Chapter

Introductory Chapter: Loop Drainage Technique for Management of Skin and Cutaneous Abscess

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1. Introduction

Skin abscess occurs when purulent fluid collects in the dermis and deep tissues. They are painful, tender, and fluctuating red nodules. It is usually polymicrobial. Rarely, bacteremia may progress to septic arthritis and osteomyelitis.

Cutaneous abscess: It is a condition that often follows minor traumas to the skin. It is characterized by the accumulation of purulent material in the dermis and deep tissues. It often starts as an inflamed erythematous papule and turns into painful nodules that are sensitive to palpation and have increased temperature. It is often surrounded by a capsule to differentiate cellulite. It can also be quite large and multiloculated. A mature abscess has an area of thinned skin over which the purulent material accumulated underneath is visible, which can later drain. Although pain is very pronounced, fever does not often accompany uncomplicated abscesses. Fever, lymphatic involvement, rapidly spreading tissue edema, and redness indicate secondary cellulitis [1, 2]. Its etiology involves the flora bacteria of the body region where it occurs and is generally polymicrobial. In 25% of cases, *Staphylococcus aureus* may be the only causative agent.

Skin abscesses are recognized by their appearance. Ultrasound is used in the diagnosis of abscesses that do not fluctuate and are not fully mature in location; Computed tomography (CT) can be used to diagnose abscesses in areas such as deep subcutaneous, intramuscular, neck, and perineum. Primary incision and drainage, followed by systemic antibiotic therapy in complicated cases, are the cornerstones of treatment. In uncomplicated abscesses, the use of antibiotics after drainage is controversial [3]. In a patient with skin abscess, if the body temperature is >38°C or < 36°C, pulse >90/min, respiratory rate > 24/minute, and leukocyte count >12,000/mm^3 or < 4000/mm^3, antimicrobial treatment should be started [4]. It should be investigated whether there is a facilitating factor in recurrent abscesses and culture samples should be taken before treatment begins. In case of relapse, decolonization (e.g., chlorhexidine bath, nasal mupirocin, cleaning of personal belongings, etc.) is also recommended for 5 days.

2. Technique

Incision and drainage technique is primary treatment of cutaneous abscesses. A single incision should be made, long enough to allow full drainage, loculated

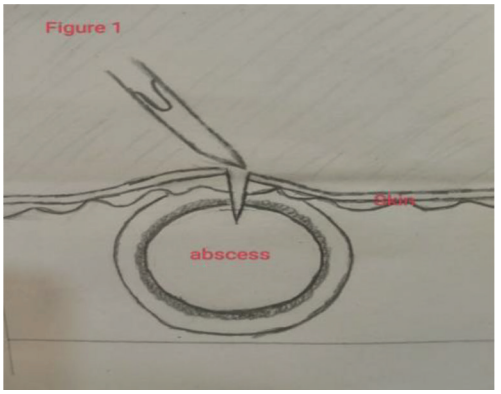

Figure 1.
Incision and drainage technique is initiated in the typical manner with lidocaine injections and incision into the apex of fluctuance. The majority of skin abscesses can be adequately drained through a small incision (average 1 cm).

areas should be disrupted with blunt equipment, and incisions should be made parallel to the natural skin folds to minimize scar formation. Cosmetic results can be optimized if the incision is made parallel to existing skin stretch lines (**Figure 1**) [5, 6]. A common mistake is not making the incision deep enough to allow complete drainage. Gram stain and culture should be performed on the sample taken. In typical cases, treatment can be started without taking a sample. In empirical treatment, it is recommended to start treatment with an agent effective against staphylococci. If there are signs of systemic inflammatory response syndrome (SIRS) or hypotension, unresponsiveness to initial treatment, or impaired host defense, effective treatment for methicillin-resistant *Staphylococcus aureus* (MRSA) should be initiated [4, 7].

Pain and poor cosmetic appearance after healing are significant disadvantages of incision and drainage technique [8–10].

In the loop drainage technique, the provider makes two small 4- to 5-mm incisions around the abscess. A hemostat is used to disrupt the loculations and the vascular loop is then passed and pulled through both incisions (**Figure 2A** and **B**). This technique is less painful than the incision and drainage method. Incisions are small, no packing is required [11, 12]. The loop drainage technique is cosmetically better [11]. Additionally, decrease in cellulite and antibiotic use was found [13]. Thus, health care costs decrease [11, 13]. The loop itself (Penrose vessiloop or even a sterile glove cuff) is removed when the cellulite has resolved, usually after 7–14 days [14].

Gottlieb et al. found that the loop drainage technique resulted in less treatment failure than the conventional incision and drainage technique [15]. However, they suggested more researches are needed [16]. Long et al. reported that the loop drainage approach had a lower risk of treatment failure compared to incision and drainage technique [17]. Hamreus reported that loop drainage provides lower cost, shorter hospital stay, and lower surgery failure rate [18]. According to the retrospective study by Ladd et al., no recurrence or serious morbidity was observed due to the operation. Loop drainage technique is a successful approach to the drainage and treatment of complex abscesses in children [19]. Lautz et al. recommend incision and loop drainage technique in pediatric patients because it is safe and successful in the treatment of subcutaneous abscesses [20].

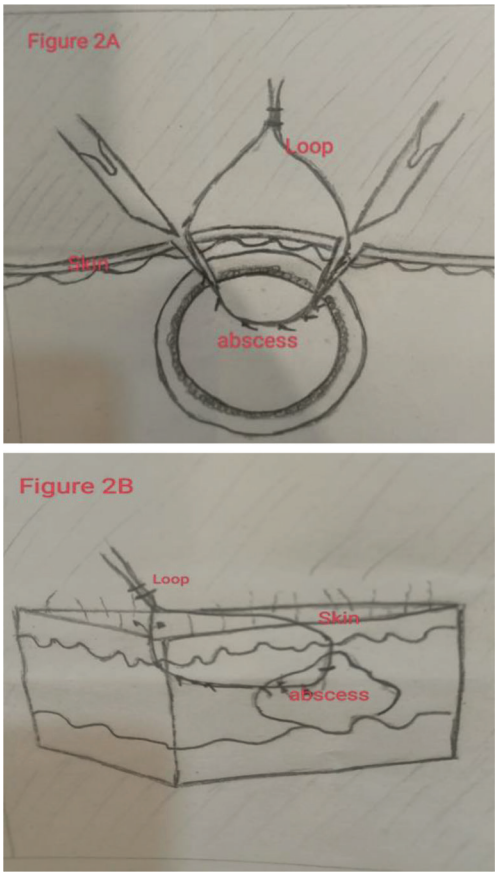

Figure 2.
(A) The provider makes a small incision around the abscess. While clearing loculations with a hemostat, the provider extends the hemostat to the other side of the abscess (opposite from the initial incision) and makes a second incision at that site; (B) Then, a sterile rubber tube—Or "loop"—Is grabbed by the hemostat, looped through the wound, and tied off.

3. Conclusion

In conclusion, loop drainage technique is better in the treatment of skin and soft tissue abscesses in terms of the overall failure rate (need for repeated incisions and drainage, need for use of intravenous antibiotics, and need for hospitalization or surgical intervention) in pediatric patients. However, results in adult patients are controversial [17]. The loop technique is a minimally invasive treatment of abscesses that allows for continuous drainage and eliminates the need for packing change.

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