

A Clinical Comparison of Needle Aspiration Versus Incision and Drainage Among Patients with Peritonsillar Abscess

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ABSTRACT

Objective: To compare the outcomes between needles aspiration versus incision and drainage for the management of peritonsillar abscess.

Methodology: This comparative study was carried out at the ENT department at Liaquat University Hospital, Hyderabad, from December 2021 to November 2022. Patients presenting with peritonsillar abscess, both genders and 12 years and above age were included. Under appropriate local anesthesia, a small curvilinear incision was made in the mucosa with a guarded quinsy knife to prevent a deep incision, over the most fluctuant part of the swelling and blunt curved artery forceps was placed into the wound and spread until adequate drainage was achieved, whereas needle aspiration was performed with a wide bore 14-gauge cannula at the site of maximum swelling and pus was aspirated or drained. Outcome was compared in terms of hospital stay, post-operative pain, and recurrence of abscess in both procedures. SPSS version 26 was used for the data analysis.

Results: Overall 36 cases peritonsillar abscess were comparatively studied as per management procedure, with overall mean age of the patients was 20.48±5.60 years and male predominance (58.3%). Average duration of onset was lower 5.22±0.87 minutes in needle aspiration group compared to the in incision and drainage group as 6.16±1.92 minutes, (p=0.069). The pain intensity was almost similar in both surgical procedures (p=0.324), while Hospital stay was significantly lower in needle aspiration group compared to the in incision and drainage group (p=0.001). There no any case found with recurrences during study period in both study groups (p>0.05).

Conclusion: The needle aspiration and incision and drainage, both observed to be effective, with favorable tendency to needle aspiration as more simple, non-invasive and effective procedure in terms of less pain and less hospital duration among cases presented with peritonsillar abscess.

Key words: Peritonsillar abscess, needle aspiration, incision, drainage, pain, recurrences.

Introduction

Peritonsillar abscess (PTA) or quinsy continues to be a frequently encountered suppurative complication in otorhinolaryngology, characterized by localized pus within peritonsillar space.¹ It is one of the most frequent deep infections of the head and neck that usually develops as a complication of acute tonsillitis or progressive peritonsillar cellulitis.^{1,2} Despite being reported in patients across a broad age range, the occurrence is more frequent in teenagers, with annual incidence estimated at around 30/100,000 individuals of age range 5-49 years, peak incidence reaching almost 167/100,000 among individuals aged 15-19 years, and mortality rate reaching around 10% in complicated peritonsillar abscess cases.² Patients with PTA commonly present with sore throat, odynophagia, dysphagia, fever, muffled or "hot-potato" voice, trismus, tonsillar node enlargement, and unilateral palatal inflammation. Prompt recognition or appropriate management may avoid severe complication, such as dehydration,

necrotizing fasciitis, mediastinitis, parapharyngeal abscess, Lemierre's syndrome, and extension of infection into the parapharyngeal or other deep neck spaces.^{3,4}

Clinical examination is generally sufficient in typical cases. However, ultrasonography or contrast-enhanced imaging may be useful in case of uncertain diagnosis, problematic differentiation from cellulitis, or suspected deep neck extension. It is important to distinguish a true abscess from peritonsillar cellulitis because the presence of a drainable pus collection can directly influence the need for procedural intervention.⁵⁻⁸

The management of PTA has evolved considerably over time. The current treatment strategies include medical therapy, needle aspiration (NA), incision and drainage (I&D), and tonsillectomy in selected circumstances.⁹ However, needle aspiration (NA) and

incision and drainage (I&D) remain the two most commonly used procedures for direct evacuation of a peritonsillar abscess. These techniques are generally combined with antimicrobial treatment and supportive care.¹⁰ NA is low cost and user-friendly, with high reported success (96%), while more frequent recurrence or the need for repeat intervention must be taken into consideration. Conversely, I&D allows for better pus drainage and reduced anaerobic bacteria survival, by increasing oxygen exposure within the abscess cavity, thereby reducing anaerobic bacterial survival. However, I&D procedure remains more invasive and may be more painful. Therefore, the optimal drainage method remains a matter of debate, considering the relative benefits, risks, and clinical circumstances.^{11,12} More recent literature continues to reflect this uncertainty rather than establishing a universally superior drainage technique.³ Comparative effectiveness of NA and I&D in the management of PTA remains controversial. A recent systematic review of PTA treatment options in pediatric population found substantial heterogeneity in treatment practices. Another study reported I & D as the most frequently used primary procedural treatment, whereas needle aspiration was represented as a less commonly employed alternative, with recurrence rates ranging from 2% to 15.8% after primary treatment.¹³

Regardless of incisional and drainage are the traditional treatment for peritonsillar abscess with shorter hospital stay and fewer repeat procedures, while it is frequently painful and tolerated poorly, on the other hand needle aspiration is a simple, easy to use, less traumatic, better tolerated by patients and the less invasive alternative with the comparable outcomes. Present study was aimed to generate updated comparative evidence on the effectiveness of both approaches to resolve this clinical uncertainty and encouragement of a more identical, evidence-based management approach.

Methodology

This descriptive comparative study was conducted in the E.N.T. Department of Liaquat University Hospital, Hyderabad, after obtaining ethical approval from the Ethical Review Committee of LUMHS. The study was conducted over a period of one year, from December 2021 to November 2022. A non-probability consecutive sampling technique was employed. All patients aged ≥ 18 years, of either gender, who were clinically diagnosed with peritonsillar abscess based on positive aspiration of pus on needle aspiration, unilateral peritonsillar swelling, trismus, and uvular deviation, and who were willing to participate in the study and complete follow-up until resolution of symptoms, were included.

Conversely, patients with bilateral peritonsillar abscess, associated deep neck space infections, or evidence of

extension beyond the peritonsillar space based on clinical or radiological assessment were excluded. Patients with a history of recurrent peritonsillar abscess, compromised airway or signs of impending airway obstruction requiring emergency surgical intervention, bleeding disorders, anticoagulant therapy, or diabetes mellitus were also excluded.

Peritonsillar abscess was defined as a condition characterized by ipsilateral upper-pole tonsillar swelling, high-grade fever, trismus, swollen and deviated uvula toward the opposite side, and positive needle aspiration of pus, accompanied by difficulty opening the mouth and swallowing. Written informed consent was obtained from each patient after explaining the purpose of the study and assuring them of their voluntary participation and their right to withdraw from the study at any time without affecting their management or treatment.

Relevant information was obtained from the patients' history and clinical examination, and radiological findings were also recorded.

Under appropriate local anesthesia, a small curvilinear incision was made in the mucosa using a guarded quinsy knife to prevent deep incision over the most fluctuant part of the swelling. Blunt, curved artery forceps was then introduced through the wound and gently spread until adequate drainage was achieved. Similarly, needle aspiration was performed using a wide-bore 14-gauge cannula at the site of maximum swelling. Pus was aspirated or drained and sent for culture and sensitivity.

All patients received antibiotics, analgesics, and oral hygiene instructions following aspiration or incision and drainage. The same preoperative and postoperative therapy was continued for the next five days. The two procedures for the management of peritonsillar abscess were compared in terms of hospital stay, postoperative pain, and recurrence of abscess. Following discharge after five days, patients were re-examined at one-month intervals.

Data were analyzed using SPSS version 26.0. Qualitative data were expressed as frequencies and percentages, while quantitative data were expressed as means and standard deviations. The Chi-square test was applied to assess differences in outcomes between the two groups. A p-value of <0.05 was considered statistically significant.

Results

A total of 36 cases of peritonsillar abscess were comparatively studied according to the management procedure. The mean age of the patients was 20.48 ± 5.60 years. Overall, males were in the majority (58.3%), and most patients resided in urban areas

(66.7%). Most patients had either primary-level (33.3%) or secondary-level (33.3%) education. Additionally, the majority of patients belonged to the middle socioeconomic class (66.7%), and most were unemployed (75.0%). However, none of the demographic characteristics showed a statistically significant difference between the study groups ($p > 0.05$), as presented in Table I.

Regarding the outcomes, the mean duration of symptom onset was lower in the needle aspiration group (5.22 ± 0.87 minutes) compared with the incision and drainage group (6.16 ± 1.92 minutes); however, the difference was not statistically significant ($p = 0.069$). Pain intensity was almost similar between the two procedures ($p = 0.324$), whereas hospital stay was significantly shorter in the needle aspiration group compared with the incision and drainage group ($p < 0.001$), as shown in Table II.

Categorical comparison of pain according to the two procedures showed that all patients in the needle aspiration group experienced mild pain, whereas only

one patient in the incision and drainage group experienced moderate pain ($p = 0.310$). No recurrence was observed in either study group during the study period ($p = 1.000$), as shown in Table III.

Table II: Comparison of the overall average time onset, pain intensity and Hospital stays according to both procedures. (n=36)

Variable	Procedure	Mean	SD	p-value
Time onset	Needle aspiration	5.22	0.87	0.069
	Incision and drainage	6.16	1.92	
Pain intensity	Needle aspiration	2.00	0.05	0.324
	Incision and drainage	2.05	0.23	
Hospital stay	Needle aspiration	1.72	1.17	0.001
	Incision and drainage	3.72	0.89	

Table: 1 Demographic profile of the patients

Variable	Category	Needle Aspiration (n=18)	Incision & Drainage (n=18)	Total (n=36)	p-value
Gender	Male	9 (50.0%)	12 (66.7%)	21 (58.3%)	0.310
	Female	9 (50.0%)	6 (33.3%)	15 (41.7%)	
	Total	18 (100.0%)	18 (100.0%)	36 (100.0%)	
Residence	Urban	9 (50.0%)	15 (83.3%)	24 (66.7%)	0.034
	Rural	9 (50.0%)	3 (16.7%)	12 (33.3%)	
	Total	18 (100.0%)	18 (100.0%)	36 (100.0%)	
Educational Level	Uneducated	5 (27.8%)	5 (27.8%)	10 (27.8%)	0.506
	Primary	7 (38.9%)	5 (27.8%)	12 (33.3%)	
	Secondary	6 (33.3%)	6 (33.3%)	12 (33.3%)	
	Higher	0 (0.0%)	2 (11.1%)	2 (5.6%)	
	Total	18 (100.0%)	18 (100.0%)	36 (100.0%)	
Socioeconomic Status	Middle	11 (61.1%)	13 (72.2%)	24 (66.7%)	0.480
	Lower	7 (38.9%)	5 (27.8%)	12 (33.3%)	
	Total	18 (100.0%)	18 (100.0%)	36 (100.0%)	
Occupational Status	Employed	4 (22.2%)	5 (27.8%)	9 (25.0%)	0.700
	Unemployed	14 (77.8%)	13 (72.2%)	27 (75.0%)	
	Total	18 (100.0%)	18 (100.0%)	36 (100.0%)	

Table III: Categorically pain comparison according to both procedures. (n=36)

Variable			Procedure performed		Total	p-value
			Needle aspiration	Incision and drainage		
Pain intensity	Mild	Number	18	17	35	0.310
		Percentage	100.0%	94.4%	97.2%	
	Moderate	Number	0	1	1	
		Percentage	0.0%	5.6%	2.8%	
Total		Number	18	18	36	
		Percentage	100.0%	100.0%	100.0%	
Recurrences	Yes	Number	--	--	--	1.000
		Percentage	--	--	--	
	No	Number	18	18	36	
		Percentage	100.0%	100.0%	100.0%	
Total		Number	18	18	36	
		Percentage	100.0%	100.0%	100.0%	

Discussion

Peritonsillar abscess is the most common complication of tonsillitis that occurs in adults and is potentially life-threatening. In this study a comparative analysis of 36 cases of peritonsillar abscess according to management method with overall mean age of 20.48 ± 5.60 years and males were in majority (58.3%) compared to females (41.7%) and resided in urban areas (66.7%), indicating that peritonsillar abscess predominantly affected mostly young adults males. This finding is consistent with the study conducted by Ketterer MC et al¹⁴ who reported relatively higher mean age of 36.1 years at the time of peritonsillar abscess treatment compared to age distribution observed in the present study. Similarly, in the study of Chi TH et al¹⁵ mean age of study subjects was 31.0 ± 15.0 years, which is lower than that in our study. Despite variations in the reported mean ages across studies, the findings support the observation that peritonsillar abscess predominantly occurs in younger populations. Similar to the present study, Qureshi H et al. reported that males constituted 61.3% of cases, while females accounted for 38.7%. Similarly, Khan MI et al. reported a male predominance, with males comprising 62% and females 38% of the study population.

However, all demographic characteristics showed no statistically significant differences between the study groups ($p > 0.05$). This finding is further supported by

Chi TH et al., who reported no significant baseline difference between the treatment groups with respect to gender ($p = 0.470$). Moreover, Alpay M et al. also reported that gender distribution did not differ significantly between the groups.

Previous studies^{3,14-16} have provided limited information regarding educational level, socioeconomic status, occupational status, and residential status as baseline variables. In this regard, the present study provides additional information by incorporating these sociodemographic characteristics. The observed difference in residential status in our cohort may reflect local population characteristics and healthcare access patterns rather than a true association with the choice or effectiveness of the drainage procedure.

In this study, needle aspiration was associated with shorter mean procedural time (5.22 ± 0.87 minutes) than incision and drainage (6.16 ± 1.92 minutes), while the difference did not reach statistical significance ($p = 0.069$), suggesting that needle aspiration may not definitively be faster than incision and drainage, indicating further investigation in studies with larger sample sizes. However, in agreement with these findings, in the systematic review carried out by Chang BA et al¹⁷ concluded that the available evidence was insufficient to establish the superiority of either needle

aspiration or incision and drainage across clinical outcomes. Particularly, procedural duration was not identified as a reported outcome. They reported substantial methodological heterogeneity and a high or unclear risk of bias among the included studies. The non-significant difference observed in the present study supports the existing uncertainty regarding whether one drainage technique offers a meaningful time-saving advantage over the other.

Additionally, in this study, mean pain scores were 2.0 ± 0.05 was in the needle aspiration group and 2.05 ± 0.23 in the incision and drainage group, with statistically insignificant difference ($p = 0.324$). Moreover, all patients undergoing needle aspiration experienced mild pain compared to 94.4% of patients undergoing incision and drainage ($p = 0.310$), suggesting comparable pain intensity between the both procedures. These findings were consistent with a recent study carried out by Lee J et al¹² who found no significant difference in visual analogue scale (VAS) pain scores between patients treated with needle aspiration and those treated with incision and drainage ($p=0.590$). Contrary to our findings, the study published by Khan MI et al¹⁸ reported a significantly greater proportion of patients with moderate-to-severe postoperative pain following incision and drainage compared with needle aspiration ($p=0.007$). The disparity in postoperative pain between studies may be explained by differences in pain assessment scales and categorization, the extent of incision and drainage, and the use of local anesthesia and analgesics.

In this study, the most notable finding was the significant difference in hospital stay as needle aspiration group showed significantly lower Hospital stay (1.72 ± 1.17 days) than incision and drainage treatment group (3.72 ± 0.89 days) ($p=0.001$), indicating a potential advantage of needle aspiration in reducing the duration of hospitalization, which may have economic benefits, including reduced utilization of healthcare resource and a earlier return to normal daily activities. In agreement with our findings, the study conducted by Ayub N et al¹⁹ reported that a significantly shorter mean hospital stay of 27.60 ± 15.10 hours was noted for needle aspiration group compared with 76.9 ± 116.3 hours for incision and drainage group ($p=0.030$).

Contrary to these findings, the study carried out by Mansour C et al¹⁶ reported a significantly shorter hospital stay among patients in incision and drainage group than those in needle aspiration group, with median hospital stay of 3 days in the needle aspiration group compared with 2 days in the incision and drainage group ($p = 0.009$). One possible explanation for the contradiction may be that higher

need for repeat procedures and additional drainage in the needle aspiration group in their cohort may have prolonged hospitalization. Contradictory findings were reported in another study by Chi TH et al¹⁵ who found no significant difference in duration of hospitalization in patients treated with needle aspiration (4.4 ± 1.7) and those managed with incision and drainage (4.6 ± 1.6); $p = 0.488$. Disparity in these findings may be attributable to the differences in patient selection, treatment protocols, the threshold for repeated intervention, and abscess severity between studies. Moreover the, longer hospital stay in incision and drainage group may be attributable to the potential confounding factors, including possible differences in clinical severity, treatment protocols, or physician preference.

In this cohort, there was no difference in recurrence was observed in either treatment group during the study period ($p = 1.000$), indicating that both needle aspiration and incision and drainage achieved satisfactory short-term treatment outcomes in this cohort. These finding were partly consistent with a recent study conducted by Khan AM et al²⁰ who demonstrating that needle-aspiration group (75%) had a lower initial treatment success rate compared with incision and drainage group (82.5%) and required additional procedures more frequently. However, they concluded that both the needle aspiration and the incision and drainage can achieve satisfactory clinical outcomes with similarly effectiveness. Notably, their study primarily assessed early treatment success and repeat intervention rather than long-term recurrence. Therefore, their study findings support the short-term effectiveness observed in the present cohort.

Consistently, the study conducted by Ketterer MC et al²¹ examined recurrence in a larger cohort of 819 cases over a longer observation period than our study and found only 2.8% cases of peritonsillar abscess recurrence in 180 patients treated with needle aspiration or incision, concluding that both procedures are less invasive and preferable options for peritonsillar abscess treatment.

The favorable short-term outcomes observed in present study may be attributable to the use of appropriate antibiotic therapy, and adequate initial evacuation of the abscess. In corresponding to above still disparities, certain significant limitations of this study specifically very limited sample size and shorter follow up period along with very limited local evidence further large scale local studies are suggested to validate these findings and to create a more robust local evidence for confidently implementation of procedure in clinical practice.

Conclusion

In the study conclusion the needle aspiration and incision and drainage, both observed to be effective, with favorable tendency to needle aspiration as more simple, non-invasive and effective procedure in terms of less pain and less hospital duration among cases presented with peritonsillar abscess. However due to a single center and very limited sample size study, further large scales studies are recommended in the line of this study to make decision for the most effective procedure implementation.

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