

A GLUTEUS MAXIMUS MYOCUTANEOUS ISLAND FLAP FOR THE REPAIR OF A SACRAL DECUBITUS ULCER

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The gluteus maximus muscle has many uses in the local surgical closure of decubitus ulcers. It can be used as a turn-over flap (Stallings *et al.*, 1974), transposed as a muscle flap (Ger, 1971; Ger and Samuel, 1976) or combined with the overlying skin as a true myocutaneous flap (Minami *et al.*, 1977). In 1975, Fujino *et al.* defined the existence of a viable myocutaneous flap based on the gluteal muscles and indeed reported its use by microvascular transfer to reconstruct the breast in a patient with mammary aplasia.

It is the purpose of this preliminary report to show that the gluteus maximus muscle can be used as a myocutaneous island flap in the closure of a sacral decubitus ulcer. Since April 1978, 8 patients have been successfully treated with this type of composite flap.

APPLIED ANATOMY

The gluteus maximus muscle arises from the outer surface of the sacrum and the coccyx, the sacrotuberous ligament and the fascia covering the gluteus medius muscle.

It is inserted into the iliotibial tract and the gluteal tuberosity of the femur. Its blood supply comes from the inferior and superior gluteal vessels which are branches of the internal iliac vessels.

The nerve supply is through the inferior gluteal nerve which runs parallel to the inferior gluteal vessels.

The overlying skin and subcutaneous tissues of the buttock are supplied by perforating vessels through the fascia of the gluteal muscle (Fig. 1).

OPERATIVE TECHNIQUE

The patient is placed prone on the operating table. The decubitus ulcer is excised down to healthy bleeding tissue and any sacral bony prominences are removed. A suitably large flap of skin and muscle is now designed to close this excisional defect, the flap being supplied by a pedicle based between the greater trochanter and the anterior iliac spine. The planned incision is made through the skin, the subcutaneous tissues and the gluteus maximus muscle.

The gluteal fascia is incised and the gluteus maximus muscle is freed from its lateral origin; by blunt finger dissection the gluteus muscle is elevated off the gluteus medius. With gentle retraction of the muscle the gluteal vessels can be clearly seen along the posterior surface of the gluteus maximus muscle. The superior gluteal vessels are the vessels of choice in the design of the island pedicle.

The superior portion of the island pedicle in the proximal portion is dissected

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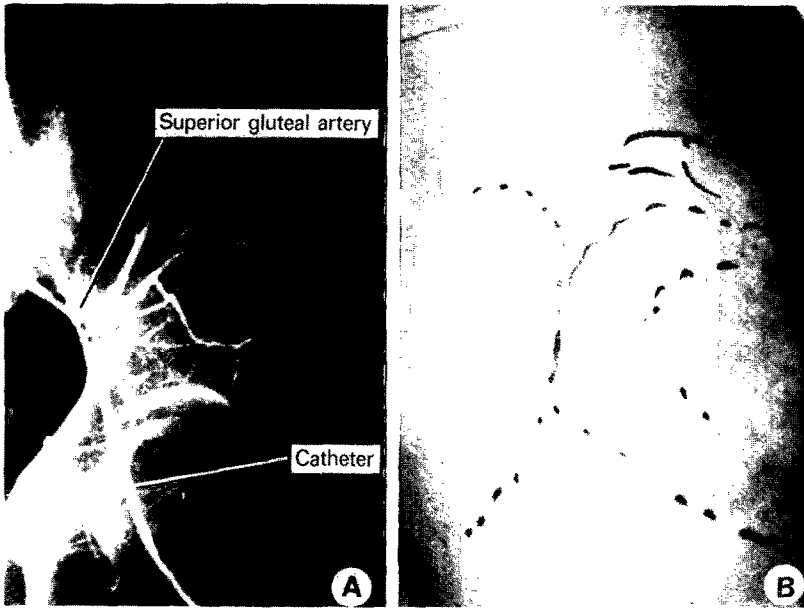


FIG. 1. A. Selective angiogram of the superior gluteal artery. B. Fluorescein injection studies of the superior gluteal artery show the territorial distribution of the dye in the buttock skin (dotted line on the right side).

carefully just beyond the overlying island skin to avoid damage to the feeding vessels. At this point the viability of the flap is assessed by the routine intravenous injection of fluorescein (McCraw *et al.*, 1977).

The composite gluteus maximus myocutaneous flap is now elevated and transferred to the defect. The gluteus maximus fibres in the flap are carefully sutured to the muscle layers on the opposite side of the sacral defect and the skin is closed in a separate layer. Suction drains are inserted as a routine beneath the flap and retained until drainage ceases.

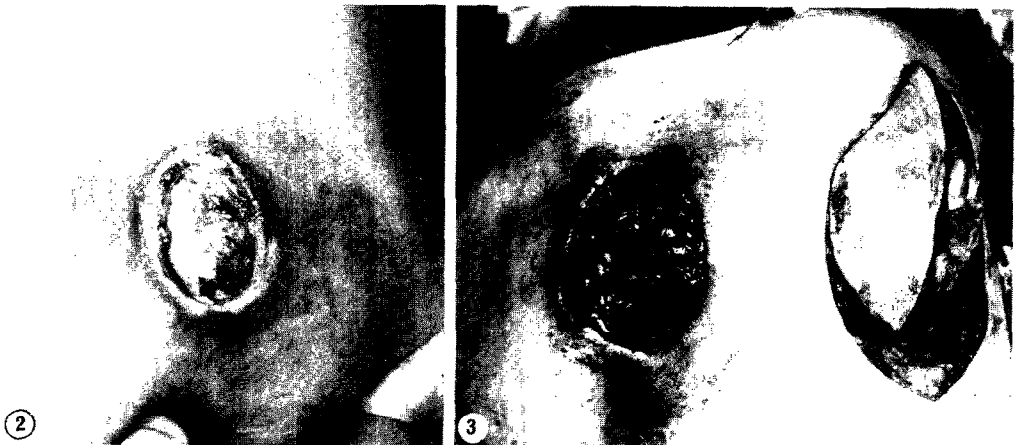


FIG. 2. Sacral decubitus ulcer (Case 1).

FIG. 3. The decubitus ulcer has been excised and a myocutaneous island flap is fashioned on the right buttock with its pedicle based between the greater trochanter and the anterior iliac spine.

Case 1. A 63-year-old woman had suffered for 2 years from a painful large sacral decubitus ulcer, measuring 7×7 cm (Fig. 2). Under general anaesthesia, after adequate excision of the decubitus ulcer and the prominences of the sacral bone, the defect was reconstructed immediately by a gluteus maximus myocutaneous island flap (Fig. 3).

The donor area was closed primarily without any difficulty. She had an uneventful postoperative recovery and the wounds healed without complication (Fig. 4). She has been followed for 12 months since this surgery, and to date she has had no evidence of breakdown of any of these wounds (Fig. 5).

Case 2. A 29-year-old man with paraplegia resulting from brain injury had a chronic sacral ulcer for over 3 years (Fig. 6). After excision of the badly scarred tissues and the underlying bony prominences, a gluteus maximus myocutaneous island flap was raised and transferred to cover the sacral defect. (Figs. 7 and 8).

The postoperative course was uneventful and there has been no recurrence of the sacral decubitus ulcer. (Fig. 9).

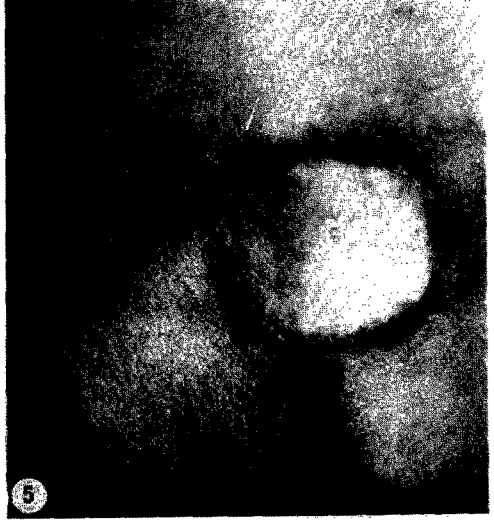
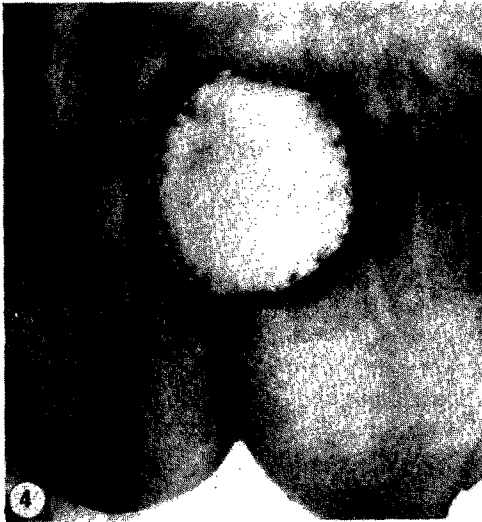


FIG. 4. The island flap is brought through the subcutaneous tunnel to the sacral defect and sutured to its edges. The donor defect over the right buttock is closed primarily.

FIG. 5. One year later the flap is soundly healed and stable.

FIG. 6. Chronic sacral decubitus ulcer (Case 2).



FIG. 7. The sacral ulcer has been excised and a musculocutaneous island flap has been fashioned from the left buttock based on the superior gluteal vessels (indicated by the arrow).



FIG. 8. Close-up view to show the vascular pedicle.



FIG. 9. The wounds healed without complications or recurrence. Stable skin flap repair 10 months later.

Case 3. A 64-year-old man had been paraplegic for 5 years after a back injury. He had developed a large sacral decubitus ulcer which was excised and reconstructed at the same operation with a gluteus maximus myocutaneous flap. He has been followed up for 8 months now and no problems have been encountered.

Case 4. A 54-year-old woman had been paraplegic for 10 years. As a complication of the resection of a spinal haemangioma she developed a large sacral decubitus ulcer.

The sacral ulcer was excised and the defect closed immediately with a gluteus maximus myocutaneous island flap. All the wounds healed primarily. She has been followed up for 7 months with no recurrence of ulceration.

DISCUSSION

In the first patient we used a subcutaneous tunnel to introduce the island flap over the sacrum. This is not necessary and it is easier to make a wide exposure of the ulcer and donor site by a single incision.

We have now treated 8 patients without any complications or recurrence of the ulceration and our longest follow up is just over 1 year.

Minami *et al.* (1977) described a gluteus maximus rotation myocutaneous flap repair, but the mobility of this type of flap is limited and a skin graft is usually required on the donor site.

Ger and Samuel (1976) described a gluteus maximus muscle transposition flap. These flaps also have the same disadvantage of limited movement and the need for a split skin graft to the secondary defect.

By contrast, the gluteus maximus myocutaneous island flap has several distinct advantages. Previous delay procedures are unnecessary. The flap can reach further

than a turn-over or myocutaneous rotation flap. The donor site can usually be closed primarily. In our experience a donor defect less than 8 cm in diameter can be closed primarily without any difficulty. If the defect is larger than 8 cm in diameter, bilateral gluteus maximus island flaps may be required.

No split skin grafts are required on the secondary defect, so the postoperative nursing and rehabilitation is greatly simplified.

SUMMARY

The gluteus maximus myocutaneous island flap is a useful, safe and versatile flap for the repair of sacral decubitus ulcers. It is now our recommended procedure of choice for the surgical treatment of this type of wound (Maruyama and Tajima, 1978).

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