

J. Hashemi MD¹
D. Farrokh MD¹
M. Mohammadifard MD²

Delayed Post-Traumatic Parotid Sialocele: Report of a Case

This case report documents one of the more unusual causes of a facial swelling in the preauricular and buccal region, post-traumatic parotid sialocele. Facial lacerations are common injuries; however, parotid gland involvement and, in particular, ductal transection is relatively uncommon and only 0.2% of such patients have a parotid gland injury. A sialocele typically develops 8 to 14 days after the injury but in our case, the presentation was delayed (8 months after trauma). Sialography can play a significant role in the diagnosis of sialocele by indicating the extent of parotid duct injury. We describe a 17-year-old girl with progressive marked facial swelling in the left parotid and buccal area with past history of penetrating facial injury. Using text and images, we detail our diagnostic management. This case report illustrates the relationship of trauma to sialocele formation, while suggesting that sialography should be done in oral, neck and face masses suspected to be related to salivary ducts. Post-traumatic parotid sialocele should be considered in the differential diagnosis for any post-traumatic facial or high neck swelling.

Keywords: mucocele, parotid

Introduction

A sialocele (also called salivary mucocele or salivary retention cyst) is an accumulation of saliva surrounded by tissue reaction to the saliva. The result is a fluid filled sac which can occur under the tongue (a ranula), in the neck or buccal regions, or adjacent the pharynx. A parotid sialocele, also called (parotid) salivary mucocele, is a periductal accumulation of saliva resulting from a complete or partial disruption of the parotid duct. It is a pseudocyst without a distinct epithelial lining. It usually becomes apparent 8-14 days after an injury but may be delayed. Facial lacerations or an operative procedure such as a mandibular osteotomy are frequent initiating factors.¹⁻⁹ Fistula formation can also occur following ductal injury.

Facial lacerations are common injuries. However, parotid gland involvement and, in particular, ductal transection is relatively uncommon.^{10,11} Lewis and Knottenbelt¹² found only 0.2% of patients seen in a trauma unit over a 6-month period had a parotid gland injury. Another cause for these accumulations of saliva is obstruction (usually caused by inflammation, sialolithiasis or a tumor) of the distal end of a duct, which produces dilatation of the duct resulting in an epithelial-lined retention cyst.

If untreated, the wall of chronic sialoceles can become mineralised, or undergo necrosis and slough into the cavity. It can become infected and form an abscess. Extra-oral fistula formation is a possibility, as is the secondary infection.

Its main clinical manifestation is a slow developing soft to firm fluid-filled swelling under the tongue, in the neck, face or the pharyngeal region. It is usually not painful. Sometimes the swelling increases during eating and decreases in size when salivary secretion decreases. If the swelling is very large, it may interfere with eating and swallowing.

Diagnosis of a parotid sialocele is based on a history of trauma. Clinically, a soft

1. Associate Professor. Department of Radiology, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

2. Assistant Professor. Department of Radiology, Imam Reza Hospital, Birjand University of Medical Sciences, Birjand, Iran.

Corresponding Author:
Jahanbakhsh Hashemi
Address: Department of Radiology,
Imam Reza Hospital, Mashhad University
of Medical Sciences, Mashhad, Iran.
Tel: 0098 511 8543031
Fax: 0098511 8593038
E-mail: j_hashemi@mums.ac.ir

Received February 14, 2006;
Accepted after revision June 24, 2006.

Summer 2006; 4:229-233

mobile painless swelling is evident extraorally involving the buccal soft tissues. Aspiration of saliva from the cavity confirms the diagnosis but less invasive imaging modalities are preferred.⁹

Case Report

The patient was a 17-year-old girl who was referred for facial ultrasound examination as part of the work-up for progressive facial swelling. She was presented with marked swelling of the left side of his face and vague pain during oral intake but she did not mention increase in the swelling by eating, nor decreases in size when salivary secretion decreased.

On physical examination, the patient appeared generally well and was afebrile. There was no erythema of the facial skin. Her medical history was significant for penetrating facial and neck injury with cutting glass 8 months ago, but was otherwise noncontributory. On palpation, the lesion was soft and mobile. She denied any fever, chills, or discharge associated with the swelling. No extra or intraoral fistula formation was detected. The swelling measured 7cm in length, 5cm in width; and on bimanual palpation it felt uniloculated. There was no skin discoloration, erythema, or sensory or motor deficits. Lymphadenopathy was not detected. The mass in the left cheek

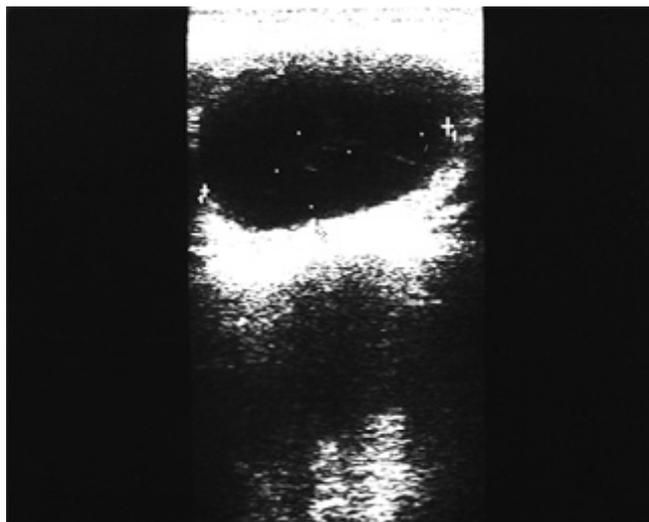


Fig 1. Ultrasound scan through the buccal area demonstrates a large complex fluid collection with septated material and some debris lying anteriorly to the left parotid gland. The mass is directly adjacent to the mandible. It extends posteriorly to contact the parotid gland.

was evident intraorally, mildly bulging the buccal mucosa. Stensen's duct was identified, but no saliva could be expressed from it.

Ultrasound scan through the buccal area demonstrated a large complex fluid collection with a few septated materials and some debris (Figure 1). The mass was lying anteriorly to the left parotid gland. Based on the history, clinical and ultrasound findings, a provisional diagnosis of a post-traumatic parotid sialocele was made.

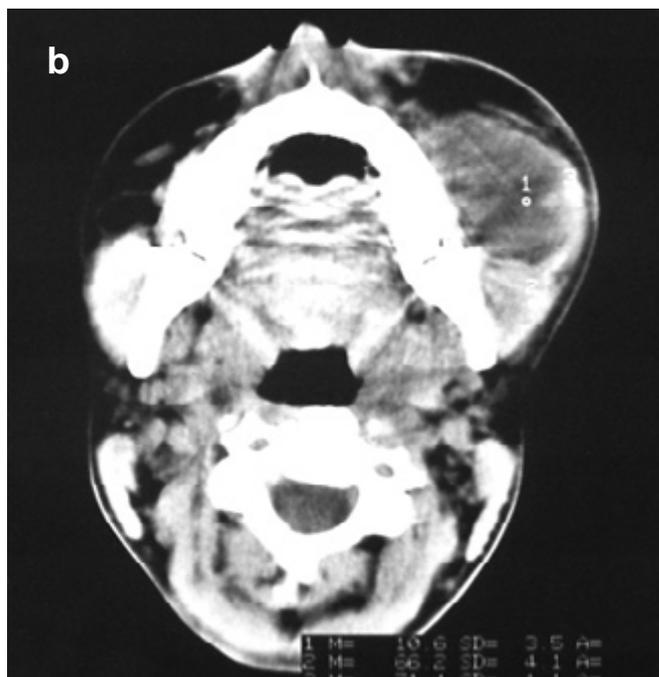
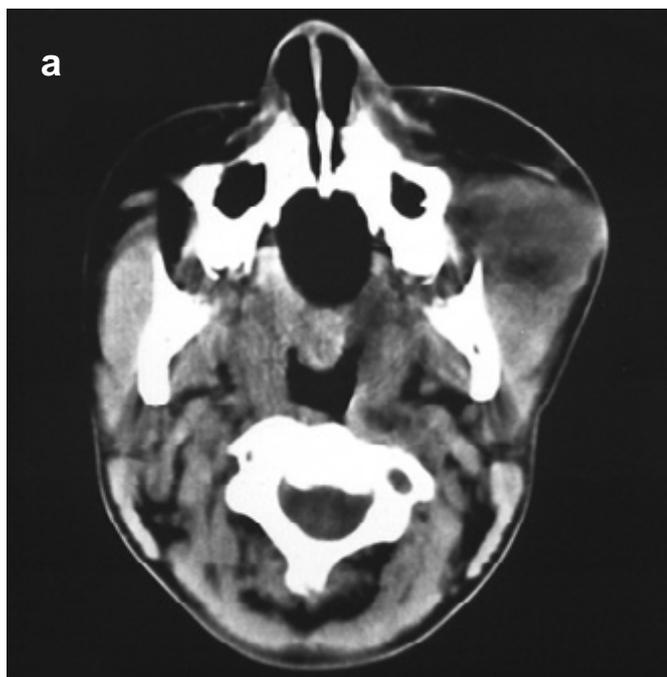
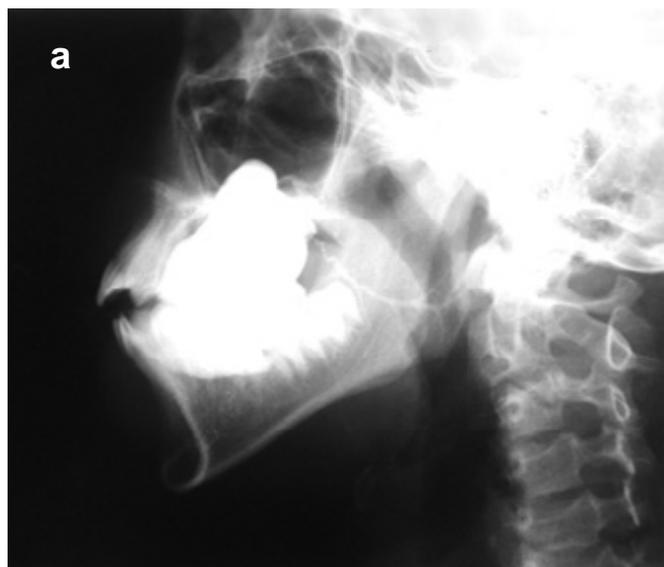


Fig 2. a,b. Axial soft tissue window non-contrast CT images through the parotid and submandibular regions. A low attenuation cystic mass lesion (3 by 5 cm) is seen anterior to the left parotid gland, extending on the surface of the mandible. The lesion's density is of fluid. The fat planes around this abnormality are not interrupted. The adjacent submandibular gland parenchyma appears normal.



A computed tomography (CT) scan with contrast medium was performed. Images through the parotid and submandibular region showed a well-defined cystic uniloculated mass lesion in the subcutaneous soft tissues of the left cheek (Figure 2). The mass was intimately applied to the superficial lobe of the parotid gland and appeared to be arising from it. There was a peripheral thick wall around the cystic lesion. The margins of the lesion were smooth and well defined. The content of the lesion was homogeneous and of a slightly greater density than water, suggestive of saliva. There was no ill-defined or irregular walls and heterogenous contents other than a sialocele. CT showed no marked enhancement or obvious communication with vascular components consistent with an aneurysm. The findings on CT reinforced the preliminary diagnosis of a post-traumatic parotid sialocele.

Finally, left parotid sialography was performed to confirm the communication between the facial fluid-filled space and the parotid duct. Sialograms revealed a large multicystic mass connecting to salivary tree filled with contrast media (Figure 3).

The patient was treated under intravenous conscious sedation and local anesthesia. A decision was made to incise and drain the sialocele. A 2-cm incision was made in the left buccal mucosa. The sialocele was opened using a sharp and blunt dissection, and this yielded approximately 30mL viscous fluid consistent with saliva. This immediately decompressed the facial swelling. A drain was inserted and was removed 4 weeks later after complete resolution

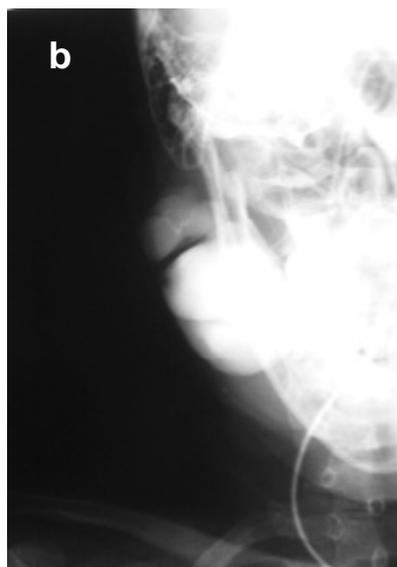


Fig 3. a,b. Left parotid sialography. These anterior (A) and lateral (B) radiographs of the left parotid sialogram demonstrate a large multicystic mass connecting to salivary tree and is filled with contrast. The duct is minimally narrowed.

of the swelling had been achieved. The patient remained asymptomatic with no recurrence after 11 months.

Discussion

Parotid sialoceles may be a complication of trauma with a penetrating salivary gland injury or may be a complication of surgical procedures involving salivary glands.^{1-9,12}

Facial lacerations are common injuries. However, parotid gland involvement and, in particular, ductal transection is relatively uncommon.^{10,11} Lewis and Knottenbelt found only 0.2% of patients seen in a trauma unit over a 6-month period had a parotid gland injury. The mechanism of injury responsible for the extravasation is often minor and not always recalled by the patient.¹²

The diagnosis of a sialocele is made by a thorough history and clinical assessment of the patient. A sialocele typically develops 8 to 14 days after the injury¹² but in our case sialocele formation was delayed.

Ultrasonography is a useful examination to use for diseases of the salivary glands and for confirming the cystic nature and precise location of a sialocele. Ultrasound scanning commonly demonstrates a complex fluid collection sometimes with septation and debris.¹³

CT scan will reveal a single or multiloculated cyst-like mass with less density than the surrounding tissues with smooth margins.¹⁴ The walls of the mass are usually not visible in the early period. The sialocele

may be soft and conform to the adjacent structures. CT with contrast may show enhancing borders after a few weeks because of capsule development. Cases earlier than 2 weeks since the occurrence showed no enhancement because of the absence of a well-developed capsule.⁴

The CT differential diagnosis would include retention cyst, sialodochitis, branchial cleft cysts, and lymphoepithelial cysts.¹⁴ By CT scanning alone it is difficult to differentiate these lesions from a sialocele, but a history of facial trauma or surgery is the key point to the correct diagnosis.

Other conditions of the neck and face that can cause cervical or facial swelling usually can be differentiated easily from a parotid sialocele. Abscesses usually have thicker walls than a sialocele. In a sialocele, unless secondarily infected, there is absence of pain, fever, chills, or erythema of the skin.^{4,14} Aneurysms usually show marked enhancement in a CT with contrast medium and may be an obvious communication with vascular components. Hematoma may mimic a sialocele and even show cystic appearance in ultrasound and CT exams but there is no communication to the parotid duct in sialography.¹⁴ Most tumors are more solid. Dermoid cysts and lipomas may contain fat. Hemangiomas are higher in density and may have calcifications. Lymphadenopathy is usually not cystic.

Magnetic resonance imaging usually is not needed for diagnosis, and demonstrates similar findings, with low signal on T1-weighted images and high signal on T2-weighted images, the findings expected for a cystic mass. The location of the mass is characteristic.

Diagnostic difficulty may arise if the cervical/facial swelling is the only sign. Knowledge that a facial or superior cervical swelling adjacent to the mandible can arise from a salivary related lesion can help with the diagnosis. Post-traumatic parotid sialocele should be considered in the differential diagnosis for any post-traumatic facial or high neck swelling.

Sialography can play a significant role in diagnosis by indicating the extent of parotid duct injury, and communication to the parotid duct.

The development of new diagnostic tools such as magnetic resonance sialography and endoscopic techniques has led to further improvements in the clinical and diagnostic assessment of this condition.¹⁵

In uncertain cases, a needle aspirate may be ob-

tained. Parotid secretion will have a high amylase content that usually exceeds 10,000 units/L thus confirming the diagnosis.¹¹

There are numerous methods described in the literature for sialocele treatment. Surgical modalities usually involve an operation with possible facial nerve injury, with the risk of a general anesthetic, and with prolonged hospitalization to be considered.¹⁶ Present-day approaches are more conservative and take many forms.^{1-3,5,9,15-18}

Acute surgical repair of damaged ducts can no longer be recommended, since conservative management of parotid duct trauma is both safe and effective.^{3,16}

Lewis and Knottenbelt investigated the outcome of non-operative management of parotid duct injuries in 19 patients. Of their patients, 47 % healed without complications. Short-term salivary fistulas complicated 37% and a sialocele occurred in 21%. All complications resolved without the need for operative intervention.¹² Sinha et al reported developing a transient seroma or sialocele in 17% of 30 patients after parotidectomy all; resolved with conservative management.⁸

A suitable surgical solution is outlined for more persistent cases.³ In selected patients, low-dose radiation therapy offers a solution to persistent salivary flow refractory to surgical management.⁷

Simple surgical procedures exist for the management of the rare long-term disorders.¹⁶ Repeated aspirations.¹⁸ Pressure dressings and antisialogogic agents are often successful.^{1,3,9} Instillation of tetracycline after aspiration may be administered. Propantheline bromide, which medically interrupts the parasympathetic control of salivary secretion, and a few days course of restricted oral intake has proved a safe, effective means of rapid sialocele control.^{5,16} Botulinum toxin therapy has recently been described as a highly effective, safe, and noninvasive method of treatment in the management of parotid sialoceles.^{2,15,17} Lapid et al. reported the application of transdermal scopolamine resulted in resolution of a post-rhytidectomy sialocele within 6 days.¹

Some new modifications in facial surgical procedures are recommended for avoiding parotid sialocele or fistula formation.¹⁹

References

1. Lapid O, Kreiger Y, Sagi A. Transdermal scopolamine use for post-rhytidectomy sialocele. *Aesthetic Plast Surg* 2004; 28: 24-28
2. Chow TL, Kwok SP. Use of botulinum toxin type A in a case of persistent parotid sialocele. *Hong Kong Med J* 2003; 9: 293-294
3. Bater MC. An unusual case of preauricular swelling: a giant parotid sialocele. *Int J Oral Maxillofac Surg* 1998; 27: 125-126
4. Cholankeril JV, Scioscia PA. Post-traumatic sialoceles and mucoceles of the salivary glands. *Clin Imaging* 1993; 17: 41-45
5. Hutchison IL, Ryan D. A parotid fistula and sialocele complicating temporomandibular joint surgery. *Br J Oral Maxillofac Surg* 1989 Jun; 27: 203-208
6. Jaquinet AR, Richter M, Laurent F, Roggero P. Surgical treatment of salivary incontinence in cerebral palsy. *Rev Stomatol Chir Maxillofac* 1993; 94: 366-370
7. Shimm DS, Berk FK, Tilsner TJ, Coulthard SW. Low-dose radiation therapy for benign salivary disorders. *Am J Clin Oncol* 1992; 15(1): 76-78
8. Sinha UK, Saadat D, Doherty CM, Rice DH. Use of AlloDerm implant to prevent frey syndrome after parotidectomy. *Arch Facial Plast Surg* 2003; 5(1): 109-112
9. Dierks EJ, Granite EL. Parotid sialocele and fistula after mandibular osteotomy. *J Oral Surg* 1977; 35: 299-300
10. Landau R, Stewart M. Conservative management of posttraumatic parotid fistulae and sialoceles: A prospective study. *J Surg* 1985; 72: 42-44
11. Payne James JJ, Fitzgibbon E. Post-traumatic parotid sialocele. *Br J Clin Pract* 1989; 43: 265-266
12. Lewis G, Knottenbelt JD. Parotid duct injury: is immediate surgical repair necessary? *Injury* 1991; 22: 407-409
13. Yasumoto M, Nakagawa T, Shibuya H, Suzuki S, Satoh T. Ultrasonography of the sublingual space. *J Ultrasound Med* 1993; 12(12): 723-729
14. Cholankeril JV, Ravipati M, Khedekar S, Janeira LF, Villacin A: Unusually large sialocele: CT characteristics. *J Comput Assist Tomogr* 1989; 13: 367-368
15. Capaccio P, Paglia M, Minorati D, Manzo R, Ottaviani F. Diagnosis and Therapeutic management of iatrogenic parotid sialocele. *Ann Otol Rhinol Laryngol* 2004: 562-564
16. Krausen AS, Ogura JH. Sialoceles: medical treatment first. *Trans Sect Otolaryngol Am Acad Ophthalmol Otolaryngol* 1977; 84: 890-895
17. Vargas H, Galati LT, Parnes SM. A pilot study evaluating the treatment of postparotidectomy sialoceles with botulinum toxin type A. *Arch Otolaryngol Head Neck Surg* 2001; 127: 339-340
18. Langenbrunner DJ. Treatment of sialocele: an experimental study in dogs. *Trans Sect Otolaryngol Am Acad Ophthalmol Otolaryngol* 1975; 80: 375-381
19. Marrero GM, Eliezri YD. The use of the SMAS to close Mohs defects invading the parotid gland. *Dermatol Surg* 1998; 24: 1335-1337