Post-Traumatic Surgical Emphysema and Sialocele with Fistula Following Knife Wounds to the Head and Neck of a 30-Year-Old Woman

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Patient: Female, 30-year-old
Final Diagnosis: Fistula • sialocele
Symptoms: Painful mass
Medication: —
Clinical Procedure: Fine needle aspiration
Specialty: Radiology • Surgery

Objective: Rare disease
Background: Trauma to the left submandibular gland is an infrequent entity, with only a few cases reported in the literature. Recommended management consists of excision of the gland if trauma is suspected; if trauma is not clearly identified during the surgical exploration and the gland is not removed, post-traumatic complications such as fistula or sialocele may occur. In such cases, conservative measures including aspiration, pressure bandages, and anti-sialogogues are the first step of treatment and surgical excision is reserved for unsuccessful cases.

Case Report: This report describes a case of post-traumatic surgical emphysema and sialocele with fistula following knife wounds to the head and neck of a 30-year-old woman. The patient had an incised wound to the left submandibular gland. Subsequently, a painful slow-growing mass developed and the diagnosis of sialocele was considered. Confirmation of this diagnosis was achieved by performing a fine-needle aspiration, which revealed a high amylase level within the collection. Afterwards, pressure bandages were applied and no recurrence of the sialocele was observed in imaging follow-up.

Conclusions: This report shows that although submandibular gland trauma is rare, it can lead to salivary fistula or sialocele. The diagnosis of sialocele can be confirmed by imaging combined with fine-needle aspiration and measurement of amylase levels in the aspirate. Identification of traumatic sialocele and fistula at an early stage will lead to the most appropriate management.

Keywords: alpha-Amylases • Biopsy, Fine-Needle • Compression Bandages • Submandibular Gland Diseases • Wounds and Injuries

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Background

Major salivary gland trauma is an unusual entity and may be associated with injuries to other facial structures such as the facial nerve or the adjacent bones [1]. It typically involves the parotid gland after a blunt or penetrating trauma, being far less common in the submandibular and sublingual glands as these structures are protected by the mandible [1]. To the best of our knowledge, only a few cases of submandibular gland trauma have been published in the literature, and there are only 2 reports of complications following trauma to this structure [1-5].

The management of salivary gland trauma varies depending on the presence of ductal damage and on the site of injury [1]. If surgical exploration reveals that the submandibular gland is injured during surgery, excision of the gland is usually performed to avoid complications such as skin fistulas and sialoceles [1].

This report describes a case of post-traumatic surgical emphysema and sialocele with fistula following knife wounds to the head and neck of a 30-year-old woman.

Case Report

A 30-year-old woman presented at the Emergency Department with knife wounds in the head and neck after an attack. Physical examination revealed multiple incised wounds in the lower third of the face, in both latero-cervical areas, and in the submental region (Figure 1). The patient was hemodynamically stable and did not show any signs of stridor or dyspnea.

A CT scan of the neck with intravenous contrast was immediately performed to assess the severity of the injuries (Figure 2). Edema of the subcutaneous fat anterior to the platysma was observed in the left submandibular region, as well as an overlying skin defect corresponding with an incised wound. The underlying left submandibular gland was enlarged and caudally located, showing a hypodense area in its anterior margin and some high-attenuation foci consistent with focal bleeding. All these findings were suggestive of laceration of the gland. Moreover, emphysema was observed in the superficial and deep cervical spaces, predominantly on the right side, causing contralateral displacement of the airways (Figure 2).

After assessing the results of the neck CT scan, a surgical exploration of the wounds was performed. All the wounds were explored and sutured; however, no additional surgical procedures were performed on the left submandibular gland as it did not appear to be affected.

Six days later, the patient presented with a painful, slow-growing mass in the left submandibular area without clinical signs of infection. A neck ultrasound (US) was performed, showing an anechoic collection within the left submandibular gland, with focal clots inside (Figure 3). The differential diagnoses included hematoma, seroma, and sialocele.

An US-guided fine-needle aspiration (FNA) was then performed using a 23-gauge needle. A total of 5 cc of serosanguineous fluid was aspirated and sent to the laboratory for analysis (Figure 4). Laboratory tests revealed a high amylase content (>65,000 U/l), and routine microbiology cultures were negative. These findings confirmed the existence of a sialocele as a complication of a traumatic laceration to the left submandibular gland.

After drainage of the collection, pressure bandages were applied on the left submandibular region. The patient presented no further symptoms of swelling or pain in this area.

A follow-up neck US was performed 4 weeks later, showing no signs of recurrence of the sialocele. The patient was asymptomatic and did not present new complications during the following 6 months.

Discussion

We present a case of post-traumatic sialocele of the left submandibular gland. A high clinical suspicion of this potential complication is essential to achieve a prompt diagnosis, and US-guided FNA can help to confirm the diagnosis and to treat this complication in a minimally invasive manner.

Injuries to the major salivary glands have been reported to result from motor vehicle crashes, penetrating mouth floor injuries, gunshot and stab wounds, strangulation, manipulation,
or sport-related lesions [6,7]. As previously mentioned, the submandibular gland is less frequently affected than the parotid gland, and, in most cases, it is associated with mandibular fractures [6].

Figure 2. CT scan of the neck and axial images at the level of the submandibular space. The left submandibular gland is enlarged and demonstrates a heterogeneous appearance with an anterior hypodense area (arrowheads, Figure 1) in keeping with laceration of the gland. The hyperdense foci represent focal intraglandular bleeding. Air bubbles are observed in both the submandibular and retropharyngeal spaces (arrows, A, B). There is a lineal disruption of the skin and the underlying subcutaneous fat (arrow, B) in the submandibular region, reaching the left submandibular space and revealing the wound trajectory.

Figure 3. Longitudinal neck US image. There is an anechoic collection at the submandibular region with hyperechoic clots (arrowheads). This collection disrupts the submandibular gland (arrows).

Figure 4. Photograph of aspirated fluid from the collection. It had a serosanguineous appearance and was slightly viscous.
Blunt trauma usually causes hematoma, contusion, or laceration of the gland, while penetrating injuries as in the presented case can lead to ductal injury [6]. After a ductal injury, complications such as skin fistulas or sialoceles can occur [1]. The latter consist of saliva accumulation with a cyst-like appearance and a high amylase content (higher than 10,000 U/l) [8].

Clinically, sialocele manifests as a progressively growing mass in the days following a glandular trauma [1]. Imaging evaluation of this complication can be performed with US, MRI sialography, conventional sialography, or CT scan of the neck [1]. Findings can include gland enlargement, structural abnormalities, or hematoma [6]. The importance of performing a pre-contrast CT scan to detect hemorrhagic foci and to distinguish them from normal glandular enhancement has also been described [6]. A clear diagnosis can be achieved by performing US-guided FNA and detecting high amylase content within the collection [8].

Initially, both sialoceles and fistulas are conservatively managed with anti-sialogogues, pressure bandages, and fine-needle aspiration [8,9]. Parekh et al proposed a combination of these measures with restricting oral intake and giving intravenous fluid to decrease gland secretion in parotid sialoceles [8].

Botulinum toxin has also been used in sialoceles, as it blocks neurotransmission at the salivary gland [5]. The therapy consists of botulinum toxin injections at 5-month intervals in parotid sialoceles [5].

If these therapies are unsuccessful, salivary gland excision may be recommended. If the submandibular duct is damaged, marsupialization should be performed to avoid strictures [1]. In case of glandular damage with an intact duct, neurectomy can be performed. Neurectomy of the tympanic nerve has been reported as a treatment for parotid fistulas and sialoceles [8].

In our case, resection of the gland might have been performed if gland laceration had been suspected during the surgical exploration. However, fine-needle aspiration and pressure bandages were sufficient to manage this sialocele and the preservation of the gland was possible.

**Conclusions**

This report shows that although submandibular gland trauma is rare, it can lead to salivary fistula or sialocele. The diagnosis of sialocele can be confirmed by imaging combined with fine-needle aspiration and measurement of amylase levels in the aspirate. Identification of traumatic sialocele and fistula at an early stage will lead to the most appropriate management.

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**Declaration of Figures’ Authenticity**

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