

## Ultrasound-guided needle aspiration of parotid abscess

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### ABSTRACT

Ultrasound (US) has been used as a tool for parotid abscess diagnosis and treatment. The present article aimed to report a case of 72-year-old woman with parotid abscess treated by US-guided needle aspiration and conventional surgical drainage. Along with the clinical report, indications, advantages, and limitations of the method are discussed.

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The management of parotid abscess may be difficult because of the density of the parotidomasseteric fascia, the underlying gland parenchyma, and the proximity to the facial nerve.<sup>[1]</sup> The acute parotid infection is characterized by the sudden onset of an indurated, warm, erythematous swelling of the cheek extending to the angle of the jaw. The infection is usually unilateral, the gland becomes swollen and tender, and patients often have toxemia with marked fever and leukocytosis. The parotid duct orifice is red and pouting, and pus may be exuding or may be produced by gentle pressure on the duct. Pus rarely points externally because of the dense fibrous capsule of the gland.<sup>[2]</sup>

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The most common pathogens associated with acute bacterial parotitis are *Staphylococcus aureus*<sup>[3]</sup> and anaerobic bacteria.<sup>[4]</sup> Cultures for anaerobic bacteria should not be taken from the Stensen's duct orifice because contamination with oropharyngeal bacteria is certain. Needle aspiration of the gland is the best method to identify the causative organism.<sup>[5]</sup> General conditions can be predisposing to parotitis, i.e., dehydration, malnutrition,<sup>[6]</sup> immunosuppression, hypothyroidism, and diabetes.<sup>[7]</sup>

Surgical drainage is considered necessary when an abscess has formed.<sup>[2]</sup> Methods include quite radical procedures such as multiple drainage incisions or rising of a full posterior-based flap as for parotidectomy. But it seems that in most cases, quite a small procedure is enough, especially when modern imaging techniques can assist in the procedure, and broad-spectrum antibiotic therapy is included. More radical procedures may lead to poor wound healing, fistula formation, and poor cosmetic outcome, and therefore should be avoided.<sup>[8]</sup>

Originally, the ultrasound (US) has been used as an aid for maxillofacial infections diagnosis,<sup>[1,9]</sup> and later, its intraoperative application to guide the drainage with needle has been described.<sup>[10,11]</sup> US imaging is useful as the initial diagnostic method and for assistance in the surgical incision.<sup>[12,13]</sup>

## CASE REPORT

A 72-year-old woman sought the Department of Oral and Maxillofacial Surgery in a level I trauma hospital in the northern region in Sao Paulo city, Brazil, with the chief complain of 3 days of pain experience. According to the medical history, the woman was a hypertension-controlled patient. According to the examination, dysphagia, limited mouth opening, fever, toxemic appearance, and swelling of the left side of the face were observed; also, the overlying skin was tense, erythematous, and shiny [Figure 1]. No focal dental pathology was identified as a source of the infection. No sign of fluctuation was elicited. The parotid duct orifice was red and pouting, and purulent material was exuding by pressure over the gland. The patient was diagnosed as presenting parotid abscess that involve masticatory space.

Antibiotic therapy with penicillin G crystalline 5.000.000 ui and metronidazole 100 ml 400 mg was administrated intravenously at each 4 hours. The drainage was made with yelko 14 guided by the US and Doppler (US-GE Logic 400, with 9 MHz transducer) [Figure 2]. Soon after, the patient underwent the conventional drainage of the abscess with *Penrose* drain and removed after 2 days. After 4 days, the patient presented improvement and was discharged from the hospital. The definitive liberation was done after two months of the postoperative follow-up [Figure 3].

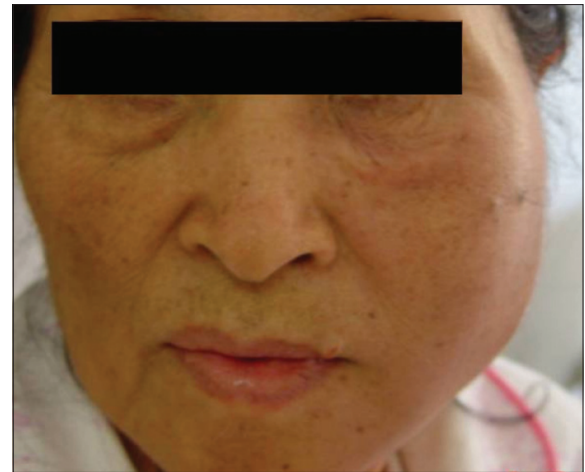
## DISCUSSION

In order to discuss the present case in more detail, additional patient information would be beneficial, i.e., blood leukocyte count, CRP (C-reactive protein), and erythrocyte sedimentation rates together with bacterial culture results.<sup>[14]</sup> This information is generally requested in clinical practice for monitoring fulminate infections.

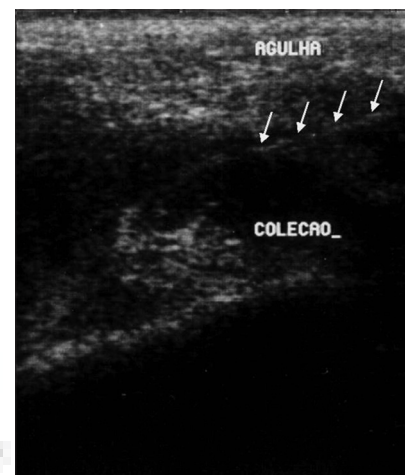
Considering the most common pathogens involved in parotid abscesses, penicillin-resistant penicillin or cephalosporins together with anaerobic coverage would possibly be the best first-line treatment.<sup>[2]</sup> The presence of methicillin-resistant *Staphylococci* may mandate the use of vancomycin. However, bacterial culture should be taken whenever possible and antibiotic therapy chosen in accordance to the culture results.

The US is an important tool for the diagnosis of the phase of evolution of the abscess, providing information that differentiates between pus and cellulites.<sup>[9]</sup> Abscesses with pus generally are represented by a regular hypoechoic image.

US has been reported to be a quick, relatively inexpensive, noninvasive, harmless, painless, sensitive, and available diagnostic tool for identifying the location and the extent of head and neck abscesses.<sup>[11,6]</sup> Furthermore, the procedure requires simple maneuver, gains patient acceptance easily,



**Figure 1:** Patient with massive swelling of the left side of face



**Figure 2:** Ultrasound-guided needle aspiration of pus. White arrows indicating needle. The dark area named "colecao" is a hypoechoic ultrasonic pattern compatible with a purulent collection



**Figure 3:** The postoperative aspect after two months

offers an instantaneous tissue display, is readily available, and does not expose the patient to radiation. If associated with color Doppler US, differentiation may be done between an abscess and the surrounding vessels.<sup>[13]</sup>

The size and the location of the abscess are determinants that dictate the success of the method. US-guided drainage treatment is found to be very effective for small and superficial abscesses;<sup>[1,9]</sup> however, the effectiveness is somewhat limited for abscesses with greater extension once these often present continuous pus formation, being necessary the conventional surgical drainage and drain placement to keep the passage constantly drainable. Sivarajasingam *et al.*<sup>[11]</sup> used US to guide the aspiration of a lateral masticator space abscess. Preoperative scanning was performed in order to improve mouth opening and, consequently, to facilitate anesthetic intubation; then, the abscess of drainage was executed conventionally. Thiruchelvam *et al.*<sup>[6]</sup> accomplished the conventional drainage of a large parotid abscess following with the US-guided method to drain the purulent remnants stores. Furthermore, Magaram and Gooding<sup>[10]</sup> used the US to guide the aspiration of parotid abscess before the conventional drainage.

Despite its limitation in the drainage of large abscesses, the guided puncture decreases the tension of the tissues and provides a clear visualization as well as the delimitation of the abscess cavities. These advantages are helpful in the conventional drainage, once pus stores and their surrounding vessels may be located accurately, so that drain may be placed without damaging the vessels. Although the images displayed by the scan are bidimensional, along with a straight contact of the target area, the dynamics of the method is able to furnish the surgeon the three-dimensional feature of the abscess. Also, the needle is able to probe the depth.

In the present case, the correct diagnosis and the location of purulent stores were achieved by US. In addition, the drainage of the pus was also possible by US-guided

procedure, and therefore radical surgery could be avoided.

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