TWO YEARS WOUND FREE TO FOLLOW UP OF A CHRONIC PRESSURE SORE IN A PARAPLEGIC PATIENT AFTER PERFORMING THREE MUSCLE FLAPS: A CASE REPORT

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ABSTRACT

Background

Joint involvement underlying pressure sore is a challenge to manage because of the extensive tissue damage that usually requires wide debridement leaving behind significant defects to fill and the possibility of recurrence after reconstruction.

Case presentation

We present a case of large communicating ischial and trochanteric pressure sore with femoral head osteomyelitis in a paraplegic patient that was managed by femoral head resection and a musculocutaneous flap instead of lower limb amputation. Management of chronic pressure sores in neglected spinal cord injury patients requires teamwork to prevent a recurrence. We could give our patient a chance and save her lower limb from amputation by a combined vastuslateralis, vastusintermedius and rectus femoris flap ('three muscle flap') based on the lateral circumflex femoral artery following proximal femoral resection.

Conclusion

Our two years follow up showed that this method is effective for the management of large deep ischial pressure sores with no recurrence.

Keywords: *Pressure sore, Musculocutaneous flap, Osteomyelitis.*

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INTRODUCTION

One of the plastic surgeon's challenges is managing large pressure sores with underlying hip joint involvement because these patients often will need extensive debridement, which in turn leaves a large cavity behind that is very difficult to fill unless using a musculocutaneous flap or even full pelvic flap when the pelvis is involved [1].

We present a case of chronic large communicating ischial and trochanteric ulcer (18×35cm) with hip joint osteomyelitis in a paraplegic patient who had a previous failed reconstructive attempt with local flap, Figure 1, that was managed by proximal femoral head resection and "three muscle flap" including vastuslateralis, vastusintermedius and rectus femoris en-bloc based on the descending branch of the lateral circumflex femoral artery along with a skin island [2] .The result of which was satisfactory with no recurrence of infection or ulceration in the course of 2 years follow up.

CASE PRESENTATION

Our patient was a newly diagnosed diabetic middle-aged paraplegic lady who has had many operations and hospital admissions for pressure sores; she even had a failed attempt to cover the ischial ulcer before. On gross examination, she had a large(18×35cm) communicating ischial and trochanteric ulcer with purulent discharge showing systemic signs of infection. She was debilitated with anaemia and malnutrition. Initially, several sessions of debridement were done with resection of the femoral head because it was necrotic, and a tissue biopsy was taken. The microscopic study came back indicating osteomyelitis, and the organism was *Acinetobacter baumannii* sensitive to Doxycycline, so she received it for 5wk. Her anaemia and protein malnutrition were corrected with high protein and calorie intake and blood transfusion before the final reconstruction. Her diabetes was controlled under physician supervision, too. Inspired by the excellent work of Acartürkon using three muscle flaps for complex cases of pressure sore [2], we decided to try something similar for this lady who strongly refused lower limb amputation, which is the usual surgical decision in her case.

On the day of flap harvesting, the acetabulum was found to be necrotic as well, so the flap was raised but not placed in the cavity until 1wk later to allow complete cleaning of the recipient bed with dressing and use the advantage of the delay to enhance the flap's vascularity because our defect was more significant than those in the original paper, Figure 2, 3.

DISCUSSION

Management of chronic wounds is one of the primary jobs of a plastic surgeon, a difficult one that demands good experience and knowledge.

Pressure sores are on the top of the list of chronic wounds that are difficult to manage and require teamwork for early diagnosis, treatment and follow up aiming at prevention of recurrence [3].

Spinal cord injury patients are at particular risk for developing pressure sores, often presenting with large deep ulcers, especially the neglected cases [4].

Chronic ulcers usually develop when the wound becomes deep enough to involve the underlying structures like joints. The wound's surface may be small, but if this connection is missed, the result will be recurrent bouts of fever and draining sinuses due to osteomyelitis, synarthrosis and flap breakdown. While most of these pressure ulcers can be treated using musculocutaneous flaps and the result can be as good as fasciocutaneous flaps [5], when the hip joint is involved and we want to control this infection, a large cavity will be left behind once wide debridement of all infected unviable tissues is performed including Gilderstone arthroplasty [6] .That is why ordinarily total thigh and leg amputation was the choice previously for the reconstruction of such significant cavity defects with exposed hip joint and intractable infection [7].

However, this problem can be addressed by a combined vastuslateralis, vastusintermedius and rectus femoris flap ('three muscle flap') based on the lateral circumflex femoral artery following proximal femoral resection that we did for our patient and kept her in the ward for 3wk after the operation during which no complications were faced. She had no recurrence of pressure ulcers or infection in 2 years of follow up Figure 4.

When the wound was clean and ready for final closure, the patient has placed in semi lateral decubitus. The dimensions of the cavity were measured with the hip being in semi flexed position. Then the distal edge of the skin island was marked 5cm proximal to the upper edge of the patella, and a line was drawn joining the anterior superior iliac spine and the superolateral edge of the patella, making the midsection of the skin island lie over the intermuscular septum between rectus femoris and vastus lateralis.

The width and length of the flap's skin island were nearly the same as the skin defect's (18×38cm), which differentiate our design from Acartütk's where they took the length of the skin island 50% longer than the defect's length, Figure 2. To open a tunnel for the flap to lie in, we continued the skin island's incision to the defect from the upper edge. Later, to prevent any injury to the descending branch of the lateral femoral artery, it was not exposed during the raising of the three muscles (rectus femoris, vastuslateralis and vastusintermedius) from distal to proximal in an en-bloc with preservation of the periosteum of the femur. Then, the flap was placed in the defect omitting all the dead space. Finally, the skin was closed using clips, and the donor site was closed primarily apart from a small proximal area (6×6×3cm) that needed to be covered with a skin graft, Figure 3. Postoperatively the patient was advised to not lie on the flap for three weeks, and the hip was adequately positioned to prevent hyperflexion.

This patient's right lower limb was saved using this "three muscle flap", and she has not had other pressure sores in the 2years follow up period, Figure4, because this flap's advantages are: (a) the flap has a reliable and consistent vascular pedicle which has a wide arc of rotation and could be dissected safely, (b) the muscle volume is sufficient to fill large wounds, (c) the integrity of the muscular structure is not violated by previous surgeries, (d) this procedure has no significant functional sequelae and (e) the rest of the lower limb is preserved. The 'three muscle flap' offers a solution for deep cavities that need to be filled with a large bulk of tissue and preservation of the rest of the thigh. Although the flap's elevation is fast, safe and the vascular pedicle is reliable, this technique must be reserved for the management of large pressure sores that are complicated with deep cavities created after resection of the proximal femur [(2)].

Inconclusion, we find that this technique is a reliable way of preserving the lower limb in spinal cord injury cases with chronic large pressure sores involving the hip joint by providing a durable cover that prevents future recurrence.

Conflict of interest

None

Figure 1. Communicating deep ischial and trochanteric pressure sore after several debridement sessions.

Figure 2. The flap was marked and raised but not set into the recipient bed.

Figure 3. Once the wound was clean, the flap was inserted in place, and the skin island was sutured with staples.

Figure 4. The flap healed well with no complications or recurrence after two years.

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