Case Report

# Management of Ductal Sialolith Simplified: A New Technique

**Abstract**

Sialolithiasis is a common salivary gland disease. It may cause swelling of the gland, infection of the gland, or even death of glandular parenchymal cells. Various treatment modalities are available for management of sialolithiasis such as extracorporeal shock wave lithotripsy, sialoendoscopy, laser intracorporeal lithotripsy, interventional radiology, the video-assisted conservative surgical removal of the parotid, and submandibular calculi. These sophisticated procedures may not be available in all health-care centers. In this article, a new simple yet precise technique for management of ductal sialolith with minimum armamentarium is introduced.

**Keywords:** *Conventional radiography, ductal sialolith, gutta-percha, natural ductal papilla preservation*

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## Introduction

Obstructive sialadenitis is the most frequent nonneoplastic salivary disorder.[1] It may be due to calculi (sialolith), fibromucinous plugs, duct stenosis, foreign bodies, anatomic variations, or malformations of the duct system leading to a mechanical obstruction associated with stasis.[2] Sialolithiasis accounts for >50% of the salivary gland diseases.[3] Proper management of sialolith is necessary to avoid morbidity and mortality. Management of sialolith includes extracorporeal shock wave lithotripsy, sialoendoscopy, laser intracorporeal lithotripsy, interventional radiology, the video-assisted conservative surgical removal of the parotid, and submandibular calculi.[4] In places where these sophisticated modalities are not available, the traditional methods of management of sialolith are still in practice such as papilla dilatation and milking, incision of duct, or sialoadenectomy. This article describes a simple and innovative technique for management of ductal sialolith surgically using a simple instrument like periodontal probe and materials such as gutta-percha and stent.

## Case Report

A total of four patients reported to the Department of Oral Medicine and Radiology, Dental College, RIMS, with a chief complaint of swelling over the ear region (two patients) and neck region (two patients) during meals which reduces after the meal. The patients were associated with occasional pain. Pus discharge was present only in one case. At the time of presentation, there were mild swellings over the parotid and submandibular regions which were soft to firm in consistency and mild tender on palpation. The patients were subjected to conventional radiography for diagnosis of sialolith. Intraoral periapical radiograph (IOPAR) for parotid cases and occlusal radiograph for submandibular cases were used. Conventional radiography of sialolith revealed radiopacity with varying radiodensity. After the conventional radiography, the patients were screened using ultrasonography to rule out any other undiagnosed sialolith, but none were found. Ultrasonography of sialolith revealed a hyperechoic mass with acoustic shadowing [Figure 1a and b]. After the radiological assessment, patients were planned for removal of sialolith.

After diagnosing the presence of sialolith radiologically, patients were planned for determination of distance between the natural ductal papilla and the sialolith. Stensen's papilla (for parotid sialolith) and Wharton's papilla (for submandibular sialolith) were located using periodontal probe. Milking the gland also facilitates in locating the ductal papilla by visualizing the point from where saliva flows out. Premarked gutta-percha

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point (any size between 15 and 80 with 28 mm length) was used to determine the distance between the ductal papilla and the sialolith [Figure 2a]. The gutta-percha point was then inserted into the Wharton's duct [Figure 2b] or parotid duct [Figure 2d] till the premarked length. Radiographs (IOPA films for parotid duct and occlusal films for submandibular duct) were taken, and the distance of the sialolith from the papilla was determined [Figure 2c and e].

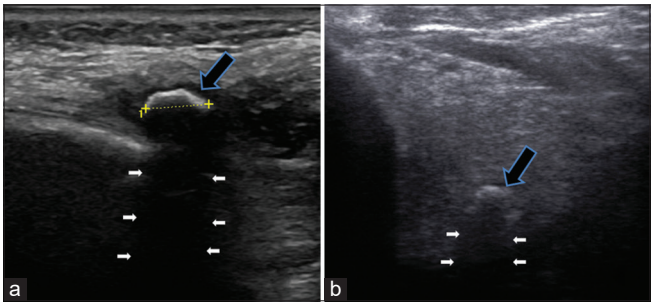


**Figure 1: (a) Ultrasonography showing hyperechoic parotid ductal sialolith (black arrow with blue outline). Note the hypoechoic zone due to acoustic shadowing (white arrows), (b) ultrasonography showing hyperechoic submandibular ductal sialolith (black arrow with blue outline). Note the hypoechoic zone due to acoustic shadowing (white arrows)**

After locating the sialolith, the removal of sialolith was planned. Local anesthesia (infiltration) was given. The periodontal probe was inserted into the duct till the determined length [Figure 3a], and incision was made longitudinally through the duct against the probe till the papilla [Figure 3b]. The duct was dissected longitudinally along its course [Figure 3c]. Sialolith was then visualized and removed [Figure 4a and b]. Lavage of the duct was done with saline. A stent (catheter part of IV cannula 24G which is made up of fluoropolymer) was placed within the dissected duct [Figures 4c and d; 5]. After the stent placement, a simple interrupted suturing of the oral mucosa over the stent was done using mersilk suture 4-0. A firm knot was given around the stent along with the last suture to prevent the dislocation of the stent from the duct. Postoperatively, the stent was placed for 7–10 days and removed. Postoperative period was uneventful. Sutures were removed within 2 weeks. Salivary flow from the papilla was observed and whole salivary flow was evaluated on the day of placement of stent, 1 week postoperative, on the day of stent removal, and 3 weeks postoperative. Salivary flow was evaluated using draining method into preweighted test tube allowing saliva to flow from the mouth for 2 min. Salivary flow was normal in all the follow-ups.

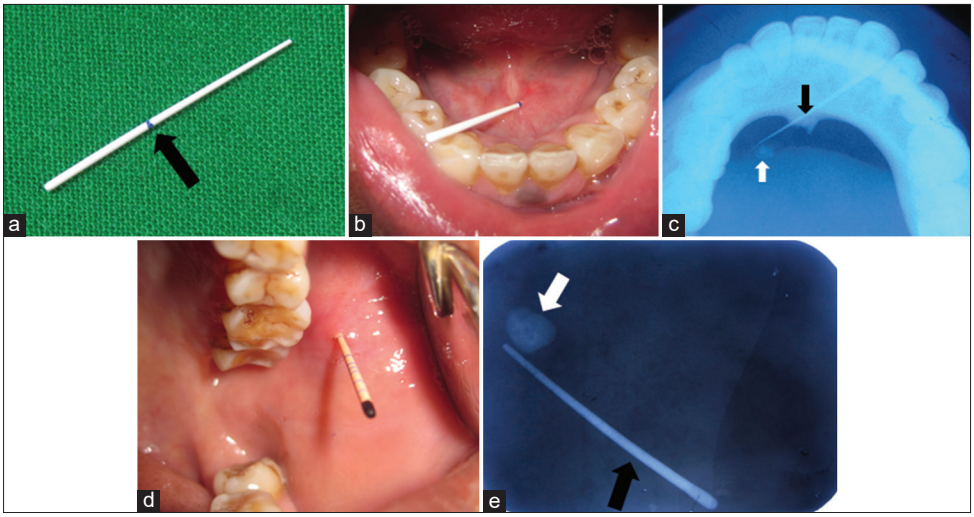


**Figure 2: (a) Gutta-percha with marking (arrow), (b) insertion of gutta-percha into the Wharton's duct up to the marking, (c) occlusal radiograph showing sialolith (white arrow) and gutta-percha (black arrow), (d) insertion of gutta-percha into the Stensen's duct up to the marking, (e) intraoral periapical radiograph showing sialolith (white arrow) and Gutta-percha (black arrow)**

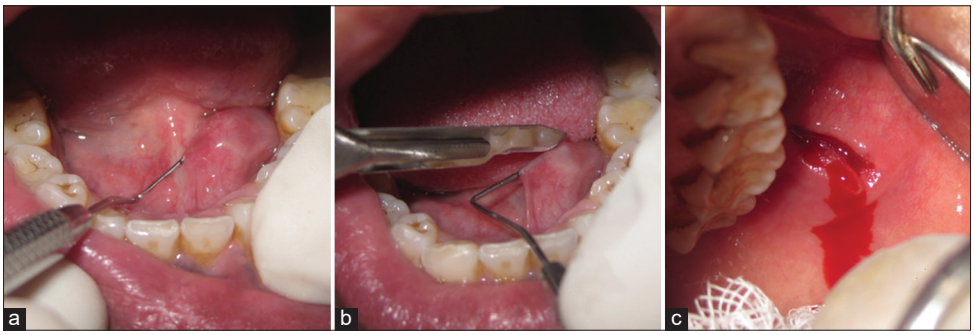


**Figure 3: (a) Insertion of the periodontal probe into duct up to the predetermined length, (b) incision of the mucosa with the periodontal probe forming a base as well as an indicator for the length of incision to be given, (c) a dissected duct (Stensen's duct) longitudinally along its course**

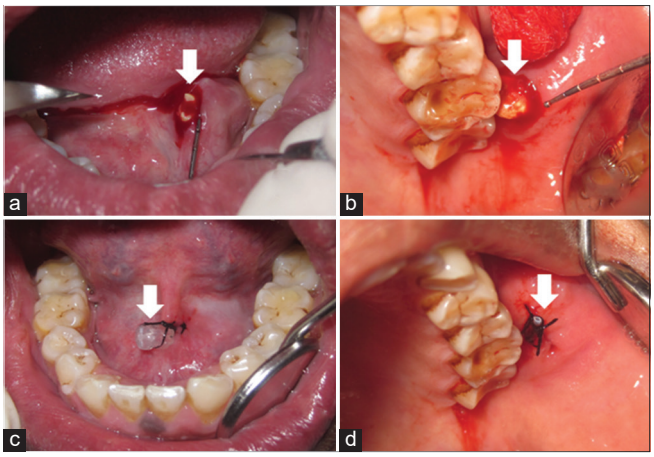


**Figure 4: (a) Image showing submandibular ductal sialolith (white arrow), (b) image showing parotid ductal sialolith (white arrow), (c) stents (white arrow) inserted in Wharton's duct and sutured with mucosa to avoid displacement, (d) stents (white arrow) inserted in Stensen's duct and sutured with mucosa to avoid displacement**

## Discussion

Sialolith is difficult to determine since many cases are symptomatic and very painful, due to its severity in pain and swelling characteristics clinicians may tend to confuse with odontogenic infections and diseases and find difficult in diagnosing.[5] Normally, for surgical management of sialolith, incision is directly placed over the suspected location of sialolith through the mucosa and reaches the duct.[6-8] After the removal of the sialolith, the site is left open or the stent is directly placed into the site, hence creating a new ductal opening or papilla. In this new technique, the incision starts from the location of the sialolith and extends till the natural papilla under the guidance of a periodontal probe. After the removal of sialolith, the stent was placed throughout the dissected part of the duct, thus preserving the natural papilla.

Conventional radiology is simple and useful in diagnosing sialolith but difficult to diagnose sialolith which is located far posterior. Ultrasonography proves to be a useful imaging modality in diagnosing intraglandular sialolith, multiple sialoliths, lesser calcified sialolith, and sialoliths which are located far posterior.[9]

One of the most important steps is locating the sialolith. Too rigid materials should not be used as it may traumatize the salivary duct. A material that provides the required stiffness and flexibility is gutta-percha. It is flexible and can be slightly precurved according to the desired anatomy. The length of available gutta-percha is approximately 28 mm. There is a need to develop longer gutta-percha to address deeper sialoliths. Locating the sialolith using gutta-percha radiographically gives an idea of the length of the duct that needs to be incised and thus avoiding unnecessary extension of the incision. It is useful, especially in case of sialoliths which are clinically less evident.

**Figure 5: Stent within the right submandibular duct**

Insertion of periodontal probe into the duct and lifting the duct slightly gives a clear picture of where and in which direction the incision should be given. It also makes possible to give a continuous incision through the mucosa as the probe forms a hard base and supports the mucosa. Specialized longer probes may be developed for use in cases of deeper sialolith.

Incision of mucosa directly over the sialolith will create a new papilla formation. This will lead to formation of a dead space within the duct between the natural and the new papilla. In this article, longitudinal incision was given from the location of sialolith till the natural papilla and sialolith was removed. The stent was then placed and sutured. There was no new papilla formation (natural papilla preservation procedure). After the removal of sialolith, placing a stent is very essential because it allows saliva to flow without obstruction postoperatively, preserves the natural papilla, and stabilizes the duct during healing.

This technique is significantly important for sialoliths which are clinically less evident but radiologically diagnosed. In hospitals or health-care centers where higher treatment modalities such as sialendoscopy and extracorporeal shock wave (EC) lithotripsy are not available, this technique may be considered as a Nobel technique for managing ductal sialolith with precision.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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