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Exposed giant submandibular duct calculus: A case report

Thuduvage Vasanthika*; Perera Shantha

***Thuduvage Vasanthika**
Department of Clinical Sciences, Faculty of Medicine, Sir John Kotelawala Defence University, Sri Lanka
Email: vasanthikasthuduvage@gmail.com

Abstract

A 56-year-old patient presented to Ear-Nose and Throat (ENT) department of Colombo North Teaching Hospital of Sri Lanka with a history of palpable mass over the floor of the mouth. He did not have symptoms such as pain or swelling related to submandibular salivary gland. On examination, there was an exposed hard-white color mass over the right sided floor of the mouth. A lower occlusal radiograph was taken and it showed a radio opaque mass. A right submandibular salivary duct calculus was diagnosed. The calculus was removed under general anaesthesia which was 4.5 cm x 3.5 cm in size.

Keywords

sialolith; submandibular glands; salivary calculus; sialolithiasis

Introduction

Sialolithiasis is the most common disease of salivary glands [16]. Sialolithiasis is a condition where a calcified mass or *sialolith* are formed within a salivary gland, commonly affecting the duct of the submandibular gland and less commonly the parotid gland. The great majority of salivary calculi (80%) occur in the submandibular gland and in the duct [5]. Salivary calculi are usually small and measure from 1 mm to less than 1 cm. They rarely measure more than 1.5 cm [2,3]. Mean size is reported as 6 to 9 mm [4,5]. Giant Sialoliths are rare and defined as the size of 3.5 cm or larger [2].

Case Presentation

A 56-year-old male patient presented to Ear Nose Throat department, Colombo North Teaching Hospital after referring from outpatient department. He complained about a hard mass visible and palpable over the floor of mouth for the last few months duration. He did not give a history of any pain or features of any infection around the submandibular gland area.

On examination, there was a big hard white mass over the right side of the floor of the mouth. Pal-

pation of the right submandibular gland was normal. A lower occlusal radiograph was arranged and a radioopaque mass being evident in the right submandibular region. A right submandibular salivary duct calculus was diagnosed. Removal of the calculus was planned.

Surgery was done under general anaesthesia. Examination under general anaesthesia was performed and found a calculus over right sided floor of the mouth which was completely exposed, without having mucous membrane over it (Figure 1). An oral retractor was used to get a good exposure. Calculus was removed from the duct using a foreign body forces without making any incisions over the floor of the mouth (Figure 2). The calculus was 4.5 cm x 3.5 cm from its greatest lengths. It was observed that the duct was auto marsupialized due to the large size of the calculus and presence of calculus for a longer duration over the floor of the mouth. Salivary duct was kept open without suturing, for the drainage of saliva. Patient was followed up in the clinic and he did not have any features of complications.

Discussion

Sialolithiasis accounts for more than 50% of diseases of the large salivary glands leading to acute and chronic infections. More than 80% occur in the submandibular gland or its duct, 6% in the parotid gland and 2% in the sublingual gland or minor salivary glands [9]. Aetiological factors for genesis of salivary calculi include inflammatory, infective, mechanical, neurogenic, and chemical. Stone formation is currently thought to be multifactorial, leading to the precipitation of amorphous tricalcic phosphate around an organic matrix of salivary mucin, desquamated epithelial cell, and bacteria [16].

Salivary calculi are usually small and measure less than 1 cm. Giant calculi are rare and defined as the size of 3.5 cm or larger [2]. Large calculi may perforate the floor of the mouth by ulcerating the duct or may result in a skin fistula by causing a suppurative infection [6]. Although large sialoliths have been reported in the body of salivary glands, they have been rarely been reported in the salivary ducts [13], Giant salivary gland calculi and bilateral cases are considered as rare cases. Most giant salivary calculi adopt an oval or elongated shape. Giant calculi are described as being hard in texture, yellow in color and with a porous aspect [1].

Several factors predispose the submandibular gland to from stones. These include the length of the duct and caliber of the duct, as well as the direction of flow and content of the saliva [16]. Wharton's submandibular ducts are longer and of larger caliber than parotid (Stenson's) ducts. These factors, along with the need for saliva to flow against gravity, result in slower salivary flow rates. Saliva produced in the submandibular gland is more alkaline than that produced in the parotid glands, with a higher calcium and mucin concentration. The predisposition to calculi, and ability to tolerate expansion, lead to a higher incidence of giant calculi associated with this gland [7].

Diagnosis of giant salivary calculus is often straight forward from a thorough history taking and clinical examination. Special investigations are useful in confirming the diagnosis and plan for treatment. Characteristic presenting symptom is pain and swelling of the concerned gland in response to any salivary stimulus and symptoms gradually reduced with time. Bimanual palpation of the floor of the mouth, in a

posterior to anterior direction is advised, to reveals a palpable calculus in large number of cases.

Imaging studies are very useful for diagnosing sialolith. The best view for visualizing radiopaque stones is a standard mandibular occlusal radiograph [12]. Plain radiography is able to show only 80-90% of submandibular stones (which are usually in the duct) and 60% of parotid duct stones (frequently found within the gland itself). Ultrasound provides an excellent, non-invasive method of detecting sialoliths [1]. Stones that are greater than 1.5 mm and of high mineral content are reported to be identifiable on ultrasound with an accuracy of 99 % [15].

Other diagnostic methods include sialography, computed tomography, and scintigraphy for sialoliths. Computerised tomography (CT) scanning is more expensive, yet has been described as the most accurate non-invasive technique for defining the location of stones [1]. Currently, magnetic resonance sialography obtained in two or three dimensional images is suggested for diagnosis of sialoliths, but these methods are not suitable to see the inner duct system of the salivary glands [11].

Different treatment options may be selected according to the size and location of the sialolith [3]. Small duct calculi may be "milked out" through the ductal orifice using bimanual palpation. Sialoendoscopy is a new way and minimally invasive technique for treating obstructions of the ductal system. Sialoendoscopic system was developed in the 1990's as an endoscopic technique, and provides to examine the ductal system completely due to the scopes are so small [12], Sialoendoscopy can be used for both diagnostic and treatment purposes. Yu et al reported that sialoendoscopy was superior in diagnosis of calculi to plain film or even to magnetic resonance imaging for especially the small and more distal located stones. If the stone is too large or located in the proximal duct, piezoelectric extracorporal shock wave lithotripsy or surgical removal of the stone or removal of gland may be required [4]. Submandibular gland excision is recommended in cases of substantial intra-glandular caliculli, which are inaccessible via a trans-oral approach.

Recurrent or continuous obstruction of the salivary duct may lead to acute or chronic sialadenitisrequiring surgical removal of the gland [2]. Although chronic sialedenitis secondary to persistent obstruction from a giant calculus leads to a fibrotic and poorly functioning gland, symptoms apparently resolve after calculi removal [15].

The giant sialolith should be removed in a minimally invasive manner, via a transoral sialolithotomy, to avoid the morbidity associated with sialadenectomy [13]. Possible complications of this procedure include, duct stenosis and lingual nerve damage. Sialendoscopy is now an established intervention for stone removal, and has been described for use in giant salivary calculi [10]. The incorporation of extracorporeal short-wave lithotripsy to endoscopic removal has also been shown to be an effective modality and an alternative to conventional excision. Excision of the submandibular gland with the stone in certain situations should still be preferred as the gold standard of treatment, leaving the ductal stone for endoscopic removal [8].

All patients should be followed up regularly as recurrence has been reported in the literature [14].

In our case, it was observed that duct was auto marsupialized due to the large size of the calculus and long duration of presence of calculus over the floor of the mouth. So, the stone was easily removable intra-orally without an incision made over the mucosa of the floor of the mouth. As the duct was open to the floor of the mouth, there were no obstructive feature of the submandibular salivary gland.

Conclusion

Sialolithiasis is a common condition affecting the salivary glands predominantly involving the submandibular glands. Giant salivary calculi are rare to present and most cases present with the classical features of pain related to salivary stimulation. Even though modern methods of investigation and intervention are available for the treatment of giant calculi, trans oral excision of calculusor sialodenectomy remain the mainstay of treatment.

Figures

Figure 1: Submandibular duct calculus over the floor of the mouth(intra operative)

Figure 2: Removed calculus with the scale

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Authors Infomation: Thuduvage Vasanthika[1]*; Perera Shantha[2]
[1]Department of Clinical Sciences, Faculty of Medicine, Sir John Kotelawala Defence University, Sri Lanka
[2]Department of Otolaryngology, National Hospital of Sri Lanka, Sri Lanka

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