported an average surgical duration of 26 ± 14 minutes and 73 ± 43 minutes for diagnostic and interventional parotid sialoendoscopy procedures respectively.<sup>1,18</sup> The same authors reported average surgical durations of 28 ± 15 minutes and 71 ± 41 minutes for diagnostic and interventional submandibular sialoendoscopy procedures respectively.<sup>19</sup> Surgical times in our cohort were similar, with an average duration of 54.5 ± 30.1 minutes.

The approach that we propose has the obvious advantage of avoiding a general anaesthesia, thus reducing the length of hospital stay and the likelihood of complications for the patient, and ultimately decreasing the costs connected to the procedure.

- Obstructive pathology of the salivary glands is a benign condition that can affect elderly patients with co-morbidities
- This population is more prone to surgical complications
- This preliminary study aimed to assess advantages of sialoendoscopy under local anaesthesia in an elderly and co-morbid population
- The procedures were successful in most cases, with no immediate complications and a low recurrence rate
- Sialoendoscopy under local anaesthesia is feasible, safe and effective in elderly and co-morbid patients, and can be considered a valid alternative to sialoadenectomy

The main limitations of our study are its retrospective nature and the small sample size of our cohort, which consisted of only 18 patients. This low number of patients reflects the rarity of the pathology, especially among patients aged more than 65 years. Furthermore, half of the patients in our cohort had no significant co-morbidities (having a low Charlson Comorbidity Index score), which could potentially affect the representativeness of the sample. Further studies, with larger numbers or even a multicentric setting, are needed to confirm our preliminary results.

## Conclusion

Elderly people tend to be frailer and more prone to local and general anaesthesia complications than are younger patients, partly because of their co-morbidities. We are here proposing a first-line treatment with sialoendoscopy performed under local anaesthesia for elderly patients affected by obstructive salivary gland pathology. In our early experience, this approach proved to be feasible, safe and effective in this cohort of patients, with the advantages that general anaesthesia was avoided and hospitalisation time reduced. Sialoendoscopy under local anaesthesia should therefore be considered as an alternative to gland removal in elderly patients.

**Competing interests.** None declared

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