Surgical Retrieval of Parotid Stones

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KEYWORDS

• Parotitis • Stone • Sialolith • Parotid • Stensen duct • Sialendoscopy

KEY POINTS

- The prevalence of salivary stones in the general population is 1.2% according to post mortem studies. Sialolithiasis accounts for approximately 50% of major salivary gland diseases.
- The submandibular glands are affected 80% of the time, compared with 20% occurrence in the parotid glands, which has been postulated to be because the submandibular duct has 2 bends, whereas the parotid has only 1, and dependent positioning may lead to a proximal "pooling effect" in the submandibular duct.
- Given the risk of more diffuse facial nerve injury during parotidectomy compared with submandibular gland excision, a gland sparing treatment of obstructive parotid sialolithiasis is even more desirable.

Statement of the problem

The prevalence of salivary stones in the general population is 1.2% according to post mortem studies. Sialolithiasis accounts for approximately 50% of major salivary gland diseases.[1] The submandibular glands (see Joseph P. McCain and Jose Montero's article, "Surgical Retrieval of Submandibular Stones," in this issue) are affected 80% of the time, compared with 20% occurrence in the parotid glands. This distribution is postulated to be because of differences in the anatomy of the 2 ductal systems. The submandibular duct has 2 bends, whereas the parotid has only 1, and dependent positioning may lead to a proximal "pooling effect" in the submandibular duct (see Anatomy sections in Erica M. Jackson and Rohan R. Walvekar's article, "Surgical Techniques for the Management of Parotid Salivary Duct Strictures," Justine Moe and Joseph I. Helman's article, "Surgical Techniques for the Management Submandibular Salivary Duct Strictures," and see Joseph P. McCain and Jose Montero's article, "Surgical Retrieval of Submandibular Stones," in this issue).

Given the risk of more diffuse facial nerve injury[2] during parotidectomy compared with submandibular gland excision, a gland sparing treatment of obstructive parotid sialolithiasis is even more desirable.

Diagnostic methods

The diagnosis of obstructive parotitis is made on clinical history, examination, and imaging studies. Patients usually present with periprandial and preauricular upper neck swelling as well as expression of cloudy, thick saliva from Stensen duct (Fig. 1). Imaging studies may demonstrate a calcified stone, a noncalcified blockage, or a stricture (presenting as ductal dilatation preceding ductal narrowing in a proximal to distal course from the gland).

The most effective imaging methods of acutely involved glands are noncontrast computed tomography (CT) and ultrasound (see Henry Hoffman and Nitin A. Pagedar's article, "Ultrasound Guided Salivary Gland Techniques and Interpretations," in this issue). CT scans can demonstrate stone detection (Fig. 2) or dilation (which indicates stricture). If the history is not consistent with obstructive salivary gland pathology, such as an enlarged parotid gland, which persists, does not wax and wane, and is progressively increasing in size, facial nerve involvement, and persistent pain (not just on eating), an MRI is suggested to rule out a mass or tumor.[3]

Surgical technique

Sialendoscopy is a technique that offers a minimally invasive and gland-preserving approach to obstructive salivary gland diseases such as sialoliths, mucous plugs, or foreign bodies. Sialendoscopy has been used to guide the operation, check patency, and detect leaks after repair of the duct in consequence of acute trauma.[4,5]

Parotid gland sialadenitis secondary to sialolithiasis, strictures (see Justine Moe and Joseph I. Helman's article, "Surgical Techniques for the Management Submandibular Salivary Duct Strictures," in this issue), or mucous plugs is successfully treated with endoscope systems with diameters from 1.1 to 2.3 mm. Using a basket, grasper, lithotripsy, laser, or a combination of these, stones can be fragmented and/or removed endoscopically (see Michael D. Turner's article, "Surgical Armamentarium for Sialendoscopy," Oded Nahlieli's article, "Extra-corporeal Lithotripsy," and Jack Kolenda's article, "Intra-corporeal Lithotripsy," in this issue).[4,6,7]

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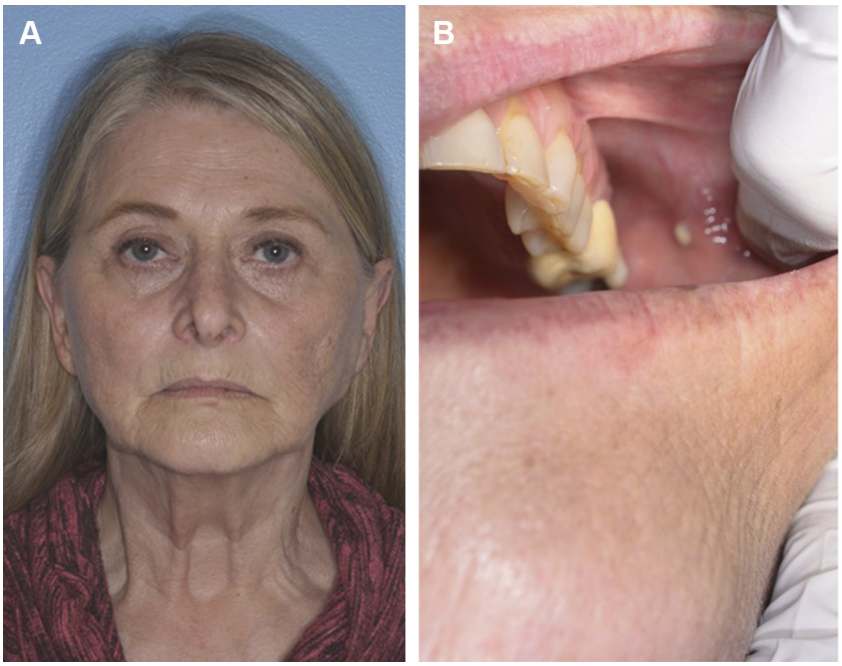

Fig. 1 (*A*) Swollen patient and (*B*) cloudy saliva.

Step 1: patient positioning

Sialendoscopy of the parotid gland is carried out with the patient under general anesthesia on an outpatient basis. The patient is placed supine with head fixed on a head rest and turned toward the surgeon.[4,7,8]

Step 2: identification and dilatation of Stensen duct

The punctum of Stensen duct is identified. It is located over the buccal mucosa opposite the upper second molar. The punctum is serially dilated with conical dilators through the natural orifice. Irrigating with 2% lidocaine without epinephrine can aid in vasodilation while performing this procedure. Typically, small dilators (0000, 000) are used serially to dilate the duct. An alternative method, to decrease false passage or spasm, is to place a dilator (00, 0), followed by a second dilator (0, 1) parallel to the first, gently separating them to "open" the orifice. Then a larger dilator, with a preinserted catheter, can be guided along one of the dilators as one is removed to make room (Fig. 3). Another technique is to use a guidewire, with serial dilation overlying the guidewire and placement of either an angiocatheter or salivary gland introducer.

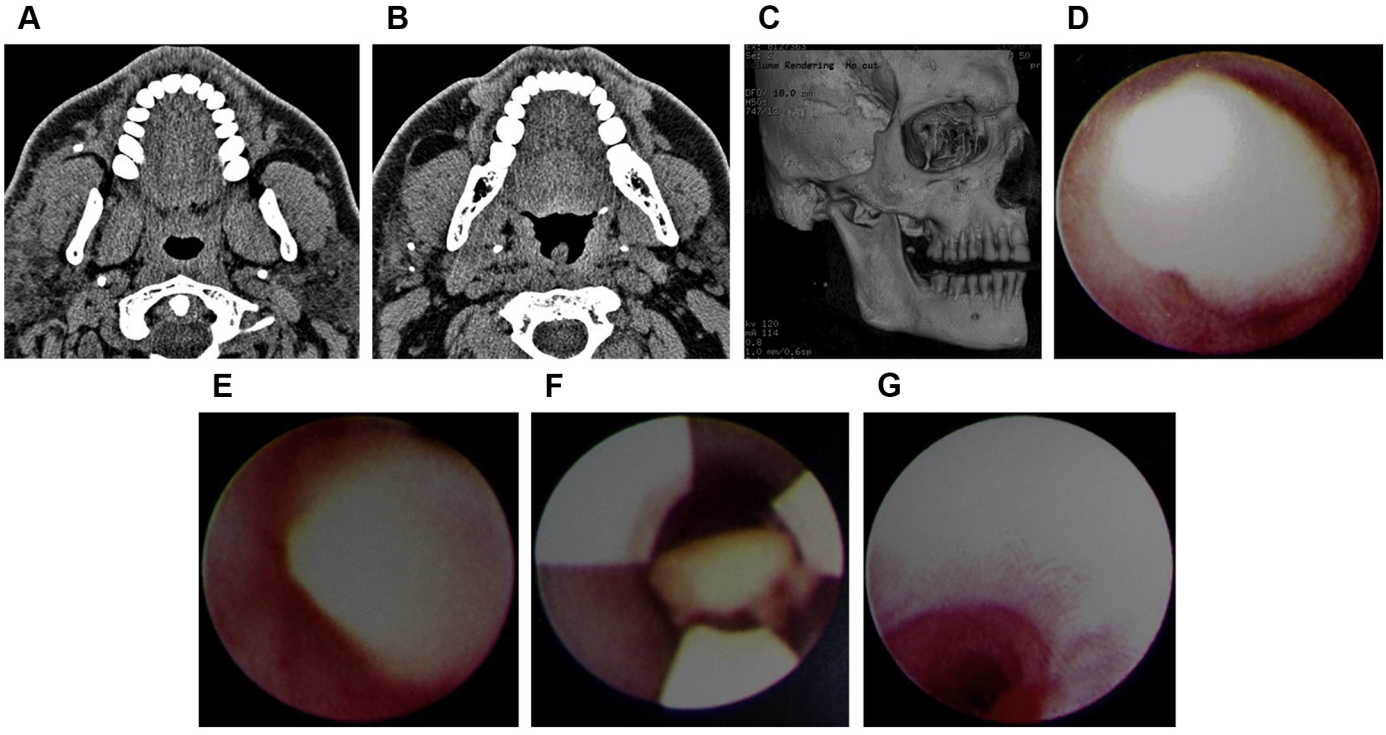

Fig. 2 (*A*, *B*) Axial; (*C*) 3D reconstruction CT of right parotid stone; and (*D*–*G*) subsequent endoscopic removal.