

CASE REPORT

Sialostent for Warthon's Duct Repair in Submandibular Sialolithiasis in Pediatric Patient

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ABSTRACT

Background: Sialolithiasis is disease found in the salivary glands which is marked by obstruction of salivary secretion by salivary gland stone. Submandibular gland is the highest predilection for sialolithiasis with 80% occurrence rate. The gland stones in Wharton's duct cause ductal stenosis and inflammation that causing pain. The main purpose of surgery on sialolithiasis is not only to take salivary gland stones, but the most important thing is to maintain the warthon duct as an outlet for the submandibular salivary glands. **Objective:** This paper explains case of sialolithiasis related to the management of Warthon's duct repair surgery with sialostent in pediatric. **Case:** A 5 years-old female patient came to our hospital with a complaint of swealing in the floor of the mouth for 2 weeks that sometimes disturbing when eating. Clinical examination revealed a mobile 5 mm swealing and inflamation in the floor of the mouth in the sublingual caruncle. Ultrasoundgraphy examination results showed a picture of a very hyperechoic circle measuring 3 mm. Patient was planned for surgical removal of gland stone and Warthon's duct repair with sialostent under general anesthesia. **Case management:** The suture technique for sialostent fixation is an important key to the success of this surgery, especially in children, because children often feel uncomfortable and want to remove this sialostent that appears intraorally. Result of this successful surgery is the Warthon's duct can be maintained without relapse. Good soft tissue healing and normal salivary gland function. There was no complications in this surgical result. Sialolithectomy in combination with sialostent is a promising method for repairing the Wharthon duct. **Conclusion:** This method is able to correct the unfavorable curvature of the Warthon duct, prevent stenosis, and avoid sublingual caruncle closure due to inflammatory and healing processes.

Keywords: Warthon's duct repair, ductoplasty, sialolithectomy, ultrasoundgraphy, submandibular salivary gland

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INTRODUCTION

Sialolithiasis is the most common salivary gland disorder. 1.2% unilateral salivary gland swelling is sialolithiasis. Submandibular glands are the most predilections of sialolithiasis, which is 80%, followed by 19% parotid gland and 1% sublingual gland^[1]. Sialolithiasis generally appears between the ages of 30 and 60, and it rarely occurs in children. Sialolithiasis in children is only 3% of all cases of sialolithiasis have been reported. Men are twice as affected as women^[2]. Since most cases of sialolithiasis in children are rarely discussed in the literature, this paper explains case of sialolithiasis in 5 years old child related to the management of Warthon's duct repair surgery with sialostent.

Sialolithiasis is a common disease in adults, rarely found in cases of children. Cases of pediatric sialolithiasis report no more than 150 reports^[3,4]. This disease is the formation of glandular obstruction that is influenced by pH, mucin content, and Ca^{2+} concentration in saliva. The formation of stones in the salivary gland duct requires a long process. This is what causes cases of sialolithiasis rarely occur in pediatric. Debris, bacteria, and foreign substances can also cause the formation of glandular stones. However, the sublingual caruncle and Wharton's duct in children are very small. This is also one of the reasons sialolithiasis rarely occurs in children^[5,6].

The main purpose of surgery on sialolithiasis is not only to take salivary

gland stones, but the most important thing is to maintain the Warthon duct as an outlet for the submandibular salivary glands. After the gland stone is removed, sialostent is positioned, and fixed with surgical sutures. This needs to be done to avoid salivary stenosis and fistula, as well as to achieve recanalization^[7,8].

CASE AND CASE MANAGEMENT



Figure 1. Clinical examination revealed a mobile 5 mm swelling in the floor of the mouth in the sublingual caruncle.

A 5 years-old female patient came to our hospital with a complaint of swelling in the floor of the mouth for 2 weeks that sometimes disturbing when eating. Clinical examination revealed a mobile 5 mm swelling in the floor of the mouth in the sublingual caruncle. The color was yellowish-white with hard consistency. The mucosa around the swelling was red and little response of pain in palpation (Figure 1). The submandibular and sublingual lymphnode were normal and not palpable.

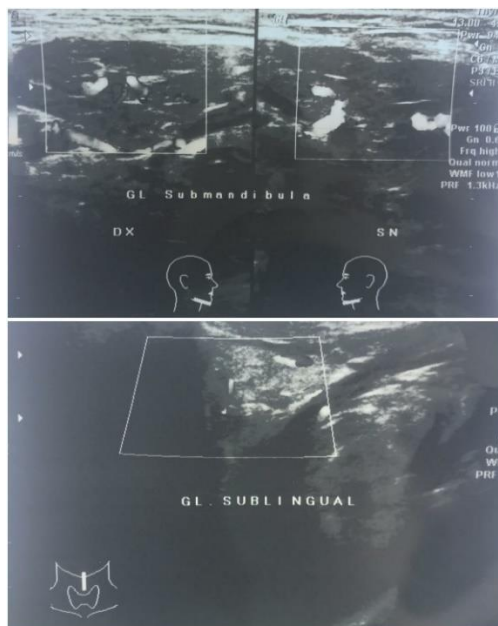


Figure 2. Submandibular and sublingual USG showed hyperechoic circle measuring 3 mm. Widening of the Wharton's duct was also detected.

Occlusal radiography didn't show abnormal radiopaque lesion, so we did ultrasoundgraphy on her sublingual and submandibular region. Ultrasonography is quite capable of detecting cases with suspected sialolithiasis. This examination can visualize stones in many cases of sialolithiasis and also the salivary gland itself^[9]. Ultrasound examination results showed a very hyperechoic circle image measuring 3 mm (Figure 2).

A diagnosis of sialolithiasis was given base on clinical and radiological examination. Patient was planned for surgical removal of gland stone and Warthon's duct repair with siaolostent under general anesthesia.



Figure 3. Sialostent was placed intraductal after the gland stone was removed.

Before the incision was started, the Warthon's duct was ligated with silk at the distal of palpated stone gland. This step has to be done to prevent the gland stone move to the deeper site of the duct. Incision was made on the mucosa that covered the gland stone. After all the gland stone were taken out, the sialostent was inserted into the duct at least 2 cm inside the lumen of Wharton's duct. The sialostent was fixed intraorally with silk to keep it stay (Figure 3).



Figure 4. Illustration of Suturing Method



Figure 5. Sialostent was well placed ten days after surgery.



Figure 6. Sialostent was removed after ten days.



Figure 7. Ten days after surgery, the sublingual caruncle was created and functional well.

The suture technique is one of important part in this procedure (Figure 4). The suture must be adequate to maintain the sialostent in its position for at least 7 to 14 days. At the end of the procedure we did aspiration from the stent and the saliva was pulled out. This step was done to make sure the stent had been inserted to the Warthon's duct. We have discharged patients the first postoperative day. Antibiotic was administered for 6 days. Ten days after surgery, the sialostent was still in the warthon duct. The sialostent

was taken out, the healing was satisfactory and the duct still intact without relapse (Figure 5, 6, and 7).

DISCUSSION

Sialolithiasis can be diagnosed based on clinical appearance. Occlusal radiography is a very useful examination in determining radiopaque stones. However, stones <3 mm in size will be difficult to see with this examination. In this case the occlusal radiography was examined, but the stone was not seen. Sialography is useful in patients who show signs of sialadenitis associated with radiolucent or deep submandibular/parotid stones. Sialography is contraindicated in acute infections or patients who have contrast validity.^[10] Therefore, in this case ultrasound is the most appropriate choice to help establish the diagnosis. Ultrasonography has an accuracy of 99%, considered the gold standard in diagnosis. This examination can visualize stones in many cases of sialolithiasis and also the salivary gland itself^[9]. Ultrasound examination results showed a picture of a hyperechoic circle measuring 3 mm.

The management of sialolith is based on its location and the symptoms associated with it. This paper explains case of sialolithiasis in 5 years old child related to the management of Warthon's duct repair surgery with sialostent. Surgery was done under general anesthesia. Surgery on sialolithiasis is not only to take salivary gland stones, but the most important thing is to maintain the warthon duct as an outlet for the submandibular salivary glands.

The choice of management of sialolithiasis is based on the size of the glandular stone and its location from

the sublingual caruncle. The size of glandular stones and Wharton's duct in children are generally small around <5 mm, so extraoral surgery is rarely performed. This is what distinguishes sialolithiasis in pediatric from adults. The principle of choosing sialolithiasis management in children and adults is no different^[5,6].

As we know before, the submandibular salivary gland is the highest predilection of sialolithiasis because it has curved upward duct against gravity around the lingual nerve and the mylohyoid muscle. Placement of the sialostent in the Wharton's duct can correct the unfavorable angle of Wharton's duct. The aim of this procedure is to prevent recurrence of new stone. Sialostent also prevent the obstruction of the ductal lumen by postoperative edema or unwanted healing of incision wound. Stenosis of the Wharton's duct also often occur when conventional surgery was done. The placement of the sialostent will keep the width of Wharton's duct lumen to prevent stenosis^[11,12,13].

Sialostent must be maintained for 7 to 14 days to provide oral mucosal healing time, which occurs quickly compared to the epithelium of the skin. This duration is also needed to restore the normal function of the submandibular salivary gland, which generally occurs for 7-21 days. This also provides an opportunity for calculus fragments, which may still be left behind when surgery, are pushed out by salivary flow. All of these things can prevent recurrence^[14,15,16]. The healing was accompanied by a temporary external secretion of saliva from the wound immediately after removal of the sialostent.

Main goal of treatment for sialolithiasis is not just removing the

glandular stones. Preservation of the wharton duct is more important than that. Sialolithectomy in combination with sialostent is a promising method for repairing the Wharthon duct. This method is able to correct the unfavorable curvature of the Warthon duct, prevent stenosis, and avoid sublingual caruncle closure due to inflammatory and healing processes.

CONCLUSION

The technique of fixating sialostent in pediatric sialolithiasis is a matter of concern for the child's comfort and stent retention in the oral cavity.

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