

CASE STUDY

Decoding Hidden D's of Salivary Gland (Diseases, Diagnosis, Digital Imaging) – A Case Series

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ABSTRACT

Salivary gland disorders are diverse in origin—ranging from infections and obstructions to autoimmune and neoplastic conditions—yet often share overlapping clinical signs. While acute sialadenitis presents with sudden pain and swelling, obstructive lesions typically cause recurrent, meal-time discomfort. In contrast, neoplastic growths are usually painless, firm, and progressively enlarging. Glandular swelling remains the most frequent presenting symptom. Radiological imaging, including ultrasound, Computed Tomography (CT) and Magnetic resonance imaging (MRI) plays a crucial role in accurate diagnosis and treatment planning. This case series emphasizes the value of early, image-guided diagnosis and a multidisciplinary approach to improve patient care and minimize complications.

Keyword – Acute bacterial sialadenitis, sialolithiasis, ductal strictures.

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INTRODUCTION

The salivary glands—including the parotid, submandibular, sublingual, and numerous minor glands—are essential exocrine structures that produce saliva, playing a crucial role in maintaining oral hygiene and initiating digestion [1]. These glands are prone to a wide range of pathologies—including inflammatory, infectious, autoimmune, and neoplastic conditions. The parotid gland bears the brunt of salivary gland tumours, accounting for nearly two-thirds of all cases, while the minor salivary glands trail behind with 22% and 17% respectively. Pleomorphic adenoma stands out as the most frequent benign tumour, whereas adenoid cystic carcinoma and mucoepidermoid carcinoma are the predominant malignant types [2]. These disorders are more common in females, particularly in the 51–60 age group, with swelling being the most typical presentation [1]. Obstructive diseases such as sialolithiasis often present with xerostomia and require imaging and serological tests for accurate diagnosis [3]. In autoimmune cases like Sjögren's syndrome, markers such as anti-Ro/SS-A and anti-La/SS-B are diagnostic [4]. Imaging modalities like ultrasound, CT, and MRI are pivotal in evaluating these conditions, though histopathological confirmation is often necessary. Ultrasonography-guided core-needle biopsy has shown a diagnostic accuracy of up to 97% for parotid masses [5]. This case series explores various salivary gland disorders—including Bacterial Sialadenitis, Viral Parotitis, Necrotizing Sialometaplasia, Parotid Abscess, and Pleomorphic Adenoma which emphasizing clinical evaluation, imaging modalities, histopathological examination and tailored treatment approaches.

MATERIAL AND METHODS

Case Report 1 – A 34-year-old male patient presented with right facial swelling that has been worsening with heat exposure since the last four days. He had no fever, difficulty eating, or speech issues. Extraoral examination showed a soft, tender facial swelling that subtly lifted the right ear lobe, indicating underlying glandular involvement. Intraorally, purulent discharge was noted from the right parotid

papilla (Figure 1a). Orthopantomogram (OPG) showed sialoliths in the right parotid (Figure 1b), left submandibular region, and a tonsillolith in the left ramus. The puffed-cheek posteroanterior radiograph clearly delineated a sialolith in the right parotid region, affirming the obstructive pathology. CBCT detailed calculi in the right parotid, left submandibular gland (Figure 1c), and a calcified left tonsillar mass. Serum calcium was normal (9.3 mg/dL). Based on clinical and radiological examination Acute bacterial sialadenitis of the right parotid due to obstructive sialolithiasis as final diagnosis was made. Viral sialadenitis and abscess were considered but less likely due to lack of prodromal symptoms. Management includes Hydration, gland massage, Vitamin C Chewable tablets (500 mg TID × 5 days), and antibiotics (Ampicillin + Cloxacillin, 250 mg TID × 5 days). Sialendoscopy and lithotripsy were planned post-swelling reduction.

Case Report 2 – A 19-year-old male patient presented with painful left facial swelling and fever that have persisted since the last four days, unrelated to meals. His medical history was unremarkable. Extraorally, a firm, tender swelling with local warmth and ear lobe elevation was noted, along with an enlarged left submandibular lymph node. Intraoral examination revealed an inflamed left parotid papilla with reduced salivary flow and thick mucous saliva. Contrast-enhanced CT showed an enlarged left parotid gland compressing adjacent tissues (Figure 2a) and a markedly enlarged submandibular lymph node (Figure 2b). A diagnosis of viral parotitis (mumps) was made. Differentials included pericoronitis, bacterial sialadenitis, parotid abscess, and tumour. The patient was advised home isolation and supportive care, including Vitamin C Chewable tablets (500 mg TID for 7 days), Ibuprofen tablet (400mg BD for 7 days) for pain and fever, and increased fluid intake. At one-week follow-up, symptoms had significantly improved, with resolution of fever and facial swelling.

Case Report 3 – A 48-year-old female patient reported with a persistent, painful ulcer on the posterolateral aspect of her hard palate, lasting for two weeks, with no notable medical or dental background. Clinical examination revealed a round shape ulcer measuring about 1.5cm with indurated, erythematous borders and intact mucosa (Figure 3a), raising suspicion of malignancy. Histopathology from an incisional biopsy revealed non-specific inflammation, confirming necrotizing sialometaplasia. Differential diagnoses included squamous cell carcinoma, aphthous ulcer, mucoepidermoid carcinoma, and tuberculous ulcer. Management involved supportive care: chlorhexidine 0.12% mouthwash twice daily for 10 days, soft diet, hydration, and oral hygiene. At the two-week follow-up, the ulcer showed reduced erythema, diminished induration, and early healing. The patient remains under observation, with complete resolution expected within 3–12 weeks.

Case Report 4 – A 43-year-old HIV-positive male patient on antiretroviral therapy presented with a one-month history of progressively enlarging right facial swelling, initially painless but later tender. He had a history of tuberculosis and was undergoing treatment. General examination revealed pallor without lymphadenopathy. Extraoral assessment showed a firm, tender, well-defined swelling on the right face. Intraorally, mouth opening was restricted, with generalized periodontitis and decreased salivary flow from the right parotid. MRI revealed a T1 hypointense, STIR hyperintense mass involving the right parotid and pterygoid muscles, with peripheral rim enhancement (Figures 4a, b, c), suggestive of an inflammatory lesion. FNAC confirmed a tuberculous abscess. Management included Anti-Koch's Therapy (AKT) per RNTCP guidelines, NSAIDs, a high-protein diet, and hydration. Surgery was deferred due to a positive response to medical management. The patient was counselled on TB-HIV co-infection and the need for strict treatment compliance.

Case Report 5 – A 58-year-old female patient presented with a slow-growing, painless intraoral swelling persisting for 7–8 months. Medical history was unremarkable, though prior access opening in the maxillary left first molar was noted. OPG showed disto-occlusal caries in the left maxillary first premolar and molar, with a missing second premolar. CT axial sections revealed a well-defined hypodense lesion medial to the palatal cortex, sparing the midline. Coronal views showed thinning of the nasal floor and mild maxillary sinus haziness, with intact surrounding structures (Figures 5b). An incisional biopsy confirmed pleomorphic adenoma (intermediate grade) (Figures 5c). The lesion's presentation raised suspicion for mucoepidermoid carcinoma and adenoid cystic carcinoma as potential differential diagnoses. The lesion was surgically excised, and the patient remains under regular follow-up for recurrence monitoring.

RESULT AND DISCUSSION

Salivary gland disorders span a broad spectrum—from benign, self-limiting conditions to aggressive malignancies. Common conditions include obstructive sialolithiasis, mucoceles, acute and chronic infections, and neoplastic lesions. Afrah A. et al. (2022) highlighted that salivary gland disorders span all age groups, showing a higher prevalence in females and predominantly affecting the parotid gland.

Diagnosis often requires correlating patient age, gland involved, and lesion type [1]. Acute Suppurative Parotitis, as illustrated in Case 1, typically presents as sudden, painful, unilateral swelling caused by retrograde infection—most often due to *Staphylococcus aureus*. Inadequate oral hygiene and dehydration serve as key predisposing factors, with retrograde bacterial entry via the salivary duct being the most common pathway of infection [2]. Culture of purulent discharge and empiric antibiotic therapy—such as antistaphylococcal agents—are essential, as illustrated in Case 1. Diagnosis is aided by imaging (CT, MRI), while MRI findings vary depending on the disease stage. Sialolithiasis, more common in the submandibular gland (~80%), may cause glandular obstruction and secondary infection. Sialendoscopy is the preferred treatment for small stones, though complications like ductal damage can occur [6]. Necrotizing Sialometaplasia, highlighted in Case 3, is a self-limiting, benign inflammatory condition that can mimic malignancy both clinically and histologically. Since its initial description in 1973, necrotizing sialometaplasia has been known to closely resemble squamous cell carcinoma or mucoepidermoid carcinoma both clinically and histologically, Biopsy is essential when healing does not progress as expected [7–9]. Ultrasound combined with colour Doppler stands as the preferred imaging tool for parotid abscesses, typically showcasing irregular, hypo-anechoic lesions with peripheral blood flow—making it invaluable for both detection and follow-up [10]. Mumps, the most common viral parotiditis in children, typically presents with bilateral swelling and prodromal symptoms, though unilateral cases, like Case 2, are seen in about 25%. The diagnosis is mainly based on clinical evaluation, with imaging rarely required. When imaging is utilized, CT scans may reveal a non-specific enlargement of the parotid gland accompanied by increased attenuation [11]. On MRI, the parotid glands often display heightened signal intensity on T2-weighted sequences. In post-pubertal males, orchitis arises in roughly 10–20% of mumps cases, whereas post-pubertal females experience mastitis and oophoritis in about 5–10% of infections. Mumps is generally a self-limiting illness, with most patients recovering fully within a few weeks of symptom onset. Vaccination has significantly reduced its incidence [10–12]. Pleomorphic Adenoma, the most common benign salivary tumour, usually arises in the parotid. Case 5 demonstrated typical imaging features and successful management via surgical excision. While benign tumours are treated with superficial parotidectomy, malignant variants often require more extensive resection [13]. Imaging, including USG, CT, and MRI, plays a vital role in diagnosis, especially in assessing gland function, local invasion, and guiding treatment decisions.



Figure 1: (a)pus discharge from right parotid papilla. (b)orthopantomogram shows radiopaque mass over right ramus region suggestive of parotid gland sialolith and radiopacity present over left inferior border of mandible as left submandibular gland sialolith, small radiopacity present over left ramus region suggestive of tonsilolith. (c) coronal section of CBCT showed the presence of a right parotid gland sialolith and left submandibular gland sialolith.

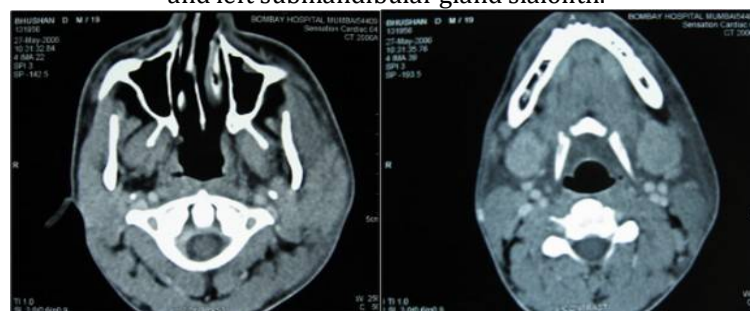


Figure 2: (a) axial section of CT scan show enlargement of right parotid gland with compression of subcutaneous fat. (b)axial section of CT scan show enlargement of submandibular lymph node.



Figure 3: (a) single ulcerative lesion over posterolateral surface of palate measuring about 1.5cm in diameter with indurated margin. (b) post treatment follow up after 10 days

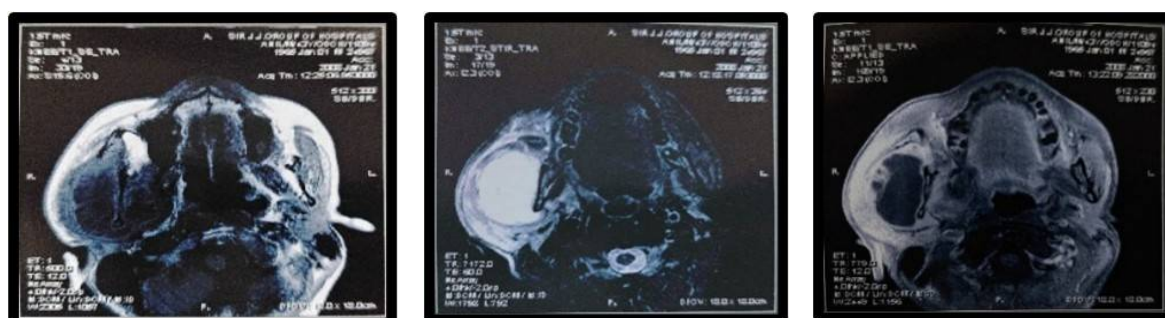


Figure 4: (a) T1 weighted axial section of MRI shows hypointense area on right side with involvement of lateral and medial pterygoid muscle and parotid gland (b) STIR axial section of MRI shows hyperintense area on right parotid gland region (c) Post contrast T1 weighted axial section shows peripheral rim enhancement with displacement of masseter muscle superiorly.

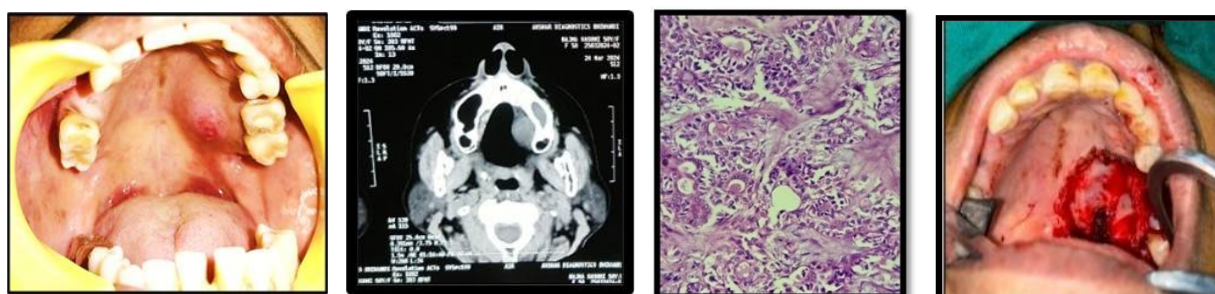


Figure 5: (a) Swelling over palatal aspect of left side of maxilla (b) Axial section of CT scan shows a hypodense area on left side medial to the palatal cortical plate. (c) H & E-stained section under scanner view showed Para keratinized stratified squamous epithelium, fibrous connective tissue band, Sheets and islands of proliferating epithelial cells which were of stellate, spindle form. (d) excision of complete lesion.

CONCLUSION

Early diagnosis through clinical evaluation and imaging is key to effective management of salivary gland disorders. This case series illustrates the diverse presentation of five salivary gland conditions—from infections and obstructions to benign tumours—successfully managed with a multidisciplinary approach. A holistic focus on diagnosis, disease, and digital imaging ensures optimal patient outcomes and underscores the importance of tailored care for salivary gland pathologies.

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