

The Reusable V-Y Advancement Gluteus Maximus Fasciocutaneous Flap in Management of Sacral Pressure Sores

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ABSTRACT

This study was for evaluation of V-Y advancement gluteus maximus fasciocutaneous flap in management of sacral pressure sores. We asked whether this technique would be simple and results in few complications. Thirteen patients with large sacral bed sores due to long period bed ridden post traumatic or senility had reconstructed using this technique in one stage.

The size of the defect and postoperative complications in each patient were assessed. The mean follow-up period was 10 months (ranges from 9-12 months). All wounds healed with no recurrence during follow-up 2 patients in whom superficial necrosis occurred in the distal end of the flap; the wound healed without necessitating a secondary operation. No patients had deep infection, wound dehiscence, or partial loss or shrinkage of the flap at final follow-up.

In conclusion, the use of V-Y advancement gluteus maximus fasciocutaneous flap offers an easy, practical, and secure attachment in sacral pressure sore reconstruction.

INTRODUCTION

The terms decubitus ulcer and pressure sore have been interchanged inappropriately over years. Technically, the term decubitus ulcer refers to wounds developed over bony prominences while in the recumbent position (ie, sacrum, heel, and occiput), the Latin *decumbere* means to lie down.

Therefore, semantically, wounds acquired from extended pressure in the seated or turned position (ie, ischeal or trochanteric ulcers) are not decubitus ulcers.

In general, wounds acquired from pressure over bony prominences can always be called pressure sores [1].

The sacral region is one of the most frequent sites of pressure sore development.

Debridement of pressure sores in the sacral region often results in excessive soft tissue defects

that cannot be closed primarily and are further associated with increased risk of flap ischemia, wound dehiscence, and deep infection [2].

Numerous surgical methods have been used to correct these defects, including skin grafting, local flaps, muscle flaps and free flaps. Local flaps in the sacral region are the first choice for reconstructions of sacral defects.

Overall, patients with sores are important users of medical resources. They require more nursing time, remain hospitalized for significantly longer periods and incur higher hospital charges [3].

PATIENTS AND METHODS

Between December 2010 and December 2011 we managed pressure sores in 13 patients (7 males and 6 females) by using V-Y advancement gluteal fasciocutaneous flap.

The patients ranged in age from 21 to 68 years (mean 42 years), and the most common reason for prolonged bed rest were RTA.

Of the eight trauma cases, seven involved spinal cord injury. Six of these individuals were paraplegic. In the five patients who were not trauma cases, senility accompanied by diabetes mellitus and chronic renal failure were the reasons for extended bed confinement.

All of the patients had stage IV pressure sores that extended to the bone.

The sores ranged in size from 8 to 18cm in diameter (mean 12cm). Seven sores that ranged from 8 to 12cm (mean 11.4cm) were reconstructed with unilateral flap, and six sores that ranged from 12 to 18 (mean 15.2cm) were reconstructed with bilateral flaps.

Operative technique:

Our operative procedures were performed under general anesthesia and with the patients in the prone position.

The first step was to debride the ulcer, underlying bursa, and involved bone (Fig. 1).

The V fashioned wide enough and long enough to close as a Y without tension. The elasticity and redundancy of the tissues in the gluteal region were also important for achieving optimal wound closure.

The flap is completely islanded, taking care to only deepen the incision through the dermis and sparing the gluteus maximus fascia (i.e., supra-fascial plane). This prevents injury to gluteal maximus perforators.

An attempt is then made to transpose the flap. If no tension is encountered, closure of the donor defect is commenced and completed first. The flap is then found to fit snugly into the recipient defect. Suction drains are left for 5 days and then removed (Fig. 2).

The postoperative protocol requires that the patient be placed in the prone or lateral position for a total of 2 weeks. Pressure relieving measures include frequent positional changes during this time and usage of proper mattresses. The patient can subsequently lie on the flap either after 2 weeks or once the wound has healed.

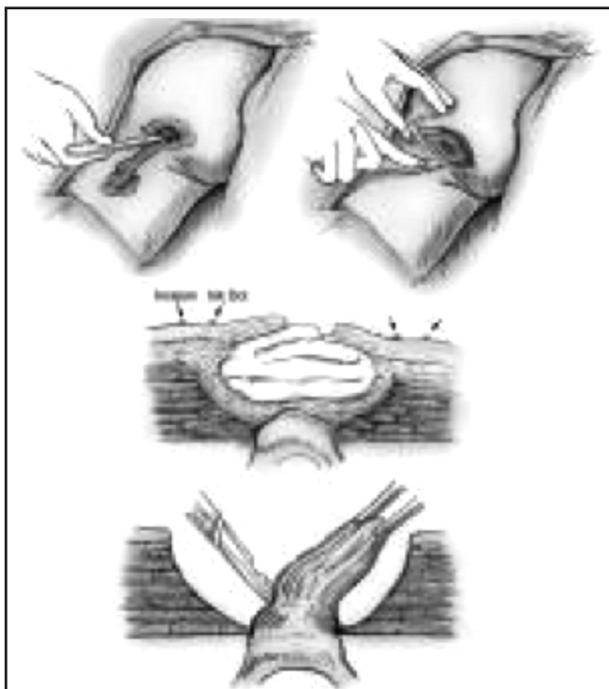


Fig. (1): Removing the bursa and excising the pressure sore circumferentially and removing all granulation tissue, even from the base of the wound.

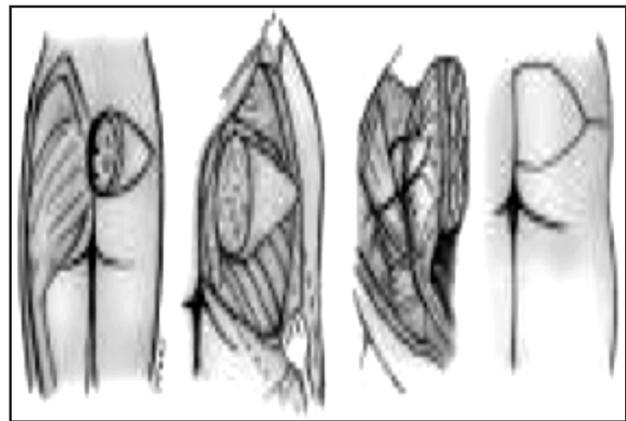


Fig. (2): Larger sacral ulcers require the use of bilateral flaps such as bilateral V-Y advancement flaps.

RESULTS

Of the thirteen bed ridden patients included in the study, the demographic data including the sex, age size of the ulcer and follow-up period are summarized in (Table 1).

The sutures were removed after 14 to 18 days postoperatively. The mean follow-up period was 10 months (range, 9-12 months).

All flaps survived without major problems except in 2 patients in whom superficial necrosis occurred in the distal end of the flap; the wound healed without necessitating a secondary operation.

Table (1)

Pt no.	Age	Sex	Ulcer size	Follow-up
1	43	M	13.5	11
2	26	F	11	9
3	54	F	9.5	10
4	33	M	8	12
5	37	M	14	11
6	39	M	18	10
7	61	F	8.5	12
8	46	M	9.	9
9	68	F	10	10
10	45	M	12	9
11	25	F	11.5	10
12	21	F	15.5	9
13	57	M	16	9



Fig. (3): Sacral pressure sore after debridement.



Fig. (4): Design of unilateral V-Y advancement fasciocutaneous flap.



Fig. (5): Immediate postoperative unilateral flap.



Fig. (6): Big sacral pressure sore.



Fig. (7): Design of the bilateral flaps.



Fig. (8): Immediate postoperative bilateral flaps.



Fig. (9): 2 weeks postoperative after removal of clips.



Fig. (10): Late postoperative with complete healing.



Fig. (11): Late postoperative with complete healing.



Fig. (12): Sacral pressure sore.



Fig. (13): The bilateral, extended V-Y flap.



Fig. (14): Early postoperative.

DISCUSSION

The number of the patients with pressure ulcers is getting higher, as the percentage of the RTA, the elderly and the chronically ill people continuously increases. However meticulous the conservative treatment of stage IV ulcers might be, it is ineffective, especially in non ambulatory patients [4].

Wide surgical debridement to healthy tissue, followed by coverage with well-vascularized tissues and tension-free closure, is considered the treatment of choice [5].

As for sacral pressure ulcers, reconstruction can mainly be achieved with the use of local gluteal flaps, either fasciocutaneous or musculocutaneous. Both types of the flaps possess certain advantages and disadvantages.

Gluteal musculocutaneous flaps provide well-vascularized tissue, but gluteus muscle harvesting inflicts a serious functional deficit in ambulatory patients [6-8].

Also, sacrifice of the muscle, either functional or not, deprives the patients from future use in case of pressure ulcer relapse. Gluteal fasciocutaneous flaps when compared with musculocutaneous flaps, except for being gluteal muscle sparing, seem to be more resistant to pressure and easier to harvest. They also seem to ensure longer pressure-ulcer-free survival rate [7].

Unilateral V-Y advancement fasciocutaneous flaps can be used to close defect that coverage 10cm in diameter. If the wound is larger or unilateral flap would have to be closed under tension, bilateral flaps are indicated [8].

The largest defects that were closed with unilateral and bilateral gluteal fasciocutaneous V-Y advancement flaps were 10-11cm and 15-21cm, respectively, in the series of Ohjimi et al., [9].

The largest defect that we closed with a unilateral advancement flap was 12cm in diameter, and the largest one that we closed with bilateral flaps was 18cm in diameter.

Several modifications of V-Y advancement gluteal fasciocutaneous flaps have been reported. Mithat-Akan et al. [10] introduced the "Pac Man" flap, and Ay et al. [11] described the interdigitating technique. In both techniques, the midline vertical scar was broken in a Z-plasty pattern. Another modification, introduced by Borman and Maral, [12] was the gluteal fasciocutaneous rotation-

advancement flap. Although all the aforementioned flaps minimized tension along the midline, they did not manage to obliterate dead space and also distorted or deleted the natal cleft.

If the subcutaneous tissue loss beyond the wound periphery is extensive, then it is difficult to obliterate the dead space with a fasciocutaneous flap. A musculocutaneous flap may be more appropriate for longer, deep ulcer as other authors suggested. If the subcutaneous tissue loss is minimal, then a fasciocutaneous flap will fill the ulcer defect well in most cases [13].

Conclusion:

The success of the design of the gluteus maximus fasciocutaneous flap depends on the following factors: Accurate assessment of the defect size (apparent vs. true), closure of the donor defect first to achieve a locking barrier, and inserting of the flap without tension. These factors will allow for a smooth and complication free outcome, and a short duration of surgery.

This refinement of these flaps shows that up to two re-advancements of each of these flaps can be done, thus preserving reconstruction option prone to pressure ulcer recurrence.

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