

Case Report

A Case of Spontaneous Passage of Salivary Calculus from the Parotid Gland Duct into the Oral Cavity

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Abstract : Sialolithiasis most commonly affects the submandibular glands, followed by the parotid and sublingual glands. Sialolithiasis is a condition characterized by the obstruction of a salivary gland or its excretory duct due to calculi. Herein we describe a case of a 72-year-old male patient with a painful swelling of the parotid gland region. Parotitis due to sialolithiasis in the parotid gland duct was diagnosed based on computed tomography findings of a calculus (12×6×5 mm) in the parotid gland duct. The calculus was spontaneously discharged from the parotid gland duct with viscous pus into the oral cavity after the inflammation had decreased. Thereafter, the parotitis quickly decreased more markedly. This case indicates that a calculus may be discharged spontaneously into the mouth, even if its diameter is >5 mm.

Key words : parotid gland duct, sialolithiasis, spontaneous passage

Introduction

Sialolithiasis is a disorder in which a calcified mass (calculus) forms within a salivary gland. Intraductal or intraglandular calculi develop as a result of localized inflammation or retention of saliva¹⁾. Sialolithiasis is most common in the submandibular glands, with only 5%-10% of all cases of sialolithiasis occurring in the parotid gland²⁾. Although it has been suggested that sialendoscopy achieves the best results when the maximum size of the calculus does not exceed 5 mm³⁻⁵⁾, such criteria for the spontaneous passage of a calculus have not been defined⁵⁾. Spontaneous passage of a calculus will most likely depend on the size of the calculus relative to duct width, and to the exact site of calculus formation⁵⁾. Herein we describe a case of sialolithiasis in the parotid gland duct in which the relatively large calculus (diameter >5 mm) passed spontaneously into the mouth.

Case report

A 72-year-old man complaining of a painful swelling in the left cheek presented to Department of Oral and Maxillofacial Surgery, School of Dentistry, Showa University in April 2013. The patient had been aware of the symptoms for 3 days prior to attending hospital. At his first hospital visit, there was redness and tender swelling of his cheek in the area of the left

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Fig. 1. Intraoral findings of the patient. Pus was discharged from the opening of the left parotid gland.



Fig. 2. A dental panoramic radiograph did not reveal any opacity suggestive of a salivary calculus.



Fig. 3. Computed tomography findings. (A) Horizontal section ; (B) Sagittal section. A radiopacity of approximately 12 mm (arrow) was evident within the duct near the oral opening of the left parotid gland.

parotid gland. The patient's body temperature was increased to around 38.0°C. Diffuse redness and swelling of the left buccal mucosa were apparent, and a yellowish-white viscid pus was discharged from the opening of the parotid gland (Fig. 1).

Blood tests revealed an elevated white blood cell (WBC) count 12,100 / μ l, segmented neutrophils 91.1%, lymphocytes 3.3%, C-reactive protein 2.1 mg/dl, amylase 173 U/l, and Type S amylase isoenzyme 93%.

A dental panoramic radiograph did not reveal any signs suggestive of a calculus in the duct

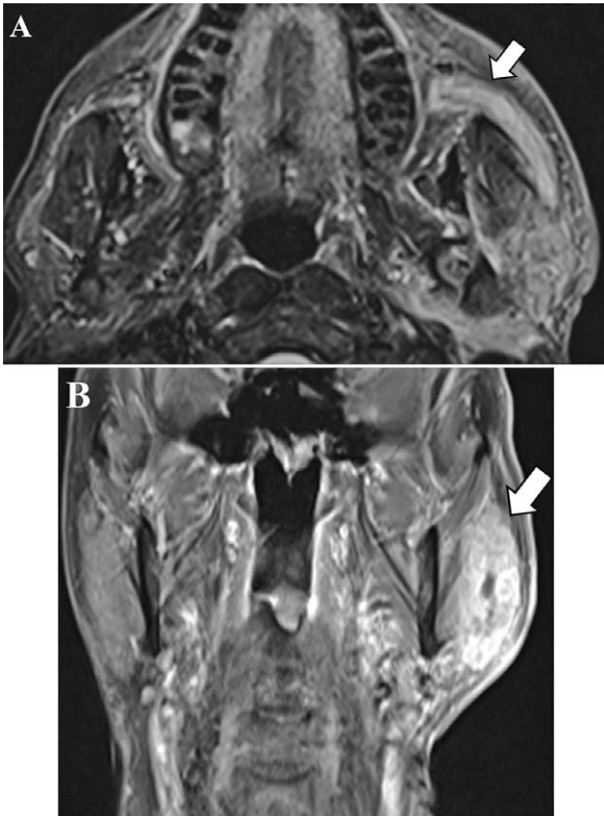


Fig. 4. Magnetic resonance imaging findings. (A) Horizontal section; (B) sagittal section. Dilation of the duct (A; arrow) and swelling of the left parotid gland (B; arrow) were observed.

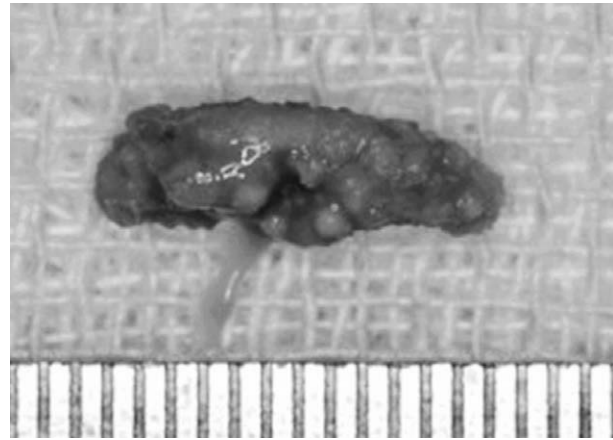


Fig. 5. The parotid salivary calculus that was passed spontaneously. The grayish-white calculus measured $12 \times 6 \times 5$ mm and had a rough surface.

or body of the left parotid gland (Fig. 2). Findings on computed tomography (CT) were suggestive of a calculus in the duct near the oral opening of the left parotid gland (Fig. 3). Magnetic resonance imaging (MRI) revealed swelling of the left parotid gland and dilation of the duct (Fig. 4).

On the basis of a clinical diagnosis of sialolithiasis in the parotid gland duct followed by left parotitis, the patient was hospitalized and started on intravenous ampicillin sodium 2 g/day. Three days after admission to hospital, the patient's WBC count had improved to $7,000/\mu\text{l}$, and a large amount of pus was discharged from the oral opening of the left parotid gland. Intravenous antibiotic administration was continued for 6 days. To enhance the discharge of pus, pressure was applied to the patient's left cheek every day. Six days after admission, a grayish-white calculus with a rough surface and measuring $12 \times 6 \times 5$ mm was spontaneously discharged along with pus into the mouth via the oral opening of the left parotid gland (Fig. 5). Subsequent ultrasonography did not show a calculus in the parotid gland duct. Nine days after admission, the patient was discharged because his inflammatory symptoms had completely disappeared.

Discussion

Sialolithiasis is more common in young and middle-aged men¹⁾, with a male to female ratio of 2:1⁶⁾. Because the symptoms appear to take a while to become apparent, it is difficult to identify the onset of calcification. Smoking, drinking, and poor oral hygiene may be reasons for the higher incidence of sialolithiasis in men. The increased incidence of sialolithiasis in younger women since the 1990s may be attributed to the increased rates of smoking and drinking among women. In the present case, although the patient was not a habitual smoker or drinker, his oral hygiene was poor.

The incidence of calculi in the parotid glands is lower than that in the submandibular glands because the ducts in the submandibular glands are longer and have more curves. Saliva must flow up from below against the force of gravity. Because saliva from the submandibular glands contains a large mucinous component and a high calcium concentration, saliva from the parotid glands flows easier than does saliva from the submandibular glands. Moreover, the oral openings of the submandibular gland ducts are located in a lower position than those of the parotid glands, making them more susceptible to the effects of food debris⁷⁾.

Sialolithiasis of the parotid gland can be treated conservatively or surgically. Surgical treatment for sialolithiasis of the parotid gland is divided into intra- and extra-oral approaches⁸⁾. A shallow calculus near the oral opening can be removed via an intra-oral approach⁹⁾. Intraglandular or intraductal calculi near the origin can be removed using an extra-oral approach involving an incision, even though this procedure carries the risk of facial nerve damage⁷⁾. In the extra-oral approach, whether the calculus can be removed alone or together with the surrounding parotid gland tissue will depend on the location of the lesion¹⁰⁾. Recently, it has been proposed that the calculus could be removed through the salivary gland ductal system using interventional sialendoscopy, which would avoid damaging the essential structures of the salivary glands³⁻⁵⁾. However, instead of using these approaches, it may be useful to encourage the spontaneous passage of calculi by promoting the secretion of saliva by encouraging patients to eat citrus fruits, or giving them oral vitamin C¹⁰⁾, pilocarpine hydrochloride tablets, “white tiger with ginseng decoction” herbal medicine, or other medications, or applying salivary gland massage^{6,7)}. Furthermore, removing the calculus with forceps or pulverizing it by extracorporeal shock wave lithotripsy are feasible alternative approaches^{6,9)}. However, spontaneous passage of a parotid calculus is less likely because of the pathway of the parotid gland duct through the buccinator muscles, even though the use of both conservative and alternative approaches has been reported for cases of submandibular calculus^{11,12)}. Moreover, spontaneous passage will most likely depend on the size of the calculus relative to duct width and on the exact site of calculus formation (5). Because the extraction of calculi through the salivary duct system using sialendoscopy is suitable only for calculi up to 5 mm in diameter, it appears that large calculi are hard to extract or spontaneously pass through the oral opening³⁻⁵⁾. Further, Nahlieli *et al*¹³⁾ indicated that glandular function, ductal wall thickness, stone consistency, and stone connection to the duct are related to the prognosis of endoscopic mechanical retrieval of sialoliths. This

knowledge of sialoendoscopic procedures can also be applied when discussing the possibility of spontaneous passage of salivary calculi. Specifically, it may be unreasonable to expect spontaneous passage in the case of large (>5 mm) salivary calculi and/or in cases of abnormal function and structure of the glandular and ductal system. Although there has been a previous case report of spontaneous passage of calculus from the parotid gland and duct³⁾, the diameter of the calculus was not reported. However, the present case report suggests the potential for spontaneous passage of a calculus even if its diameter is >5 mm. In the present patient, good glandular function, appropriate ductal wall thickness, and stone consistency may have prompted the spontaneous passage of the calculus from the parotid gland duct.

In the case of sialolithiasis with bacterial infection, the clinical symptoms include redness and swelling at the opening of the parotid gland and the surrounding buccal mucosa. Moreover, pus may be discharged from the opening. Because the present patient had similar symptoms, it was possible that the calculus could be extruded by the discharged pus after the administration of intravenous antibiotics. The spontaneous passage of a salivary calculus from the oral opening of the duct is a reasonable expectation; however, the calculus may be passed via another site when an abscess is ruptured^{1,9)}. In the present case, the discharge of pus was promoted by the application of pressure to the patient's cheek. Thus, even if the calculus is relatively large (diameter >5 mm), discharging pus may move the calculus out through the oral opening, thus contributing to its spontaneous passage into the mouth.

Conclusion

Herein we reported on a case with a large calculus in the parotid gland. The calculus, which had a diameter >5 mm, was discharged spontaneously with pus into the mouth from the opening of the parotid gland after the administration of intravenous antibiotics. This case provides evidence that even if the calculus is large, it may be discharged spontaneously from the oral opening.

Conflict of interest disclosure

The authors have no conflicts of interest to disclose.

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