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ORIGINAL ARTICLE

Comparison of catheter drainage with incision drainage in children with soft tissue abscesses.

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ABSTRACT… Objective: To compare the efficacy of catheter drainage with incision and drainage in children having soft tissue abscess. **Study Design:** Randomized Control Trial. **Setting:** Department of Paediatric Surgery, Allied Hospital Faisalabad. **Period:** January 2016 to June 2017. **Material & Methods:** After taking approval from the hospital ethical committee, 160 patients coming through OPD of the department who fulfilled the inclusion criteria were enrolled, and informed consent was taken from them. The patients were randomly divided into two groups using a computer-generated random number table. In group A, patients underwent catheter drainage method, and in group B, patients underwent incision and drainage method. **Results:** Out of 160 cases (80 in each group), 60% (n=48) in Group-A and 67.5% (n=54) in Group-B were between 1-6 years while 40% (n=32) in Group-A and 32.5% (n=26) in Group-B were 7-12 years of age. 70% (n=56) in Group-A and 67.5% (n=54) in Group-B were males. On efficacy comparison, it was shown that 73.75% (n=59) in Group-A and 47.5% (n=38) in Group-B had efficacy; the p-value was calculated as 0.0007, showing a significant difference. **Conclusion:** We concluded that catheter drainage is better than incision and drainage in children having soft tissue abscess in terms of length of hospital stay < 24 hours.

Key words: Children, Catheter Drainage with Incision, Drainage, Efficacy, Soft Tissue Abscess.

INTRODUCTION

Infections of skin and soft tissues may result from a spectrum of pathological processes. Underlying fascias and muscles are frequently involved.[1] Though skin and subcutaneous tissues in any part of the body may become infected but extremities and buttocks are the most common sites of involvement. Infection may occur at head or neck and trunck of the patient.[2] This devastating condition has grossly increased emergency department visits over last years. Almost ten years back the hospital visits due to skin and soft tissue infections were almost 1.2 millions, which has alarmingly increased to 3.4 million visits. More and more patients are presenting to emergencies with this condition.[3]

Among the general population; infants as well as children are generally affected. The treatment, that has been followed traditionally, comprises of opening the wound surgically to allow drainage of pus. It is followed by packing of the surgical wound, which is changed periodically, postoperatively. This surgical procedure has been tested over time and proved to be very effective and hence is used in adults and children very often.[4] It has become a gold standard for the management of such cases. The conventional procedure is associated with extended stay at hospital, multiple irrigations, good nursing care at home, pain and emotional traum for the child.[5] However, there is controversy whether to irrigate wounds postoperatively with potential advantages and disadvantages.[6] Over the time a new technique has evolved that includes simple linear incision followed by primary closure of the wound and antibiotics are added in treatment. Another technique uses placement of catheter drain rather than wound packing.

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It has resulted in a decrease in duration of hospital stay and cost of treatment. A draining Pezzer catheter or nelton drain can be used.[7] It is a minimally invasive (MI) procedure and is being used increasingly for paediatric subcutaneous abscesses.[8]

The conventional method using drainage followed by packing leads to highest pain scores in post-operative period, thus use of more analgesics. Moreover this technique doesn't offer any advantage for prevention of recurrence of an abscess. Drainage of an abscess by catheter offers benefit in terms of a short hospital stay, less pain and better cosmesis.[9]

The rationale of this study was to evaluate whether catheter drainage is beneficial in the treatment of subcutaneous abscess when compared to incision and drainage methods in terms of shorter length of hospital stay.

OBJECTIVE

The aim of this study was to compare the efficacy of catheter drainage with incision and drainage in children having soft tissue abscesses.

MATERIAL & METHODS

A Randomized Control trial was conducted in the Paediatric Surgery Department, Allied hospital Faisalabad, after taking approval from the hospital Ethical Review Board, CPSP/REU/PSG-2012-035-23. The study was conducted over a period of one year since 01-07-2016 to 30-06-2017. The sample size was calculated using WHO sample size calculator, keeping P1=28%[4] and P2=47%[4], power of study 80% and level of significance 5%. Total sample size calculated was 160. Patients were distributed in two groups, CD and ID, 80 each. In group CD, patients underwent catheter drainage method, and in group ID, patients underwent incision and drainage method. Patients were admitted throughout patient department and those who fulfilled inclusion criteria i-e age 10 days to 12 years, single soft tissue abscess, whose parents were willing to be part of study, were distributed among two groups. Patients with osteomyelitis, bacteremia, sepsis, myositis, necrotizing fasciitis and recurrent abscess were excluded from the study.

The patients were randomly divided into two groups using a computer-generated random number table. A senior paediatric surgeon performed these procedures. Efficacy of treatment was assessed by length of hospital stay; stay lesser or greater than 24 hours was noted. Decision for discharge from hospital was made if patient was afebrile. All the information was collected on proforma. SPSS Version 17.0 was used for data entry and analysis. Mean ± Standard Deviation was calculated for age. Frequency and percentages were calculated for gender, site of soft tissue abscess and efficacy. The Chi-square test was used to compare in terms of efficacy between two groups. Effect modifiers like age and gender were stratified, and the post-stratification chi-square test was applied. A p-value of less than or equal to 0.05 was considered significant.

RESULTS

A total of 160 cases (80 in each group) fulfilling the inclusion/exclusion criteria were enrolled to compare the efficacy of catheter drainage with incision drainage in children having soft tissue abscesses. Patients were distributed according to age, 60% (n=48) in Group-CD and 67.5% (n=54) in Group-ID were between 1-6 years while 40% (n=32) in Group-CD and 32.5% (n=26) in Group-ID were 7-12 years of age, mean+sd was calculated as 5.99+2.60 and 5.66+2.65 years in Group-CD & ID.70% (n=56) in Group-CD and 67.5% (n=54) in Group-ID were male while 30% (n=24) in Group-CD and 32.5% (n=26) in Group-ID were females.

Comparison of efficacy among both groups shows that 73.75% (n=59) in Group-CD and 47.5% (n=38) in Group-ID had hospital stay for up to 24 hours while 26.25% (n=21) in Group-CD and 52.5% (n=42) in Group-ID had to be admitted for more than 24 hours, the p-value was calculated as 0.0007 showing a significant difference. (Table-I)

Effect modifiers like age and gender were stratified, and the post-stratification chi-square

test was applied. A p-value of less than or equal to 0.05 was considered significant. (Table-II and III)

Efficacy	Group-CD (n=80)	Group-ID (n=80)
	No. of Patients (%)	No. of Patients (%)
Yes	59 (73.75%)	38 (47.5%)
No	21 (26.25%)	42 (52.5%)
Total	80 (100%)	80 (100%)

Table-I. Comparison of efficacy in terms of hospital stay between both groups (n=160) P value= 0.007

Age (in Years)	Group-CD (n=80)	Group-ID (n=80)
	No. of Patients (%)	No. of Patients (%)
1-6	48 (60%)	54 (67.5%)
7-12	32 (40%)	26 (32.5%)
Total	80 (100%)	80 (100%)
Mean+- SD	5.99+-2.60	5.66+-2.65

Table-II. Age (n=160)

Gender	Group-CD (n=80)	Group-ID (n=80)
	No. of Patients (%)	No. of Patients (%)
Male	56 (70%)	54 (67.5%)
Female	24 (30%)	26 (32.5%)
Total	80 (100%)	80 (100%)

Table-III. Gender (n=160)

DISCUSSION

Methicillin resistant Stapylococcus Aureus has become a common organism causing infections of skin and subcutaneous tissue. Drainage along with administration of antibiotics has been the treatment of choice for such infections.[10]

Our study showed that drainage of a soft tissue abscess with a catheter is better than conventional technique i-e incision drainage, in terms of shorter hospital stay, patients become afebrile early showing decreasing infection load. 73.75% i-e 59 patients from Catheter drainage group stayed at hospital for up to 24 hours as compared to 47.5% i-e 38 in group ID. The p-value calculated was 0.0007 which shows a significant finding. 21 patients from group CD while 42 from group ID had an extended stay beyond 24 hours. Gender and age distribution was non-significant among both groups. Our study shows similar results to the systemic review done by Gottlieb M etal in 2018, their meta-analysis results show that incision technique failed in 25 out of 265 cases while loop drainage failed in 8 out of 195 cases. Odds ratio calculated was 2.63% and it favoured more failure in the traditional technique as compared to newer intervention. These results were statically significant in children.[11]

The results of our study are also comparable with that of Alder AC etal. Who identified that hospital stay in catheter drainage group was significantly less than in children with standard drainage technique with p=0.001, Fischer exact test. They also identified that pain was less and scar was negligeble in catheter drainage group. Moreover patient satisfaction was greater and researcher concluded catheter drainage more effective as well as a safe technique.[4] Ladde JG etal conducted a study over surgical techniques for abscess drainage, they identified that there is a marked failure rate that is 10.5% in patients where standard technique was used as compared to 1.4% in cases where LOOP Drainage was used. P-value was less than 0.030 showing significant result. They found this alternate technique promising as compared to conventional method, just similar to our interpretation.[12] Yang C etal used high vaccum drainage system and compared the results to that of drainage by incision followed by packing, and they identified it as a good substituent to that of a standard practice, causing less pain and minimal complications post-operatively. It also supports our study results which show catheter drainage a better procedure.[13]

Since our study shows catheter drainage a better minimally invasive technique, the study results by Rencher L etall were a bit different. They identified that both techniques give similar outcome; considering failure of treatment method, satisfaction of the parent and cosmetology of the scar. They concluded that none of the two techniques is inferior to the other.[14] Aprahamian CJ etal conducted study with a sample size of 576 patients, all of these received loop drainage treatment for soft tissue abscess. In these patients duration of stay at hospital after the procedure was

0.69 days, drain was kept in place for 8.38 days. 4.5% of the cases had a re-do procedure. They reached a conclusion that alternative technique offers better outcome. It is similar to our study which shows a shorter hospital stay after catheter drainage of an abscess in children.[8] Salfity HV etal conducted a study in adult patients to identify benefit of an alternate technique. They observed that with $p < 0.01$ use of a drainage technique implying vessel loop showed fewer complications as compared to the traditional incision drainage procedure. Moreover they recommended further work in this regard to identify loop drainage as a first line treatment option.[15] Tsoraides SS etal, conducted a study to assess usefulness of a minimally invasive procedure for drainage of abscess in children. They included 115 patients in their study, all underwent loop drainage of the soft tissue abscess. The results showed that mean duration of study at hospital was 03 days with 10.4 days as mean for duration of placement of a drain. They recommended catheter drainage owing to less financial burden, short duration of the procedure and better tolerability by the patients, as no postoperative dressing changes are required. They did not compare it with the control group with standard incision drainage, still their results are promising.[16] Ladd AP etal conducted a study with 128 patients, who were treated with a small incision over abscess, followed by washing via irrigation technique and placement of a catheter. The average time for stay at hospital was 1.6 days which is very close to the results in our patients group. Even they treated 30 patients as an outpatient case. They identified loop catheter drainage of the soft tissue abscess in children as a good alternate to standard incision and drainage, a conclusion similar to our study.[17]

Our study identifies an alternate technique for treating soft tissue infections in children eliminating family concerns regarding repeated packing, anesthetic concerns and prolong hospital stay. The limiting factor of our study was a small sample size, we would recommend that further research should be done over a larger group of patients in an effort to allow for wider acceptance of the minimally invasive surgical procedure.

CONCLUSION

Catheter drainage is better than incision and drainage in children having soft tissue abscess in terms of length of hospital stay 24 hours.

REFERENCES

1. Sartelli M, Malangoni MA, May AK, Viale P, Kao LS, Catena F. **World society of emergency surgery (WSES) guidelines for management of skin and soft tissue infections.** World J Emerg Surg. 2014; 9:57.

2. Gaspari R, Dayno M, Briones J, Blehar D. **Comparison of computerized tomography and ultrasound for diagnosing soft tissue abscesses.** Crit Ultrasound J. 2012; 4:5.

3. Marin JR, Bilker W, Lautenbach E, Alpern ER. **Reliability of clinical examinations for paediatric skin and soft tissue infections.** Paediatrics. 2010; 126:925–30.

4. Alder AC, Thornton J, McHard K, Buckins L, Barber R, Skinner MA. **A comparison of traditional incision and drainage versus catheter drainage of soft tissue abscesses in children.** J Pediatr Surg. 2011; 46:942-7.

5. Marin JR, Dean AJ, Bilker WB, Panebianco NL, Brown NJ, Alpern ER. **Emergency ultrasound-assisted examination of skin and soft tissue infections in the paediatric emergency department.** Acad Emerg Med. 2013; 20:545–53.

6. Hawkins A, Ponnusamy S, Markiewicz MR, Callahan N. **Use of a Foley catheter in the drainage of deep space neck infections.** The British journal of oral & maxillofacial surgery. 2019 Nov; 57(9):942-3.

7. Chumpitazi CE, Rees CA, Camp EA, Valdez KL, Choi B, Chumpitazi BP, Pereira F. **Factors influencing drainage setting and cost for cutaneous abscesses among pediatric patients.** The American Journal of Emergency Medicine. 2017 Feb 1; 35(2):326-8.

8. Aprahamian CJ, Nashad HH, DiSomma NM, Elger BM, Esparaz JR, McMorrow TJ, Shadid AM, Kao AM, Holterman MJ, Kanard RC, Pearl RH. **Treatment of subcutaneous abscesses in children with incision and loop drainage: A simplified method of care.** Journal of Pediatric Surgery. 2017 Sep 1; 52(9):1438-41.

9. Mohamedahmed AY, Zaman S, Stonelake S, Ahmad AN, Datta U, Hajibandeh S, Hajibandeh S. **Incision and drainage of cutaneous abscess with or without cavity packing: A systematic review, meta-analysis, and trial sequential analysis of randomised controlled trials.** Langenbeck's Archives of Surgery. 2021 Jun; 406(4):981-91.

10. Parrish KL, Salwan NK, Thompson RN, Hogan PG, Orscheln RC, Newland JG etal, **"Skin and soft tissue infection treatment and prevention practices by paediatric infectious diseases providers",** J Paediatric Infect Dis Soc. 2020 Dec 31;9 (6):760-765.

11. Gottlieb M, Peksa GD. **Comparison of the loop technique with incision and drainage for soft tissue abscesses: A systematic review and meta-analysis.** The American journal of emergency medicine. 2018 Jan; 36(1):128-133.

12. Ladde JG, Baker S, Rodgers CN, Papa L. **The LOOP technique: A novel incision and drainage technique in the treatment of skin abscesses in a paediatric ED.** The American journal of emergency medicine. 2015 Feb; 33(2):271-276.

13. Yang C, Wang S, Li CC, Kong XR, Zhao Z, Deng XB, Peng L, Zhang J. **A high-vacuum wound drainage system reduces pain and length of treatment for pediatric soft tissue abscesses.** European journal of paediatrics. 2017 Feb 1; 176(2):261-7.

14. Rencher L, Whitaker W, Schechter-Perkins E, Wilkinson M. **Comparison of minimally invasive loop drainage and standard incision and drainage of cutaneous abscesses in children presenting to a Paediatric emergency department: A prospective, randomized, Noninferiority trial.** Paediatric Emergency Care. 2021 Oct 1; 37(10):e615-e620.

15. Salfity HV, valsangkar N, Schultz M, Salfity J, Stanton-Maxey KJ, Zarzaur B etal, **" minimally Invasive Incision and drainage technique in the Treatment of simple Subcutaneous abscess in adults".** Sage Journals 2017 July 83(7):699-703.

16. Tsoradies SS, Pearl RH, Stanfill AB. **Incision and loop drainage: A minimally invasive technique for subcutaneous abscess management in children.** J Pediatr Surg. 2010 March; 45(3):606-609.

17. Ladd AP, Levy MS, Quilty J. **Minimally invasive technique in treatment of complex, subcutaneous abscesses in children.** J Pediatr Surg. 2010July; 45 (7):1562-1566.

AUTHORSHIP AND CONTRIBUTION DECLARATION

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3	Ayesha Ayub	Data analysis, Critical analysis, Manuscript writing and finalization.	
4	Humaira Ahmad	Manuscript writing, Data collection.	
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