

Prospective Randomized Study of Needle Aspiration vs Incision and Drainage in Superficial Abscess

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Abstract: ***Aim/Background:** An abscess is a localized collection of purulent fluid that can significantly affect a patient's care and clinical outcome. The traditional treatment for abscesses is surgical incision and drainage. However, minimally invasive surgery such as needle aspiration is becoming more accepted by patients. Aim of the study is to compare the outcomes of needle aspiration and incision and drainage in managing superficial abscesses up to 5 cm in diameter. **Material & Method:** The present prospective randomized study included a total of 114 adult patients aged 18 years and older, all of whom had been clinically diagnosed with superficial abscesses. These patients were randomly divided into two groups: Group A underwent needle aspiration as a treatment method, while Group B underwent incision and drainage. A comprehensive patient history was meticulously recorded, and essential laboratory investigations were conducted. Regular follow - up assessments were carried out to assess improvements in terms of abscess size reduction, pain relief, erythema reduction, fluctuation, and the duration of hospital stay. **Results:** The most common presentation in both groups was painful swelling. The mean abscess diameter in the aspiration group was 3.4 cm, while it was 4.5 cm in the incision - drainage group. Patients who underwent percutaneous needle aspiration had significantly less pain, with a mean VAS score of 5.5, compared to 8.5 in the incision and drainage group immediately after the procedure. Patients who underwent aspiration found it more convenient and did not require dressing. Erythema was resolved with needle aspiration in subsequent follow - up visits, while it persisted in 8.7% of patients until Day 14 of incision and drainage. It was observed that in the I&D group, the fluctuation of an abscess diminished immediately after the procedure, while in the Needle Aspiration group, 17.5% of patients had fluctuation on Day 3. Additionally, 7.1% of patients had fluctuation on Day 7, and 3.5% of patients had to convert to an I&D procedure (a maximum of 3 attempts of needle aspiration was done). The mean healing time in the Needle Aspiration Group was 8.4 days, while in the I&D group it was 17.9 days. Furthermore, the mean length of hospital stay in the Needle aspiration group was 1.6 days, while in the I&D group, it was 5.6 days. **Conclusion:** Needle aspiration is a simple, painless, daycare procedure and an effective alternative treatment method to incision and drainage in properly selected patients.*

Keywords: Abscess, Needle Aspiration, Incision and Drainage, Hospital Stay

1. Introduction

An abscess is a localized collection of purulent fluid that can significantly affect a patient's care and clinical outcome.¹ The traditional treatment for abscesses is surgical incision and drainage. Incision and drainage (I&D) is a widely used procedure in various care settings, including emergency departments and outpatient clinics.² It is the primary treatment for skin and soft tissue abscesses, with or without adjunctive antibiotic therapy. Typically, I&D is well tolerated with pain being the most common complication. Inadequately drained abscesses can lead to the extension of the infection into adjacent tissues and worsening of clinical status. However, minimally invasive surgery such as needle aspiration is becoming more accepted by patients. It is less invasive, and because less tissue is removed, it will result in less scarring. The present study aimed to compare the outcomes of needle aspiration and incision and drainage in managing superficial abscesses up to 5 cm in diameter.

2. Material & Method

The present prospective randomized study was conducted among the patients presenting with abscess to surgical department of SMS&R, Sharda Hospital, Sharda University between May 2022 to July 2023. Patients aged 18 years and older, all of whom had been clinically diagnosed with superficial abscesses were included. Patients less than 18yrs, pregnant women, facial abscesses with nasolabial fold,

dental abscess, peritonsillar abscesses, anorectal and pilonidal abscess, complication abscess with sepsis, lymphagitis or osteomyelitis, hand and finger abscess, abscess communicating with joint space and patients with history of IV drug use of immunocompromised patients were excluded from the study.

These patients were randomly divided into two groups: Group A underwent needle aspiration as a treatment method, while Group B underwent incision and drainage. A comprehensive patient history was meticulously recorded, and essential laboratory investigations were conducted. Regular follow - up assessments were carried out to assess improvements in terms of abscess size reduction, pain relief, erythema reduction, fluctuation, and the duration of hospital stay. Abscess size measured using; Measuring tape: well - defined geometric shapes and Gauze method: ill - defined geometric shapes. The pain was assessed using visual analogue scale, scoring from 0 as no pain and 10 as unbearable pain.

3. Statistical analysis

All the data were collected in proforma and entered in excel sheet. The data were analysed using SPSS v23.0 operating on windows 10. The data were summarised as mean, standard deviation, frequency and percentage. The summarised data were represented using tables, figures, bar diagram. The mean difference between the continuous data

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were compared using unpaired t - test and categorical data using chi - square test. For all statistical purpose, a p<0.05 was considered statistically significant.

4. Result

A total of 114 patients fulfilling inclusion criteria were included, with mean age of 32.66yrs, with no significant difference of mean age between the groups. The most common presentation in both groups was painful swelling.

Table 1: Showing demographic details of patients

		Needle aspiration		Incision & Drainage	
		Frequency	Percent	Frequency	Percent
Age (yrs)	18 - 25	25	43.8	15	26.3
	26 - 32	10	17.5	10	17.5
	33 - 40	4	7.0	10	17.5
	41 - 48	14	24.7	13	22.8
	49 - 56	4	7.0	3	5.2
	>56	0	0.0	6	10.7
Gender	Male	16	28.1	18	31.6
	Female	41	71.9	39	68.4

Table 2: Comparison of study variable between groups

		Needle aspiration	Incision & Drainage	p - value
		Mean ± SD	Mean ± SD	
Pain score	Day 0	5.5±0.9	8.5±1.66	0.01*
	Day 3	4.7±1.0	7.0±1.1	0.01*
	Day 7	1.82±0.42	3.0±0.5	0.01*
	Day 14	0.14±0.1	0.18±0.1	0.684
Mean healing time		8.4±2.5	17.9±3.6	0.01
Healing in days according to size group	0 - 1.49cm	3.0±1.2	7±2.6	0.01*
	1.5 - 3.0cm	9.8±3.1	21.0±5.9	0.01*
	3.1 - 5cm	12.4±4.5	25.9±9.3	0.01*
Length of hospital stay according to size group	0 - 1.49cm	0	3	0.01*
	1.5 - 3.0cm	2	6	
	3.1 - 5cm	3	8	

Table 3: Comparison of erythema and fluctuation between groups

		Needle aspiration		Incision & Drainage	
		Frequency	Percent	Frequency	Percent
Erythema	Day 0	0	-	57	100.0
	Day 3	2	3.5	21	36.8
	Day 7	1	1.75	16	28.07
	Day 14	0	-	4	7.01
Fluctuation	Day 0	0	-	0	-
	Day 3	10	17.54	0	-
	Day 7	4	7.01	0	-
	Day 14	1	1.75	0	-

The mean abscess diameter in the aspiration group was 3.4 cm, while it was 4.5 cm in the incision - drainage group. Patients who underwent percutaneous needle aspiration had significantly less pain, with a mean VAS score of 5.5, compared to 8.5 in the incision and drainage group immediately after the procedure. Patients who underwent aspiration found it more convenient and did not require dressing. Erythema was resolved with needle aspiration in subsequent follow - up visits, while it persisted in 7% of patients until Day 14 of incision and drainage. It was observed that in the I&D group, the fluctuation of an abscess diminished immediately after the procedure, while in the Needle Aspiration group, 17.5% of patients had fluctuation on Day 3. Additionally, 7.1% of patients had fluctuation on Day 7, and 3.5% of patients had to convert to an I&D procedure (a maximum of 3 attempts of needle aspiration was done). The mean healing time in the Needle Aspiration Group was 8.4 days, while in the I&D group it was 17.9 days. Furthermore, the mean length of hospital stay in the Needle aspiration group was 1.6 days, while in the I&D group, it was 5.6 days.

5. Discussion

The present study observed that patients of percutaneous needle aspiration had the significant lower pain score compared to the patients in I&D procedure. Odiya S et al., had also observed same finding that the pain score among the needle aspiration was significantly lower.³

It is been inferred patients in needle aspiration group erythema has resolved in subsequent follow up visits as compared to I & D group where erythema persisted. Kaushal S et al., found that all the patients who underwent incision and drainage complained of an redness around wound site.⁴ Dieter Ulitzsch et al., and Singh et al., in their study reported 96% of patients treated by aspiration were satisfied in respect of same.^{5,6} It was found that patients in I & D group fluctuation of an abscess is diminished immediately after procedure. Imperiale A et al., and Francisco Leborgne et al., also observed serial needle aspiration was required and I & D should be last resort after 3 attempts of aspiration.^{7,8}

The mean healing time in needle aspiration was found to be 8.4 days and in I&D group was 17.9days, which was statistically significant. In a study by Dener C et al., documented that healing rate of the two group were not statistically significant.⁹ Similar context was also mentioned in literature review by Mastitis IS.¹⁰ Similarly, the mean hospital length of stay was significant lower in patients underwent needle aspiration (1.6days) compared to patients in group with I&D procedure (5.6days). It is been observed in era of COVID 19 by Sami A. Chadi et al., choosing minimal invasive surgery like needle aspiration over I & D as an effective risk mitigation strategy to decrease LOHS.¹¹

Four patients in needle aspiration group had recurrence of abscess which was managed with repeated aspiration, and in I&D only 1 patient had repeated drainage. Berna - Serna JD

et al., observed Serial percutaneous needle aspiration should be the first line of therapy (up to a maximum of 3 attempts) than choose I & D as last resort.¹²

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6. Conclusion

The present study conclude that percutaneous needle aspiration is widely accepted simple, painless, cost effective and day care procedure, also the patients in I&D group due to daily requirement of dressing and packing of the wound observed the procedure to be painful and cumbersome.

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