Incision and Drainage Versus Incision and Drainage with Primary Closure and Use of Closed Suction Drain in Acute Abscesses

Visbal Dubey, MS, and Sanjeev Kumar Choudhary, MS, MCh

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From the R.D. Gardi Medical College, Ujjain, Madhya Pradesh, India

Address correspondence to:
Visbal Dubey, MS
Assistant Professor
Department of General surgery
R.D. Gardi Medical College
Ujjain, Madhya Pradesh, India
456006
drvishaldubey7@gmail.com

Abstract: Introduction. Acute abscesses are one of the most common acute problems seen in the surgical department of the R.D. Gardi Medical College (Ujjain, Madhya Pradesh, India). A conventional method used in the treatment of abscess is incision and drainage. The aim of this study was to compare the conventional method of incision and drainage with the alternative method of incision and drainage with primary closure, and use of a closed suction drain to reduce secondary infection. Material and methods. One hundred fifty patients admitted to the authors’ hospital with an abscess were randomly divided into 2 groups: Group A included 75 patients treated by incision and drainage with primary closure and use of a closed suction drain; Group B included 75 patients treated by the conventional method of incision and drainage only. Results. Healing time in Group A patients was less than that of Group B patients. The length of hospital stay and number of additional hospital visits for dressing changes were less for Group A patients. Conclusion. The method of incision and drainage with primary closure combined with use of a closed suction drain is more effective than that of incision and drainage only.

In 600 BC, Sushruta,¹ who is considered the Father of Indian Surgery, recommended the incision and drainage of acute abscesses. Today this remains a widely used conventional method even though it has a number of disadvantages such as repeated, painful dressing changes and delayed convalescence, leading to wasted time in the postoperative period. Ellis² later advocated for primary closure after incision and drainage of abscesses. The present study compares Sushruta’s method and a modified Ellis method. The authors modified the Ellis² method by using a closed suction drain (Romo VAC, Romsons, New Delhi, India) and compared both methods.

Material and methods.

Patients admitted to the R.D. Gardi Medical College Hospital (Ujjain, Madhya Pradesh, India) with abscess were included in this study. Patients provided written, informed consent in adherence to the standards of ethics at the medical college. Patients with intra-abdominal abscess, parotid abscess, anorectal abscess with fistula, and submandibular abscess were excluded from
this study, as well as patients with diabetes and immuno-compromised states. A total of 150 patients were selected. The study population was randomly divided between 2 groups, with 75 patients in each group. Patients in Group A were treated by incision and drainage with primary closure after a closed suction drain was placed; patients in Group B were treated by incision and drainage only.

In Group A, the tetanus vaccine was given to each patient followed by intravenous prophylactic antibiotics. Local or general anesthesia was used according to its merit in each case. Abscesses were incised, drained of pus, and had all loculi broken with a finger. The wall of each abscess was thoroughly curetted and all pyogenic membrane was removed. A closed suction drain was placed and wounds were primarily closed by mattress sutures. A closed suction drain (Romo VAC, Romsons, New Delhi, India) was used to evacuate the collection and to obliterate the dead space by negative pressure suction, and a firm dressing was applied. After 24 hours the drain was removed; and after 7 days, stitches were removed. Patients remained ambulatory during the postoperative period. Followup was done 11 days and 30 days postoperatively.

In Group B, patients received the same tetanus shot and prophylactic antibiotic as the patients in Group A. Local or general anesthesia was used according to its merit in each case.

After incision and drainage of the abscess, a gauze-dependent drain was placed through a counterincision, and the cavity was packed with povidine iodine-soaked gauze. Dressings were changed on alternate days or daily, depending on how soaked the dressing became or upon the patient’s pain level, until healing was complete. Patients remained ambulatory during the postoperative period, and were followed until 30 days after healing was complete.

Postoperative antibiotics were used in both groups according to the report of bacterial culture and sensitivity.

**Results**

The ages of the patients in this study ranged from 6 years to 65 years. The male to female ratio was 1:1.2. Table 1 shows the distribution of patients according to site of abscesses. Gluteal abscess was most common in both groups, followed by breast abscess, perianal abscess, axillary abscess, and ischiorectal abscess. Healing time for Group A patients ranged from 7 days to 11 days, while Group B healing time ranged from 12 days to 36 days. Length of hospital stay for patients in Group A was 1 day to 2 days, while the hospital stay required for patients in Group B ranged from 2 days to 8 days. Additional hospital visits for subsequent dressing changes were 2 to 3 times for patients in Group A, and 5 to 17 times for patients in Group B.

**Postoperative complications.** In Group A, 1 patient with a gluteal abscess developed persistent fistula. In Group B, 2 patients with gluteal abscesses, and 1 patient with a perianal abscess, developed persistent fistula. One patient from Group B who had a breast abscess experienced a recurrence of the abscess.

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**Discussion**

Treatment for patients in Group A included the use of a suction drain with primary closure. There are primarily 2 types of drains used in abscess surgeries: one is open, like a corrugated drain; and the other is closed, and provides suction.

In this study, a closed suction drain was used to allow for continuous drainage in a closed environment to prevent secondary infection, which is associated with open drains. This method provided better results compared to the results obtained from conventional incision and drainage. These results are also supported by the findings of other researchers, such as Jones et al.

In his study of 61 cases, Abraham et al. found primary closure and use of a closed suction drain superior to incision and drainage only, in terms of duration and
quality of healing. Abscesses requiring drainage under a general anesthetic were considered for the study, excluding extensive, secondary, and deep suppurations. In the “open” group, the abscess was drained, curetted, irrigated, and then packed. Instead of packing, the cavity in the “closed” group was obliterated using interrupted vertical mattress skin sutures with/without closed suction drainage. Of the 32 abscesses treated using the closed technique, 25 (78%) healed by primary intention after 1 week (SE \( P = 7.3\%\); 95% CI = 63.7% - 92.4%). One of the 29 abscesses (3%) treated using the open technique healed by secondary intention in a similar period of time. In the closed group, healing was obtained by primary intention, leaving a linear surgical scar in 84% of the cases. Hospitalization and the need for analgesia and dressing changes were reduced by 40%-60%.

Edino et al\(^5\) found similar results. One hundred and six patients with acute soft tissue abscesses were involved in the study to assess the outcome of primary closure in the treatment of acute soft tissue abscesses using the healing rate, cost effectiveness, quality of scars, and postoperative complications as parameters. The patients were divided into 2 groups: Group A for primary closure, and Group B for the conventional method. There was a statistically significant difference (\( P < 0.05 \)) in the healing time for study Group A (6.96 +/-123.56) compared with control Group B. Similarly, Group A was more cost effective (total cost = N406 +/-123.56) compared with control Group B (total cost = N580.47 +/- 174.24). The difference was statistically significant (\( P < 0.05 \)). Ninety one percent of the primary closure group had cosmetically acceptable scars compared with 9.3% in Group B; a difference that was significant statistically (\( P < 0.05 \)). Complications were low in the 2 methods of treatment. However, 2 patients (4.4%) in Group A developed reaccumulation of pus and wound dehiscence. The results of this study show that primary closure after incision of an acute soft tissue abscess heals faster with more appealing scars, and is more cost effective, than simple incision and drainage followed by daily dressing.

In a systemic literature review from 1950 to 2009, Singer et al\(^6\) also found primary closure superior to incision and drainage only.

In the current study, the healing time was shorter for patients in Group A, possibly because of better access of antibiotics in the abscess cavity due to the curettage of pyogenic membrane and use of closed suction drains. The reduction of hospital stay lengths and subsequent hospital visits for dressing changes reduces the work load of hospital staff and is more economical for both patients and hospitals. This method also allows patients to return to work more quickly and has more satisfactory cosmetic results.

**Conclusion**

Acute superficial abscesses treated by incision drainage with primary closure and use of a closed suction drain healed more quickly, and required a shorter hospital stay with more satisfactory cosmetic results, as compared to the conventional method of incision and drainage only.

**Reference**