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Original Research Paper

Plastic Surgery

CLINICAL STUDY ON VARIOUS METHODS SACRAL RECONSTRUCTION OF GRADE 4 PRESSURE SORES AND ITS OUTCOME

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ABSTRACT Pressure sores remain a common health problem, particularly among the physically limited or bedridden elderly, and can cause significant morbidity and mortality. This study aimed to present our surgical treatment and strategy for patients with multiple pressure sores. Between January 2016 and December 2018, 12 patients were enrolled. After adequate debridement, pressure sores were managed based on our treatment protocol. Patient's age, aetiology, defect size and location, flap reconstruction, outcome, and follow up period were reviewed. A total of 6 men and 6 women with a mean follow up period of 6 month to 15 months were included. The most common aetiology of the bedridden state were paraplegia/ cerebrovascular accident

KEYWORDS : Bedsore, decubitus ulcer, pressure sore, pressure ulcer

INTRODUCTION

Sacral pressure sore are still serious problem and their reconstruction poses a challenge to Plastic Surgeon. Sacral Pressure sore are commonly seen in Paraplegic patients, elderly with limited mobility. Such sore extends for longer period of time and therefore involves considerable cost.

MATERIAL AND METHODS

Table 1.List of cases

S. No.	Age/ Sex	Etiology	Site of Sore	Type of Flap
1.	24/F	Cervical Cord Injury (Fixation done with paraplegia)	Sacral/B/L Ischial decubitus ulcer	Bilateral Gluteal rotation skin flap
2.	32/M	Cervical Cord Injury (Fixation done with paraplegia)	Paraparesis /Multiple pressure sore	Bi-lateral Gluteal advancement flap
3.	32/M	Traumatic Brain Injury with Paraplegia	Bilateral Sacral pressure sore	Limberg Flap
4.	33/M	Traumatic Brain Injury with Paraplegia	Paraplegia /sacral pressure sore	Gluteal rotation skin flap
5.	34/F	Spinal cord injury with Paraplegia	Sacral pressure sore	Limberg Flap
6.	37/M	Traumatic Brain Injury with Paraplegia	Quadriparesis Sacral pressure sore	Gluteal rotation skin flap
7.	45/M	Cervical Cord Injury (Fixation done with paraplegia)	Paraplegia sacral & trochontris pressure sore	Gluteal rotation skin flap
8.	50/M	Spinal cord injury with Paraplegia	Sacral pressure sore	Bi-lateral Gluteal rotation skin flap
9.	50/F	Spinal cord injury with Paraplegia	Sacral pressure sore	Gluteal rotation skin flap
10.	58/F	Traumatic Brain Injury with Paraplegia	Multiple pressure sore sacral &Rishy trochanteric	Superior Gluteal artery perforator flap
11.	65/F	Elderly Patient CVA	Sacral pressure sore	Gluteal rotation skin flap
12.	78/F	Elderly Patient CVA	Sacral pressure sore	Gluteal rotation skin flap

The End results were assessed seroma seen in 2 patients, marginal necrosis at the business end of the Flap in 1 patient, same debrided and limberg flap done .In all our cases wound healed well in 2 to 3 weeks. Donor site was primarily closed in 10 cases and SSG done in 2 cases for the donor site.

Figure 1: Sacral pressure sore managed by debridement and covered by gluteal myocutaneous Rotation flap cover

Figure 2: Sacral pressure sore with myelomenigocoele managed by debridement and covered by limberg flap and 1 year follow up

Figure 3: Sacral pressure sore managed by debridement and covered by gluteal rotation flap cover

Figure 4: Sacral pressure sore managed by debridement and covered by gluteal rotation flap cover

DISCUSSION

The aim of sacral reconstruction is to give adequate soft tissue cover and maintaining functional recovery with good understanding of anatomy regarding sacral region and availability of pedicled flaps. Provide durable coverage of sacral defects.

Pressure sores are wound that forms as direct result of pressure over bony prominence. 75% of these ulcers results from injury to pelvic girdle and cervical spine resulting in paraplegia leadingontopressure sores over

1) Ischium 2) greater trochanter 3) Sacrum.

Tissue Ischemia results when external pressure exceeds capillary bed pressure, which ranges from 12 to 32 mmHg.

Apart from Ischemia,other factors that prevents wound healing includes

1) Poor nutrition 2) Edema 3) Infection 4) Faecal and urinary soiling and 5) Shearing forces**.**

Main risk factor for sacral pressure sore is lying supine and faecal incontinence. Sacral Pressure ulcer classified according to
Grade I: Skin intact and erythema for more than 1 hr
Grade II: Blister/Break in dermis/ infection
Grade III: Subcutaneous tissue destruction into muscle.
Grade IV: Involvement of bone/ Joint with infection**.**

Braden risk assessment scale can be utilised to assess Patient risk of developing pressure ulcer.This scale assesses
1) Levels of sensory perception
2) Mobility
3) Activity
4) Moisture/Nutrition/Friction.

All categories are rated on scale 1 to 4 except friction criteria, closer to score of 23 lower risk of developing sacral pressure sore.

Adults with less than score of 18 have higher risk of pressure ulcer. Norten scale also available for assessment.

Surgical techniques for reconstruction of sacral pressure sore are
1. Local Fasciocutaneous flaps
a) Limberg Flap
b) Gluteal Rotation skin Flaps
c) Gluteal Maximus muscle and
d) musculocutaneous flap.
e) Sliding Gluteal maximus flap
f) Thorolumbar sacral flap
g) Transverse Lumbarsacral back flap

Even in the era of muscle and musculocutaneous flap, reconstruction with Limberg flap is ideal because of its versatility and simplicity of surgical reconstructions and continues to be best choice for sacral pressure sore.

There are 4 basic principles in reconstruction of Pressure sore
1) Excision of pressure sore (Pseudotumour excision) with devitalised tissue infection.
2) Ostectomy of Sacral bone(offending pressure point)
3) Muscle flap transfer (Restoration of contour and obliteration of dead spaces)
4) Replacement with like tissue (local flap cover).
5) Limberg Flap: Arterial supply of limberg flap derived from subdermalplexes. The random pattern flap permits flap layout in any design.

Advantages of early surgery in wound closure is
1) Reducing septicaemia and spread of infection.
2) Improve in quality of life
3) Facilitating rehabilitation.
4) Eliminating the contributing factors

Multidisciplinary approach to management of sacral Ulcer:
1) Optimizing Nutrition.
2) Improving general health
3) Control of Infection
4) Eliminating the sources of external pressure.

Initial Surgical Management of sacral pressure sore involves:
1) Debridement
a) Mechanical
b) Biological using Maggot therapy
c) Enzymatic therapy
d) Surgery
2) Wide excision of the ulcer (Tangential excision), centripetal /Centrifugal using versajet
3) Reconstruction of the defect performed immediately after debridement or may be delayed until other factors are eliminated.
4) Options low on reconstructive ladder such as SSG/Primary closure is less appropriate for closing the wound.
5) Primary closure should be avoided because high rate of recurrence and closure to bony prominence.

Common flap options for reconstruction of sacral pressure sore are
1) Fasciocutaneous Flap
2) Musculocutaneous Flap
3) Random skin Flap
4) Perforator Flaps
5) Free Flaps

Gluteus maximus muscle is used as Musculocutaneous Flap/Rotation Flap/advancement Flap and Muscle split Flap.
Other Distant Flaps used for reconstruction includes:
1) Thorocolumbar Flap
2) Posterior thigh Flap
3) Extended Tensor fascia Lata flap

Fasciocutaneous Flap
1) Superiorgluteal perforator flap
2) Inferior Gluteal perforator Flap.

Perforators are marked preoperatively using doppler. Based on prominent perforator, flap dissected and islanded, flap inset given to the defect.This has the advantage of closing the donor site primarily.

Post operative care management
1) Patient to be nursed in Alpha bed/water bed.
2) Improving the Nutrition
3) Frequent change of posture every 2 hours.
4) Physiotherapy to lower limb and upper limb.
5) Bowel and bladder care.

12 patients had surgery for the pressure sores 10 cases were paraplegia and 2 patients had CVA with sacral pressure sore. The mean follow up period was 6 to 15 months,the size of the flap was variable from 3 x 3 cm in 15 x7 cms most of the flaps healed without any complications.The size of pressure sores ranged from 5x 4 cm to 15x5 cm and size of the bursa typically larger than the skin defect. The diameter of the bursa was estimated using a gauze swab prior to surgery.

In two cases wound dehiscence occurred but completely healed after resuturing and one patient had distal flap necrosis which was further managed using limberg flap

Gluteal rotation Flap cover for the sacral pressure yields a good result without any complication for a mean follow up period of 24 months

Treating pressure ulcers requires careful patient education,

intensive multidisciplinary optimization, and meticulous wound care, and our treatment protocol ensures a shorter surgery time, less bleeding, and low complication

CONCLUSION

On analysing our data on the management of sacral pressure sore, we are of opinion that the extensive sacral pressure sore can be covered with unilateral gluteal rotation flap cover if they are well planned.

All patients with bone involvement was done gluteus maximus musculcutaneous flap and the results were good because musculocutaneous flap improve local circulation and has robust blood supply.

Preparation of patient is must prior to surgery. Bowel preparation should never be neglected.

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