

Stensen's duct obstruction by foreign body and subsequent candidal infection of the parotid gland

PANAGIOTIS K. STEFANOPOULOS, D.M.D., DEMETRIOS TH. KARAKASSIS, D.M.D., M.D.,
AIKATERINI TRIANTAFYLIDOU, D.M.D., M.D.

Abstract

A case of chronic inflammation complicated by *Candida* infection of the parotid gland in a 50-year-old woman is presented. This eventually proved to be caused by Stensen's duct obstruction due to an unusual radiolucent foreign body. The process that led to the proper diagnosis is presented and the importance of surgical exploration of the main duct in cases suggesting distal duct obstruction is stressed.

Key words: Parotid Gland; Foreign Bodies; *Candida*

Introduction

Acute forms of sialadenitis are usually caused by bacteria or viruses, whereas secretory disorders and immunopathologic reactions play an increasingly important role in chronic cases. Non-viral parotitis is usually due to organisms ascending the duct system from the oral flora, frequently secondary to systemic dehydration or xerostomia.¹ Alternatively, mechanical obstruction of Stensen's duct in the form of calculus, stricture or mucus plug may predispose to acute infection by means of decreased salivary flow.^{2,3} In addition, a variety of foreign objects lodged within the parotid duct have been reported to result in this situation, including toothbrush bristles and fish bones.^{4,5} Herein we present a case of recurrent suppurative parotitis complicated by candidal infection of the gland, due to ductal obstruction by a grass seed.

Case report

A 50-year-old female presented complaining of a painful swelling of the left cheek. Nine months previously an acute swelling had appeared in the area, not associated with meals, which subsided after oral administration of amoxicillin. Three months later an episode of trismus occurred and a painful skin nodule appeared on the left parotid region without swelling. With antibiotic administration (amoxicillin/clavulanate) the trismus gradually disappeared whereas the nodule ruptured leaving a fistula. A computed tomography (CT) scan performed four months ago was reported without specific features. Three weeks before this presentation the nodule reappeared along with a diffuse swelling of the left cheek. This time antibiotic administration had no results. The patient was diabetic and had been treated effectively with metformin for the last four years.

Examination showed a firm, tender swelling of the left preauricular area extending anteriorly to the buccal space, with a fistula in front of the lobule of the ear (Figure 1). Intraoral examination disclosed moderate trismus. Milking of the parotid gland produced pus excretion from the



FIG. 1

Patient with swelling of the left parotid gland and draining sinus.



FIG. 2

Intraoral view showing purulent discharge from Stensen's duct orifice.



FIG. 3

Axial CT section through parotid glands shows increased size and enhancement of the left parotid gland (reflecting inflammatory changes), with obliteration of the fascial plane between the parotid and masseter muscle. The overlying skin is fixed around the draining sinus.

Stenson’s duct (Figure 2). On admission, the patient had low grade fever (37.8°C), the white cell count was 6 500/mm³, the haematocrit was 37.7 per cent and the erythrocyte sedimentation rate was 34 mm during the first hour. The differential count was normal. The blood glucose was 170 mg/dl.

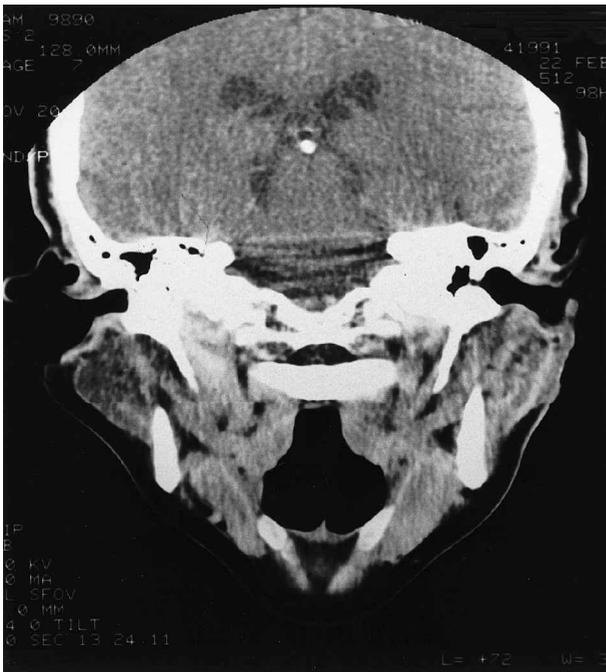


FIG. 4

Coronal CT image shows the inflammatory process extending beyond the parotid fascia with discrete cystic areas (early abscess formation) in the superficial portion of the gland.

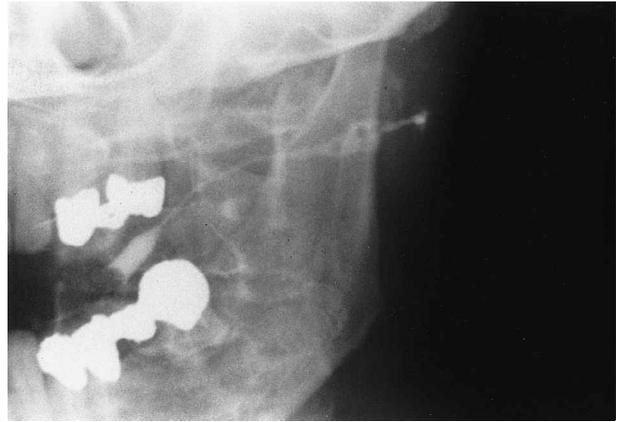


FIG. 5

The sialogram demonstrates duct dilatation with small filling defects suggesting obstruction.

The patient was placed on intravenous antibiotic therapy with clindamycin 600 mg every eight hours. Bacteriological examination of the pus from the duct orifice revealed *Candida albicans* and *Streptococcus viridans*, but the sinus tract discharge was negative. Consequently fluconazole 100 mg daily was added to the regimen. Panoramic X-ray examination showed no infection in the jaw bone and no opaque calculi. A CT scan performed on the sixth day showed enlargement of the superficial lobe of the parotid with inflammatory signs in the subcutaneous adipose tissue and the superficial parotid fascia (Figures 3 and 4). A tru-cut biopsy was negative for malignancy, revealing only non-specific inflammatory changes. Six days later ultrasound examination confirmed the presence of a cystic (hypoechoic) area at the proximal end of the duct, containing echogenic shadow within it. In the meantime the patient’s condition started to improve and she was discharged from the hospital on oral antibacterial and antifungal therapy, pending subsidence of the acute inflammation.

Twenty-five days after the first examination, contrast sialography was performed demonstrating distention of the main duct with a filling defect at the ductal phase (Figure 5) and nearly complete lack of opacification of the parenchyma at the acinar phase (Figure 6), suggesting

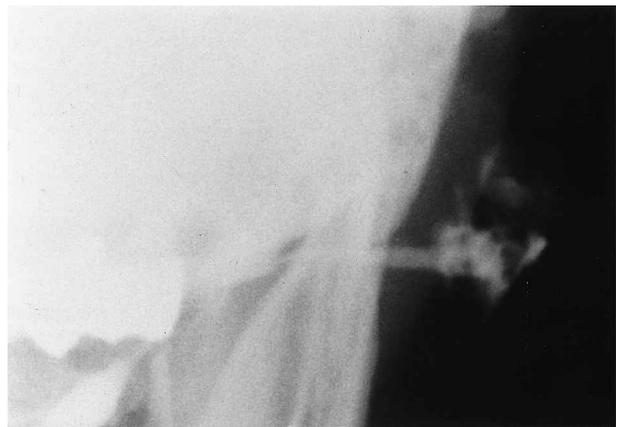


FIG. 6

The acinar phase shows lack of opacification of the parenchyma with accumulation of the contrast medium distal to, and within, the obstruction.

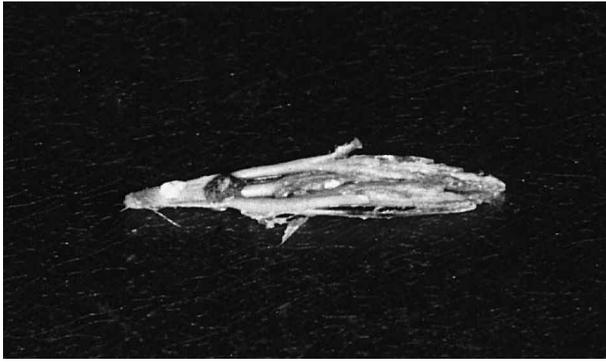


FIG. 7

Brome grass seed removed via surgical exploration of Stensen's duct orifice.

chronic obstructive sialadenitis. The patient was once again discharged with antifungal prescription only, to be followed in the out-patient department.

- **This is a case report of chronic inflammation complicated by a *Candida* infection in the parotid gland**
- **The cause was found to be ductal obstruction due to a radiolucent foreign body**
- **The importance of examining and exploring the duct in such cases is stressed**

By the time the patient had stopped antifungal therapy, two weeks later, there was still drainage from the duct orifice, although the sinus tract had started to heal. Consequently a decision was made to explore the duct through an intraoral incision. However, during the procedure a foreign body was discovered projecting from the duct orifice, which on removal turned out to be a brome grass seed (Figure 7). With manipulation the duct expressed copious amounts of exudate, but reculture was considered unnecessary as drainage establishment and subsequent decompression of the gland provided almost instant relief. Pilocarpine was prescribed to stimulate salivary secretion and the patient continued to be seen weekly for a fortnight until she had fully recovered and the gland appeared functional.

Discussion

Acute suppurative sialadenitis occurs most often in the parotid gland, partly because of the characteristics of its serous secretions which possess less bacteriostatic capabilities than the mucous secretions of the submandibular gland.² Most cases of suppurative parotitis represent ascending bacterial infection from the normal oral flora, thus, with the administration of the proper antibiotics a remission can be anticipated; however, persistence of the underlying cause of the disease will lead to a chronic course with acute exacerbations. Such a recurrent infection may be conveniently ascribed to a sialolith but in the absence of positive roentgenographic findings, along with the presence of a radiolucent calculus, the possibility of a less identifiable obstructive cause such as a foreign body should be considered.

The ingress of a foreign object into a major salivary duct is thought to be an extremely rare phenomenon.⁴ However, a number of cases have been reported,⁴⁻⁸ revealing

the variety of the foreign bodies that can be found within these structures and also the diagnostic difficulties encountered in such cases. Although plain film radiographs are often the first imaging studies obtained in patients with symptoms suggestive of salivary gland pathology, ultrasonography is better because it can demonstrate the presence of sialoliths as well as radiolucent intraductal masses and also alterations in the normal echogenic nature of the gland due to inflammatory lesions.⁹ Ultrasonography is especially useful in the presence of acute infection, when sialography is contraindicated. However, sialography is more accurate in detecting suspected ductal obstruction and its precise location,³ and is more familiar than ultrasonography to the nonexperts.

Removal of obstruction by gentle probing under antibiotic coverage is considered the appropriate therapy of acute non-calculus obstructive bacterial parotitis.^{6,8,10} Antimicrobial therapy, if possible, should be based on sensitivity testing but because *Staphylococcus aureus* has been cultured from ductal exudates in up to 50 to 90 per cent of cases,¹¹ and streptococcal species, including viridans streptococci, may play a role in some cases,¹² empirical antimicrobial therapy should be directed primarily against Gram positive cocci. In addition, oral anaerobes have been found when collection and culture techniques permitting anaerobic preservation were used.^{2,11}

However, the administration of broad-spectrum antibiotics for extended periods in refractory cases increases the risk of the emergence of resistant forms in the pathogenic flora. In our case, failure to initially recognize the obstructive cause of the disease had led to inadequate treatment with multiple course of antibiotics, which are frequently associated with the overgrowth of *Candida albicans*. *C. albicans* is part of the normal oral flora and its main habitat is the dorsum of the tongue where it is found in low numbers. Although a great number of these fungi indicate a close association to a given lesion, even a low number may be of clinical significance in view of their ability to produce growth-stimulating factors for other microorganisms.¹³ This is especially the case when *Candida* organisms are isolated together with *Strep viridans* which normally predominates as normal flora preventing the growth of more pathogenic organisms; thus, this finding should be regarded as an indication for an association of the fungi with the lesion.¹³ In our case, the final response of the infection to antifungal treatment apparently verified the causality with *C. albicans*. However, the absence of the typical antibiotic-associated pseudomembranous candidiasis suggests a different origin of the fungi; thus, the presence of a vegetal object is likely to represent the main, if not the only, precipitating factor for the initial colonization of the duct epithelium with these organisms. Diabetes mellitus definitely predisposes to candidosis, but this association is questionable in the present case, since control of the patient's blood glucose had been effective, to the best of our knowledge.

Although in the few reported similar cases^{6,8} the discovery of the grass seed was largely coincidental, an obstruction felt during careful probing of the excretory duct should raise the suspicion of either a mucous plug or a foreign body not necessarily detectable with conventional imaging techniques. Consequently the only chance for pre-operative diagnosis is by means of a sialogram.⁴ In the presence of a foreign body, it is our belief that attempts to probe the duct will not help to remove the object and may even force it deeper. Therefore, an incision across the intraoral part of the duct (sialodochotomy) is preferable

and if needs be the duct can be traced through the buccinator and incised a little further until the obstruction is met.

The pathogenetic mechanism is difficult to determine since the anatomical position of the parotid papilla normally prevents wedging of a food particle. The negative pressure generated in the vestibulum during chewing could probably drive one within the ductal orifice; it is noteworthy that in the case of Knezević,⁷ it was sucking of a blade of grass that caused its lodgement within Wharton's duct. Nevertheless, once trapped into the duct, a seed with barb-like awns would resist expulsion by salivary outflow,⁶ hence the need for surgical exploration.

References

- 1 Seifert G, Miehle A, Haubrich J, Chilla R, eds. Sialadenitis. In: *Diseases of the Salivary Glands*. Stuttgart: Georg Thieme Verlag, 1986;110–63
- 2 McQuone SJ. Acute viral and bacterial infections of the salivary glands. *Otolaryngol Clin North Am* 1999;**32**:793–811
- 3 Berry RL. Sialadenitis and sialolithiasis: Diagnosis and management. *Oral Maxillofac Surg Clin North Am* 1995;**7**:479–503
- 4 Abe K, Higuchi T, Kubo S, Oka M. Submandibular sialoadenitis due to a foreign body. *Br J Oral Maxillofac Surg* 1990;**28**:50–2
- 5 Ray JW. Foreign bodies in the salivary ducts. *Ann Otol Rhinol Laryngol* 1967;**76**:1067–9
- 6 Harbert F, Igarashi M, Riordan DR. Brome grass seed in parotid duct. *Laryngoscope* 1961;**71**:1597–9
- 7 Knezević G. Facial sinus caused by a foreign body in the submandibular salivary duct. *Br J Oral Surg* 1983;**21**:69–72
- 8 Schwager K. Grassamenkorn im Ausführungsgang als seltene Ursache einer akuten Parotitis. *Laryngo-Rhino-Otol* 1995;**74**:248
- 9 DelBalso A. Salivary imaging. *Oral Maxillofac Surg Clin North Am* 1995;**7**:387–422
- 10 Goldberg MH, Bevilacqua RG. Infections of salivary glands. *Oral Maxillofac Surg Clin North Am* 1995;**7**:423–30
- 11 Brook I, Frazier EH, Thompson DH. Aerobic and anaerobic microbiology of acute suppurative parotitis. *Laryngoscope* 1991;**101**:170–2
- 12 Peterson LR, Thomson RB Jr. Use of the clinical microbiology laboratory for the diagnosis and management of infectious diseases related to the oral cavity. *Infect Dis Clin North Am* 1999;**13**:775–95
- 13 Dahlén G, Jonsson R, Öhman S-C, Nielsen R, Möller AJR. Infections of oral mucosa and submucosa. In: Slots J, Taubman MA, eds. *Contemporary Oral Microbiology and Immunology*. St Louis: Mosby-Year Book, 1992;476–99

Address for correspondence:
Panagiotis K. Stefanopoulos,
12 P Papageorgiou Street,
Thessaloniki, 54635,
Greece.

Fax: 0030 2310 265370
E-mail: paplib@axiom.gr

P. Stefanopoulos takes responsibility for the integrity of the content of the paper.
Competing interests: None declared
