SVOA Dentistry

ISSN: 2753-9172

ScienceVolks Open Access

Review Article

Sialendoscopy as An Alternative Treatment for Sialoliths in Salivary Glands

Juan Mancilla Uribe[1]* and Diego Fonseca Escobar[2]

[1] *DDS, Universidad Andrés Bello, Santiago, Chile.*

[2] *Oral & Maxillofacial surgery resident, Universidad de los Andes, Chile.*

***Corresponding Author**: Juan Mancilla Uribe, DDS, Universidad Andrés Bello, Santiago, Chile.*

DOI: https://doi.org/10.58624/SVOADE.2024.05.0195

***Received:** September 17, 2024* ***Published:** November 11, 2024*

Abstract

Introduction: Salivary gland obstruction affects approximately 1% of the general population. Common symptoms include pain and edema that worsen with eating. Sialolithiasis is responsible for 60%-70% of all salivary gland blockages. Sialendoscopy was first introduced in 1988 and is now established for the diagnosis and treatment of salivary duct disorders.

Objective: The objective of this review is to evaluate and present the treatment of sialadenitis, including the indications, technique, and results of sialendoscopy.

Method: A manual literature review search was carried out in the PubMed and EBSCO databases by two researchers independently, using a combination of keywords and the Boolean terms "Sialolith" AND "Sialendoscope"AND "Sialolithiasis" AND "Salivary gland"

Discussion: Sialendoscopy performed under general anesthesia uses small semi-rigid or semi-flexible endoscopes to access the salivary ducts orally and visualize their lumen. Once the sialolith is found, it is trapped with a basket or clamp. Thus avoiding the removal of the affected gland, which reduces the complications associated with it, nerve damage, salivary fistula, sialocele and aesthetic consequences.

Conclusion: Sialendoscopy is an innovative and minimally invasive technique that proves to be effective in the diagnosis and treatment of sialolithiasis. Complications derived from sialendoscopy were not significant and this procedure may be superior to sialadenectomy, since it preserves the salivary gland.

***Keywords:** Sialolith, Sialendoscopy, Sialolithiasis, Salivary gland.*

Introduction

Salivary gland obstruction affects approximately 1% of the general population. The submandibular gland being the most affected, this is due to the length and ascending direction of its duct. Common symptoms include pain and edema that worsen during meals.1

Sialolithiasis is responsible for 60%-70% of all salivary gland obstructions.2 This is a pathological condition characterized by the presence of stones within the ducts of the major salivary glands which causes obstruction of the ducts, followed by inflammation of the salivary glands, especially before and during meals, with a reported incidence of 1 in 10,000 to 1 in 30,000.3

One of the definitive treatments for obstructive sialadenitis is the removal of the gland, which entails various complications, which may include permanent damage to the facial, hypoglossal or lingual nerves, depending on the gland removed, salivary fistula, sialocele and aesthetic sequelae.[4]

For this reason, sialendoscopy emerges as an innovative alternative for the treatment and diagnosis of obstructive sialadenitis, which consists of an endoscope that is inserted into the mouth of the excretory duct of the affected gland, allowing direct vision of the intraduct system and removal. . of the sialolith.[5]

Sialendoscopy was first introduced in 1988 and is now established for the diagnosis and treatment of salivary duct disorders.[6]

This procedure allows for the safe removal of duct stones while avoiding the need to remove the salivary glands. As a result, the risks associated with traditional surgery are eliminated.[6]

The objective of this review is to evaluate and present the treatment of sialadenitis using sialendoscopy.

Method

A manual literature review search was performed in the PubMed and EBSCO databases by two researchers independently, using a combination of keywords and the Boolean terms "Sialolith" AND "Sialendoscopy" AND "Sialolithiasis" AND "Salivary gland." . Regarding the criteria

For inclusion, bibliographic reviews, observational studies, clinical trials, clinical guidelines, systematic reviews and published meta-analyses were considered.

Between 2014 and 2024, in English or Spanish. Animal studies and letters to the editor were excluded. Finally, 17 articles were included in this review.

Algorith Search

(((Sialolith) AND (Sialendoscopy)) AND (Sialolithiasis)) AND (Salivary gland)

Results

In general, the sialoendoscopy technique is considered a safe and effective technique; as it is minimally invasive, it is well tolerated by both adult and child patients.

A meta-analysis evaluating the efficacy of sialendoscopy determined that the combined success rate for interventional sialendoscopy alone was 86% and 93% for the combined approach, with a low incidence of major complications and recovery of secretory function.4 En aquellos pacientes tratados únicamente mediante extracción endoscópica de cálculos, la efectividad fue del 87% en flandula submandibular y 85% en glandula parotideo.[11]

In pediatric patients, in a study with a sample size of 70 treated children, the authors found that in 93% of patients, a single endoscopic procedure was sufficient for resolution of symptoms.[5]

Postoperative care

Postoperative antibiotics are not routinely prescribed, generally only paracetamol and ibuprofen are sufficient for the treatment of postoperative pain.

Parents are advised to keep their children well hydrated for 2 weeks after surgery.[9]

Surgical risk

The surgical risk during sialendoscopy is extremely low or none, but if it is operator dependent, it means that the greater the experience of the surgeon, the lower the rate of intraoperative complications.[12]

Complications

Some complications described are postoperative stenosis, which were related to the passage of the wire basket to remove the fragmented pieces, and perforation of the duct was caused by the same mechanism, when its walls were weakened by the basket, but all short-term and reversible complications.[13]

The authors reported a 15% risk of lingual nerve paresthesia in the immediate postoperative period, but indicated that it resolves over time.

The complication rate is relatively low at 10%, none of the injuries were permanent.[7]

Perforation (false route) of the duct may occur either near the duct orifice due to separation of the duct wall from the oral mucosa or during intraductal sialendoscopic mechanical procedures, such as stone extraction and stricture dilation.[14]

Benefits

Cost

Studies show that patients who underwent submandibulectomy with average costs of 2,293 euros compared to sialendoscopy 1,673 euros is a more economical procedure in most cases with a high success rate.[15-16]

Complication rate

Complication rates for sialendoscopic surgeries range from 2 to 25%.[9]

Success rate

Success rate of 85 to 90% in the treatment of salivary gland diseases.[12]

Quality of life

Sialendoscopy reduced the ailments of patients with sialadenitis, after surgery a reduction in discomfort and pain was reflected in a Quality of Life survey, the 15D-HRQoL questionnaire was applied to patients before sialendoscopy, as well as to 3 and 12 months after the operation.[15-17]

Discussion

The introduction of sialendoscopy has radically changed the diagnosis and treatment of salivary gland diseases, with a more conservative axis, avoiding possible complications associated with excision of the affected gland, reducing morbidity and improving the quality of life of each patient. .

The traditional treatment of obstructive salivary disorders (sialadenectomy, dilation, duct dissection, and sialodochoplasty) has been replaced by minimally invasive gland-sparing techniques since van den Akker and Busemann-Sokole observed that salivary gland function recovers. completely after stone extraction.[2]

For the study and diagnosis of sialolithiasis, computed axial tomography such as cone beam computed tomography (CBCT) can be used, the latter having a slight advantage as it becomes increasingly routine in maxillofacial surgery departments. Ultrasound is another useful tool in the hands of a well-trained radiologist, with the added advantage of being able to visualize radiolucent stones and the absence of ionizing radiation.[7]

Sialendoscopy Treatment

Description of the sialendoscopy procedure.

The technique was first described by Katz in 1991 for the removal of salivary stones, and since then different rigid, semi-rigid and flexible devices of various diameters have been developed. According to anatomical studies, 1.2 mm should be the upper limit of the diameter of a sialendoscope to avoid iatrogenic injuries.[8]

Diagnostic sialendoscopy is usually performed on an outpatient basis under general and hard anesthesia, in the hands of experts, lasting approximately 26 minutes.

The first step is the introduction of the endoscope, and sometimes it is necessary to perform dilation (which can be done with tear tubes), papillotomy, ductal exploration (microsurgically), or an open sialolithotomy. During the procedure, the lumen of the canal is irrigated with isotonic saline to maintain dilation and allow advancement of the endoscope. When sialendoscopy is used for therapeutic purposes, it is usually performed under general anesthesia, which usually lasts about 73 minutes.[8]

Small semi-rigid or semi-flexible endoscopes are used to access the salivary ducts orally and visualize their lumen.[2]

The papilla is dilated serially using conical metal dilators or silastic dilators on a guidewire, taking care to avoid trauma to the mucosa around the papilla. The sialendoscope is then introduced into the canal. The outer diameters of the sialendoscope vary between 0.89, 1.1, 1.3 and 1.6 mm. Allowing a direct view of the causal agent of the pathology and removal.[9]

Indications

The main indication for sialendoscopy is the diagnosis and/or treatment of non-neoplastic disorders of the salivary glands, including sialolithiasis, chronic recurrent sialadenitis, recurrent juvenile parotitis, sialadenitis induced by radioactive iodine and sialadenitis due to autoimmune processes such as Sjögren's syndrome.8

Regarding the indications for the sialoendoscopy technique, there are several factors that determine the type of treatment for salivary stones. Important factors are size, location (distal duct, hilum, intraparenchymal duct system) and number of stones.[1]

The stones should be small in size (< 5 mm) (1), in the case of larger stones, prior fragmentation into smaller pieces by extracorporeal or intracorporeal lithotripsy may be necessary.[8]

Salivary disorders managed with sialoendoscopy

Etiology

The precise etiology is not fully understood, but several hypotheses have been proposed: an anatomical aberration in the duct, for example; desquamated epithelium and postinfection debris; and foreign bodies that allow calcium deposition.[6]

Sialolithiasis

Sialolithiasis is the main cause of obstructive salivary disease: it is detected in approximately two-thirds of cases and is responsible for approximately 50% of all salivary gland disorders.[10]

Recurrent juvenile sialadenitis

The disease is usually unilateral with a male predominance and the cause of Recurrent juvenile sialadenitis is not clear; multiple causes have been proposed, including genetic, congenital, infectious, and autoimmune causes.[9]

Conclusion

Sialendoscopy is an innovative and minimally invasive technique that has proven to be effective in the diagnosis and treatment of sialolithiasis. Complications derived from sialendoscopy were not significant and this procedure may be superior to sialadenectomy, since it preserves the salivary gland.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Galdermans M, Gemels B. Success rate and complications of sialendoscopy and sialolithotripsy in patients with parotid sialolithiasis: a systematic review. Oral Maxillofac Surg. 2020 Jun;24(2):145-150. doi: 10.1007/s10006-020-00834-x. PMID: 32162129.

2. Kallas-Silva L, Azevedo MFD, de Matos FCM, Petrarrolha SP, Dedivitis RA, Kulcsar MAV, Matos LL. Sialendoscopy for treatment of major salivary glands diseases: a comprehensive analysis of published systematic reviews and meta-analyses. Braz J Otorhinolaryngol. 2023 Sep-Oct;89(5):101293. doi: 10.1016/j.bjorl.2023.101293. Epub 2023 Jul 15. PMID: 37487402; PMCID: PMC10382863.

3. Takahara M, Sabusawa T, Ohara K, Katada A, Hayashi T, Harabuchi Y. Treatment outcomes of sialendoscopy for submandibular gland sialolithiasis. Auris Nasus Larynx. 2023 Oct;50(5):783-789. doi: 10.1016/j.anl.2023.01.006. Epub 2023 Feb 11. PMID: 36775770.

4. Schwartz N, Hazkani I, Goshen S. Combined approach sialendoscopy for management of submandibular gland sialolithiasis. Am J Otolaryngol. 2015 Sep-Oct;36(5):632-5. doi: 10.1016/j.amjoto.2015.04.001. Epub 2015 Apr 14. PMID: 26052045.

5. Silva L, Babicsak G, Dolci RL. Salivary gland endoscopy in children: A systematic review. Rev Assoc Med Bras (1992). 2016 Nov;62(8):795-799. doi: 10.1590/1806-9282.62.08.795. PMID: 27992022.

6. Matsunobu T, Kurioka T, Miyagawa Y, Araki K, Tamura A, Niwa K, Tomifuji M, Yamashita T, Shiotani A. Minimally invasive surgery of sialolithiasis using sialendoscopy. Auris Nasus Larynx. 2014 Dec;41(6):528-31. doi: 10.1016/j.anl.2014.05.009. Epub 2014 Jun 23. PMID: 24970706.

7. Van Cleemput T, Vanpoecke J, Coropciuc R, Politis C. Sialendoscopy: A Four-Year Single Center Experience. J Oral Maxillofac Surg. 2021 Nov;79(11):2285-2291. doi: 10.1016/j.joms.2021.06.020. Epub 2021 Jun 22. PMID: 34331872.

8. Atienza G, López-Cedrún JL. Management of obstructive salivary disorders by sialendoscopy: a systematic review. Br J Oral Maxillofac Surg. 2015 Jul;53(6):507-19. doi: 10.1016/j.bjoms.2015.02.024. Epub 2015 Mar 29. PMID: 25823614.

9. Ogden MA, Rosbe KW, Chang JL. Pediatric sialendoscopy indications and outcomes. Curr Opin Otolaryngol Head Neck Surg. 2016 Dec;24(6):529-535. doi: 10.1097/MOO.0000000000000314. PMID: 27636984.

10. Badash I, Raskin J, Pei M, Soldatova L, Rassekh C. Contemporary Review of Submandibular Gland Sialolithiasis and Surgical Management Options. Cureus. 2022 Aug 18;14(8):e28147. doi: 10.7759/cureus.28147. PMID: 36148182; PMCID: PMC9482556.

11. Kopeć T, Wierzbicka M, Kałużny J, Młodkowska A, Szyfter W. Sialendoscopy and sialendoscopically-assisted operations in the treatment of lithiasis of the submandibular and parotid glands: our experience of 239 cases. Br J Oral Maxillofac Surg. 2016 Sep;54(7):767-71. doi: 10.1016/j.bjoms.2016.04.026. Epub 2016 May 13. PMID: 27185233.

12. Ramsha A, Keskool P, Ongard S, Metheetrairut C. Outcome of the Management of Salivary Gland Diseases by Sialendoscopy: A University Hospital's Experience. J Oral Maxillofac Surg. 2023 Mar;81(3):344-349. doi: 10.1016/j.joms.2022.11.010. Epub 2022 Dec 8. PMID: 36502857.

13. Jouan R, Picot E, Hermann R, Faure F, Marchal F. Sialendoscopy for sialolithiasis in children: 4-8 years follow up. Br J Oral Maxillofac Surg. 2018 Feb;56(2):120-123. doi: 10.1016/j.bjoms.2017.12.005. Epub 2018 Jan 17. PMID: 29373144

14. Nahlieli O. Complications of sialendoscopy: personal experience, literature analysis, and suggestions. J Oral Maxillofac Surg. 2015 Jan;73(1):75-80. doi: 10.1016/j.joms.2014.07.028. Epub 2014 Jul 30. PMID: 25443381.

15. Jokela J, Saarinen R, Mäkitie A, Sintonen H, Roine R. Costs of sialendoscopy and impact on health-related quality of life. Eur Arch Otorhinolaryngol. 2019 Jan;276(1):233-241. doi: 10.1007/s00405-018-5196-9. Epub 2018 Nov 14. PMID: 30430242; PMCID: PMC6338794.

16. Velasquez N, Gardiner L, Ramprasad V, Shaffer A, Jabbour N, Stapleton A. Cost analysis of sialendoscopy for the treatment of salivary gland disorders in children. Int J Pediatr Otorhinolaryngol. 2022 Feb;153:111020. doi: 10.1016/j.ijporl.2021.111020. Epub 2021 Dec 28. PMID: 34973523.

17. de Paiva Leite S, de Oliveira MMR, Ahmad Z, Morton RP. Impact on quality of life in obstructive sialadenitis predicting outcomes after sialendoscopy. Am J Otolaryngol. 2022 May-Jun;43(3):103431. doi: 10.1016/j.amjoto.2022.103431. Epub 2022 Apr 6. PMID: 35460971.

Citation: Uribe JM, Escobar DF. Sialendoscopy as An Alternative Treatment for Sialoliths in Salivary Glands. *SVOA Dentistry* 2024, 5:6, 215-219. doi:10.58624/SVOADE.2024.05.0195