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Giant Salivary Lithiasis: About a Clinical Case

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Abstract

This case report describes the diagnosis and surgical management of a 25-year-old male patient presenting with a giant submandibular salivary stone (sialolith). Diagnosis was established through clinical examination and confirmed with an occlusal radiograph revealing a 1.5 cm calculus in Wharton's duct. The stone was successfully removed via an intraoral surgical excision, which preserved gland function and resolved the patient's symptoms without recurrence.

Keywords

Salivary Lithiasis, Salivary Glands, Oral Floor, Surgical Removal

1. Introduction

Salivary lithiasis is the most common salivary disorder after mumps, affecting the submandibular gland in almost 80% of cases [1]. It corresponds to the formation and migration of calcium concretions in the salivary excretory tract and can occur at any age, particularly in adults between the 3rd and 4th decade of life, and more exceptionally in children. Although the aetiology of this condition is not yet fully understood, certain factors favour its appearance: salivary stasis, dental infections or inflammatory lesions in neighbouring tissues. These form a partial or total obstacle to saliva secretion, leading to an acute symptom known as hernia, characterised by swelling and moderate pain. Salivary colic, with a more severe clinical picture, is characterised by sharp pain of sudden onset radiating towards the ear [2]. We report the case of a young patient with giant salivary lithiasis who underwent endo-buccal excision surgery.

2. Clinical Case

This is a 25-year-old man in good general health who consulted for swelling of the

oral floor. His medical history reveals episodes of purulent discharge associated with acute pain that occurs during meals and subsides spontaneously for 6 months. The intraoral clinical examination revealed a swelling on the right side of the floor of the mouth, covered with erythematous mucosa. In addition, we noted inflammation of the ostium of Wharton's duct, which was turgid and oozing pus (Figure 1).

Figure 1. Swelling on the right side of the floor of the mouth, covered with erythematous mucosa, with a turgid Wharton's duct ostium expressing pus.

Two-finger palpation revealed a hard, stony, elongated mass (Figure 2). Palpation of the lymph node areas revealed no notable abnormalities.

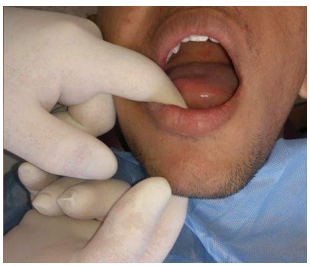

Figure 2. Comparative bi-digital palpation, performed to detect any obstacle hindering normal salivary flow, revealed a hard, stony, elongated mass.

The occlusal radiograph shows a radiopaque image projecting onto the path of the right Wharton's canal, measuring approximately 1.5 cm in length opposite the right mandibular premolars (Figure 3).

Figure 3. The occlusal radiograph shows a radiopaque image projecting along the path of the right Wharton's duct, measuring approximately 1.5 cm in length, located opposite the right mandibular premolars.

Due to the large size of the calculus and the history of recurrent infection, treatment consisted of complete surgical removal of the salivary stone via an intraoral approach, according to the following surgical protocol:

- Local anesthesia by infiltration of the floor of the mouth;
- Ligation distal to the stone to prevent it from being projected into Wharton's duct (**Figure 4**);
- Superficial incision along the duct;
- Controlled dissection using blunt-tipped scissors (**Figure 5**);
- Removal of the stone (**Figure 6**);
- Ovoid-shaped salivary stone, rough in appearance and measuring 1.5 cm in width (**Figure 7**);
- Sutures of the mucosa.

Figure 4. Ligation distal to the stone to prevent its projection into Wharton's duct.

Figure 5. Controlled dissection using blunt-tipped scissors.

Figure 6. Stone removal following gentle intraoral digital pressure.

Figure 7. Ovoid-shaped salivary stone with a rough surface, measuring 1.5 cm in width.

Analgesics and a chlorhexidine mouthwash were prescribed. The patient was advised to drink three to four liters of water every day, especially during the summer, and maintain good oral hygiene to prevent sialolith formation as much as possible. Healing was achieved with little post-operative discomfort. No recurrence was noted.

3. Discussion

Salivary lithiasis, also known as sialodochitis, is a common condition; submandibular lithiasis is by far the most common and occurs at all ages. A study of 64 individuals reporting salivary gland pain comparing sialography and sialo-MRI revealed the presence of 32 salivary lithiases, including 26 submandibular lithiases (81%) and 6 parotid lithiases (19%) [3]. In terms of size, 88% of the salivary calculi measured less than 10 mm, with the majority between 3 and 7 mm. Calculi longer than 15 mm are known as "giant calculi" or "megaliths" and are relatively rare [1] [4]. In our case, salivary calculi measuring 15 mm in width can be considered as such. Positive diagnosis of sialolithiasis is based essentially on clinical manifestations, whether mechanical, inflammatory, or infectious. Inspection of the ostium of Wharton's duct, which is red and turgid, with or without pus discharge, points to salivary pathology [5]. If a calculus is seen, bi-digital palpation confirms the presence of lithiasis. As described above, we found the triad of swelling, turgidity of the ostium, and expression of pus. It should also be noted that, if not managed properly, salivary lithiasis can lead to severe infections of the submaxillary region, which can be life-threatening: this is known as Ludwig's angina [6]. Before confirming the diagnosis, it is important to consider other causes of swelling in the floor of the mouth. The differential diagnosis includes a ranula, which typically presents as a bluish, fluctuant mass arising from mucous extravasation of the sublingual gland, and infections of dental origin, particularly abscesses related to mandibular molars, which may mimic salivary obstruction due to pain, swelling, and inflammatory symptoms. Mentioning these entities helps to better frame the clinical reasoning and highlights the relevance of the clinical and radiographic findings that guided us toward sialolithiasis in this case. When the clinical manifestations are less obvious, additional tests will confirm the diagnosis. In this case, occlusal radiographs are preferred to reveal the presence of radio-opaque calculi, as in the case of our patient, where the occlusal bite showed the presence of a

radio-opaque image projecting along the path of the right Wharton's duct, 1 cm in length, opposite the right premolars. Ultrasound is also a simple, non-invasive way of identifying radiolucent calculi with a less marked calcium tone, but its diagnostic performance is still considered imperfect [7]. Sialography can also be used to assess the functional value of the gland. It involves injecting a radio-opaque contrast medium into the salivary ducts, followed by X-rays or Computed Tomography (CT) images. Lastly, sialendoscopy, a new technique that is still not widely used, is now gradually being incorporated into the diagnostic and therapeutic tools for small, mobile lithiasis of less than 5 mm in size with no associated infectious condition [8].

The management of salivary lithiasis follows a well-codified approach. The main objective in their treatment should be above all to preserve the function of the gland while minimizing the level of complications and post-operative discomfort. A distinction is therefore made between non-surgical techniques and surgical methods with varying degrees of invasiveness.

On the one hand, non-surgical techniques consist of conservative measures such as massage of the salivary gland after meals, adequate fluid intake, and prescription of non-steroidal anti-inflammatory drugs and sialogogues [9]. Our patient, who consulted us late and had a long history of acute pain that did not respond to analgesics, was not eligible for this approach. Signs of infection, including the presence of cervical adenopathy, purulent discharge from the salivary ducts, or erythema, dictate the need for antibiotic therapy [10]. Secondarily, and in the absence of any infectious or mechanical accident, further treatment is dictated by the size, number, location, and orientation of the calculus if conservative management is unsuccessful. If the stone is visible and small, the definitive treatment will consist of expulsion by sequential bimanual pressure along the obstructed duct, in addition to optimal hydration of the patient [11].

On the other hand, a simple intra-oral surgical approach under local anaesthetic is the treatment of choice when bidigital pressure is unsuccessful or in patients with superficially located mobile calculi that can be palpated manually, as in the case of our patient. In terms of post-operative advice, massage of the salivary glands several times a day is recommended, combined with an acidic diet and sialogogues to stimulate salivary flow. It is advisable to avoid using sutures in the incised duct, as this could increase the risk of poor healing [12]. Joint excision of the causal gland is no longer a criterion for success and does not guarantee the absence of recurrence. However, surgical methods, although effective, can lead to complications such as neurological problems or persistent salivary fistula. Specifically, during an intraoral approach to the submandibular gland, the primary neurological structure at risk is the lingual nerve, which runs medial to the duct and can be injured, potentially causing temporary or permanent sensory deficits in the anterior two-thirds of the tongue. In terms of post-operative follow-up, after transoral surgical removal of submandibular calculi, the secretion rate of the treated gland is similar to that of the contralateral gland in 75% of cases. Recovery of salivary gland function is thought to be related to factors such as pre-existing glandular

infection, sialolith diameter, and patient age [9].

In addition, a number of advanced surgical therapies have been developed as an alternative to reduce the morbidity of open surgery [13]. On the one hand, sialolithotripsy is a non-invasive method of fragmenting salivary calculi into smaller portions in order to promote their elimination spontaneously or after salivation induced by citric acid or other sialogogues [9]. Shock waves can be applied extracorporeally using piezoelectric and electromagnetic techniques or intracorporeally using laser or pneumatic endoscopic devices [14]. With this technique, the surrounding tissue is damaged as little as possible, while precise fragmentation of the stone is possible. It is a suitable technique for the removal of medium-sized calculi, used in combination with other treatment methods to optimise results and ensure effective stone removal while preserving the function of the gland.

Sialendoscopy, on the other hand, is a technique requiring progressive dilatation of the ostium of the salivary gland's excretory duct using dedicated instruments to a diameter equal to that of the endoscope. The operation is then carried out under continuous irrigation with pressure and endoscopic control on the screen. To remove the calculus, this endoscopic device, initially used for diagnostic purposes, is supplemented by a basket probe or forceps, which may be combined with laser fragmentation [8]. We did not use these techniques because the calculus was easily accessible intraorally.

4. Conclusion

The presence of sialolithiasis should always be considered when a patient experiences acute pain under the mandible with or without a history of purulent discharge. To define the exact position of the calcification and establish the clinical diagnosis, precise imaging techniques and a thorough medical history are required. Despite the advent of more sophisticated and apparently effective techniques, occlusal radiographs remain a valuable diagnostic tool for sialoliths. If more recent technologies are not available, the treatment of choice for large stones remains sialolithotomy combined with the prescription of analgesics. Small stones can be treated conservatively.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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