



Treatment of subcutaneous abscesses in children with incision and loop drainage: A simplified method of care[☆]



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ABSTRACT

Purpose: The aim of this study was to expand on our previous report of 115 patients after more than a decade-long experience using incision and loop drainage for pediatric subcutaneous abscess management. This report comprises the largest consecutive series of pediatric abscess patients from a single institution ever recorded.

Methods: A retrospective study was performed of all pediatric patients who underwent incision and loop drainage of subcutaneous abscesses at our institution between January 2002 and December 2014.

Technique: Two sub 5 mm incisions were made at the periphery on the abscess. The abscess cavity was probed to break down loculations and drain pus. The abscess cavity was irrigated with normal saline. A loop drain was passed through one incision and brought out through the other. A simple absorbent dressing was applied over the drain.

Results: Five hundred seventy-six consecutive patients underwent loop drainage procedures. Mean values are as follows: age, 3.84 years; duration of symptoms, 6.17 days; postoperative length of stay (with 4 outliers excluded), 0.69 days; drain duration, 8.38 days; and number of postoperative visits, 1.28. Twenty-six patients had reoperations (4.5%), 2 of which were planned staged excisions of pilonidal cysts and 1 because of accidental home removal.

Conclusions: Micro-incisions and loop drainage is a safe and effective treatment modality for subcutaneous abscesses in children. The findings eliminate the need for repetitive wound packing and simplify postoperative wound care. Loop drainage offers shorter time to discharge, lower recurrence rates, and minimal scarring. Additionally, there is expected cost reduction. We recommend this minimally invasive procedure to be the standard of care for subcutaneous abscesses in children.

Type of study: Treatment study – retrospective review.

Level of evidence: Level IV – case series with no comparison group.

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Incision and drainage, followed by packing, has been the classic surgical care for subcutaneous abscesses [1]. However, minimally invasive (MI) techniques have gained popularity in the past ten years among pediatric surgeons [2–6] as well as emergency department physicians [7,8]. Some institutions even consider MI techniques as the new standard of care for pediatric subcutaneous abscesses [2,9]. In this study we expanded our pilot report of 115 patients from 2009, which was the first published report in the literature about minimally invasive subcutaneous abscess management as a replacement for wide exposure,

debridement, and repetitive packing. In this report of the largest consecutive series of pediatric abscess patients from a single institution, we aim to simplify management of subcutaneous abscesses.

1. Methods

1.1. Patient population

After approval by our local institutional review board, retrospective chart review was conducted on all pediatric patients who underwent surgical drainage procedures for subcutaneous abscesses at Children's Hospital of Illinois between January 2002 and December 2014. The procedures were performed by 14 pediatric surgeons who each had prior experience in subcutaneous abscess treatment but none had performed this technique prior to the study period. Data collected included:

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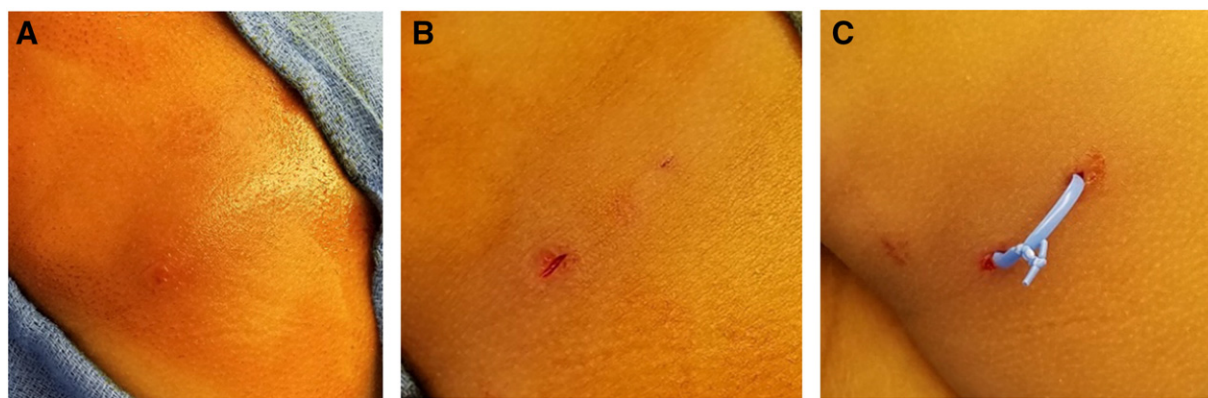


Fig. 1. (A), Abscess appearance prior to procedure. (B), Two small 4–5 mm incisions are made as widely separated as possible within the borders of the abscess. (C), The two ends of the loop drain are affixed to each other without tension.

demographic information, abscess location and size, duration of symptoms, presenting temperature, type and duration of antibiotics prior to admission, sedation type, sedation mechanism, type of drain, number of drains placed, days until drain removal, length of hospital stay, cultured bacteria, post-operative antibiotic type and duration, number of postoperative outpatient visits, recurrence, and mortality. Demographic and baseline variables are reported as mean values with the range.

1.2. Surgical technique

The standard technique used for subcutaneous abscesses (Fig. 1A) by all participating surgeons were as follows. Two small (4–5 mm each) incisions were made, as widely separated as possible within the borders of the abscess (Fig. 1B). In cases of very large abscesses, occasionally 3 or even 4 incisions are made. Pus is evacuated, and the abscess cavity is probed to break down loculations if any. A large-bore intravenous plastic catheter is inserted to irrigate the abscess cavity with sterile warm saline. A sterile rubber band, vessel loop, or rarely, Penrose drain is then passed into the abscess cavity through one incision and brought out through the other. The two ends are then affixed to each other, without tension (Fig. 1C). Drain selection is made by surgeon preference, depending on incision size and location of the wound. The drain keeps the skin incisions open allowing continued drainage. A simple absorbent dressing is applied over the drain.

1.3. Home care

The overlying gauze dressing was changed as needed, when saturated, or at least twice a day for the first 3 days. Each patient was also advised to bathe or shower twice daily for the first 3 days to promote continued drainage.

1.4. Follow-up care

Drains were left in place until drainage stopped and cellulitis improved, usually occurring 7 to 10 days postoperatively. Patients were evaluated in the clinic postoperatively for removal of the drain by one of the pediatric surgeons. Recurrence of an abscess and need for reoperation was defined as treatment failure.

2. Results

Five hundred seventy-six patients underwent six hundred thirty procedures for subcutaneous abscesses by the technique described above. The male-to-female ratio was 244:332 respectively. The mean for age was 3.84 ± 4.5 years (14 days to 20.5 years). Outcomes were not found to vary by abscess location described in Table 1.

Mean duration of symptoms was 6.2 ± 9.5 days (1–150) (Table 2). Anesthesia data were obtained for 542 patients, 534 received general anesthesia, 7 patients received intravenous sedation, and 1 patient received local anesthetic. The 576 procedures utilized 684 loop drains. Penrose drains were used in 41 (7.3%) procedures, rubber bands in 80 (13.9%), and vessel loops in 455 (79.0%). Post-operative length of hospital stay (LOS) (with 4 outliners excluded because of extended lengths of stay; two for nephrotic syndrome, one for diabetic ketoacidosis, and one for complex single ventricle) was 0.69 ± 1.1 days (range, 0–13 days) (Table 2).

Bacterial culture data were available for 530 patients (Table 1). Of these, 331 patients (62.4%) had MRSA, 72 (13.6%) had methicillin-sensitive *Staphylococcus aureus* (MSSA), and 25 (4.7%) had streptococcal species (Fig. 1B). No consistency was observed in the type or duration of antibiotic use before surgical drainage. Of the 576 patients, 328 received antibiotics before admission, 435 received antibiotics at some point during their hospitalization, and 514 patients were prescribed oral antibiotics upon discharge. The mean drain duration was 8.36 ± 3.0 days (1–26 days), and the mean number of outpatient postoperative visits was 1.29 ± 1.0 (1–17) (Table 2). Thirteen of the patients were lost to follow-up.

Of the 576 patients, 26 (4.5%) patients required reoperation. Three patients were excluded from this calculation. Two had reoperations for planned staged excisions of pilonidal cysts. One had accidental home removal 3 days postop. Of the 23 reoperations, 20 patients had loop drains, 2 patients required packing, and one was treated with wet/dry bandage.

There were 6 patients with pilonidal abscesses out of the 576 patients. One pilonidal abscess required reoperation for persistent sinus drainage. One other pilonidal required a planned staged excision of the sinus tract. These outcomes were anticipated and discussed with parents of children with pilonidal disease.

3. Discussion

Abscess drainage is a common inpatient and outpatient surgical procedure. Incision and drainage, followed by packing, has been the gold standard for this minor procedure [1]. However, there have not been many evidence-based studies in the literature to evaluate this widely spread approach to treat subcutaneous abscesses. In the last decade, alternative techniques have been reported in the literature as attractive options that offer some advantages both to the patient and caregiver with comparable success rates, if not superior.

Some reports question the necessity of packing after subcutaneous abscess drainage, because it can be painful and cumbersome to the patients, and has additional costs because of the need of health care personnel for dressing changes and the use of professional home health services in the pediatric population [10,11]. These reports did not

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