

A COMPARITIVE STUDY BETWEEN STANDARD I & D AND NOVEL TECHNIQUE INCISION & LOOP DRAINAGE (I & LD)

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ABSTRACT

PURPOSE:

The aim of the study was to evaluate the outcome after a minimally invasive approach to pediatric subcutaneous abscess management as an alternative to wide exposure, debridement and repetitive pack dressing.

METHODS:

A Retrospective study was performed of 280 children who underwent standard I & D and I & LD for subcutaneous abscesses between JAN-2011 to MAY-2017 in our institute.

TECHNIQUE:

In I & LD, two (sometimes three) mini incisions 4-5 mm each were made on the abscess as far apart as possible, cavity probed and septa broken with hemostat forceps and pus drained. A swab for pus culture and sensitivity was taken. Cavity irrigation was done with betadine & hydrogen peroxide. A thin slit of corrugated drain, penrose drain or surgical glove-finger was used as a loop and tied to itself such that there was no tension on the skin.

Postoperatively empirical antibiotics were started & altered SOS based on pus CS report. Daily close dressing was done for 3-4 days and then open dressing depending upon discharge coming from incisions. Most patients were discharged on 3rd to 7th day and drain was removed around 8th day.

RESULTS:

The technique was applied to all sites of subcutaneous abscesses. Some cases of I & LD were converted to traditional I and D based on clinical observation of dressings, bringing the failure rate of I & LD to 4% in our study. But the technique provided numerous advantages over the traditional I & D.

CONCLUSION:

The use of loop drainage proved safe, effective and better in the treatment and management of subcutaneous abscesses in children in our study.

INTRODUCTION:

The incidence of pediatric patients developing subcutaneous abscesses has been steadily increasing in recent years. These abscesses cannot be treated successfully with oral or intravenous antibiotics alone. Instead, they require drainage, tissue debridement, and wound care with secondary intention healing in order for the infection to fully resolve.¹

The traditional method of drainage is called open drainage, and it is done with a single linear incision, curettage of loculations using a hemostat, and expression of the purulent and necrotic material within the abscess. It is then irrigated with sterile fluid, either normal saline or lidocaine, and packing is occasionally used to keep the tissue pocket open to allow for further drainage. The packing is changed after 24-48 hours. The variability in irrigation, packing, and time until packing is removed is based on individual patient basis and the provider or clinic's preferences.²

An alternative treatment to the traditional open drainage is loop drainage. This procedure involves making a small incision in the abscess, curettage of loculations using a hemostat, and irrigation of the abscess using normal saline or lidocaine or antiseptic. Then a second small incision is made on the opposite site of the initial incision. A drain (Vessi-loop or Penrose drain) is introduced into the abscess through one incision and pulled out of the other incision using a hemostat. The drain is loosely tied on the outer surface of the skin.³ If the abscess is large or if it is an irregular shape, then multiple drains may be required. The drain is removed after 7-10 days after the initial procedure.⁴

This is a relatively new procedure that was first introduced at Orlando Medical Center for pediatric patients with subcutaneous abscesses in 2008 by researcher Dr. Ladde, so many providers are still unaware that it exists as an option to treat subcutaneous abscesses.⁵

METHODS:

A Retrospective study was performed of 280 children who underwent standard I & D (Incision & Drainage) and I & LD (Incision and Loop Drainage) for subcutaneous abscesses between JAN-2011 to MAY-2017 in our institute, in the Pediatric Surgery Department.

In Incision & Loop Drainage (I & LD), two (sometimes 3) mini incisions 4-5 mm each were made on abscess as far apart as possible, then the abscess cavity was probed, septa broken with hemostat forceps and pus drained. A swab for pus culture and sensitivity was taken. Cavity irrigation was done with betadine & hydrogen peroxide. A thin slit of corrugated drain, penrose drain or surgical glove-finger was used as a loop and tied to itself such that there was no tension on the skin.

Postoperatively empirical antibiotics were started & altered SOS based on pus CS report. Daily close dressing was done for 3-4 days and then open dressing depending upon discharge coming from incisions. Most patients were discharged on 3rd to 7th day and drain was removed around 8th day. This procedure was performed on all subcutaneous abscesses, regardless of their location: neck, upper limb, thorax, abdomen, lower limb, under short GA.

In standard Incision and Drainage (I & D), an incision was made directly over the center of the cutaneous abscess oriented along the Langer's lines. After spontaneous drainage of the abscess and obtaining pus for culture & sensitivity, a hemostat forceps was introduced to break up loculations inside the cavity. Cavity irrigation was done with normal saline, and betadine & hydrogen peroxide. Cavity was packed with betadine-soaked gauze. Postoperatively empirical antibiotics were started & altered SOS based on pus CS report. Daily dressing was done, sometimes BD as judged by discharge and soakage, till healthy granulation tissue was seen at the wound. Patients were discharged at around post-op day 7-20 (based on wound size, dressing soakage and need for daily dressings) and called for follow-up for wound evaluation every 2-3 days once the dressing soakage and discharge had reduced. Some patients were admitted again for secondary suturing to oppose the wound edges (healing by tertiary intention), while the rest achieved satisfactory healing by secondary intention.

RESULTS:

Table 1 – Incidence of I & D and I & LD

REGIONS	CASES TREATED WITH <i>I & D</i>	CASES TREATED WITH <i>I & LD</i>
SCALP	19	29
NECK	15	24
THORAX	23	35
UPPER LIMB	1	12
ANTERIOR ABDOMINAL WALL	12	21
BACK	1	7
LOWER LIMB	34	47
TOTAL	105	175

Table 2 – Distribution according to Sex

SEX	PATIENTS	PERCENTAGE
MALE	169	60.36
FEMALE	111	39.64

Table 3 – Distribution according to Age

Age	I & D	I & LD
1 month to 1 year	4	9
1 to 3 years	23	45
3 to 6 years	43	59
6 to 12 years	35	62
Total	105	175

Table 4 – Distribution according to Length of Hospital Stay

Procedure	Minimum Post-OP stay in a patient	Maximum Post-OP stay in a patient
I & D	POD – 7	POD – 20
I & LD	POD – 3	POD – 8

Discussion:

In pediatric patients with subcutaneous abscesses, this study shows that loop drainage compared to open drainage results in decreased cost, reduced length of hospital stay, and is cosmetically more appealing.

Using loop drainage to treat subcutaneous abscesses is not a mainstream procedure in the medical community because it is a very new procedure. The loop technique is a minimally invasive treatment of abscesses that allows for continuous drainage and eliminates the need for regular pack dressings, thereby reducing wound gaping, ugly scars associated with I & D, allows for better home-based care and a more rapid return to routine life for both the patient and the caretaker.

The evidence to support its efficacy is promising. It is cost effective for the hospital and the patient because there is a decreased need for home wound care materials.^{3,6} It can be done as an outpatient procedure,^{3,6} and when done in the hospital then length of stay was significantly shorter compared to open drainage procedures.³

As described above, the loop drains are removed when cellulitis and induration subside.



Failure, for the purpose of our study, was defined as requiring repeat drainage, or recurrence of the abscess at the same site. Repeat drainage was done with traditional I & D technique. In our study, the Failure rate of I & LD was 4%.

The numerous advantages of I & LD, as per our study, are-

1. Single staged
2. Short duration procedures, mostly done under short GA.
3. Mini incision small scars also made it cosmetically appealing.
4. Shorter hospital stay.
5. Dressings were found to be less cumbersome, easily managed, requiring no pack dressings making it less painful.

Also, there is notable wound care noncompliance with open drainage procedures, especially in pediatric populations. This is because the packing is occasionally pulled out or it falls out, and daily packing replacement can be painful and complicated.⁴ Patients coming from places where access to health services is not easy, must either stay in the hospital until the wound is manageable or provide quality wound care by themselves at home; either way, it becomes cumbersome and costlier for the patient.

Similar results have been seen in other studies that we reviewed, namely articles by McNamara et al³, Ladde et al⁴ and Wright et al⁶.

However, the Failure rate in 2 studies was found to be lesser than that of I & D, which was not seen in our study; namely McNamara et al³, where the study found that there were four incidences of failure within the open drainage group and zero incidences within the loop drainage group, which was a significant clinical difference, and Ladde et al⁴, where the study investigated treatment failure defined as a need for re-incision, surgical intervention, or additional antibiotic use and found that the incidence in open drainage group was 17% and the loop drainage group was 4% ($P = 0.03$), indicating a significant difference between the treatment groups.

Conclusion:

Incision and Loop Drainage (I & LD) seems to be a safe and effective treatment modality for subcutaneous abscesses in children.⁷ They offer numerous advantages in comparison to the traditional I & D procedure practiced since centuries, notably effective and simple wound care, shorter time to discharge, and minimal scarring. The failure rate of I & LD also seems to be lesser than that of I & D, although such a result was not found in our study. There is also an expected reduction in the cost of treatment both, for the patient and the hospital, and a better cosmesis and earlier return to routine activity and life.

We, therefore, recommend this minimally invasive technique to be the standard of care for subcutaneous abscesses in children.

References:

1. Ladd AP, Levy MS, Quilty J. Minimally invasive technique in treatment of complex, subcutaneous abscesses in children. *J Pediatr Surg.* 2010;45:1562-1566.
2. Tsoraides SS, Pearl RH, Stanfill AB, Wallace LJ, Vegunta RK. Incision and loop drainage: a minimally invasive technique for subcutaneous abscess management in children. *J Pediatr Surg.* 2010;45:606-609.
3. McNamara WF, Hartin CWJ, Escobar MA, Yamout SZ, Lau ST, Lee Y. An alternative to open incision and drainage for community-acquired soft tissue abscesses in children. *J Pediatr Surg.* 2011;46:502-506.
4. 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 pediatric ED. *Am J Emerg Med.* 2015;33:271-276.
5. Wendling P. Novel Technique Improved Skin Abscess Drainage. Elsevier Global Medical News [serial online]. 2009:February 23, 2016.
6. Wright TN, Gilligan L, Zhurbich O, Davenport DL, Draus JMJ. Minimally invasive drainage of subcutaneous abscesses reduces hospital cost and length of stay. *South Med J.* 2013;106:689-692.
7. Treatment of subcutaneous abscesses in children with incision and loop drainage: A simplified method of care
Arahamian, Charles J. et al.
Journal of Pediatric Surgery , Volume 52 , Issue 9 , 1438 – 1441
8. Treatment of subcutaneous abscesses in children with incision and loop drainage : A simplified method of care. / Arahamian, Charles J.; Nashad, Hilana; DiSomma, Nerina; Elger, Breanna; Esparaz, Joseph; McMorro, Thomas; Shadid, Alexandria; Kao, Angie; Holterman, Mark J.; Kanard, Robert; Pearl, Richard H.
9. Pallin DJ, Egan DJ, Pelletier AJ, Espinola JA, Hooper DC, Camargo CAJ. Increased US emergency department visits for skin and soft tissue infections, and changes in antibiotic choices, during the emergence of community-associated methicillin-resistant *Staphylococcus aureus*. *Ann Emerg Med.* 2008;51:291-298.