



HAL
open science

Tips & tricks for transoral approach for submandibular lithiasis (TASL)

E. Carbonnel, M.-K. Le Roux, C. Chossegras, U. Scemama, N. Graillon

► To cite this version:

E. Carbonnel, M.-K. Le Roux, C. Chossegras, U. Scemama, N. Graillon. Tips & tricks for transoral approach for submandibular lithiasis (TASL). *Journal of Stomatology, Oral and Maxillofacial Surgery*, 2020, 121 (6), pp.736-739. 10.1016/j.jormas.2020.04.001 . hal-03222276

HAL Id: hal-03222276

<https://hal.science/hal-03222276>

Submitted on 15 Dec 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

TIPS & TRICKS FOR TRANSORAL APPROACH FOR SUBMANDIBULAR LITHIASIS

(TASL)

Carbonnel E¹, Leroux MK¹, Chossegras C MD, PhD¹, Scemama U MD², Graillon N MD¹

¹Department of Oral and Maxillofacial Surgery, Aix-Marseille University, La Conception University Hospital, 147 Boulevard Baille, 13005 Marseilles, France

²Department of radiology, Aix-Marseille University, La Conception University Hospital, 147 Boulevard Baille, 13005 Marseilles, France

Corresponding author: Emeric CARBONNEL

Department of Oral and Maxillofacial Surgery, Aix-Marseille University, Conception University Hospital, 147 Bd Baille, 13005 Marseilles, France

Telephone: 0033666191180

Fax : +33491543322

Email: emeric.carbo@gmail.com

Postal address : 147 Bd Baille, 13005 Marseilles, France

Declarations of interest : none

This work did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

color should be used for any figures in print

Abstract :

Introduction : Sialolithiasis mainly affect the submandibular gland. More often, the lithiasis is large and located at the junction of the middle and the posterior third of the duct, in the hilum region. In such situation, transoral approach is recommended to avoid sialadenectomy because of its lower morbidity. Tips and Tricks : Because of our experience with over 300 cases operated with this transoral approach, we have decided to describe the tips and tricks that can help the surgeon who operates large stones impacted in the hilum of the submandibular gland. Discussion : the benefits of these tips and tricks are exposed. Conclusion : These keypoints can help to overcome intraoperative issues and save time.

Keywords: submandibular gland, salivary lithiasis, minimal invasive surgery

INTRODUCTION

The salivary glands can be affected by multiple pathologies such as autoimmune and inflammatory diseases, neoplastic diseases, and sialolithiasis. Among the main salivary gland pathologies, sialolithiasis is the most frequent. In most cases, the submandibular glands are affected [1].

The rise of minimally invasive surgery for salivary lithiasis in the 1990s was possible with the development of the sialendoscope, primarily the lithotripter. Transoral techniques were similarly modified and codified, such as in the combined approach [4-6]. According to the GTD classification, the management of lithiasis of the submandibular glands is based on three criteria: the gland involved, topography of the lithiasis, and diameter of the lithiasis, as Foletti et al. published in the GTD classification[2]. . The transoral approach is recommended for palpable impacted large lithiasis (diameter > 8 mm) situated in the posterior third of Wharton's duct. Using the GTD classification, we observed that many lithiasis are S-P-LI lithiasis, which are submandibular lithiasis over 8 mm in diameter (large and impacted) situated in the posterior third of Wharton's duct. Such lithiasis are better operated with a transoral combined removal, also called the transoral approach for submandibular lithiasis (TASL) [3] S-P-LI are always quite intra-orally palpable.

TASL is now performed by multiple teams [3-6]. TASL is minimally invasive, repeatable, allows functional recovery of the gland after the obstruction's removal, and minimizes scarring [7,8], even for large lithiasis [9].

We have performed this intervention in our department for approximately 10 years and more than 300 patients have undergone TASL. This surgery can be challenging for the practitioner. The goal of this article is to detail certain tips and tricks of this intervention enabling the facilitation and shortening of the procedure for the oral and maxillofacial or ENT surgeon who performs it.

TECHNICAL NOTES: TIPS AND TRICKS

1- Preoperative assessment

Clinical examination is essential. The indication for this surgery is based on the fact that the lithiasis must be palpable. We also recommend the patient undergo an unenhanced CT or a CBCT scan before the procedure.

2- Installation in the operating room (Fig 1)

This step is very important. The patient is placed in the dorsal decubitus position. Unlike other intra-oral operations, the head must be fixed so the chin can rest on the patient's chest. The head will also be fastened onto the table with medical adhesive. This position improves the exposure and facilitates access to posterior third lithiasis.

3-Anesthesia

Nasotracheal intubation allows the oral area to be free, facilitating the intra-oral procedure. In patients with precarious health, the procedure can be performed under local anesthesia combined with sedation.

4- Surgical technique

The surgical technique is performed as described by McGurk [4], with few improvements. The buccal floor is infiltrated under the mucosa with saline solution with epinephrine 1% (0.25 mg in 20 cc).

We use a Doyen retractor (COLLIN Ref AT3209) to open the mouth because it leaves more space to work than a McKesson mouth prop (Fig 2). The assistant surgical aid must push up the submandibular gland to largely facilitate the exposure of the hilum in the mouth. An incision is made on the lingual side of the salivary crest, medially to the sublingual gland. It must run to the level of the wisdom tooth, posteriorly enough. Then the mucosal plane is incised and some lingual veins can be coagulated in the anterior portion of the mouth floor. The medial portion of the sublingual gland is followed outside the sublingual aponeurosis. Then Wharton's duct is easily visible, especially in its anterior third because at this level, Wharton's duct is superficial. Once Wharton's duct is isolated, a silicon loop (Ethicon Ethiloop Ref EH384) is placed around it to apply a slight traction to the natural axis of the duct (Fig 3). Wharton's duct is then followed to the lithiasis level. The lithiasis can be palpated again to check its level between the first and third molar in the posterior duct third. Then Wharton's duct is opened on its top (at 12 o'clock) with the help of a n°12 blade

from back to forth while maintaining contact with the lithiasis (Fig 4). At this step, the lingual nerve is in contact only with the hilum of the gland crossing it. The lithiasis is gently removed from the duct using scissors while maintaining contact with the lithiasis. Brugirard currettes sometimes can assist. A post-removal hilum check is carefully performed with angulated currettes to control the hilum vacuity. Then the two anterior thirds of the duct must be checked to control their permeability. This can be easily accomplished via retrograde irrigation using a bent ear cannula (Fig 5). If this is not feasible, retrograde irrigation can be replaced by anterograde irrigation through Wharton's duct papilla with the plastic part of a 20-gauge cathlon inserted on a 0000 probe passed through the papilla. When feasible, the Wharton's duct hilar incision is sutured with 1 or 2 4/0 silk thread stitches. The mouth floor is then sutured with 3 or 4 absorbable stitches.

5- Follow-up

A postoperative check-up is scheduled at 1 month and then 1 year postoperatively due to the risk of recurrence of submandibular lithiasis (5% to 10% at 5 years). However, we prefer to follow the patient and prescribe computed tomography only in rare cases with symptoms of salivary gland obstruction. If the patient is impaired and if the CT shows new lithiasis, a second surgery can be performed. After 3 or more TASL procedures, a submandibulectomy is recommended, but this is rare (2/300 patients). To prevent lithiasis recurrences, we recommend the patient undergo postprandial salivary gland pressure or massages from back to forth, particularly patients with submandibular gland meal-time tenderness. These massages can last for 30 seconds only on the concerned gland.

DISCUSSION

Preoperative assessment. We recommend the patient undergo a computed tomography (CT) scan because this is the most efficient exam for the preoperative diagnosis of sialolithiasis (100% sensitivity, 75% specificity, 99% positive predictive value, and 100% negative predictive value [10]). CBCT, which is interesting in terms of X-ray dose reduction and reduced metallic artefacts, can also be done, even if it provides less information regarding the soft tissues¹⁰. Multi-planar reconstructions allow the precise assessment of the topography of the lithiasis (extra-glandular, which is frequent, or intra-glandular, which is much rarer). CT also assesses the opposite side: multiple sialolithiasis is a condition that requires more

aggressive management, that is, the removal of all of the lithiasis in one session, which is the gold standard in salivary gland surgery. Installation in the operating room. The exposition is essential to obtain the best visibility of the posterior lithiasis. This is why we use this installation and instrumentation that minimally hinders the surgeon's view. It avoids the lower incisor teeth that could obstruct the view of the mouth floor. This position also provides soft tissue laxity that is needed to push the submandibular gland upward into the oral cavity. Anesthesia. We advise performing this intervention under general anesthesia, both for the patient and practitioner's ease, especially for untrained surgeons or for frequent posterior lithiasis topography. The surgeon must differentiate between easily accessible anterior lithiasis and posterior lithiasis that require a posterior dissection, which is unacceptable for patients under local anesthesia due to the gag reflex and because this surgery is sometimes painful (when the assistant hand pushes the gland upward).

Surgical technique. We recommend infiltrating the buccal floor with serum solution/epinephrine and not lidocaine, as it causes bleeding. The traction with the silicon loop facilitates the duct incision in the mouth floor to the hilum. The hand of the second aid that pushes the submandibular gland into the oral cavity is called the "hand of god" because without it, the posterior lithiasis cannot be removed. The second surgical aid can put a wrist on the clavicular bone for strong support that helps to push hard onto the gland. An incision is made on the lingual side of the salivary crest, medial to the sublingual gland to avoid damage to the sublingual gland that can lead to iatrogenic ranulas. Wharton's duct incision is made on the top (at 12 o'clock) of the duct so that the saliva can stay inside the duct as much as possible. The calculi are gently removed from the duct to avoid fragmentation and residual calculi. The retrograde irrigation ensures ductal vacuity and permeability after lithiasis removal. The closure is made with silk thread stitches because their non-inflammatory nature allows the avoidance of any risk of ductal postoperative stenosis.

Follow-up. We do not recommend postoperative systematic ultrasound because the results can stress the patient and postoperative US is sometimes difficult to interpret. There is no proof of massages' efficiency or candy sucking to avoid submandibular lithiasis recurrence but these simple techniques should logically prevent salivary stasis and the neoformation of lithiasis.

While TASL is now a codified and reliable technique for palpable lithiasis of the hilum of Wharton's duct, it can be challenging for practitioners who are not used to it.

Following the aforementioned tips and tricks, the procedure can be easier and faster for the ENT or maxillofacial surgeon.

1. Sigismund P. E, Zenk K, Koch M, Schapher M, Rudes M, IroH. Nearly 3,000 salivary stones: some clinical and epidemiologic aspects. *The Laryngoscope*. 2015;125:1879–1882. [https://doi: 10.1002/lary.25377](https://doi.org/10.1002/lary.25377).
2. McGurk M. Surgical release of a stone from the hilum of the submandibular gland: a technique note. *Int. J. Oral Maxillofac Surg*. 2005;34:208–210. [https://doi: 10.1016/j.ijom.2004.04.007](https://doi.org/10.1016/j.ijom.2004.04.007)
3. McGurk M, Makdissi J, Brown J.E :Intra-oral removal of stones from the hilum of the submandibular gland: report of technique and morbidity. *Int. J. Oral Maxillofac Surg*. 2004; 33:683–686. [https:// doi: 10.1016/j.ijom.2004.01.024](https://doi.org/10.1016/j.ijom.2004.01.024)
4. Foletti JM, Graillon N, Avignon S, Guyot L, Chossegros C. Salivary Calculi Removal by Minimally Invasive Techniques: A Decision Tree Based on the Diameter of the Calculi and Their Position in the Excretory Duct. *J Oral Maxillofac Surg*. 2018;76:112-118. [https:// doi: 10.1016/j.joms.2017.06.009](https://doi.org/10.1016/j.joms.2017.06.009).
5. Capaccio P, Bottero A, Pompilio M, Ottaviani F. Conservative transoral removal of hilar submandibular salivary calculi. *Laryngoscope*. 2005;115:750-752. [https:// DOI: 10.1097/01.mlg.0000161348.15505.11](https://doi.org/10.1097/01.mlg.0000161348.15505.11)
6. Salles F, Chossegros C, Guyot L, Brignol L, Cheynet F, Blanc JL. Transoral removal of submandibular hilar calculi: 36 cases. *Rev Stomatol Chir Maxillofac*. 2008;109:139-142. [https://doi: 10.1016/j.stomax.2008.03.005](https://doi.org/10.1016/j.stomax.2008.03.005).
7. Benazzou S, Salles F, Cheynet F, Brignol L, Guyot L, ChossegrosC. Transoral removal of submandibular hilar calculi. *Rev Stomatol Chir Maxillofac*. 2008;109:163-166. [https:// doi: 10.1016/j.stomax.2008.03.002](https://doi.org/10.1016/j.stomax.2008.03.002).

8. Park JS, Sohn JH, Kim JK. Factors influencing intraoral removal of submandibular calculi. *Otolaryngol Head Neck Surg.* 2006;135:704-709. [https://doi: 10.1016/j.otohns.2006.07.013](https://doi:10.1016/j.otohns.2006.07.013)

9. Makdissi J, Escudier MP, Brown JE, Osailan S, Drage N, McGurk M. Glandular function after intraoral removal of salivary calculi from the hilum of the submandibular gland. *Br J Oral Maxillofac Surg.* 2004;42:538-541. [https:// doi: 10.1016/j.bjoms.2004.08.006](https://doi:10.1016/j.bjoms.2004.08.006)

10. Gardon MA, Foletti JM; Avignon S, Graillon N, Chossegras C. CT scan assessment in salivary gland lithiasis diagnosis. *J Stomatol Oral Maxillofac Surg.* 2018;119:110-112. <https://doi:10.1016/j.jormas.2017.11.012>

Caption to illustrations :

Fig 1. Installation: nasotracheal intubation inclined upward, head fastened, and chin on the chest (sternum).

Fig 2. The Doyen retractor is used to open the mouth.

Fig 3. Silicon loop around Wharton's duct (WD = Wharton's duct).

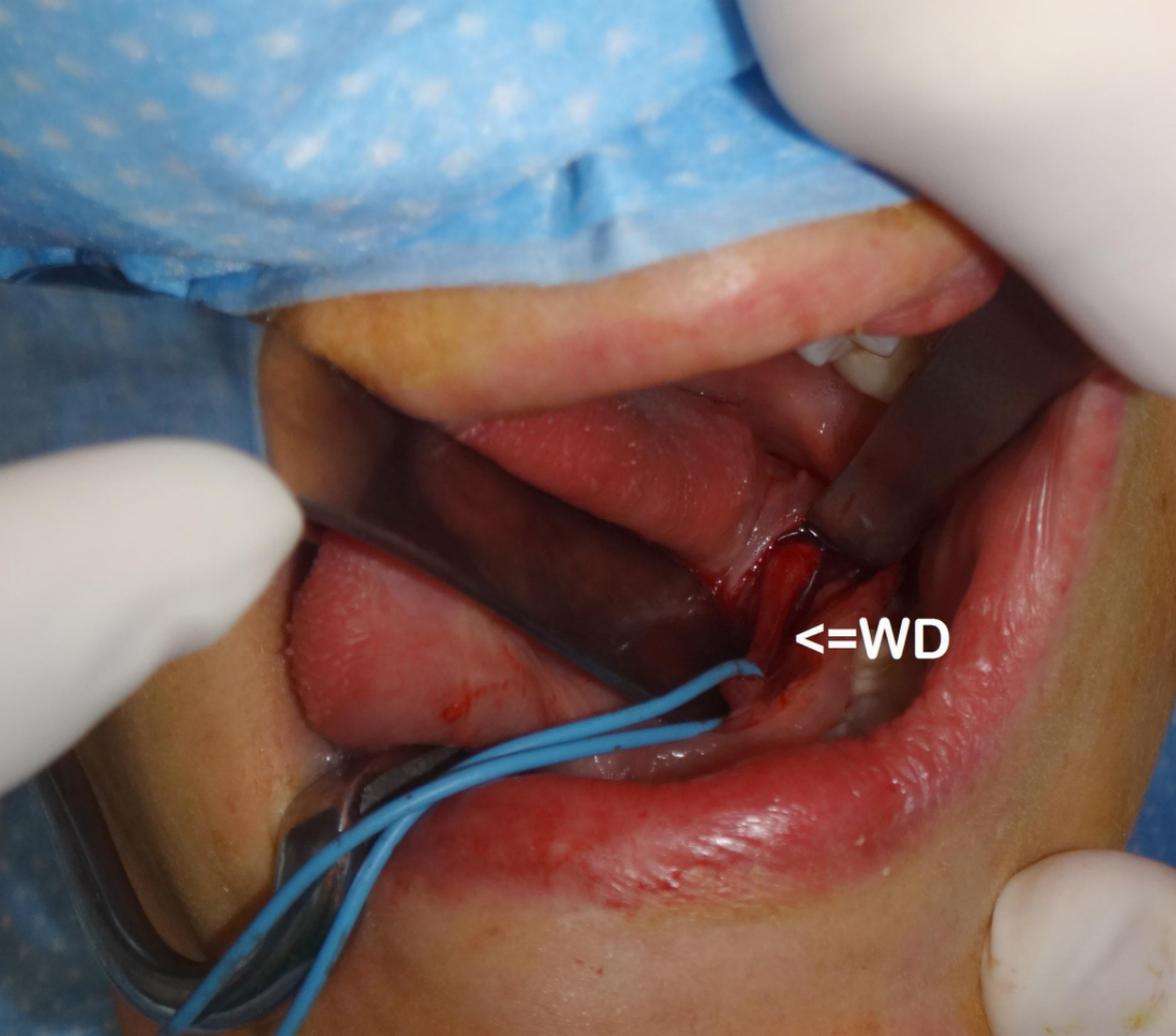
Fig 4. Wharton's duct incision on the top (at 12 o'clock) of the duct with an n°12 blade (SML = submandibular lithiasis visible through the 12 o'clock hilar incision, WD = Wharton's duct, LN = lingual nerve).

Fig 5. Control of Wharton's duct permeability (emptiness). Saline solution injected into the hilum through the bent ear cannula must come out the duct through the papilla.

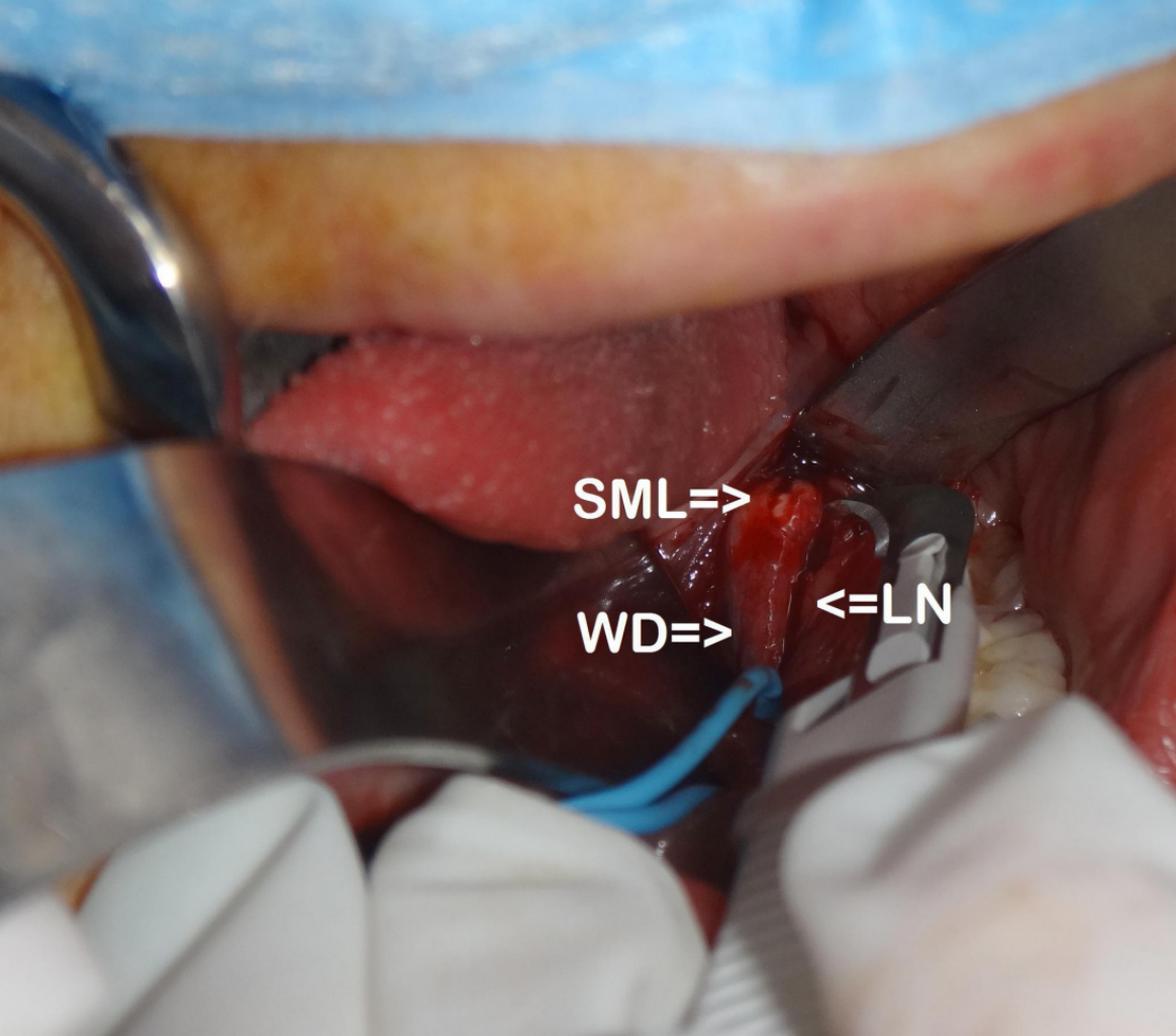


Chin on Chest =>





←WD



SML=>

WD=>

<=LN

An intraoperative photograph showing a surgical procedure on an ear. A clear plastic suction cannula is inserted into the Wharton's hilum, a small opening in the ear canal. The surrounding tissue is red and moist. A blue surgical drape is visible at the top, and a blue suction tube is connected to the cannula. A metal surgical instrument is also visible in the field.

**BENDEE EAR SUCCION CANNULA
INSERTED IN THE WHARTONS' HILUM =>**