Sialendoscopy
Minimally Invasive Surgery for Benign Salivary Gland Diseases
Dr Loh Woei Shyang

Mdm Ng began having right parotid swelling and pain in December 2009. She initially consulted her family physician and the parotitis was treated with oral antibiotics. Shortly after completing the antibiotics, the right parotid swelling recurred and needed a repeat course of antibiotics. She was subsequently referred to NUH Otolaryngology-Head & Neck Surgery’s Outpatient Clinic for further management. CT scan of the parotid gland performed showed a 3mm calculus in her right parotid duct.

Conventionally, she will require open surgery in the form of trans-oral removal through the Wharton’s duct or a parotidectomy. She was very concerned as she is a chronic renal failure patient on hemodialysis and is worried about having higher risks going through the surgery. So when the option of sialendoscopy to remove the calculus was given to her, she was very keen to undergo the particular procedure, which renders any open surgical approach unnecessary.

Sialendoscopy is a procedure whereby small endoscopes are introduced into the major salivary ducts. It can be a diagnostic procedure as well as a therapeutic one. Many salivary gland infections or inflammations are a result of ductal calculi or ductal stenosis. Occasionally, they can be due to saliva stasis or mucous plugging. The glandular swelling is a response to the damming of salivary flow, resulting to secondary inflammation and infection. Few studies have shown that removal of the ductal pathology allows restoration of the gland function; hence, salivary glands may be salvaged by removing the obstructive pathology.1,2

Obstructive Salivary Gland Diseases
The study of sialadenitis started in 1896, when Kuttner published his observations in two patients with chronic submandibular glands, which were initially diagnosed as salivary gland malignancy, as the swelling caused by chronic inflammation led to the clinical appearance of malignancy. He later found that the inflammation was a result of sialolith in the gland of one of the patients.

In chronic sialadenitis, there seemed to be a cycle of obstruction by the sialoliths inciting an inflammatory reaction, resulting in glandular atrophy and fibrosis. The decreased secretory activity of glandular atrophy facilitates ascending infection and thus, sustaining the inflammation. Sialolithiasis is more commonly seen in the submandibular gland due to the higher calcium content in its saliva and the lack of spontaneous secretory activity in the absence of parasympathetic stimulation. Stenosis or stricture of the main duct can sometimes be seen in chronic sialadenitis and is likely secondary to...
chronic inflammation. The partial obstruction of the salivary flow caused by the stenosis is an important additional propagating factor in the persistence of sialadenitis and formation of sialoliths.

**Sialendoscopy Service**

NUH’s Department of Otolaryngology-Head & Neck Surgery introduced this service in 2010, lead by the author and A/Prof Thomas Loh. This came after getting hands-on training and experience in Geneva, Switzerland, as well as many hours of practice in the animal lab on porcine specimens. So far, the procedure has been performed in 15 patients for various inflammatory salivary gland diseases.

**Sialendoscopes**

Sialendoscopes are small-caliber fiberoptic telescopes that can be introduced into the salivary ducts. There are two types of sialendoscope: the flexible sialendoscopy or the semi-rigid sialendoscopes. The diameter of endoscopes ranges from 0.9mm to 2.7mm and can be configured as a single-, double- or triple-lumen scopes. The additional lumen allow introduction of instruments for therapeutic work. Dormia basket, gasping forceps and even laser fibers can be passed into these endoscopes. In addition, there is a lumen for saline flush to dilate the salivary duct.

**The Procedure**

The main indication for sialendoscopy is to aid in the evaluation of any unexplained major salivary gland swelling. Patients are usually counselled for the procedure, as well as informed regarding the likelihood of per-oral duct exploration and possible salivary gland excision. The complications of the procedure are sialadenitis and small possibility of oral cavity swelling, necessitating proper airway control.

The procedure can be done under local anaesthetics but general anaesthesia is preferred as there might be much manipulation involved. Intravenous antibiotics and steroids are given to minimize post-operative infection and oedema. The procedure begins with sequential dilatation of the salivary duct papillae to allow the ease of introduction of the sialendoscope [Figure 1]. Once entered, the sialendoscope can be navigated through the branches of the salivary duct down to the second-generation ducts.

Upon diagnosis, the sialendoscope can then be used as a therapeutic tool. Small Dormia baskets can be deployed to remove small calculi [Figure 2 & Figure 3]. Larger calculi (>3mm) might require prior fragmentation using laser or extracorporeal lithotripsy. Balloon dilatation can be performed to widen stricture and salivary duct stent can be inserted to maintain patency. An added advantage of sialendoscopy is the ability to re-inspect the salivary duct for additional pathology or calculi [Figure 4].

Patients can usually be discharged on the same day.

**Case Discussion Continued**

Mdm Ng underwent the procedure under general anaesthesia. A 3mm calculus was seen in the mid-portion of right parotid duct. The calculus was removed with Dormium basket and inspection of the remaining duct was unremarkable. Mdm Ng recovered uneventfully from the procedure and was recommenced on normal diet immediately post-operatively. She was discharged the next day. Mdm Ng has not experienced any further parotitis following the procedure.

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**References**


**Figure 4.** Sialendoscopy: tip of sialendoscopy (illuminated point) within parotid gland

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**Dr Loh Woei Shyang** is a Consultant in the Department of Otolaryngology-Head & Neck Surgery at the National University Hospital. He started his residency in Otolaryngology in Singapore in 1998 and was elected a Fellow of the Royal College of Surgeons of Edinburgh in January 2000. He went on to complete his residency in 2003 and continued to pursue a fellowship in Paediatric Otolaryngology in The Children’s Hospital in Denver, Colorado, USA. Dr Loh is trained in all aspects of general as well as paediatric otolaryngology. He also started sialendoscopy service in NUH in 2009.