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Minimally invasive and inexpensive percutaneous abscess drainage using an indwelling needle cannula

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ARTICLE INFO

Keywords:
Cervical abscess
Drainage
Facial abscess
Indwelling needle cannula
Nosocomial infection

ABSTRACT

Purpose: Abscess is still a formidable disease and requires adequate drainage. Moreover, drainage in the head and neck area needs cosmetic care, especially in the pediatric population. In this report, we introduce our method of percutaneous abscess drainage using an indwelling needle cannula.

Patients and methods: Ten pediatric and five adult patients with cervical and/or facial abscess treated with this drainage method were retrospectively reviewed. Using an indwelling needle cannula (18-14 G Surflow®, Terumo, Tokyo, Japan), abscesses were penetrated under ultrasonic examination. Once purulent retention was identified, the inner metal needle was removed and the outer elastic needle was left and fixed. The outer needle was connected to the tube for continuous suction drainage for large abscess.

Results: The primary diseases of these abscesses were cervical abscess of dental origin (5), purulent lymphadenitis (3), pyriform sinus fistula (2) and subperiosteal abscess due to mastoiditis (2), circumorbital cellulitis (1), infection of Warthin’s tumor (1), and unknown origin (1). The median (range) duration of drainage was 4 days (3–9 days). Abscesses were successfully treated, and no patients required additional incision for abscess drainage. No apparent scars after drainage were observed.

Conclusion: This technique resembles the usual venous placement of an indwelling needle cannula and is thought to be familiar to physicians. Although simple and inexpensive, this drainage is safe, effective, and minimally invasive for the treatment of abscess.

1. Introduction

In principle, the treatment of abscess in the head and neck area is effective drainage based on bacteriological examination and antibiotic administration [1–4]. However, in the otolaryngological region, the skin is visible, and cosmetic problem inevitably occurs after surgical drainage, especially in pediatric patients. We introduce here our method of percutaneous abscess drainage using an indwelling needle cannula.

2. Patients and methods

After confirming the location of the abscess and puncture route by enhanced computed tomography and/or ultrasonic images, a 18-14 G indwelling needle cannula (Surflow®, Terumo, Tokyo, Japan) with plastic syringe was prepared (Fig. 1). Under ultrasonic examination, the abscess was punctured (Fig. 2). After confirming the presence of abscess, the inner metal needle was removed. The pus was submitted for bacterial examination. Then, the outer elastic needle, which is the indwelling needle cannula, was fixed by adhesive tapes. After the rest of the abscess was suctioned, the indwelling needle cannula was left and covered with gauze. An extension tube was connected when continuous suction drainage was needed (Fig. 2). All cases were hospitalized. The cannula was removed when discharge was no longer obtained.

3. Results

One patient with pyriform sinus fistula required drainage twice due to the blockage of an indwelling needle cannula (Case 1). The median (range) duration of drainage was 4 days (3–9 days). No troubles, such as evulsion by patient, were observed. No patients required additional incision for abscess drainage, and no apparent scars after drainage were observed (Fig. 3). Cases 1 and 15 underwent removal of fistula and tumor after severe inflammation was ceased (Table 1).
4. Discussion

After the advent of antibiotics, the frequency of encountering abscess decreased. However, otolaryngological organs consist of the upper airway, so abscess formation leads to life-threatening situations [2]. As mentioned, abscess is usually visible in the otolaryngological area, and cosmetic problems inevitably occur after surgical drainage, especially in pediatric patients [5]. A less invasive technique was also reported for submandibular abscesses [6]. However, our method is much easier for clinicians and less invasive for patients. The method is performed in the same fashion as the usual use of peripheral venous placement of an indwelling needle cannula and so is familiar to physicians. Drainage is easy to perform, and it provides both sufficient abscess control and satisfactory cosmetic results without any complications. We recommend at least 18G size of needles but preferably 14G to 16G. Although these needles are relatively thick, the procedure is less invasive compared to skin incision. In addition, this procedure reduces the risk of infection to the medical staff. Like COVID-19 pneumonia, nosocomial infection is a serious problem and less invasive technique is much safer both for patients and clinicians [7,8]. We are convinced that our method reduces damage both to the patients and to the medical staff.

5. Conclusion

The percutaneous abscess drainage using an indwelling needle cannula is not only effective but also easy, minimally invasive, and inexpensive. The technique resembles the usual venous placement of an
CRediT authorship contribution statement

Kumiko Tanaka and Atsunobu Tsunoda: Conceptualization, Methodology, Writing- Original draft preparation, Writing- Reviewing and Editing.
Miri Tou, Kenji Sonoda, Shinpei Arai, Takahi Anzai, Fumihiko Matsumoto.: Investigation.
Fumihiko Matsumoto: Supervision.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amjoto.2020.102664.

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**Fig. 3.** A 9-year-old girl with abscess in the temporal region. Gadolinium-enhanced magnetic resonance imaging showed abscess and surrounding enhancement in the outer perioisteal temporal area (left). An outer needle (16G indwelling needle) was left (middle). A day after the removal of the outer needle, no apparent scar was observed (right).

**Table 1**

| Case | Age/sex | Disease | Bacterial examination | Size of needle | Vacuum drainage | Duration of needle insertion (days) | Antibiotics |
|------|---------|---------|----------------------|----------------|----------------|-----------------------------------|-------------|
| 1    | 10 y/F  | Pyriform sinus fistula | Eikenella sp./Prevotella | 18G + | 7 | ABPC/SBT |
| 2    | 49 y/M  | Circumorbital cellulitis | Prevotella | 16G − | 7 | ABPC/SBT, CLDM |
| 3    | 88 y/M  | Cervical abscess | Fusobacterium | 16G + | 9 | CLDM |
| 4    | 6 mo/F  | Subperiosteal abscess due to mastoiditis | Group A beta-streptococcus | 14G + | 4 | ABPC/SBT |
| 5    | 9 y/F   | Subperiosteal abscess due to mastoiditis | Streptococcus pneumoniae, mucoid strain | 16G + | 4 | ABPC/SBT − ABPC |
| 6    | 7 y/M   | Purulent lymphadenitis | Staphylococcus aureus | 18G + | 7 | PIPC |
| 7    | 5 y/M   | Purulent lymphadenitis | Microaerophilic streptococcus | 14G + | 3 | ABPC/SBT |
| 8    | 7 y/M   | Pyriform sinus fistula | Microaerophilic streptococcus, Prevotella | 14G + | 4 | ABPC/SBT |
| 9    | 5 y/M   | Purulent lymphadenitis | Microaerophilic streptococcus | 14G + | 3 | ABPC/SBT |
| 10   | 7 y/M   | Cervical abscess | Microaerophilic streptococcus, Prevotella | 14G + | 4 | ABPC/SBT |
| 11   | 2 y/F   | Cervical abscess | Staphylococcus aureus | 18G + | 4 | ABPC/SBT |
| 12   | 75 y/M  | Cervical abscess | Microaerophilic streptococcus | 16G + | 4 | ABPC/SBT |
| 13   | 75 y/M  | Cervical abscess | α-Streptococcus | 14G + | 4 | PeG |
| 14   | 7 mo/M  | Cervical abscess | Staphylococcus aureus | 16G − | 4 | ABPC/SBT |
| 15   | 70 y/M  | Warthin’s tumor | Negative | 14G − | 6 | ABPC/SBT |
| 16   | 69 y/M  | Masticator space abscess | Peptostreptococcus sp. | 14G + | 3 | ABPC/SBT |