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PRIMARY CLOSURE OF PRESSURE ULCERS REVISITED

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Summary

A total of 20 paraplegic patients with pressure ulcers under this study constituted of ten ischial, eight trochanteric and two sacral sores. Basic principles of conservative management laid down were strictly followed. After excision of the ulcers, the wounds were primarily closed. Maximum size of the pressure ulcer under this study was 10 x 8 cm.

Five patients lost to follow up. Remaining fifteen patients were followed for 6 months to 5 years, and in one patient recurrence was noticed. The most common complication noticed during the study was infection (20%) followed by partial wound dehisence (15%). Recurrence was noticed in one case.

Keywords: Pressure ulcer, Primary closure

Introduction

The pressure ulcer may be a problem in bed ridden patient, if proper attention to prophylaxis is not paid. It's depth and extent in early stages may not be appreciated. Anaemia, sepsis, protein and fluid loss are usual associated problems. The improved multidisciplinary care has played a positive role in reducing the incidence. The recurrence after currently avilable surgical techniques is high. The purpose of this article is to describe an experience with primary closure of pressure ulcers, leaving surrounding tissues undisturbed for further flaps.

Methods

The study involves a retrospective analysis of twenty patients of pressure ulcers treated by primary closure between 1994 to 1999. General demographic informations were recorded (Table 1 to 4). All the pressure ulcers were classified into four stages[1] (Table 5). Patient selection criteria (Table 6) was pressure ulcers with maximum dimension of 10 x 8 cm with surrounding healthy skin. The basic principles for excision of pressure ulcers[1] were followed (Table 7) and primary closure was done. The role of conservative management (frequent change of posture, nutritional support, use of specialised mattress eg. water mattress, and care of ulcer and surrounding skin) was stressed in the post-operative period and after discharge.

Table 1. Gender distribution

Gender	No. of Patients
Males	12 (60%)
Females	8 (40%)

Table 2. Sites of Pressure Ulcers

Sites	No. of patients
Ischial	10 (50%)
Trochanteric	8 (40%)
Sacral	2 (10%)

Table 3. Etiological Factors

Etiological Factors	No. of Patients
Trauma	19 (95%)
Spinal Tumor	1 (5%)

Table 4. Duration of ulcers

Duration of ulcer	No. of Patients
< 6 months	2 (10%)
> 6 months	18 (90%)

Table 5. Classification of Pressure Ulcers

Stages	No.of Patient
Stage I-Erythema, abrasion or blistering of epidermis	Nil
Stage II-Blister formation to full thickness skin loss	Nil
Stage III-Involvement of subcutaneous fat down to the deep fascia	15 (75%)
Stage IV A-Bursae, muscle, tendon involement	4 (20%)
Stage IV B-Bone and joint involvement	1 (5%)

Table 6. Selection criteria for primary surgical closure

- Stage III, StageIV A and Stage IV B pressure ulcers
- Pressure ulcers with maximum dimension of opening of 10x8cm
- Pressure ulcers with surrounding lax healthy skin with or without undermined edges.

Table 7. Basic Principles of Pressure Ulcer Surgery

- Excision of entire ulcer including fibrous lining, scar tissue, soft tissue calcification, bursae and involved bone.
- Careful hemostasis and obliteration of all potential dead spaces
- Closure with negative suction drains after undermining surrounding skin
- Stress on conservative physiotherapy in pre-operative period, continued care in post-operative period and after discharge

Patients were followed for 6 months to five years and evaluated for both immediate and late post-operative complications, recurrence and mean hospital stay.

Operative Steps

After control of infection and correction of malnutrition, patients were operated under general anesthesia. The ulcer was excised with the fibrous wall (Fig 1), bursa and /or soft tissue calcification. Bony prominences and /or osteomylitic bones were excised whenever necessary. After careful hemostasis and obliteration of all potential dead spaces, the defect was primarily closed after undermining the surrounding skin (Fig 1b). Negative suction was continued up to 10 - 14 days (till the collection was reduced to a negligible quantity). Conservative management was continued in the post-operative period.

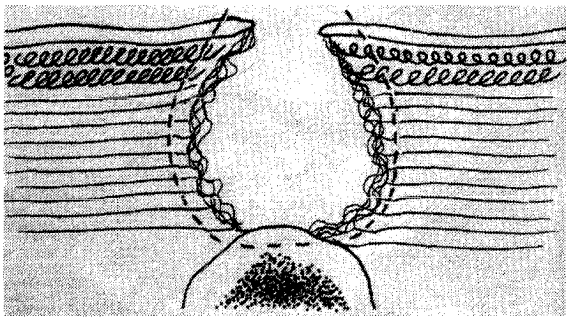


Fig 1a. Line diagram showing excision of entire ulcer including fibrous lining, scar tissue, soft tissue calcification, bursae and involved bone

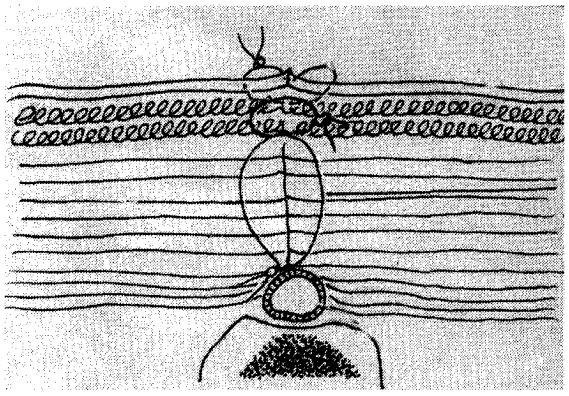


Fig 1b. Line diagram of the wound after primary closure over a suction drain

Results

The patient population consisted of 12 males and 8 females with mean age of 40 years (Table 1).The most common site of pressure sore selected for primary closure was ischium followed by trochanter and sacrum (Table 2). All the patients were paraplegics and the most common cause of pressure sore was trauma (Table 3). Duration of ulceration ranged from 6 months in 2 patients to >6 months in 18 patients (Table 4). The maximum number of cases were in stage III followed by stage IV A (Table 5). Wound infection was the most common complication (20%) followed by partial wound dehisence (15%) (Table 8). All the complications were managed conservatively. Mean hospital stay ranged from 20 days (without complications) to 30 days (with complications). Five patients lost to follow up. Out of remaining 15 patients one patient had recurrence (at stage I) was detected one year after primary closure and was managed conservatively.

Table 8. Complications

Complications	No. of Patients
Wound Infection	4 (20%)
Partial Wound Dehiscence	3 (15%)
Recurrence	1 (5%)
Total	8 (40%)

Discussion

Pressure ulcers are usually associated with high morbidity and mortality. Untreated these patients may develop complications like anaemia, infection (soft tissue, bone, systemic), hypoproteinaemia and ectopic calcification. Post operative recurrence of pressure ulcers, especially in old, debilitated and bed ridden patients is not uncommon. Therefore, there is no need to stress on prophylaxis. Skin, muscle, myocutaneous and sensory skin flaps have now evolved as main modalities of surgical management[2-8] with distinct advantages over skin grafting. Recurence rate after skin grafting, conventional and sensory flaps is expected in descending order.

The simplest surgical procedure, the primary closure of pressure ulcers was reported by major WB Scoville in the literature[1] for small pressure sore in 1944. In the present study, the efficacy of primary closure, being simpler surgical solution for the treatment of pressure ulcers with obvious advantages of leaving intact surrounding tissues for further flaps, was explored in the new era of better antibiotics and refined surgical techniques.

Fig 2a. Photograph showing sacral ulcer

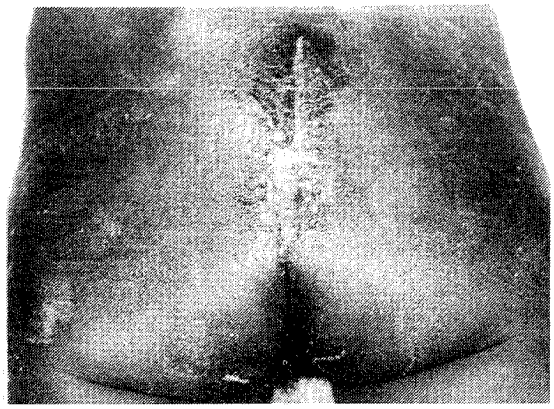


Fig 2b. Photograph showing postoperative result after 10 days

All the patients were followed from six months to five years (Fig 2-4). Five patients were lost to follow up. A very high recurrence rate varying from 23 - 61% has been reported in the literature[7]. The complications noticed during the present study were infection (20%), partial wound dehisence (15%) and recurrence in one case.The low recurrence rate in the present study may be attributed to proper selection of patients, meticulous surgical closure,

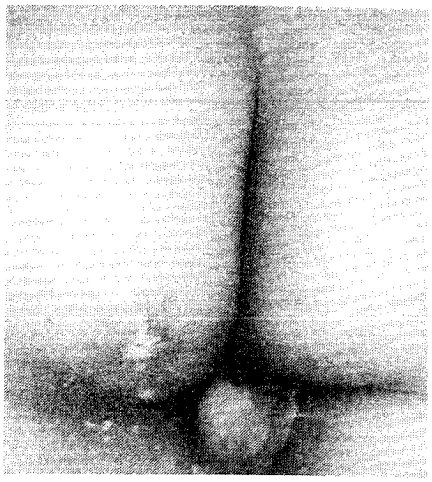


Fig 3a. Photograph showing ischial presure ulcers with 2 cm undermined edges

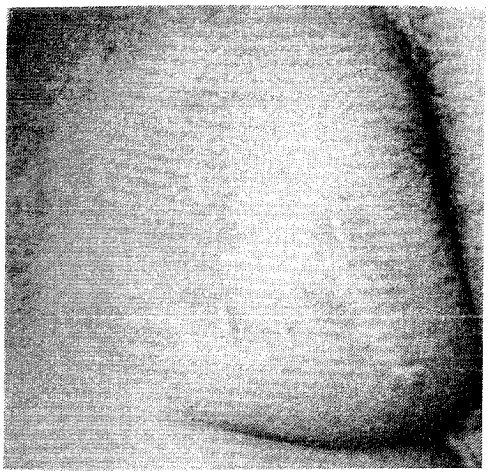


Fig 3b. Photograph showing result of primary closure of ischial pressure ulcer after one month

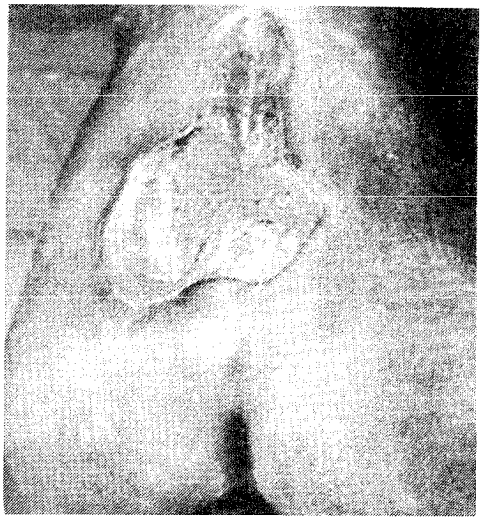
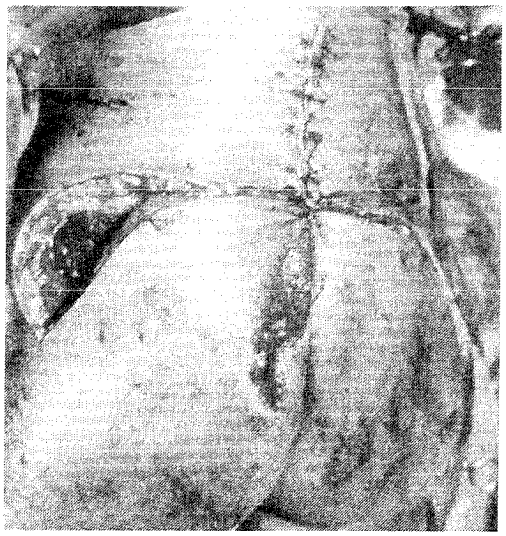


Fig 4a. Photograph showing combined sacral and spine pressure ulcer



Fib 4b. Photograph showing primary closure of pressure of pressure ulcer over spinal area and rotation flaps for sacral pressure ulcer

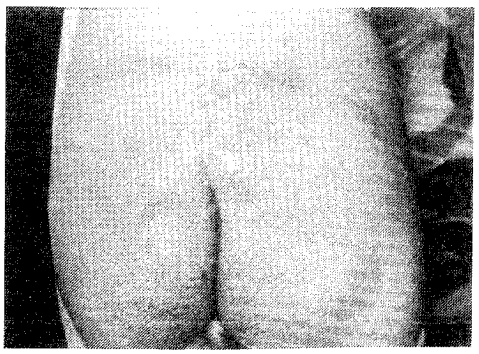


Fig 4c. One year post operative photograph

prolonged use of suction drinage in the post-operative period and continued post-operative conservative physiotherapy.

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