Available online at www.sciencedirect.com

SciVerse ScienceDirect

British Journal of Oral and Maxillofacial Surgery 53 (2015) 54–57

BRITISH Journal of Oral and Maxillofacial Surgery

www.bjoms.com

Incidence of different causes of benign obstruction of the salivary glands: retrospective analysis of 493 cases using fluoroscopy and digital subtraction sialography

L.I.T. Lee [a], R.R. Pawar [b,d], S. Whitley [c], J. Makdissi [b,*]

[a] *Barts & The London School of Medicine and Dentistry, Queen Mary University of London, Garrod Building, Turner Street, Whitechapel, London E1 2AD, United Kingdom*

[b] *Dental and Maxillofacial Radiology, Queen Mary University of London, Barts & The London School of Medicine and Dentistry, Institute of Dentistry, Turner Street, London E1 2AD, United Kingdom*

[c] *Department of Oral and Maxillofacial Surgery, Barts Health NHS Trust, Whitechapel, London E1 1BB, United Kingdom*

Accepted 19 September 2014
Available online 11 November 2014

Abstract

To identify the incidence of different causes of benign obstruction of the salivary glands, we retrospectively analysed 788 anonymised sialography reports of 719 patients referred to the department of dental and maxillofacial radiology between 2006 and 2012. Reports that showed evidence of benign obstruction were included ($n = 493$). Salivary stones were identified in 151 (31%), ductal strictures in 115 (23%), and mucus plugs in 295 (60%). In 67 cases (14%) there was evidence of 2 or 3 causes of obstruction. As previously reported, mucous plugs were the most common finding, possibly because of the use of fluoroscopy or digital subtraction sialography, or both. These methods enable images to be captured during the initial filling of the main duct and are likely to prevent mucus plugs from being obscured by the contrast medium, which is the case in conventional sialography when a single image is produced after the contrast has been injected.

Keywords: Sialography; Minimally invasive interventional procedures; Mucus plugs; Salivary stones; Ductal strictures

Introduction

Normal salivary secretion is crucial for the maintenance and preservation of oral health, and its important physiological role can be seen in patients with aberrant secretion of saliva.[1] Benign obstruction of the salivary gland is defined as a physical obstruction within the salivary architecture that affects the normal flow of saliva, and is caused by salivary stones, strictures (narrowing of the ductal architecture), and mucous plugs within the duct.[2,3] Clinically, patients present with recurrent pain and swelling of the affected gland, which becomes worse when eating. The condition, which is known as "meal-time syndrome", results in reduced salivary flow and has a serious impact on overall well-being and quality of life.[4,5] Sialolithiasis, the formation of salivary stones (Figs. 1 and 2), is often encountered and is regarded as the main cause of benign obstructive disease. Post-mortem studies have shown that stones are present in about 1.2% of the population, and they account for around 66% of all benign obstructions.[6–8] Strictures impair or totally obstruct the normal flow of saliva (Fig. 3)[9] and have been reported as the second commonest cause, accounting for almost 25%

* Corresponding author.
E-mail address: j.makdissi@qmul.ac.uk (J. Makdissi).
[d] Tel.: +44 020 7882 7315.

http://dx.doi.org/10.1016/j.bjoms.2014.09.017

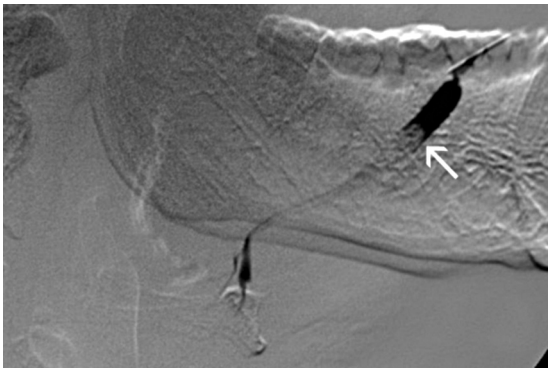

Fig. 1. Digital subtraction image showing the obstruction (white arrow), probably a stone.

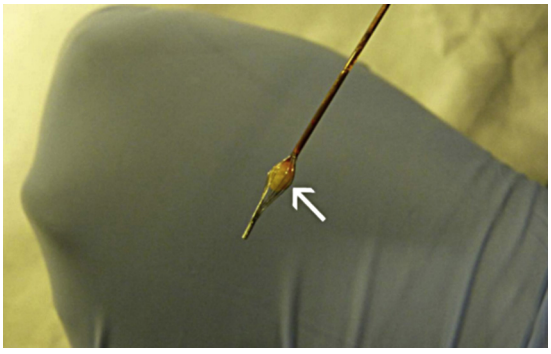

Fig. 2. Stone (arrow) removed using a minimally invasive technique.

of cases. Mucous plugs have a reported incidence of 4.2% and account for far fewer cases (Figs. 3–5).[10] We know of few studies that report the incidence of all types of benign obstructions.[4,10]

Fluoroscopy and digital subtraction sialography involve the introduction of radiopaque contrast into the duct and gland using a blunt catheter while images are captured, and enable clear visualisation of the architecture.[11,12] However, most articles we found focussed on salivary stones,[5,6,8,13–17] and to our knowledge, no previously published study has used fluoroscopy or digital subtraction sialography, or both,

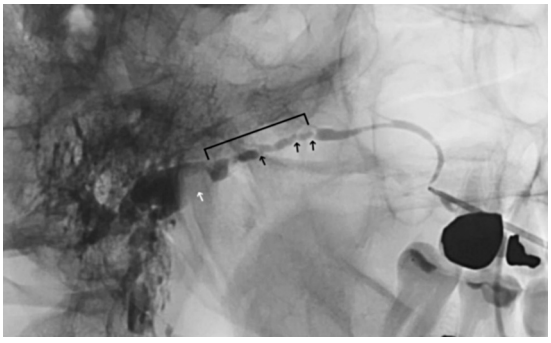

Fig. 3. The mid-portion of the main duct shows irregularity with strictures (black arrow) and mucous plugs (white arrow).

Fig. 4. Digital subtraction sialography showing the main duct filled with contrast medium. The arrows show the presence of incomplete filling.

to identify all the types of benign obstruction. Ultrasound or sialography is indicated in patients with intermittent food-related swelling,[18] but the choice of investigation largely depends on the hospital's facilities. Computed tomography (CT), magnetic resonance imaging (MRI), sialography, and ultrasound, are those most commonly available.[13,14]

We aimed to identify the incidence of salivary stones, ductal strictures, and mucous plugs in patients referred to the department of dental and maxillofacial radiology with benign obstruction of the salivary glands.

Material and methods

We obtained approval for the study from the Joint Research Management Office (Research and Development).

We identified patients who had sialography between 2006 and 2012 by a search of our electronic radiology information system. The reports were anonymised. Data on age, sex, the gland affected (left or right, parotid or submandibular), and the main cause of obstruction (stone, stricture, or mucous plug) were then entered on to a Microsoft™ Excel spreadsheet.

A total of 788 sialography reports were identified (719 patients). Those with evidence of benign obstruction to the salivary glands were included ($n = 493$) and those without were excluded ($n = 295$).

A single consultant in dental and maxillofacial radiology did all sialography examinations according to the depart-

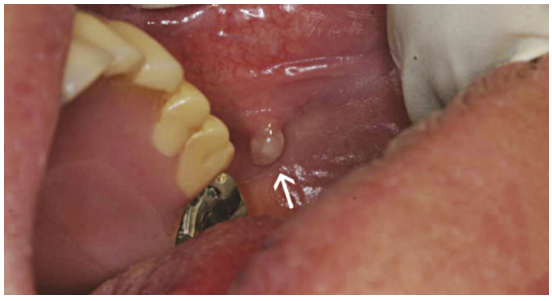

Fig. 5. Clinical photograph showing mucous plugs being expelled from the left parotid gland.