

Combined Surgical Approaches for the Removal of Submandibular Gland Sialoliths

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KEYWORDS

• Submandibular gland • Sialodochoplasty • Sialendoscopy • Sialolithectomy • Sialolithotomy

KEY POINTS

- The combined approach for the removal of submandibular gland sialoliths is indicated for multiple reasons including large sialoliths, fibrosed sialoliths, and the inability to cannulate the duct.
- The combined approach to the submandibular gland are intraoral/transoral in nature. The techniques are divided by location of the sialoliths: the orifice, the junction of the lingual nerve and the duct, and the hilum.
- The use of a combined sialendoscopy and intraoral incision has less morbidity than the removal of the salivary gland.

The removal of sialoliths using purely the sialendoscope is covered in (See Joseph P. McCain and Jose Montero article, "Surgical Retrieval of Submandibular Stones," in this issue). This article describes the various approaches to removal of the salivary gland stone using sialendoscopy and various intraoral surgical techniques.

Statistically, 80% of all symptomatic stones are located in the submandibular gland and 50% of these are located in the hilum or in the associated parenchyma.¹ It is still common for sialadenectomies to be performed for symptomatic submandibular stones because of (1) the argument that following obstruction, the gland is atrophic and is no longer functional; (2) recurrence of salivary gland stones; and (3) the ease of a sialadenectomy. Multiple studies have shown that following removal of the salivary gland stone, a return to function occurs.^{2,3} Although recurrence can occur, this treated using minimally invasive techniques, forgoing the associated risks of the sialadenectomy, such as injury to the facial, hypoglossal, and lingual nerves.^{4,5} As to the ease of sialadenectomy, studies have found transoral procedures to be more cost effective with less postoperative discomfort.^{6,7}

The combined approach to the removal of sialoliths from the submandibular gland is indicated for many reasons: sialolith larger than 6 mm, fibrosed, acutely infected, inability to cannulate the duct, and inability to mobilize the sialolith. In a study by Zenk and coworkers,⁸ of 736 patients, 681 (92%) needed to have transoral component as part of their treatment. Sialendoscopy by itself was only possible with stones that were 5 mm or smaller, typically found in the gland hilum or distal duct.

Contrary to the combined approaches to the parotid gland, the submandibular gland approaches are solely intraoral/

transoral in nature. The techniques are subdivided by the location of the sialolith and each procedure is discussed separately.

Techniques

Access to the duct orifice

A thorough preoperative evaluation can help identify narrowed or nonvisible openings into the submandibular gland. The inability to enter the puncta has been found to occur approximately 5% of the time.⁹ To evaluate this, bimanual palpation should be performed, with pressure being applied to the gland extraorally, and then with the opposite hand, a finger should be placed posteriorly at the base of the tongue and then brought forward in an anterior direction. If the puncta is not visible, particularly under magnification, consideration should be given that the patient might need some form of papillotomy (Fig. 1).

Radiographic evaluation of the sialolithiasis and the salivary glands is covered in other articles (See Henry T. Hoffman and Nitin A. Pagedar's article, "Ultrasound Guided Salivary Gland Techniques and Interpretations," in this issue). Salivary gland stones that are less than 5 mm and are spherical, without protuberances (Fig. 2) can most likely be removed using a sialendoscope and a retrieval tool. Larger than 5 mm stone (Fig. 3), or a salivary stone with protuberances (Fig. 4), might necessitate the use of a combined approach.

The objective of this technique is to create patency of the duct, allowing for removal of the sialolith, and to prevent sclerosis of the duct and the resulting obstruction.

Papillotomy technique

1. Local anesthesia with a vasoconstrictor should be infiltrated deep and lateral to the papilla. Note, try not to obliterate the anatomy of the papilla, because this makes the dissection difficult. The needle should also not be placed

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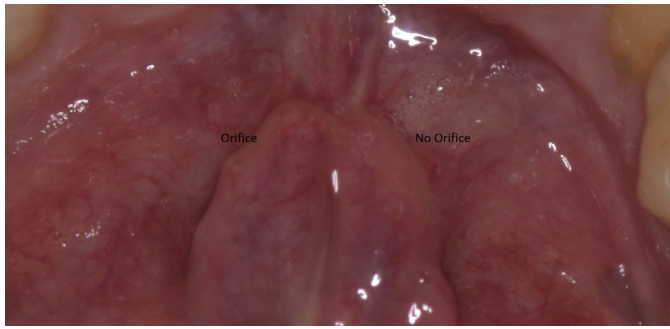


Fig. 1 Right orifice of submandibular duct visible, left orifice not visible.

into the papilla, because this also obliterates the anatomic landmarks.

2. Using a small-toothed forceps, the mucosa 2 to 3 mm anterior to the papilla should be grasped firmly. If the papilla is grasped, punctures occur and bleeding ensues. This also causes confusion as to the true orifice into the papilla and a false passage can occur if dilation is attempted.
3. A U-shaped incision is made around the papilla and the duct is dissected out using fine-tip dissectors. The overlying mucosa is removed and the duct and papilla are free from the underlying tissue (Fig. 5 and 6).

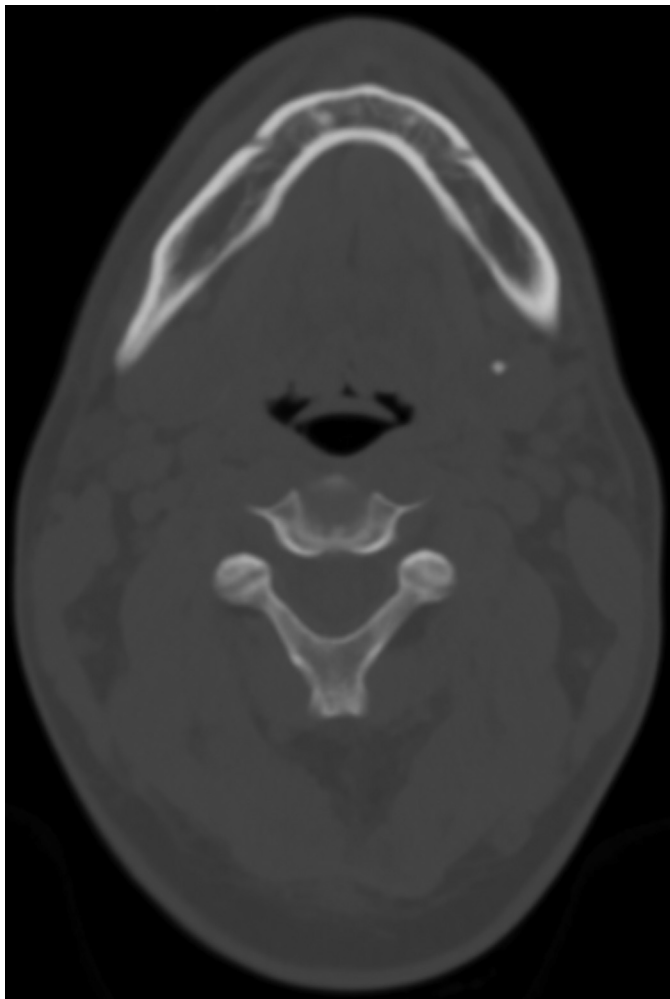


Fig. 2 Submandibular salivary gland stone less than 5 mm in diameter.

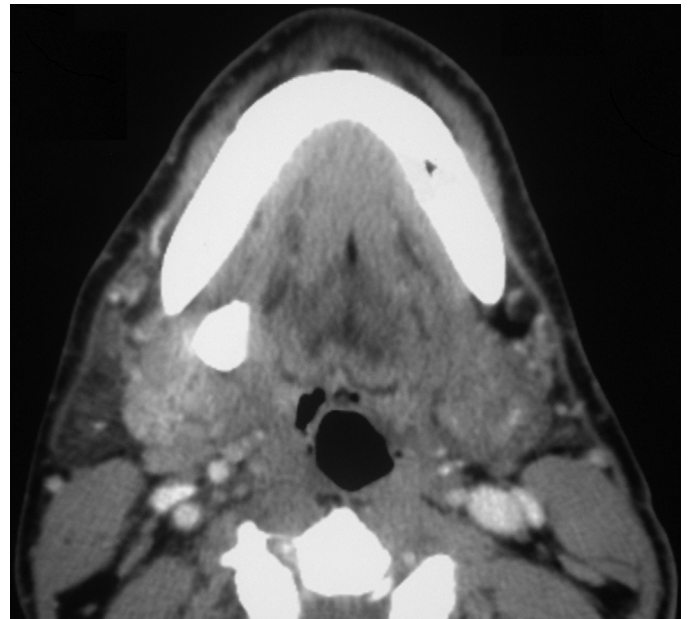


Fig. 3 Submandibular salivary gland stone greater than 5 mm (megalith displayed in computed tomography).

4. The duct is dissected away from the underlying tissues and can either be transected or a linear sialodochotomy of 3 to 4 mm is made on the lateral duct wall with an 11 to allow for access (Fig. 7). Care should be taken not to cut both duct walls.
5. The duct can then be dilated and cannulated (Fig. 8).

Anterior duct approach

Submandibular gland salivary stones are typically found in three locations: 34% in the distal duct (anterior salivary duct stones), 57% in the hilum, and 9% within the parenchyma

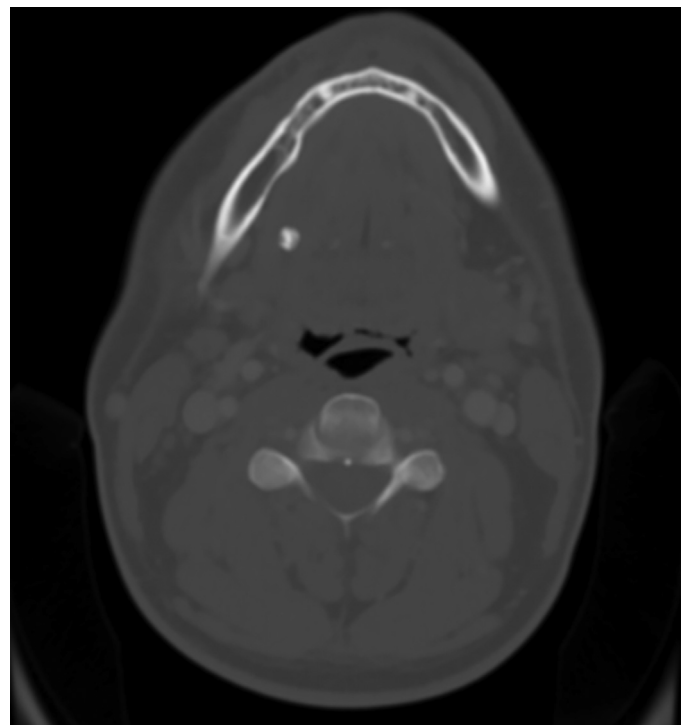


Fig. 4 Submandibular salivary gland stone with protuberances.

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