

ORIGINAL ARTICLE

Aspiration Versus Open Drainage of Suppurative Cervical and Inguinal Lymph Nodes in Children: A Prospective Comparative Study

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ABSTRACT

<p>Keywords: Suppurative Cervical lymph node; Aspiration; Incision and drainage.</p> <p>*Corresponding author: Mario Moneer Kelada Salieb E-mail: mariomoneer7@gmail.com Phone: 01207447159</p>	<p>Background: Acute localized lymphadenitis in children is usually caused by a bacterial infection. Owing to lymphatic drainage from the pharynx, bacterial cervical lymphadenitis is very common. In contrast, inguinal bacterial lymphadenitis is relatively rare in children, especially infants. Objective: The purpose of This study aims to differentiate between outcomes of 2 technique of Suppurative Cervical and Inguinal Lymph Nodes in Children by Aspiration Versus Open Drainage. Patients and methods: This study was performed on 40 patients with cervical and inguinal lymph nodes abscesses who were divided in two groups and subjected to history taking, medical examination, ultrasonography and other related laboratory investigations (complete blood count). Results: Needle aspiration might be less painful, less bleeding, less scar formation and easy . Incision and drainage had a lower recurrence rate. Conclusion: The comparison between outcomes of incision and drainage method and aspiration method for surgical treatment of cervical and inguinal lymph nodes abscess in children showed insignificant difference.</p>
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INTRODUCTION

Acute localized lymphadenitis in children is usually caused by a bacterial infection. Owing to lymphatic drainage from the pharynx, bacterial cervical lymphadenitis is very common, frequently affecting children from ages 1 to 4 years. In contrast, inguinal bacterial lymphadenitis is relatively rare in children, especially infants.⁽¹⁾

Cervical lymphadenitis is a common pediatric problem, and most patients with this condition are treated successfully by their primary care physicians. Cervical lymphadenopathy (CLA) in the pediatric age group is largely inflammatory and infectious in etiology.⁽²⁾

This study aims to differentiate between outcomes of 2 technique of Suppurative Cervical and Inguinal Lymph Nodes in Children by Aspiration Versus Open Drainage.

Lymph node aspirates are simple to obtain and the procedure is cheap and safe with limited risks, as it is less invasive and requires minimal instrumentation. This technique is especially suitable for peripheral lymph nodes and can be performed by trained nurses in small hospitals and clinics.⁽³⁾

PATIENTS AND METHODS

This prospective comparative study included 40 patients with cervical and inguinal lymph nodes abscesses, 20 patients were included in each group (group of incision and drainage technique, 10 for Cervical and 10 for Inguinal lymph nodes and group of aspiration technique, 10 for Cervical and 10 for Inguinal lymph nodes at pediatric surgery unit at general surgery department-Aswan University Hospital. An informed consent obtained from all participants' parents.

- **Patient selection:**

- Inclusion criteria:

- Children under the age of 14 years.
- Both genders.
- Patients with cervical and inguinal lymph nodes abscesses.

- Exclusion criteria:

- Children above the age of 14 years.
- Suspected malignant lymph nodes.
- lymphadenitis other than cervical and inguinal.
- Generalized lymphadenitis.
- Previous cervical and inguinal surgery.

The study was approved by the Ethical and Research committees in Aswan university hospital. All cases subjected to:

- History taking including personal history.
- Clinical examination including general and Local examination:

Head and neck region (cervical lymphadenitis), lower limb, abdominal, perineum and groin regions (inguinal lymphadenitis).

- Investigations:

Complete blood count and Ultrasound for enlarged lymph nodes.

- Operation:

- Patients were divided into two groups:
 - Group (A): patients who were managed with incision and drainage.
 - Group (B): patients who were managed with needle aspiration.
- For group (A):
 - An incision parallel to the skin crease was done. After incision, the abscess cavity was probed with a hemostat to break up loculations and proper drainage was done.
 - After incision and drainage, packing any abscess cavity was done and the pack removed after 24 to 48 hours.
- For group (B):

- The aspiration procedure was done using 18- or 21-gauge needle . lidocaine vial by filtration was applied before the aspiration in all patients, aspiration was performed until there was no return in the 20 mL syringe.
- Postoperative:
 - Discharge was after 2 hours after assessment for edema and bleeding.
 - Pain was assessed using the following scales:
 - Numerical rating scale for children >12 years old:
 - Faces pain scale-revised in children 4-12 years old:
 - FLACC (Face, Legs, Activity, Cry, Consolability) scale in children < 4 years old:
- **Follow up:**
 - The first follow up visit will be 2 days postoperative (early), follow up after 2 weeks , then follow up after 2 months. (late)
 - Early assessment included the following items: (after 2 days then after 2 weeks).
 - Evaluation for edema.
 - Recollection.
 - Body temperature measurement.
 - Pain.
 - Bleeding.
 - Late assessment included the following items: (after 2 months).
 - Recurrence.
 - Cosmetic results.
 - Other complications occurred.

Statistical analysis

Statistical analysis was done by SPSS v26 (IBM Inc., Armonk, NY, USA). Shapiro-Wilks test and histograms were used to evaluate the normality of the distribution of data.

Quantitative parametric data were presented as mean and SD and were analyzed by unpaired student t-test. Quantitative non-parametric data were presented as the median and IQR and were analyzed by Mann Whitney-test.

Qualitative data were presented as frequency and percentage (%) and analyzed using the Chi-square test or Fisher's exact test when appropriate.

P value: A two tailed P value ≤ 0.05 was considered statistically significant.

RESULTS

Pain was assessed by numerical rating scale for children >12 years old, faces pain scale-revised in children 4-12 years old and FLACC (Face, Legs, Activity, Cry, Consolability) scale in children < 4 years old.

Table 1: Follow up after 2 days of the studied groups.

		Group (A) (n=20)	Group (B) (n=20)	P value
Edema		10 (50%)	4 (20%)	0.096
Recollection		4 (20%)	10 (50%)	0.096
Fever		4 (20%)	10 (50%)	0.096
Pain scale	Mean ± SD	3.6 ± 2.23	2.3 ± 1.38	0.033*
	Range	1 - 7	0 - 4	
Bleeding		10 (50%)	2 (10%)	0.014*

*: significant as P value ≤ 0.05

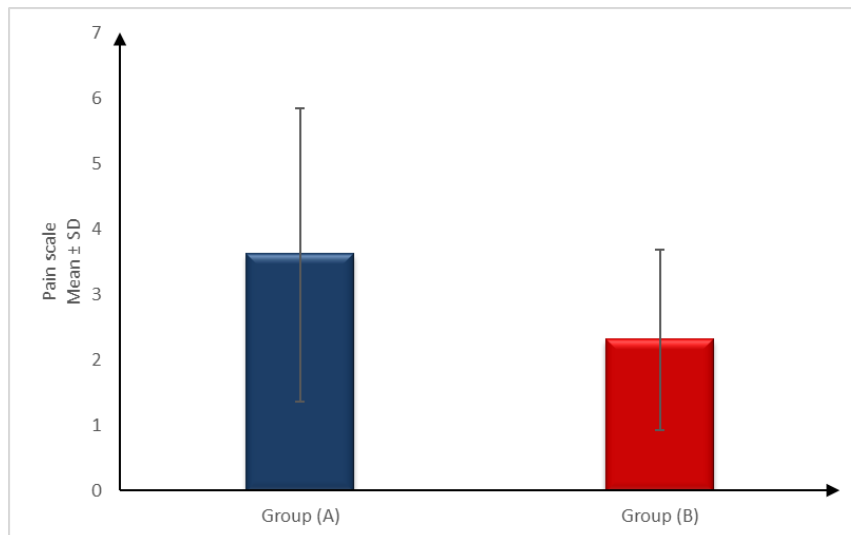


Figure 1: Pain scale of the studied groups

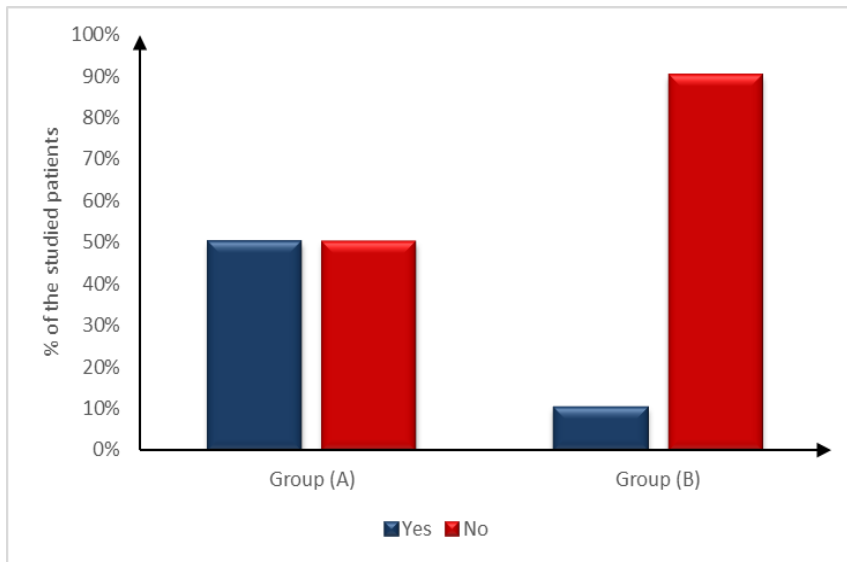


Figure 2: Bleeding of the studied groups

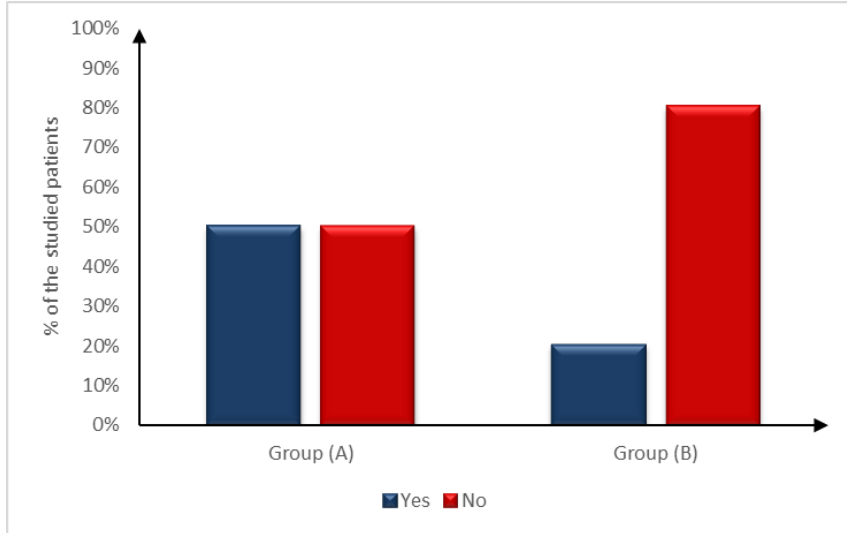


Figure 3: Edema of the studied groups

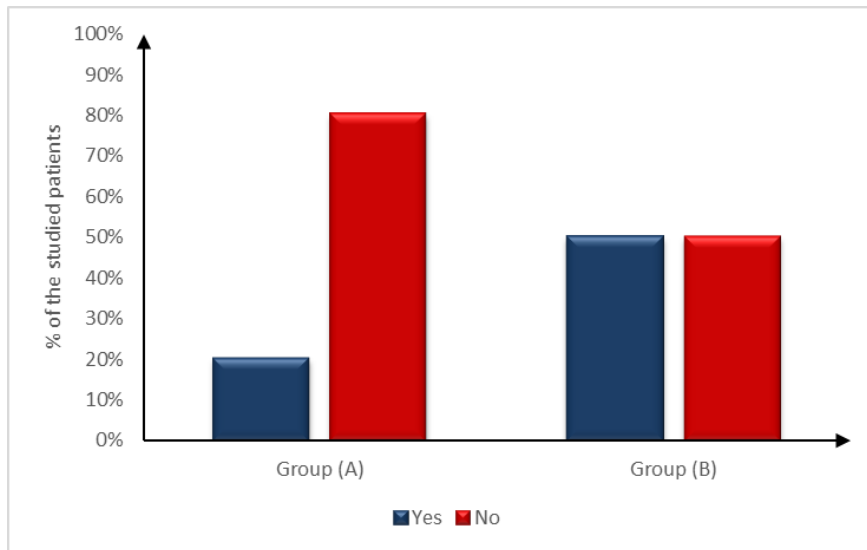


Figure 4: Recollection of the studied groups

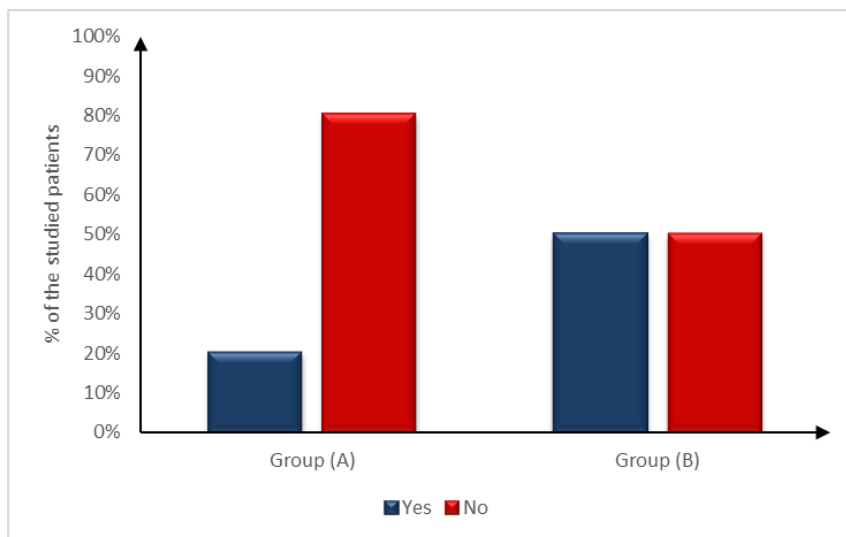


Figure 5: Fever of the studied groups

After 2 days, pain and bleeding were significantly higher in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value =0.033 and 0.014 respectively). (Table 1, Figure 1, Figure 2).

Edema, recollection, and fever were insignificantly different between the studied groups. (Table 1, Figure 3, Figure 4, Figure 5).

Table 2 :Follow up after 2 weeks of the studied groups

		Group (A) (n=20)	Group (B) (n=20)	P value
Edema		7 (35%)	2 (10%)	0.127
Recollection		3 (15%)	8 (40%)	0.155
Fever		2 (10%)	7 (35%)	0.127
Pain scale	Mean ± SD	3 ± 1.85	2 ± 1.19	0.049*
	Range	1 - 6	0 - 4	
Bleeding		7 (35%)	1 (5%)	0.044*

*: significant as P value ≤ 0.05

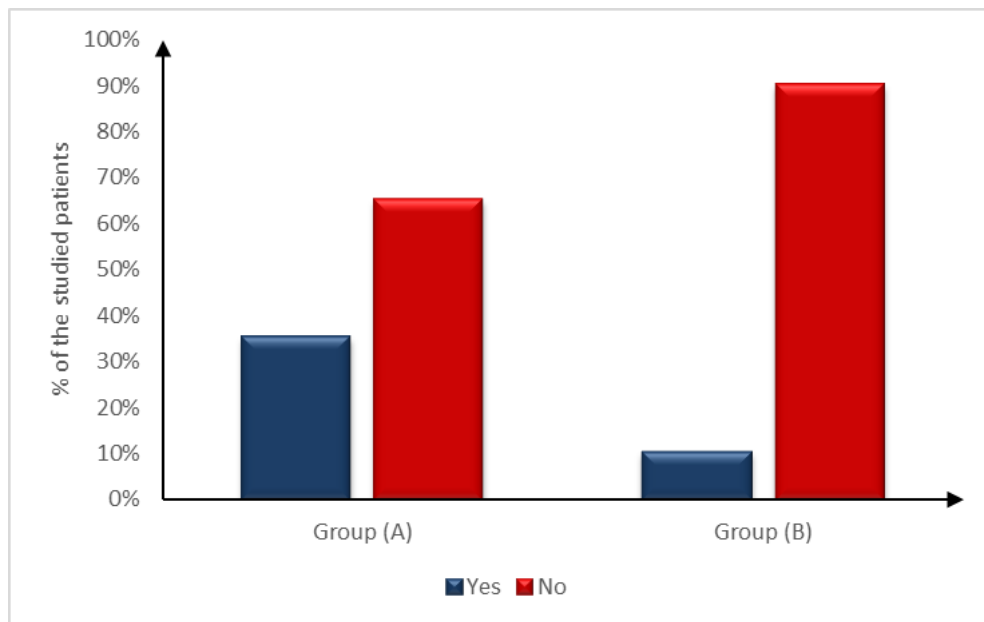


Figure 6: Edema of the studied groups

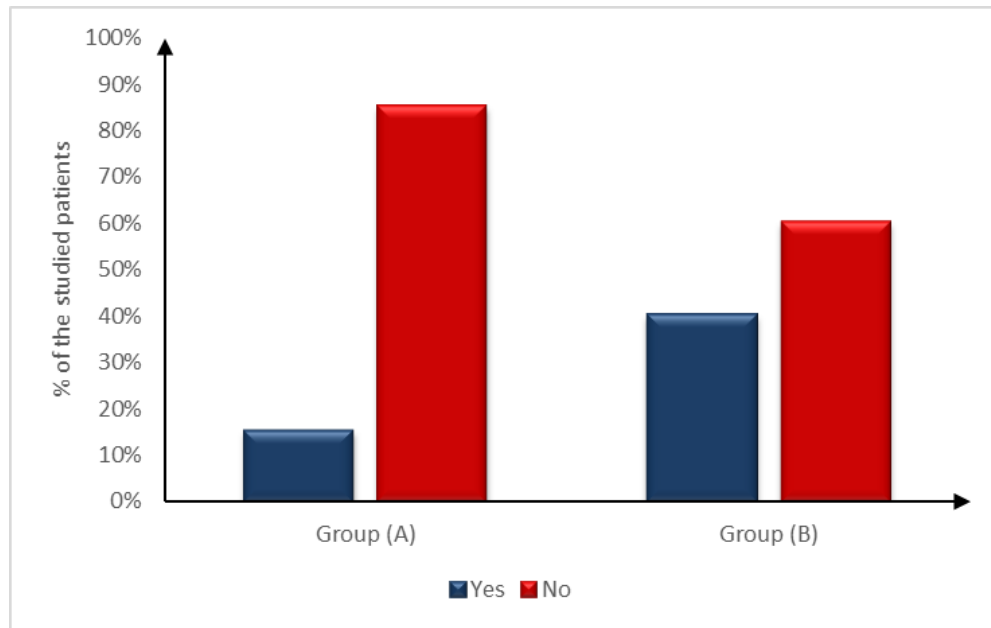


Figure 7: Recollection of the studied groups

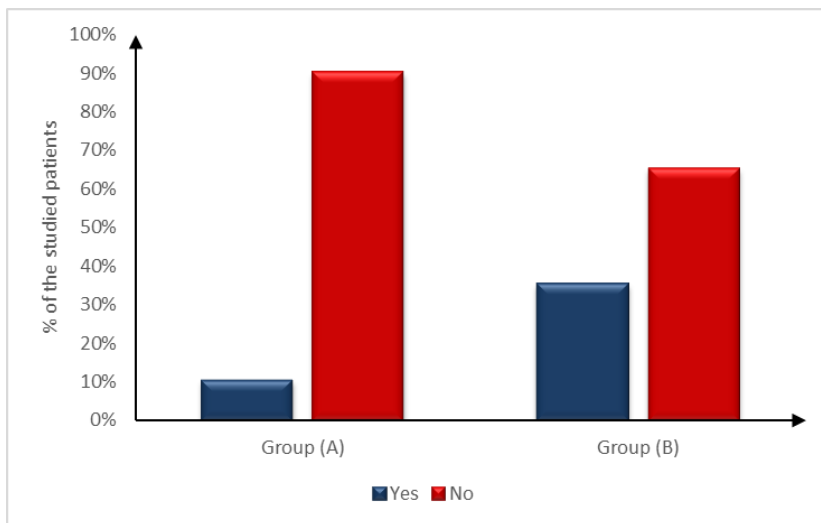


Figure 8: Fever of the studied groups

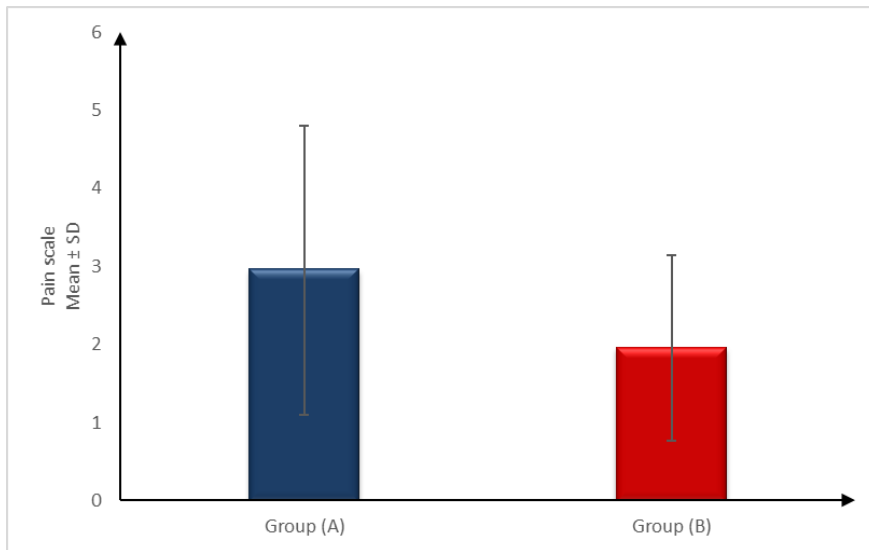


Figure 9: Pain scale of the studied groups

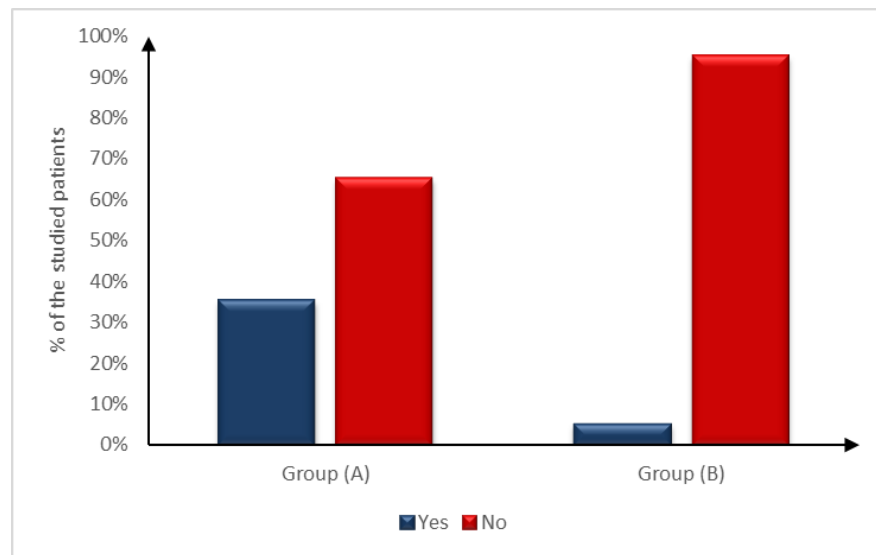


Figure 10: Bleeding of the studied groups

After 2 weeks, pain and bleeding were significantly higher in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value =0.049 and 0.044 respectively). (Table 2, Figure 9, Figure 10).

Edema, recollection, and fever were insignificantly different between the studied groups. (Table 2, Figure 6, Figure 7, Figure 8).

Table 3: Follow up after 2 months of the studied groups

	Group (A) (n=20)	Group (B) (n=20)	P value
Recurrence	0 (0%)	8 (40%)	0.003*
Scar formation	14 (70%)	0 (0%)	<0.001*

*: significant as P value ≤ 0.05

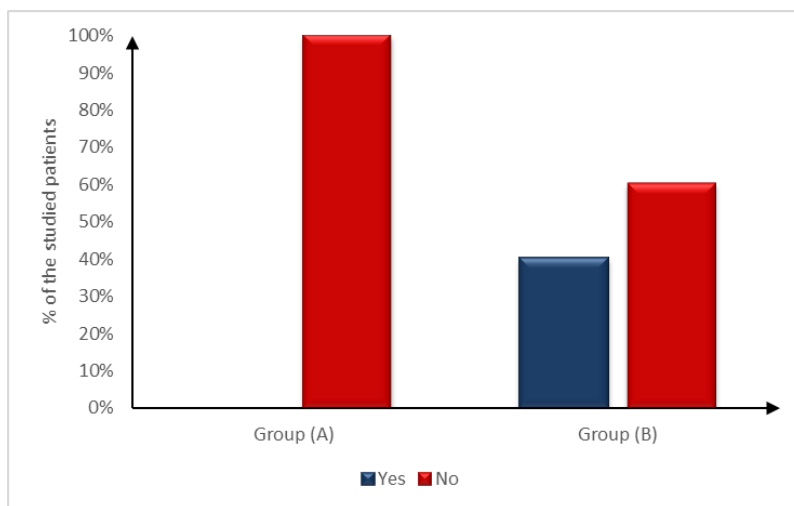


Figure 11: Recurrence of the studied groups

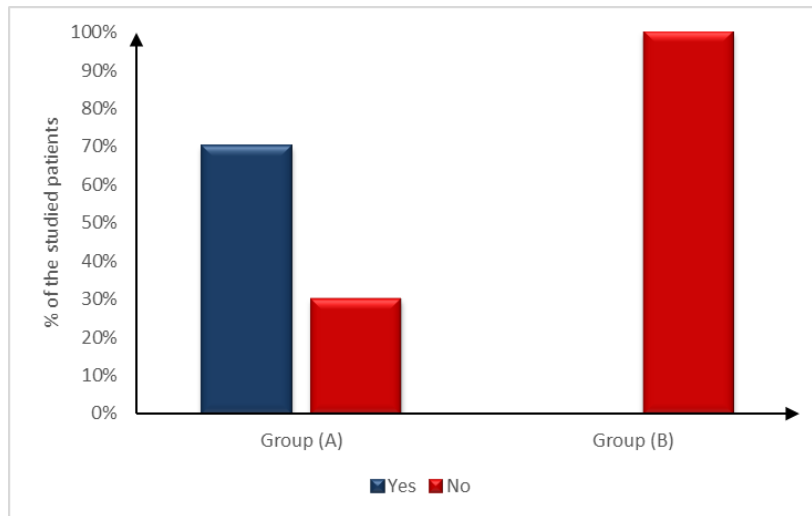


Figure 12: Scar formation of the studied groups

After 2 months, recurrence was significantly lower in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value =0.003). (Table 3, Figure 11)

Scar formation was significantly higher in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value <0.001). (Table 3, Figure 12)

DISCUSSION

This study aims to compare between outcomes of incision and drainage method and aspiration method for surgical treatment of cervical and inguinal lymph nodes abscess in children. The study design is prospective comparative study; performed at Pediatric surgery unit, at General surgery department Aswan University Hospital, Aswan, Egypt.

Forty patients had been included in the study. Twenty patients had been included in each group (group of incision and drainage technique, 10 for Cervical and 10 for inguinal lymph nodes, and group of aspiration technique, 10 for Cervical and 10 for Inguinal lymph nodes). Malignant lymph nodes and generalized lymphadenopathy were excluded.

Follow up after 2 days of the studied groups demonstrated that Pain was assessed by numerical rating scale for children >12 years old, faces pain scale-revised in children 4-12 years old and FLACC (Face, Legs, Activity, Cry, Consolability) scale in children < 4 years old. After 2 days, pain and bleeding were significantly higher in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value =0.033 and 0.014 respectively). Edema, recollection, and fever were insignificantly different between the studied groups.

In 2021, it was agreed to study done by **Tucci et al**,⁽⁴⁾ used treatment by needle aspiration of lateral neck abscess in children that demonstrated that pain is less in the needle aspiration group. In 2016, **Chang et al**⁽⁵⁾ demonstrated that pain is less in the needle aspiration group: MD -0.8, 95% CI -1.16 to -0.44 (10-point scale) than incision and drainage for the treatment of peritonsillar abscess and other studies as in 2014, **Chi et al**⁽⁶⁾ used visual analogue scores (out of 10) to assess pain intensity one hour after the procedure and discovered a statistically lower amount of pain in the needle aspiration group (4.5 ± 0.8 in the needle aspiration group versus 5.3 ± 1.1 in the incision and drainage group; mean difference (MD) -0.8, 95% CI -1.16 to -0.44, 10-point scale). In 2012, **Khan et al**⁽⁷⁾ compared

postoperative pain as measured by a subjective "mild/moderate/severe" scale. They found that the incision and drainage group had a statistically significant higher proportion of patients with higher pain scores (needle aspiration: 50.0% mild, 28.6% moderate, 21.4% severe; incision and drainage: 17.9% mild, 21.4% moderate, 60.7% severe; $P < 0.01$).

For bleeding, it was agreed to the study done by **Khan et al** on 2012.⁽⁷⁾ One of 28 patients (3.6%) in the incision and drainage group experienced haemorrhage and there was no bleeding with needle aspiration in this study. In 2021, it was agreed to study done by **Tucci et al**⁽⁴⁾ who used treatment by needle aspiration of lateral neck abscess in children that demonstrated that no hematomas were found in any patient.

Follow up after 2 weeks of the studied groups demonstrated that **Recurrence (recollection)** was significantly lower in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value =0.003). In 2007, it was agreed to study done by **Rafi et al**⁽⁸⁾ who compare between the needle aspiration and incision and drainage for treatment of pretonsillar abscess, the needle aspiration group had a recurrence rate as high as 80%. In 2012, **Khan**⁽⁷⁾ found a recurrence rate of 64% in the needle aspiration group. In several studies, the needle aspiration group had recurrence rates of more than 20%.

In 2021, **Sørensen et al**⁽⁹⁾ compared needle aspiration treatment vs. incision of acute simple perianal abscess, The recurrence rate was significantly higher after needle aspiration (41%) compared to incision drainage (15%).

Follow up after 2 months of the studied groups demonstrated that Recurrence was significantly lower in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value =0.003). Scar formation was significantly higher in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value <0.001).

Scar formation was significantly higher in group (A) (incision and drainage group) than group (B) (needle aspiration group) (P value <0.001). In 2021, it was agreed to study done by **Tucci et al**⁽⁴⁾ who used treatment by needle aspiration of lateral neck abscess in children that demonstrated that no hypertrophic scars were found in any patient.

CONCLUSION

There is no agreement on the best drainage method, and each method has risks and benefits. Needle aspiration may be less painful, less expensive, and technically easier to perform; it may also serve as a diagnostic method. Theoretically, incision and drainage that includes blunt dissection promotes more effective abscess drainage by dissecting through the tissue barriers (septations) that divide the abscess cavity into microcavities or loculations.

The drainage method used may be linked to varying degrees of abscess recurrence, pain, and haemorrhage.

Despite this, it is unclear which technique is more effective: needle aspiration or incision and drainage. There is a lack of high-quality evidence to demonstrate whether one technique is superior to the other. There is very little evidence to suggest that incision and drainage has a lower recurrence rate (recollection of pus) than needle aspiration. At the same time, evidence of very low quality suggests that needle aspiration may be less painful, less scar formation and less bleeding than incision and drainage.

In conclusion the comparison between outcomes of incision and drainage method and aspiration method for surgical treatment of cervical and inguinal lymph nodes abscess in children showed insignificant different.

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