

# Inferior Gluteus Maximus Island Flap for Reconstruction of Ischial Pressure Sores

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## Abstract

Surgical management of ischial pressure sores has always been a challenge due to high recurrence rate. Ischial pressure sores develop due to unrelieved pressure over the Ischium. Inferior gluteus maximus island flap has been used effectively for coverage of ischial pressure sores.

**Objective:** To describe the efficacy of inferior gluteus maximus flap for reconstruction of ischial pressure sores.

**Methods:** A retrospective case series, consisted of sample of 17 cases. The study was conducted in the Department of Plastic and Reconstructive Surgery, Post Graduate Medical Institute, Lahore General Hospital Lahore, over a period of 8 years from March 2008 to March 2016. The case series included 17 patients with grade 3 and grade 4 ischial pressure sores, comprising 12 male and 5 female, with age range of 28 to 64 (mean = 46 years). Follow-up ranged from 1 to 4 years with a mean of 2.5 years. Inferior

gluteus maximus island flap was used for reconstruction of Ischial pressure sores.

**Results:** In thirteen (76%) of the seventeen patients, wound healed uneventfully without any complication. Partial wound dehiscence was observed in 2 patients (12%). Both of these healed with conservative wound management. Recurrence was seen in 2 patients (12%) after 8 months. These two patients underwent *reoperation* and gluteus maximus flap was readvanced that resulted in satisfactory wound coverage.

**Conclusion:** Inferior gluteus maximus island flap can be considered as a reliable option for reconstruction of ischial pressure sores.

**Key words:** Pressure sore, ischial, flap, inferior gluteus maximus.

## Introduction

Pressure sores tend to develop when excessive pressure, shear and friction is applied to soft tissue for an extensive period of time.<sup>1</sup>

Treatment of pressure sores always begin with prevention. Prevention mainly comprises relieving pressure at bony prominences, preventing infection and improving the nutrition of patients. Conservative approach till now remains the first line of management for pressure sores but when pressure sores involve the deep structures like muscle or bone, surgical treatment is indicated.<sup>2</sup>

Among the various surgical techniques which have been described for closure of pressure sores, commonly used are local or regional flaps. These flaps are broadly classified either myocutaneous or fasciocutaneous flaps.<sup>3</sup>

The choice of flap for Ischial pressure sore reconstruction depends on size of ulcer, depth of ulcer and previous surgery scar if present. An ideal flap for

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pressure sore reconstruction should have reliable vascularity, adequate bulk and there should be no associated donor site morbidity.<sup>4</sup>

Ischial pressure sores are commonly seen in paraplegic patients confined to wheel chairs. Ischial area is subjected to continuous pressure and recurrence usually develops at this area due to unrelieved pressure. The surgical treatment of grade 3 or 4 pressure sores mainly comprises excision of ulcer, removal of bursa, ostectomy of prominent bone and coverage with well vascularized flap. Various options for repair of Ischial pressure sores are gluteus maximus myocutaneous flap, Inferior gluteal thigh flap, hamstring muscle flap, tensor fascia lata flap and gracilis flap. Maruyama and Co-workers<sup>5</sup> used gluteus maximus island flap without any recurrence or complications. We describe our experience of using inferior portion of gluteus maximus muscle along with island of overlying skin for coverage of Ischial pressure sores.

## Methods

The study was conducted in the department of plastic and reconstructive surgery, Post graduate Medical Institute, Lahore General Hospital, Lahore over a period of 8 years from March 2008 to March 2016.

Seventeen patients with Ischial pressure sores underwent reconstruction using Inferior gluteus maximus Island flap. All patients were assessed for surgical treatment preoperatively and clinical assessment made for any comorbid condition.

Of the seventeen patients, gender, grade and size of ulcer were recorded. All patients underwent full clinical examination and were evaluated for base line investigations like hemoglobin, serum albumin level, serum urea and electrolytes. Wound culture was done in all patients. Six patients (35%) were transfused blood for correction of anemia. Operative procedure was performed under general anesthesia in prone position.

Debridement of ulcer was done in all patients.

Methylene blue was used for delineation of bursa for its complete removal. Removal of prominent Ischial bone was done after removal of bursa. Marking of the large skin island was done with methylene blue. Skin Island was centered over the gluteal crease between the Ischial tuberosity and greater trochanter laterally.

After the skin incision made muscle divided distally few cm beyond the skin Island. Additional muscle mass was used to fill the cavity of the ulcer. Muscle was divided laterally and superiorly to mobilize the Inferior half of gluteus maximus muscle. The vessel on the under surface of muscle was protected while raising the flap. Flap inseting was done and suction drain was placed. Donor site was also closed primarily.

Post operatively patients were put on low residual diet for 2 weeks. Patient were kept in prone or lateral position. Adequate perineal hygiene was maintained. Flap survival and primary healing were defined as a healed wound within one month postoperative time period. Sutures were removed 14 – 18 day postoperatively. The patients were maintained non weight bearing on Ischial area for 5 weeks by using air flotation beds and frequent change of position. The patients were followed up initially monthly for 3 months, every 3 months for a year then six monthly.

## Results

Seventeen patients (Male = 12, Female = 5) of ischial pressure sores were managed with inferior gluteus maximus island flap. The age range was 28 to 64 years (mean 46 years). Size of ulcer ranged from 3 x 5 cm to 8 x 10 cm. Fourteen patients (82%) were paraplegic and 3 patients (18%) were ambulatory. 10 patients (59%) had grade 3 pressure sore and 7 patients (41%) had grade 4 pressure sore. The most common etiology for prolonged immobilization was road side accident seen in 12 patients (71%). In five patients (29%) prolonged medical illness was the cause of bed rest. Post operation stay in hospital ranged from 18 to 32 days (mean 25 days).

**Table 1:** Postoperative complications and their management.

| Complication     | No of cases | Percentage | Management                    |
|------------------|-------------|------------|-------------------------------|
| Haematoma        | 1           | 6          | Percutaneous Drainage         |
| Wound Dehiscence | 2           | 12         | Conservative Wound Management |
| Seroma           | 2           | 12         | Aspiration                    |
| Recurrence       | 2           | 12         | Re-operated                   |

The mean follow-up period was 2 years. Post-operative local complications and management of these complications are presented in table 1. Two (12%) patients were lost to follow up after six months.

Immediate complications of partial wound dehiscence occurred in 2 patients (12%). Conservative wound management dressing and good nursing care successfully managed these two patients.

Two patients (12%) showed recurrence. Recurrence was primarily due to poor nursing care. Both of these cases were re-operated. In both patients inferior gluteus maximus flap was readvanced with the same technique and wound healing was satisfactory.



**Fig. 1C:** Removal of Vac Dressing.



**Fig 1A:** Grade 4 Ischial ulcer in a 40 year old male.



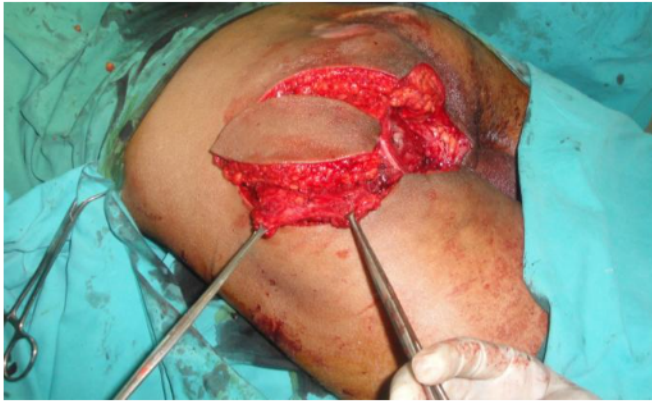
**Fig. 1D:** Excision of Bursae and Ostectomy.



**Fig. 1B:** Vacuum Dressing after Debridement.



**Fig. 1E:** Marking of Inferior Gluteus Maximus Island Flap.



**Fig. 1F:** *Flap Elevation.*



**Fig. 1G:** *Flap Insetting.*



**Fig. 1H:** *4 Years Postoperative.*

In only two patients (12%) postoperative hematoma was encountered. Drainage of hematoma was followed by uneventful recovery.

## Discussion

Pressure sores are seen in patients who have been hospitalized for long time or immobilized due to paraplegia or neurological disease. Failure of conservative management leads to progression of ulcer into a stage that requires surgical management. Ideal flap for ischial pressure sores should have a large skin island, well vascularized with adequate bulk and it should spare future reconstructive options of adjacent local flaps.

The use of muscle flaps for pressure ulcer was first described by Convey and Griffen.<sup>6</sup> In 1976 Ger<sup>7</sup> used muscle as musculocutaneous flap for various pressure sore. This study was mainly focused on ischial pressure sores. Inferior Gluteus maximus flap was also described by Mathes and Nahai<sup>8</sup> in 1979. Mathes in his series described the main advantages of inferior gluteus maximus as skin island musculocutaneous flap. Gluteus maximus muscle flap raised with skin island has advantage of lower donor site morbidity. This flap is confined to pelvic area and preserves the options for future reconstruction if required. In 1986 Stevenson<sup>9</sup> modified this flap by making it a true island flap and tunneling it under the bridge of normal skin for coverage of Ischial pressure sores. Ahmad Zadeh et al<sup>10</sup> in 2007 described the anatomical details with special emphasis on musculocutaneous perforators in the inferior gluteal area. Reis<sup>11</sup> later in his study described lesser recurrence with gluteus maximus flap as compared with fasciocutaneous flaps. Recurrence in our study is 12% compared with 11% recurrence rate described by Rajacic et al and 23% by Kim et al.<sup>12,13</sup> The similar study was done by Koshima et al<sup>14</sup> regarding the importance of musculocutaneous perforators in the gluteal area. The main advantage of gluteus maximum island flap is that it not only preserves the blood supply of inferior gluteal thigh flap and other future flap like biceps and hamstrings flaps but also provides adequate bulk that obliterates the dead space. Large Island of skin can be raised with gluteus maximus island flap.<sup>15</sup> Donor site can be closed primarily even after taking a larger skin island. In all our patients we were successful in preserving the blood supply of gluteal thigh flap for future reconstruction. The gluteus maximus island flap can be used again as it can be re-advanced in case of recurrence. In our case series we were able to manage the recurrence in 2 (12%) of our patients by mobilizing the previous flap. In the previous larger case series of Rajacic and Kims, cases of ischial pressure sore with recurrence were also man-

aged by using the previous flap. Early partial wound dehiscence was seen in 2 patients (12%) which was managed conservatively.

Faster<sup>16</sup> in 1997 did a comparative study of different flaps for reconstruction of ischial pressure sores. Among the various different flaps performed, success rate by inferior gluteus maximus flap was 94% and inferior gluteal thigh flap was 93%. Success rate was described in terms of wound healing and complete recovery. In our case series we were able to manage 88% of patients successfully.

Proper flap selection significantly improves success rate for ischial pressure sores reconstruction on long-term bases.<sup>17</sup> Maximum size of skin Island in our study is 8 x 10 which is comparable to the studies done by Mathes and Stevenson.

Harvesting the gluteus maximus island flap provide an advantage that the flap and defect area move together as a single unit and subjected to less tension and shearing forces by movement. Recurrence rate in our study is 12% and it is comparable with previous case series of ischial pressure sores.

Ease in elevation of flap, adequate bulk and preservation of vascularity of adjacent flaps make it a reliable choice for reconstruction of ischial pressure sores.

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