

INCISION AND DRAINAGE OF PAROTID ABSCESES VS USG GUIDED NEEDLE ASPIRATION- A RETROSPECTIVE STUDY

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ABSTRACT

Objective: Surgical drainage of the parotid abscess is the current standard of treatment which is carried out under general anaesthesia and carries the risk of iatrogenic facial nerve injury. Ultrasound-guided needle aspiration can be an alternative to surgical drainage.

Methods: All parotid abscess patients who are treated surgically ($n = 18$) vs ultrasound-guided needle aspiration ($n = 12$) at Department of Surgery, MKCG MCH, were included in this monocentric retrospective analysis.

Results: There was no statistically significant difference ($p = 0.142$) regarding the mean in both groups. There was a change in the duration of hospital stay (5.416 vs. 7.77 days) after ultrasound-guided needle aspiration. This trend did not reach statistical significance ($p = 0.031$). Facial nerve injury did not occur in any of the patients. Postoperative bleeding didn't occur after needle aspirations but same is seen in 2% of the patients after surgical abscess revision.

Conclusion: Ultrasound-guided needle aspiration is safe and effective in the treatment of parotid abscesses.

INTRODUCTION

Even though the parotid gland is the largest salivary gland and commonly inflamed, an abscess seldom results from parotitis [6,7]. A parotid abscess may have bacterial, viral, obstructive, or immunological origins, among other etiological factors. Adults are more frequently affected by bacterial than viral triggers, such as those linked to HIV. [5,6]. Numerous other potential causes, such as sialolithiasis, sialadenitis, chronic recurrent parotitis, cystic fibrosis, vascular disorders, alcoholism, or neoplasms, must be considered when dealing with an enlarged parotid gland [1,3,5,8].

Although parotid abscess frequently affects people who are a little older (>50 years) and immunocompromised, it can afflict people of any age. Serious consequences, such as facial nerve palsy, jaw osteomyelitis, temporal lobe abscess, descending mediastinitis, and septicaemia, may arise from parotid abscesses because they may include deep neck areas and can cause systemic infections [2, 7]. Surgery involving incision and drainage must be taken into consideration if there is insufficient progress with conservative treatment techniques. Open incision and drainage using a transcervical approach or a conventional parotidectomy is the standard surgical technique [4, 6]. Potential drawbacks include the need for general anaesthesia if neuromonitoring is necessary or because of pain-related patient non-compliance, the long incisions that may be required or the occasionally extensive dissection, the associated risk of injury to the facial nerve, as well as potentially undesirable cosmetic results from scarring [4,11]. An alternative to surgical incision and drainage for parotid abscess is ultrasonography-guided needle aspiration. Although a sonographic approach is thought to be a very reliable diagnostic tool and the preferred imaging technique for parotid gland diagnostic evaluation, it also offers potential benefits in the context of abscess therapy. These may include quicker recovery, shorter hospital stays, or improved cosmetic outcomes [4,5,11,16].

No evidence-based, comprehensive suggestions for the ideal treatment strategy exist as of yet. The number of cases is therefore limited because the experience to date is mostly based on retroactively gathered case reports or series. The scant observations that are now available, however, indicate that ultrasound-based needle aspiration is typically linked to less difficulties than surgical incision or drainage. [15,18]. In the published literature between 1999 and 2021, there have been reported 18 patient cases of parotid abscesses treated by "ultrasound-guided aspiration" without any problems [18]. We conducted a thorough retrospective analysis of all patient cases who underwent surgical treatment or ultrasound-guided fine-needle aspiration at Department of General Surgery, MKCG, MCH, Berhampur for parotid abscess during a period of three years.

The study's main objective was determining if needle aspiration is a feasible alternative to surgical drainage in terms of complication rates, length of hospital stay, and frequency of necessary treatments. The identification of parotid abscess aetiology, including the microbiological spectrum of microorganisms, and the clinical presentation of the condition were the secondary objectives.



Figure 1 : Patient showing parotid abscess

MATERIALS AND METHODS:

We retrospectively reviewed all available medical records on patients undergoing treatment for a parotid abscess from January 2019 to December 2022 at the Department of General Surgery, MKCG, MCH, Berhampur. Leucocytes and CRP were the two inflammatory markers that made up the diagnostic workup for each patient. Before open surgical drainage, all patients underwent routine CT scans.



Figure 2 : CT scan showing extension of parotid abscess

One month after being discharged, all patients were given a follow-up appointment that included a sonographic evaluation. This monocentric study's evaluated treatment time spans a total experience length of three years. This study covered all parotid abscess cases undergoing surgical therapy or ultrasound-guided needle aspiration (20-gauge needle). Depending on the patient's preference, surgical drainage was performed under local or general anaesthesia. Incisions of 1 to 3 cm were made during surgery, parallel to the estimated path of the pertinent facial nerve branches, and positioned superficially to the abscess that sonographic imaging had indicated. After that, the abscess cavity was located and exposed with blunt dissection. Then, easy flow drainages were introduced. After putrid discharge had seized, drainage systems were removed. Abscesses that did not involve the parotid gland or those were treated solely with conservative measures (n = 6) were excluded from the analysis. conservative treatment consisted of Cefaperazone/Sulbactam 1.5 g three times a day for ten days. Data on the parotid gland abscess, such as imaging approach at diagnosis, localization and extent, clinical symptoms, therapy outcome (duration of hospitalization, duration of symptoms up until hospital admission, number of interventions, complications) or microbiological findings were collected in addition to information on patient characteristics like age, sex, presumed disease aetiology, or comorbidities. Descriptive analysis was used to analyse the data.

Table 1. Patient characteristics.

Patient characteristic	USG Fine Needle aspiration	Surgical incision	Total
Number of cases	12	18	30
Mean age in years (range)	49.58(34-66)	58.55(46-70)	54.96(34-70)
Gender ratio (female: male)	8:4	11:7	19:11
<u>Number of patients with Following comorbidities</u>			
Arterial Hypertension	3	4	7
Type 2 diabetes mellitus	4	5	9
Struma (multinodosa)	1	1	2
Sialolithiasis	1	1	2
(Suspicion of) Warthin tumor	1	1	2
Depression	0	1	1
<u>Number of following symptoms at presentation</u>			
Pain	8	12	20
Swelling	12	18	30
Redness	3	10	13

Local hyperthermia	1	3	4
Trismus	1	2	3
Dysphagia	2	2	4
Fever	2	1	3
Xerostomia	0	1	1
Facial Nerve palsy	0	1	1
Pus in oral cavity	0	1	1
Putrid taste	0	1	1
<u>Laboratory Data</u>			
CRP (mg/ml)	3.74	7.79	6.17
Leukocytes (10 ³ /ml)	13.26	16.44	15.16
<u>Diagnostic imaging</u>			
USG	12	18	30
Computed Tomography	4	12	16
Magnetic Resonance Imaging	1	1	2

Table 2: Microbiological results in patients undergoing USG-guided needle aspiration and surgical incision

Bacteria	USG- Fine Aspiration	guided Needle	Surgical incision	Total
No bacterial growth	3		6	9
Streptococcus intermedius	2		3	5
Staphylococcus aureus	2		8	10
Coagulase -negative staphylococcus	1		0	1
Hemophilus influenza	1		1	2
Enterobacter gergoviae	1		0	1
Klebsiella pneumoniae	1		0	1
Bacteroides	1		0	1
Streptococcus pneumoniae	0		1	1

Recurrences were defined as patients who had to be readmitted to the hospital with a parotid abscess on the same side. In these instances, the time spent in the hospital is only represented for the initial stay. A therapeutic failure was deemed to have occurred when patients' clinical conditions did not improve or inflammatory values (CRP, leucocytes) continued to increase after FNP. These patients received surgical drainage treatment.

DISCUSSION

Conservative antibiotic therapy, surgical incision and drainage, imaging-guided percutaneous drainage, or needle aspiration are all options for treating parotid abscesses. The decision about the course of treatment is typically based on the clinician's personal preferences [18]. On the subject of whether ultrasound-controlled needle aspiration is a risk-free and efficient substitute for surgery, fully published descriptive or controlled research are

currently missing. Additionally, there are currently no established standards for determining which patients—for example, those with smaller abscesses and less obvious swelling?—are most likely to benefit [4]. To our knowledge, the data collection with the most parotid abscess cases overall is represented by the current analysis. According to preliminary data, surgical incision and drainage are not superior to ultrasound-guided needle aspiration, which also lowers the risk of complications [15,18]. Repeated ultrasound-guided needle aspirations are possible without increasing the danger of radiation exposure, frequent bleeding, irreparable damage to the neurovascular structures, or negative consequences from general anesthesia [11,17]. Using contrast-enhanced ultrasonography also has the benefit of allowing for the distinction between neoplastic tissue and avascular abscess formation within the parotid gland, or between vascularized and non-vascularized areas [11].

Only one patient in our patient cohort experienced a bleeding problem, and that was in the surgical group. Repeated needle aspiration did not cause any bleeding or injury-related problems, even after several days. Treatment cases under ultrasound monitoring needed a little shorter inpatient stay than surgically treated cases (average hospital stay 5.41 days vs. 7.77 days). In the group receiving fine-needle aspiration, the median length of stay was 6 days, while in the surgical group, it was 9 days. Additionally, the average length of symptoms was shorter (5.23 days vs. 10.56 days) in patients who underwent aspiration than in individuals who underwent surgery. Patients who underwent surgery reported pain, swelling, redness, or localized heat more frequently than patients who underwent aspiration.

Only the poster of an initial evaluation from a randomized controlled comparison research with a total of 32 patients who received ultrasound-guided aspiration vs. drainage for deep neck abscesses is currently available. The authors of the study came to the conclusion that for "uni- or multilocular deep neck abscesses," ultrasonography guided aspiration provides a secure and efficient substitute for surgical incision and drainage. A shorter hospital stay (2.63 vs. 4.81 days) was also linked to aspiration [15]. However, it must be noted that in 16.6% ($n = 3$) of the patients in our study, ultrasonography guided aspiration was insufficient as a therapy option. These patients needed to have further surgical drainage. In comparison to longer hospital stays for surgical drainage, shorter hospital stays for deep neck abscess drainage using ultrasound guidance may also result in significant cost savings [13]. A corresponding cost comparison between the ultrasound-based aspiration procedure and the surgical intervention—even if aspiration was repeated two ($n = 3$) or five ($n = 1$) times in individual patients—could come to a similar result.

The gender ratio was 8:4 for ultrasound-based needle aspiration and 11:7 for surgical incision, with women being somewhat overrepresented in both categories. Patients in the surgical group were generally slightly older than those in the ultrasound-guided needle aspiration group (49.58 vs. 58.55 years). There was no statistically significant change in this trend. The desire of younger patients to prevent scarring and the (albeit extremely minor) risk of a facial nerve lesion as a result of surgical drainage may be two plausible explanations for this occurrence. The average age of our patient cohort (54.96 years) was generally in line with earlier retrospective data collections on parotid abscesses in adults [10,14,18]. *Staphylococcus aureus* was one of the most frequently found bacterial pathogens in our data collection, which is consistent with the literature [6,14,18]. Less often described microorganisms linked to parotid abscesses in more recent research include *Streptococcus*

intermedius (5 cases) and Haemophilus parainfluenza (4 cases) [18], but have already been identified in past investigations as potential pathogens [8,12]. The absence of bacterial growth (9 instances in this investigation) appears to be a common result and is frequently seen in chronically recurring sialadenitis [8,13], according to the literature. Along with odontogenic reasons, sialadenitis has been identified as one of the most frequent causes of parotid abscesses. In our analysis, persistent sialadenitis was identified as the likely cause in at least two patients.

CONCLUSION

Aspiration of parotid abscesses using ultrasound guidance is a safe and efficient alternative therapeutic method. To ascertain which of the two modalities produces better clinical patient outcomes, prospective studies comparing ultrasound-guided needle aspiration and traditional surgical drainage as treatment options for parotid abscesses should be conducted on cases with statistically sufficient sample sizes.

Conflicts of Interest: All authors declare no conflicts of interest.

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