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EVALUATION OF CLINICAL PROFILE AND SURGICAL MANAGEMENT OUTCOMES OF POST TRAUMATIC PRESSURE ULCERS LOCATED AT VARIOUS ANATOMICAL SITES IN PARAPLEGICS PATIENTS ADMITTED TO A TERTIARY CARE HOSPITAL.

Plastic Surgery

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ABSTRACT

Background: Pressure ulcers are a chronic, debilitating complication primarily affecting immobilized patients, especially those with paraplegia. These lesions commonly occur over bony prominences such as the sacrum, trochanter, and ischium, and their management often necessitates surgical reconstruction in advanced stages. **Objective:** This study evaluates the clinical profile and surgical outcomes of pressure ulcers located at various anatomical sites among paraplegic patients admitted to a tertiary care hospital, aiming to identify optimal reconstructive techniques and minimize postoperative complications. **Methods:** A prospective observational study was conducted on 64 patients with Stage III and IV pressure ulcers. Clinical data including age, sex, ulcer size, location, staging, nutritional status, hemoglobin levels, and presence of infection were recorded. Surgical procedures performed included fasciocutaneous, musculocutaneous, and perforator-based flaps. Postoperative outcomes, including complications, recurrence rates, and flap survival, were analyzed. **Results:** The sacral (48.4%) and trochanteric (42.2%) regions were the most commonly affected sites. Most patients were male (70.3%) and aged 15–45 years. Low serum albumin (<3 g/dL) and anemia (<10 g/dL) were observed in 56.2% and 60.9% of patients, respectively, with albumin levels showing a significant association with postoperative infections ($p = 0.012$). Fasciocutaneous rotational flaps for sacral ulcers demonstrated the lowest complication and recurrence rates (16.7%) compared to gluteus maximus flaps. Trochanteric ulcers were effectively managed using tensor fascia lata (TFL) V-Y advancement flaps, while ischial ulcers showed favourable outcomes with posterior thigh flaps. **Conclusion:** Surgical reconstruction, particularly using Fasciocutaneous and TFL V-Y advancement flaps, provides favourable outcomes for advanced pressure ulcers. Preoperative optimization of nutritional and haematological status, along with flap selection based on ulcer characteristics and anatomical location, is essential to minimize complications and recurrence. A multidisciplinary approach significantly enhances recovery and rehabilitation.

KEYWORDS

Pressure ulcers, paraplegia, Fasciocutaneous flap, tensor fascia lata, surgical reconstruction, flap complications, ulcer recurrence

INTRODUCTION

Pressure ulcers, also historically termed as decubitus ulcers or bedsores, represent one of the oldest recognized medical conditions. Evidence of such lesions has been documented in ancient Egyptian mummies, and references to similar afflictions are found in Biblical texts involving figures such as Lazarus, Job, and Isaiah—highlighting their antiquity.

The term "decubitus" originates from the Latin word decumbere, meaning "to lie down." However, the terminology "pressure sore" is now preferred, as it better captures the etiopathogenesis involving sustained pressure over bony prominences commonly the sacrum, trochanter, ischium, heels, and occiput—rather than implying a solely supine origin. These lesions pose a significant burden across all levels of healthcare due to their chronicity, impact on quality of life, and resource-intensive management.

Clinically, pressure sores result from localized ischemia triggered by prolonged external pressure exceeding capillary closing pressure (~33 mmHg). This ischemia, especially in neurologically impaired or immobilized patients, initiates tissue necrosis. Additional contributing factors include shear, friction, malnutrition, incontinence, and systemic illnesses.

As per the National Pressure Ulcer Advisory Panel (NPUAP) and the European Pressure Ulcer Advisory Panel (EPUAP), pressure ulcers are defined as "localized injury to the skin and/or underlying tissue usually over a bony prominence, resulting from sustained pressure, or pressure in combination with shear and/or friction."

Reported prevalence of pressure ulcers varies globally, ranging from 0.4% to 38% among inpatients, and from 3.5% to 69% in institutional settings. In the Indian context, Chauhan et al. reported a prevalence of 4.94% among hospitalized patients, with the sacrum and heel being the most commonly affected sites. Grade III ulcers were noted as the most prevalent category.

The development of pressure sores involves both extrinsic and intrinsic factors, with unrelieved pressure being the principal causative agent. Pressure intensities between 60 and 580 mmHg applied over 1 to 6 hours can lead to ischemic injury. In supine patients, the sacrum, heels, and occiput endure the highest pressure; in sitting patients, the ischial tuberosities are particularly vulnerable.

Management of pressure sores spans conservative approaches for early-stage ulcers (Stages I and II) and surgical reconstruction for advanced lesions (Stages III and IV). Debridement remains the cornerstone of surgical management, followed by various flap reconstruction techniques—including musculocutaneous, Fasciocutaneous, perforator-based, and free flaps.

Despite advancements in prevention and wound care, pressure ulcers continue to pose a formidable challenge. Approximately 1,700 to 2,000 new cases are reported monthly despite existing preventive programs.

This study aims to evaluate surgical outcomes based on anatomical site and clinical profile to determine optimal reconstructive strategies and reduce perioperative complication.

Aim

To evaluate the clinical presentation and surgical management outcomes of pressure sores located at various anatomical sites in patients admitted to a tertiary care hospital.

Objectives:

1. To analyze the clinical profile of patients with pressure ulcers based on age, sex, ulcer size, staging (NPUAP classification), presence of muscle spasticity, mobility status, and systemic comorbidities.
2. To compare the efficacy and complication profiles of different surgical techniques used in reconstructing pressure sores at various anatomical locations.
3. To assess perioperative and postoperative complications in relation to flap type and ulcer severity.

Historical Background :
Pressure ulcers have been documented for millennia, including in Egyptian mummies dating back over 5,000 years. Ancient medical systems, such as Egyptian and Persian medicine, used topical agents like honey, mouldy bread, and animal products for ulcer healing. In the Renaissance, Ambroise Paré emphasized the importance of nutrition, pain control, and wound debridement—principles still relevant today [1].

Terminology and Definitions The term "decubitus ulcer" originates from Latin "decumbere" (to lie down), but is now largely replaced by "pressure ulcer" to encompass a broader range of causes. As defined by the NPUAP and EPUAP, a pressure ulcer is "a localized injury to the skin and/or underlying tissue, usually over a bony prominence, due to pressure, or pressure combined with shear and/or friction" [5].

Epidemiology Pressure ulcers represent a significant burden in both acute and long-term care. Global prevalence ranges from 3.5% to 69% [4]. In Indian hospitals, Chauhan et al. reported a 4.94% prevalence among inpatients [3]. Incidence increases with immobilization, advanced age, and spinal cord injuries, with up to 85% of spinal cord injury patients developing ulcers [6].

Etiopathogenesis and Pathophysiology Ulceration results from unrelieved pressure exceeding capillary closing pressure (~33 mmHg), leading to tissue ischemia and necrosis. Muscle tissue is particularly susceptible. High pressure for short durations causes more damage than low pressure over extended periods. Additional risk factors include poor nutrition, incontinence, neurological impairment, and systemic illness [7].

Staging [colour plate 1]
Stage I: Non-blanchable erythema of intact skin
Stage II: Partial thickness loss of dermis
Stage III: Full thickness tissue loss; subcutaneous fat may be visible
Stage IV: Full thickness tissue loss with exposed bone, tendon, or muscle

Management Overview Stage I and II ulcers are often managed conservatively through pressure relief, wound care, and nutritional optimization. Surgical intervention is typically required for Stage III and IV ulcers, with flap reconstruction being the mainstay [2]. Options include musculocutaneous flaps, Fascio cutaneous flaps, perforator-based flaps, and occasionally free flaps**.[colour plates 2 – 6]**

Reconstructive Options in Literature Gluteus maximus, tensor fascia lata (TFL), and anterolateral thigh (ALT) flaps are among the commonly used flaps. Recent studies highlight the utility of perforator-based flaps such as the superior gluteal artery perforator (SGAP) flap in preserving muscle integrity[8]. Multidisciplinary care and individualized flap planning based on ulcer site and patient condition are essential for optimal outcomes.

RESULTS :
The present study was conducted in the department of Plastic Surgery, a tertiary health care hospital. A total of 64 patients with pressure sore reporting to the casualty of Plastic surgery, OPD and referral cases from orthopedic, neurology, neurosurgery and spinal departments who fulfilled the inclusion criteria were included in the study. The most prevalent region of pressure sores were sacral (48.4%) and trochanteric (42.2%) [**figure 1**]. The majority of the study population was in the age group 15-45 years and 70.3% patients were male. The 15-45 year age group and males showed dominance in all the anatomical sites [**figure 2].** Fifty percent of pressure sores were medium in size and 35.9% had grade score of 4. Both the size and grade of pressure sore was observed to be highest in trochanteric site (44.4% & 63.0%, respectively) followed by sacral site (38.7% & 51.6%, respectively) **[figure 3&4, & table 1**].

Hypoalbuminemia (<3 gm%) and anaemia (Hb <10 gm%) were present in 56.2% and 60.9% of patients, respectively. Pre operative low haemoglobin (<10 gram %), low albumin (<3 gram) and infection were observed in sacral (83.9 %), trochanteric (77.8 %) and ischial site (33%) **[figure 5, table 2].).Patients with albumin level less than 3 gm% showed significant association with post-operative infection (p=0.012) [table 3].** Patients with **low haemoglobin** [<10 gram%], pre-operative infection, **different sites of** pressure sore showed **no significant** association with peri, post-operative **complications and recurrence rate** (p= 0.463), (p= 0.185**] [Table 4**].) In this study, patients with large size and grade 4 sore showed s**ignificantly** higher **intraoperative time and higher intraoperative bleeding** (p<0.0001).The patients with large size and grade 4 sore **showed significant association with higher percentage of post-operative haemorrhage (62.5% & 51.5%,** respectively; p<0.0001) in study population. In present study , **recurrence rate of large size-pressure sores with grade 4 at all anatomical show significant association with presence of post operative infection(25% & 60.6%, respectively; p<0.05)**[table **[table 5]. For grade 3 and 4 sacral ulcers , Fasciocutaneous rotational flap** resulted in fewer complications : haemorrhage (16.7%), necrosis of flap (8.3%), minor dehiscence (8.3%) and recurrence rate (16.7%) compared to gluteus maximums rotational flap which showed haemorrhage (80%), minor dehiscence in 60%, necrosis of flap 20% and recurrence 20% [**figure 6&7, table 6]**.T**rochanteric ulcers,** particularly medium and large size with grade 3 and 4 were most effectively managed by **TFL V -Y advancement flap** with low intraoperative and postoperative complications with 14.3 % recurrence rate [**figure 8&9, table 7]**. Grade 3, ischial ulcer in small size managed with border - border suturing, yielding lesser operative time and hemorrhage but with a high incidence of dehiscence. On other side medium size grade 4 ischial ulcer managed with posterior thigh flap with minimal intra and post operative complications **[figure 10, table 8].**

DISCUSSION
this study of 64 patients with pressure ulcers, the sacral region was most commonly involved (48.4%), followed by the trochanteric (42.2%), ischial (4.7%), occipital (3.1%), and calcaneal (1.6%) regions. Most patients were male (70.3%) and aged between 15–45 years. A majority of ulcers were medium-sized and classified as Stage IV.

Paraplegia was the most common underlying condition (87.5%), which aligns with the known correlation between neurological impairment and pressure ulcer development. Our findings are consistent with previous Indian and global literature, confirming the dominance of sacral and trochanteric ulcer sites.

Hypoalbuminemia and anemia were frequently noted and were associated with delayed healing and increased postoperative complications. The significant association between hypoalbuminemia and infection reinforces the importance of nutritional optimization prior to surgery. Infections at ulcer sites also contributed to poor surgical outcomes.

Surgical reconstruction remains the standard for treating advanced pressure ulcers. In our study, fasciocutaneous rotational flaps for Grade III and IV sacral sores demonstrated superior outcomes with fewer complications. These flaps offer a reliable blood supply and lower recurrence compared to gluteus maximus rotational flaps, which had higher complication rates.

Literature supports the effectiveness of axial flaps with defined vascular pedicles, providing versatility and reliability in pressure sore reconstruction. Trochanteric ulcers were best managed using TFL V-Y advancement flaps, consistent with previous reports. This method provided better outcomes and lower complication rates than alternative flaps.

Smaller and less complex ulcers were amenable to direct closure or skin grafting, but these techniques were less suitable for deep or infected lesions. Fasciocutaneous and musculocutaneous flaps remain the preferred options for extensive defects, offering durable coverage.

The findings highlight the importance of individualized surgical planning based on ulcer size, anatomical site, and patient condition. A multidisciplinary approach—including plastic surgery, nutrition, and rehabilitation—plays a critical role in optimizing recovery and reducing recurrence.

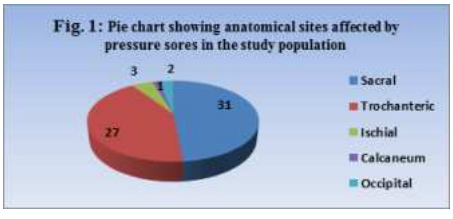
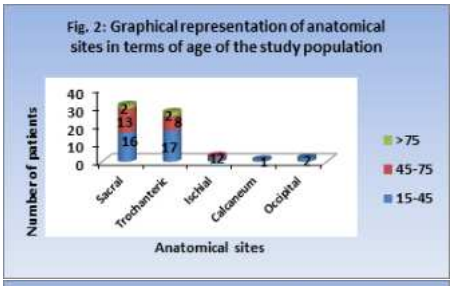
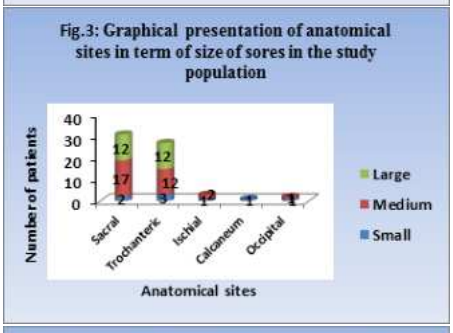


Fig. 1: Pie chart showing anatomical sites affected by pressure sores in the study population





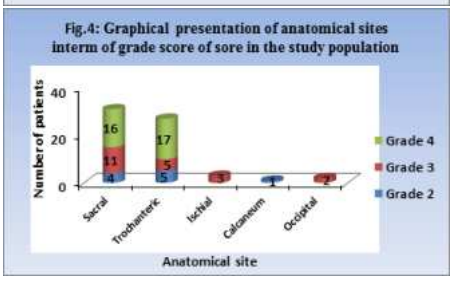


Table 1: Size And Grade Of Sores Present In The Study Population Depending Upon Affected Anatomical Site

	Anatomical sites					Total (n=64)
	Sacral (n=31)	Trochanteric (n=27)	Ischial (n=3)	Calcaneum (n=1)	Occipital (n=2)	
Size						
Small(5cm)	2 (6.5%)	3 (11.1%)	1 (33.3%)	1 (100.0%)	1 (50.0%)	8 (12.5%)
Medium(5-10cm)	17 (54.8%)	12 (44.4%)	2 (66.7%)	0 (0.0%)	1 (50.0%)	32 (50.0%)
Large(>10 cm)	12 (38.7%)	12 (44.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	24 (37.5%)
Grade score of sore						
2	4 (12.9%)	5 (18.5%)	0 (0.0%)	1 (100.0%)	0 (0.0%)	10 (15.6%)
3	11 (35.5%)	5 (18.5%)	3 (100.0%)	0 (0.0%)	2 (100.0%)	21 (32.8%)
4	16 (51.6%)	17 (63.0%)	0 (0.0%)	0 (0.0%)	0(0.0%)	23 (35.9%)

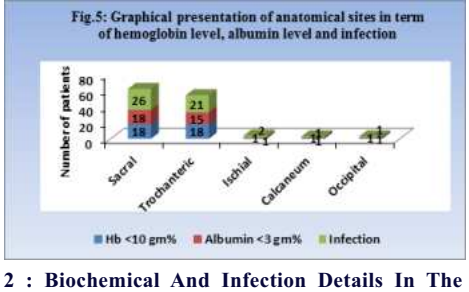


Table 2 : Biochemical And Infection Details In The Study Population Depending Upon Affected Anatomical Site

	Anatomical sites					Total (n=64)
	Sacral (n=31)	Trochanteric (n=27)	Ischial (n=3)	Calcaneum (n=1)	Occipital (n=2)	
Hb<10 gm%						
Yes	18(58.1%)	18(66.7%)	1(33.3%)	1(100.0%)	1(50.0%)	39(60.9%)
No	13(41.9%)	9(33.3%)	2(66.7%)	0 (0.0%)	1(50.0%)	25(39.1%)
Albumin <3 gm%						
Yes	18(58.1%)	15(55.6%)	1(33.3%)	1(100.0%)	1(50.0%)	36(56.2%)
No	13(41.9%)	12(44.4%)	2(66.7%)	0 (0.0%)	1(50.0%)	28 (43.8%)
Infection						
Yes	26(83.9%)	21(77.8%)	2(66.7%)	1(100.0%)	1(50.0%)	51 (79.7%)
No	5(16.1%)	6(22.2%)	1(33.3%)	0(0.0%)	1(50.0%)	13 (20.3%)

Table 3: Peri- And Post-operative Complications In Patients Depending Upon Albumin Level

Peri- and post-complications	Albumin <3 gm%		p- value
	Yes (n=36)	No (n=28)	
Intraop duration (hr)			
<1	4 (11.1%)	6 (21.4%)	0.322
1-2	13 (36.1%)	12 (42.9%)	
>2	19 (52.8%)	10 (35.7%)	
Intraop bleeding (ml)			
<100	16 (44.4%)	17 (60.7%)	0.218
≥100	20 (55.6%)	11 (39.3%)	
Significant Postop hemorrhage	12 (33.3%)	8 (28.6%)	0.788
Postop necrosis present	7 (19.4%)	3 (10.7%)	0.492
Dehiscence			
No	24 (66.7%)	24 (85.7%)	0.156
Minor (≤3 cm)	9 (25.0%)	2 (7.1%)	
Major (>3 cm)	3 (8.3%)	2 (7.1%)	
Postop infection present	22 (61.1%)	8 (28.6%)	0.012*
Recurrence	6 (16.7%)	3 (10.7%)	0.720

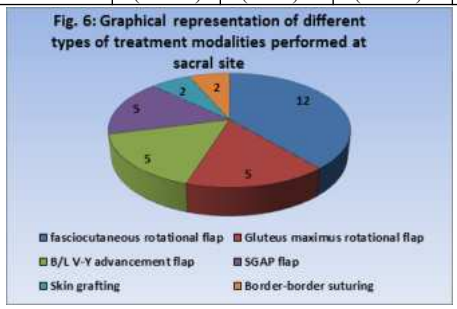
Table 4 : Peri- And Post-operative Complications In Patients Depending Upon Hemoglobin Level

Peri- and post-complications	Hemoglobin <10 gm%		p-value
	Yes (n=39)	No (n=25)	
Intraop duration (hr)			
<1	5 (12.8%)	5 (20.0%)	0.462
1-2	14 (35.9%)	11 (44.0%)	
>2	20 (51.3%)	9 (36.0%)	
Intraop bleeding (ml)			
<100	20 (51.3%)	13 (52.0%)	1.000
≥100	19 (48.7%)	12 (48.0%)	
Significant Postop hemorrhage	11 (28.2%)	9 (36.0%)	0.585
Postop necrosis present	7 (17.9%)	3 (12.0%)	0.728
Dehiscence			
No	27 (69.2%)	21 (84.0%)	0.292
Minor (≤3 cm)	9 (23.1%)	2 (8.0%)	
Major (>3 cm)	3 (7.7%)	2 (8.0%)	
Postop infection present	22 (56.4%)	8 (32.0%)	0.074
Recurrence	7 (17.9%)	2 (8.0%)	0.463

Table 5 : Peri- And Post-operative Complications In Patients Depending Upon Size Of Pressure Sore

Peri- and post-complications	Size of sore			p-value
	Small (n=8)	Medium (n=32)	Large (n=24)	
Intraop duration (hr)				
<1	7 (87.5%)	3 (9.4%)	0 (0.0%)	0.0001*
1-2	1 (12.5%)	17 (53.1%)	7 (29.2%)	
>2	0 (0.0%)	12 (37.5%)	17 (70.8%)	
Intraop bleeding (ml)				
<100	4 (16.7%)	21 (65.6%)	4 (16.7%)	0.0001*
≥100	20 (83.3%)	11 (34.4%)	20 (83.3%)	
Significant Postop hemorrhage	0 (0.0%)	5 (15.6%)	15 (62.5%)	0.0001*

Postop necrosis present	0 (0.0%)	4 (12.5%)	6 (25.0%)	0.190
Dehiscence				
No	6 (75.0%)	27 (84.4%)	15 (62.5%)	0.175
Minor (≤3 cm)	1 (12.5%)	5 (15.6%)	5 (20.8%)	
Major (>3 cm)	1 (12.5%)	0 (0.0%)	4 (16.7%)	
Postop infection present	2 (25.0%)	15 (46.9%)	13 (54.2%)	0.359
Recurrence	2 (25.0%)	1 (3.1%)	6 (25.0%)	0.042*



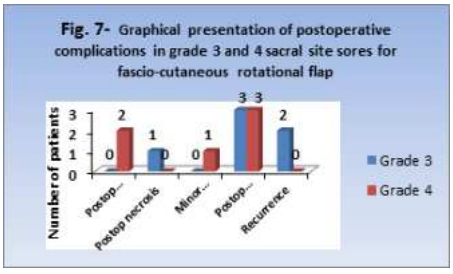
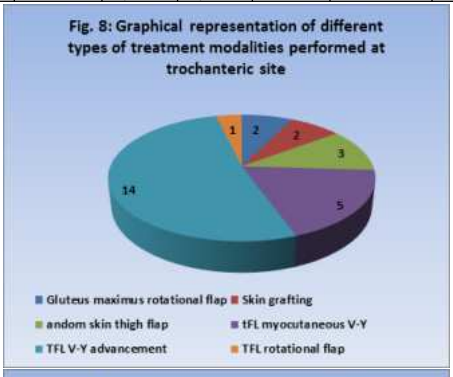


Table 6: Comparison Of Pre-, Peri- And Post- Operative Complications In Study Population With Pressure Sore At Sacral Site Depending On Treatment Modalities

Anatomical site	Treatment					
Sacral (n=31)	**Gluteus Maximus Rotational Flap (n=5)**	**B/L V-Y advance-ment Flap (n=5)**	**SGAP Flap (n=5)**	**Skin grafting (n=2)**	**Border-border suturing (n=2)**	**Fascio-cutaneous rotational flap (n=12)**
Size						
Small	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	2(100.0%)	0(0.0%)
Medium	2(40.0%)	0(0.0%)	5(100.0%)	2(100.0%)	0(0.0%)	8(66.7%)
Large	3(60.0%)	5(100.0%)	0(0.0%)	0(0.0%)	0(0.0%)	4(33.3%)
Grade score of sore						
2	0(0.0%)	0(0.0%)	0(0.0%)	2(100.0%)	2(100.0%)	0(0.0%)
3	0(0.0%)	2(40.0%)	3(60.0%)	0(0.0%)	0(0.0%)	6(50.0%)
4	5(100.0%)	3(60.0%)	2(40.0%)	0(0.0%)	0(0.0%)	6(50.0%)
Hb<10 gm%	4(80.0%)	3(60.0%)	3(60.0%)	1(50.0%)	0(0.0%)	7(58.3%)
Albumin <3 gm%	4(80.0%)	4(80.0%)	3(60.0%)	1(50.0%)	0(0.0%)	6(50.0%)
Infection present	4(80.0%)	4(80.0%)	5(100.0%)	2(100.0%)	2(100.0%)	9(75.0%)
Intraop duration (hr)						
<1	0(0.0%)	0(0.0%)	0(0.0%)	2(100.0%)	2(100.0%)	0(0.0%)
1-2	1(20.0%)	0(0.0%)	3(60.0%)	0(0.0%)	0(0.0%)	11(91.7%)
>2	4(80.0%)	5(100.0%)	2(40.0%)	0(0.0%)	0(0.0%)	1(8.3%)
Intraop bleeding (ml)						
<100	0(0.0%)	0(0.0%)	3(60.0%)	2(100.0%)	2(100.0%)	1(8.3%)
≥100	5(100.0%)	5(100.0%)	2(40.0%)	0(0.0%)	0(0.0%)	11(91.7%)
Significant Postop hemorrhage	4(80.0%)	2(40.0%)	5(100.0%)	0(0.0%)	0(0.0%)	2(16.7%)
Postop necrosis present	1(20.0%)	2(40.0%)	4(80.0%)	0(0.0%)	0(0.0%)	1(8.3%)
Dehiscence						
No	1(20.0%)	3(60.0%)	3(60.0%)	2(100.0%)	2(100.0%)	11(91.7%)
Minor (≤3 cm)	3(60.0%)	2(40.0%)	2(40.0%)	0(0.0%)	0(0.0%)	1(8.3%)
Major (>3 cm)	1(20.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Postop infection present	5(100.0%)	4(80.0%)	3(60.0%)	1(50.0%)	0(0.0%)	6(50.0%)
Recurrence	1(20.0%)	1(20.0%)	5(100.0%)	0(0.0%)	0(0.0%)	2(16.7%)



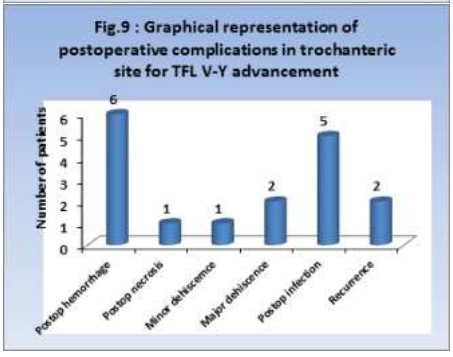


Table 7: Comparison Of Pre, Peri And Post- Operative Complications In Study Population With Pressure Sore At Trochanteric Site Depending On Treatment Modalities-

Anatomical site	Treatment					
Trochanteric (n=27)	**Gluteus Maximus Rotational Flap (n=2)**	**Skin grafting (n=2)**	**Random skin thigh flap (n=3)**	**TFLmyo-cutaneous V-Y (n=5)**	**TFL V-Y advance-ment (n=14)**	**TFL rotational flap (n=1)**
Size						
Small	0(0.0%)	2(100.0%)	1(33.3%)	0(0.0%)	0(0.0%)	0(0.0%)
Medium	1(50.0%)	0(0.0%)	2(66.7%)	1(20.0%)	7(50.0%)	1(100.0%)
Large	1(50.0%)	0(0.0%)	0(0.0%)	4(80.0%)	7(50.0%)	0(0.0%)
Grade score of sore						
2	0(0.0%)	2(100.0%)	3(100.0%)	5(100.0%)	0(0.0%)	0(0.0%)
3	2(100.0%)	0(0.0%)	0(0.0%)	0(0.0%)	3(21.4%)	0(0.0%)
4	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	11(78.6%)	1(100.0%)
Hb<10 gm%	2(100.0%)	2(100.0%)	1(33.3%)	4(80.0%)	8(57.1%)	1(100.0%)
Albumin <3 gm%	1(50.0%)	1(50.0%)	1(33.3%)	3(60.0%)	8(57.1%)	1(100.0%)
Preoperative infection	2(100.0%)	1(50.0%)	2(66.7%)	3(60.0%)	12(85.7%)	1(100.0%)
Intraop duration (hr)						
<1	0(0.0%)	2(100.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
1-2	1(50.0%)	0(0.0%)	1(33.3%)	0(0.0%)	7(50.0%)	0(0.0%)
>2	1(50.0%)	0(0.0%)	2(66.7%)	5(100.0%)	7(50.0%)	1(100.0%)
Intraop bleeding (ml)						

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<100 ≥100	1(50.0%) 1(50.0%)	2(100.0%) 0(0.0%)	3(100.0%) 0(0.0%)	0(0.0%) 5(100.0%)	3(21.4%) 11(78.6%)	0(0.0%) 1(100.0%)
Significant Post op hemorrhage	1(50.0%)	0(0.0%)	0(0.0%)	5(100.0%)	6(42.8%)	0(0.0%)
Post op necrosis present	1(50.0%)	0(0.0%)	0(0.0%)	0(0.0%)	1(7.1%)	0(0.0%)
Dehiscence						
No Minor (≤3 cm) Major (>3 cm)	1(50.0%) 0(0.0%) 1(50.0%)	2(100.0%) 0(0.0%) 0(0.0%)	3(100.0%) 0(0.0%) 0(0.0%)	4(80.0%) 1(20.0%) 0(0.0%)	11(78.6%) 1(7.1%) 2(14.3%)	1(100.0%) 0(0.0%) 0(0.0%)
Post op infection present	1(50.0%)	0(0.0%)	0(0.0%)	2(40.0%)	5(35.7%)	1(100.0%)
Recurrence	1(50.0%)	1(33.3%)	0(0.0%)	0(0.0%)	2(14.3%)	0(0.0%)

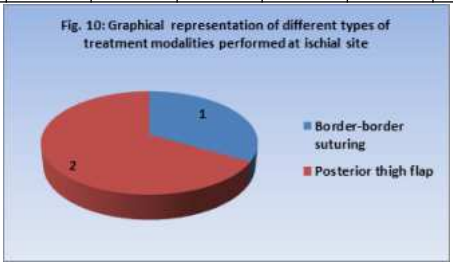
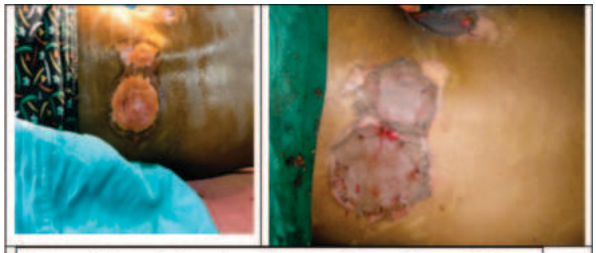
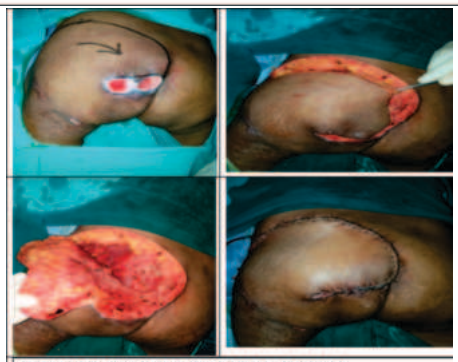


Table 8: Comparison Of Pre-, Peri- And Post- Operative Complications In Study Population With Pressure Sore At Ischial Site Depending On Treatment Modalities

Anatomical site	**Treatment**	
Ischial (n=3)	**Border-border suturing (n=1)**	**Posterior Thigh Flap (n=2)**
Size		
Small Medium	1 (100.0%) 0 (0.0%)	0 (0.0%) 2 (100.0%)
Grade score 3 of sore	1 (100.0%)	2 (100.0%)
Hb<10 gm%	0 (0.0%)	1 (50.0%)
Albumin <3 gm%	0 (0.0%)	1 (50.0%)
Infection present	0 (0.0%)	2 (100.0%)
Intraop duration (hr)		
<1 1-2	1 (100.0%) 0 (0.0%)	0 (0.0%) 2 (100.0%)
Intraop bleeding <100 ml	1 (100.0%)	2 (100.0%)
Significant Postop hemorrhage	0 (0.0%)	0 (0.0%)
Postop necrosis present	0 (0.0%)	0 (0.0%)
Dehiscence		
No Major (>3 cm)	0 (0.0%) 1 (100.0%)	2 (100.0%) 0 (0.0%)
Postop infection present	1 (100.0%)	0 (0.0%)
Recurrence	0 (0.0%)	0 (0.0%)


Colour Plate 1 showing stages of pressure sores (NPUAP Classification)


Colour Plate 2 showing skin grafting of Sacral Ulcer


Colour Plate 3 showing rotational flap for Sacral Ulcer


Colour Plate 4 showing TFL VY advancement flap for Trochanteric Ulcer


Colour Plate 5 showing minor dehiscence of border-border sutured Ischial Ulcer


Colour Plate 6 showing skin rotational flap for Ischial Ulcer

CONCLUSIONS

Pressure ulcers remain a substantial burden, particularly among immobilized and neurologically compromised individuals. Their management requires a multifaceted approach, including prevention, optimization of comorbid conditions and individualized surgical

reconstruction. Fasciocutaneous and musculocutaneous flaps offer durable coverage, with flap selection guided by ulcer characteristics and anatomical site. Our study reinforces the value of a tailored, multidisciplinary protocol in minimizing complications and promoting early rehabilitation.

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