Benign salivary gland disease

PJ Bradley

The majority of benign clinical problems that present affect the major salivary glands — parotid and submandibular. However, there are numerous minor salivary glands located in the mucosa of the head and neck which have the same predilection to the same diseases that affect the major glands but to a lesser frequency.

There are many different conditions that affect the salivary glands. A working classification to be considered in this review is inflammatory and non-inflammatory. This group of disorders can afflict the major salivary glands (the parotid and submandibular) and the minor salivary glands (the sublingual), which are mainly concentrated in the oral cavity. These conditions are generally much more common in the major glands. Both adults and children are affected by these conditions, and the reader is directed to a review of some of the uncommon conditions that may specifically affect children (Bradley, 1997).

This short review updates the reader on the current state of knowledge regarding the common inflammatory and non-inflammatory conditions that may present both in the adult and the child.

INFLAMMATORY CONDITIONS

Acute viral inflammatory lesions

The most common viral disorder involving the salivary glands is mumps (infectious parotitis), and it is probably the most common cause of parotid swelling. The peak incidence of mumps as a contagious infectious disease is in 4–6-year-olds. The incubation period is 2–3 weeks, which leads to pain and swelling accompanied by fever, malaise, myalgia and headache. The diagnosis is made by demonstrating antibodies to the mumps S and V antigens and to the haemagglutination antigen. More than 95% of adults have neutralizing antibodies. Major complications are uncommon, but include pancreatitis, meningitis, sudden deafness and orchitis.

Other viral agents also affect the salivary glands and mimic the mumps signs. They include coxsackie A, enteric cytopathic human orphan (ECHO) viruses, influenza A, lymphocytic choriomeningitis as well as cytomegalovirus. The treatment for viral infections is symptomatic.

Acute suppurative sialadenitis

The parotid gland is most commonly involved in acute suppurative sialadenitis. This increased parotid susceptibility is believed to be the result of the lessened bacteriostatic activity of the saliva produced by the parotid when compared with that of the submandibular gland. Acute suppurative sialadenitis accounts for 0.03% of hospital admissions, with 30–40% of these occurring in postoperative patients. The disease typically commences postoperatively on days three to five, with the highest incidence after gastrointestinal procedures. It occurs in approximately 1:1000–2000 procedures, and is usually associated with dehydration. Patients aged 50–70 years are the most frequently affected, with equal sex distribution. Predisposing factors include calculi, duct stricture and dehydration, coupled with poor oral hygiene.

The usual presentation is the sudden onset of diffuse enlargement of the involved gland with associated tenderness, induration and pain. Purulent saliva can be seen at the duct orifice, particularly with massage of the gland. The saliva can occasionally culture coagulase-positive *Staphylococcus aureus* with other aerobic organisms, particularly *Streptococcus pneumoniae, Escherichia coli* and *Haemophilus influenzae*. Approximately 20% of infections are bilateral.

Initial treatment includes adequate hydration, improved oral hygiene, repeated massage of the gland and intravenous antibiotics. The empirical administration of a penicillinase-resistant antistaphylococcal antibiotic should be started while awaiting the culture results. Dramatic improvements should ensue within the first 24–48 hours. If not, then incision and drainage should be con-

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sidered. Fluctuation within the parotid gland does not occur until late in the course of the disease because of the multiple investing fascia within the gland. The abscess can be located using ultrasound or computerized tomography (CT) scanning.

CHRONIC INFLAMMATORY DISORDERS

The key causative event in chronic sialadenitis is thought to be a lowered secretion rate with subsequent salivary stasis (Bhatty et al, 1998). Chronic sialadenitis is more common in the parotid gland than in the submandibular gland. It may occasionally affect the minor salivary glands, most commonly in the lower lip. This condition may result in permanent damage to the glandular ductal system because of the acute or chronic suppuration. Persisting damage, with time, may be a sequelae to sialectasis, ductal ectasia and progressive acinar destruction combined with a lymphocytic infiltrate. The sialographical appearance parallels the degree of histological damage.

In such patients, there is generally a history of mildly painful recurrent parotid enlargement, aggravated by eating. The clinician should look for treatable predisposing factors, such as a calculus or stricture. If no treatable cause is found, then the patient management should be conservative and include the use of sialagogues, frequent gland massages and antibiotics for acute exacerbations. Should conservative measures fail, other treatments include periodic duct dilatation, ligation of the duct, total gland irradiation, tympanic neurectomy (Daud and Pahore, 1995) and excision of the gland. Only the excision of the gland works uniformly.

Chronic recurrent parotitis may eventually lead to the development of a benign lymphoepithelial lesion. This lesion belongs in the spectrum of diseases characterized by a lymphoreticular infiltrate combined with acinar atrophy and ductal metaplasia. The ductal metaplasia ends in the development of epimyoepithelial islands. This lesion is first noticed as an asymptomatic enlargement, unless there is associated infection. If the lesion becomes cosmetically unacceptable, excision of the gland may be necessary (Carlson, 2000). There are well-documented cases of the evolution of this disease into more aggressive entities, including lymphoproliferative disorders, carcinoma (undifferentiated type) and pseudolymphoma (Nagao et al, 1983). The lymphoproliferative disorders are usually non-Hodgkin's lymphomas involving the extrasalivary sites.

GRANULOMATOUS DISEASES

Primary tuberculosis

Primary tuberculosis is unusual. The disease is usually unilateral, and the parotid gland is the most frequently involved salivary gland. It is believed to spread from a focus of infection in the tonsils or the teeth. It can present in one of two ways: an acute inflammatory lesion or a chronic tumorous lesion. Often the diagnosis is not made until the acid-fast salivary stain and a purified protein derivative (PPD) skin test are performed. The PPD test may be unreliable because the infection may be caused by atypical mycobacteria and may produce a negative skin test (Ganesan et al, 2000). The treatment is as for any acute tuberculous infection (Kanlikama et al, 2000).

Animal scratch disease

Animal scratch disease does not involve the salivary glands directly but may involve the periparotid and submandibular triangle lymph nodes, and these may involve the salivary glands by contiguous spread. Cat scratch disease is one such entity, which primarily involves children and young adults. A history of animal contact, usually cats or even kittens (scratches, bites or even licks by a cat), has been elicited in 67–90% of reported cases. Recently, the true origin of this disease has been implicated as *Bartonella henselae,* a Gram-negative bacterium. A polymerase chain reaction assay to detect bartonella DNA has been used to identify the agent. A serology test for cat scratch disease patients has shown titres of at least 1:64 for *B. henselae* antibodies (Malatskey et al, 2000). Treatment consists of supportive therapy and reassurance, as antibiotics have not been shown to be effective in shortening the course of the disease. The lymphadenopathy usually disappears within 2–3 months without complications.

SARCOIDOSIS

Clinically, salivary gland involvement occurs in only 6% of cases. Uveoparotid fever (Heerfordt's disease) is a particular form of sarcoidosis characterized by uveitis, parotid enlargement and facial palsy. It usually occurs in 20–30-year-olds. The swelling can last from months to years without suppuration but will eventual resolve.

Sjögren's syndrome

Sjögren's syndrome is a common disorder, which occurs predominantly in women (9 females:1 male) in the fourth and fifth decades of life, with the correct diagnosis often being made a few years after the initial clinical presen-

tation. At present, there is no single definitive test that accurately diagnoses Sjögren's syndrome, and therefore several sets of diagnostic criteria have been proposed (Sood et al, 2000). Enlargement of one or more of the major salivary glands may occur and is usually self-limiting. Parotid swelling is more common than submandibular gland swelling and may be recurrent and painful. Lymphoma is an important complication with an estimated relative risk for developing lymphoma in patients with Sjögren's syndrome of between 33 and 44%. The presence of serum autoantibodies to Ro (SS-A) or La (SS-B) antigens, antinuclear antibodies or rheumatoid factor with clinical signs and symptoms helps with diagnosis. Treatment is empirical (Tzioufas and Moutsopoulos, 1998).

SIALOLITHIASIS

Eighty per cent of salivary calculi occur in the submandibular gland, with the remaining 19% occurring in the parotid gland and approximately 1% in the sublingual gland. In 75% of cases, only a single stone is found. Gout is the only systemic disease known to be associated with salivary calculi, and these stones are composed of uric acid. The majority of calculi seen and diagnosed are calcium phosphate with small amounts of magnesium, ammonia and carbonate. Despite their similar chemical make up, 90% of submandibular calculi are radio-opaque, whereas 90% of parotid calculi are radiolucent (Bodner, 1999).

The theoretical cause for the formation of stones or calculi is some anatomical nidus of precipitate calcium material which is associated with saliva fluid stasis. The submandibular gland is considered more susceptible to sialolithiasis than the other salivary glands because its saliva is more alkaline and has a higher concentration of calcium and phosphate, coupled with a higher mucin content. The duct is longer and flows a distance of several centimeters, from the gland at the back of the mouth to the front of the mouth where it opens.

Most patients present with a history of recurrent swelling and pain in the gland, which is usually aggravated by eating. The calculus may be palpable in the duct and the involved gland is swollen and tender. Occlusal plain X-rays of the floor of mouth frequently reveal the stone in the submandibular duct or gland but are less reliable in the parotid gland. Sialography is essentially 100% effective in making the diagnosis but can be complemented with CT scanning. The complications of sialolithiasis include acute suppurative sialadenitis, ductal ectasia and stricture.

Treatment depends on the location of the calculus: simple ductoplasty can be used to remove the stone if it is visualized or palpated anteriorly in the anterior floor of the mouth near the duct opening or papilla. If the stone is located more distally in the duct or located near the gland itself, then excision of the submandibular gland itself is indicated. The use of extracorporeal shock wave lithotripsy may be useful in the management of parotid calculus to minimize resultant cosmetic deformity (Iro et al, 1998). Simple removal of the stone is associated with a recurrence of the stone estimated in about 18% of cases, because the underlying cause, which may be unknown, may not be corrected.

NON-INFLAMMATORY

Cystic lesions

True cysts of the parotid gland account for less than 5% of lesions presenting. The cysts may be either acquired or congenital. Type I branchial arch cysts are a duplication anomaly of the membraneous external auditary canal (Arndal and Bonding, 1996), whereas type II cysts are a duplication anomaly of the membraneous and cartilaginous external auditary canal. Excision during a quiescent period with preservation of the facial nerve is curative.

Acquired cysts may be associated with mucus extravasation, parotitis, trauma, calculi, ductal obstruction, benign epithelial lesions and neoplasms (Antoniadis et al, 1990). If the cyst is associated with a salivary duct stenosis, then correcting or fixing the stenosis may cure the cystic swelling by encouraging drainage. Should this treatment not be possible or attempts to treat it have failed, then the cystic lesion itself should be excised. Some cysts that present may not be of the 'simple' variety but associated with neoplasms, such as pleomorphic adenoma, adenoid cystic carcinoma, mucoepidermoid carcinoma and Warthin's tumour. There exists a special type cystic lesion found in the floor of the mouth. This is the mucus retention cyst or ranula of the sublingual gland, which is visible from the neck because of its size and therefore called 'the plunging ranula' (Davison et al, 1998). The treatment is excision.

Sialadenosis

Sialadenosis is a non-specific term used to describe a non-inflammatory, non-neoplastic enlargement of a salivary gland, usually the parotid (Pape et al, 1995). The enlargement is generally asymptomatic, and the mechanism of aetiology is unknown in many cases. Bilateral parotid enlargement is common in obesity, sec-

ondary to fatty hypertrophy. Complete endocrine and metabolic screening should be performed before making this diagnosis. Diagnoses such as diabetes mellitus, hypertension, hyperlipidaemia and menopause are associated. This condition has also been associated with alcoholic cirrhosis. It is rare in non-alcoholic cirrhosis. The prognosis is good if the underlying disease can be corrected. Sometimes surgical excision is indicated to correct the cosmetic deformity.

OTHER CONDITIONS

Parotid gland enlargement frequently occurs in patients with human immunodeficiency virus (HIV) infection (Huang et al, 1991). It usually occurs as a diffuse symmetrical enlargement of both parotid glands, with or without involvement of the submandibular glands. This clinical presentation in a young patient should raise the suspicion of HIV infection. In such a patient, a CT scan is to be recommended to aid diagnosis and location of the associated cystic lesions. The additional use of needle aspiration cytology of the cyst fluid and confirmation that the fluid contains amylase will confirm the diagnosis of HIV. Watchful waiting is advised for such cytic pathology.

CONCLUSION

Inflammatory and non-inflammatory conditions may present with similar clinical histories and physical findings, both in adults and children. An accurate diagnosis is essential to optimize patient management and to minimize the likelihood of chronicity. To assume that a local diagnosis of a benign disease is all that is necessary in salivary glands and not to consider serious or systemic disease may result in serious patient mismanagement. **HM**

Conflict of interest: none.

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KEY POINTS

- Mumps is contracted once and immunity is generally lifelong.
- Sialadenitis most commonly affects the parotid gland and should be treated aggressively by antibiotics and sialagogues.
- In Sjögren's syndrome, there is no single diagnostic test with 100% sensitivity. Several sets of diagnostic criteria have been proposed. The presence of serum autoantibodies may aid with a diagnosis.
- Sialolithiasis is confirmed by sialography in 100% of cases, but can be complemented with computed tomography scanning.
- Cystic lesions in the parotid gland should be considered as a serious diagnosis as they may be associated with malignancy or HIV infection.

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