

## Modalities of Surgical Management of Pressure Sores in Sohag University Hospital: A Review of 42 Cases

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### ABSTRACT

**Background:** Pressure sores are localized injury to the skin and/or the underlying tissue usually over bony prominences. Pressure sores affect significantly the patients' life especially those with limited mobility, 70% of sores occur in persons older than 65 years. There is an inverse relationship exists between the amount of pressure and the length of time required to cause ulceration. Pressure sores usually occur due to combination of extrinsic and intrinsic factors. Surgical management include debridement and reconstruction by local or distant flap, the most commonly used are rotational, rhombic, V-Y advancement and tensor fascia lata flaps. Rarely skin graft is the adequate treatment.

**Patients and Methods:** This is a prospective study included 42 patients of different age and sex, having 57 pressure ulcers of variable etiology and severity. All patients were evaluated and managed in the Plastic Surgery Department at Sohag University Hospital.

**Results:** Rotational flap was the most common type of surgical procedures followed by V-Y advancement flap then tensor fascia lata and rhombic flap. In most cases, the results were accepted.

**Conclusion:** A person that is bedridden or cannot move, or who has diabetes, vascular disease (circulation problems), incontinence, or mental disabilities, should be frequently checked for pressure ulcers. Surgical treatment is the main treatment for pressure sores especially for 3<sup>rd</sup> and 4<sup>th</sup> degrees. Rotational flap is the most common flap used in the surgical. However protection is much better and cheaper than treatment.

**Key Words:** Pressure ulcers – Paraplegia – Surgical treatment – Rotational flap – Post-operative case.

### INTRODUCTION

Pressure ulcers occur mainly in parts of the body that are under high pressure from body weight on bony prominences [1]. Pressure compresses the capillaries, reducing blood flow thus leading to tissue ischemia, capillary thrombosis and occlusion of the lymphatic vessels. Increased capillary permeability means that fluid can escape into the extravascular space, causing interstitial edema and eventually cell and tissue death leading to ischemia

and tissue necrosis [2]. Pain, longer hospital stays, scarring, increased morbidity and increased medical costs all these play great role in psychological state of the patient [3]. The incidence of PUs formation is about 9% of all hospitalized patients mostly in association with other medical problems, including cardiovascular disease (41%), acute neurologic disease (27%), and orthopedic injury (15%) [4]. Pressure ulcers are usually caused by combination of extrinsic factors such as pressure, shear, and friction and intrinsic factors such as age, malnourishment, and consciousness level that influence a person's tissue tolerance [5]. It has been shown that the pressure in the capillary bed in healthy medical student volunteers ranges between 12 and 32 mmHg. This information becomes clinically relevant when interface pressures between the skin and the standard National Health Service contract mattress have been reported as between 70 and 100 mmHg over the main bony prominences and the interface pressure between the skin and a commercially available pressure reducing replacement mattress has been shown to be between 30 and 40 mmHg when measured on an "average" individual lying in the supine position [6].

Because pressure ulcers remain a major health problem; identification of patients at risk for pressure ulcer development is very important as the continuous clinical review and assessment of the patient's pressure ulcer risk, with the goal of conducting preventive measures that meet the particular risk factor [7]. Pressure ulcers, also called decubitus ulcers, bedsores, or pressure sores. Pressure ulcers affect significantly on patients' life specially whom with limited mobility. The frequent checking of patients vulnerable to develop pressure ulcer is a major part of the management protocol; protection is much better and cheaper than treatment. Protective measure can be done to help preventing bed

sores; a person that is bedridden or cannot move due to paralysis, or who has diabetes, vascular diseases (circulation problems), incontinence, or mental disabilities, should be frequently checked for pressure ulcers. Special attention should be paid to the areas over a bony prominence where pressure ulcers mainly form [8].

#### *Aim of the work:*

The aim of this work is to study the different modalities used for surgical reconstruction of pressure sores in Sohag University Hospital.

### PATIENTS AND METHODS

This is a prospective study included 42 patients with 57 pressure sores who were presented to the outpatient clinic of Plastic Surgery Department at Sohag University Hospital in the period from March 2014 to December 2015. Inclusion criteria were any ages, good general condition, co-operative patient, fit for surgery and exclusion criteria were: Patients refused of surgical interference, patients who were unfit for surgery and uncooperative patients.

*The initial assessment included:* Age, sex of the patient, special habits (smoking-alcohol), relation of onset to trauma, relation of onset to constitutional manifestation (as fever), possible etiology, discharge or not, diabetes and hypertension. Back finding as: Spina bifida, kyphoscoliosis, hair tuft and scars for previous trauma or operations. Lower limb examination was done to detect muscle wasting, atrophic changes, heel ulcers.

Assessment of ulcer site, size, shape, surroundings, discharge, floor, grade, edge and number of ulcers, relation to underlying muscles and bones and detect level of sensation is important to evaluate the patient.

### RESULTS

This study included 42 patients (32 males and 10 females) with different types of bed sores (ischial, trochanteric and sacral) and different degrees of severity (3<sup>rd</sup> and 4<sup>th</sup> degree). The mean age was 42 (range from 14 to 75 years). The patients had 57 bed sores, most frequent operation was done to reconstruct the ulcer was rotational flap in 32 bed sores: 14 sacral, 12 ischial and 6 trochanteric (Figs. 3,4). Other techniques used were V-Y flap in 6 cases, tensor fascia lata in 4 cases (Fig. 7) and rhombic flap in 3 cases. Primary closure was done in 9 cases and S.T.G in 3 cases.

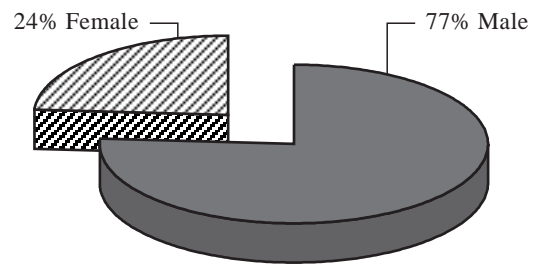


Fig. (1): Sex distribution.

The etiology of bed sore were road traffic accident in 17 patients (40%) that lead to bed sores due to paraplegia in 10 cases and other 7 cases developed bed sores due to long hospital stay, cerebrovascular strokes in 15 patients (35%) which lead to bed sores due to hemiplegia resulting and falling from height in 10 patients (24%) that lead to bed sores due to paraplegia Fig. (2).

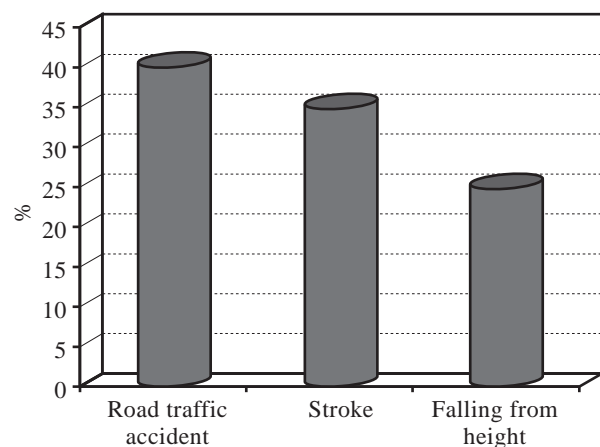


Fig. (2): Etiology of bed sores.

*The sites of bed sores were:* 25 sacral, 21 ischial and 11 trochanteric.

Patients who had more than one bed sore were 10 patients 7 of them had 2 bed sores, one of them had 3 bed sores and 2 of them had 4 bed sores (Table 1).

Table (1): Different types of bed sores with different surgical techniques.

	Sacral	Ischial	Trochanteric
Rotational flap	14	12	6
V-Y flap	4	2	—
Tensor fascia lata flap	—	—	4
Rhombic flap	3	—	—
S.T.G	3	—	—
Primary closure	1	7	1



Fig. (3): Bilateral ischial bed sores reconstructed by rotational flap.

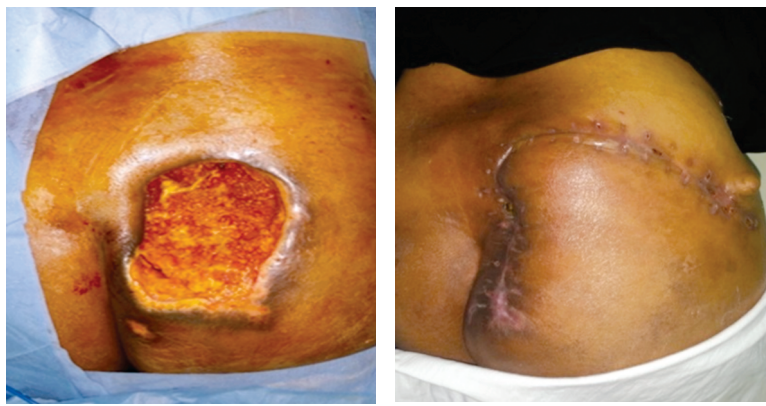


Fig. (4): Right ischial bed sore reconstructed by rotational flap.



Fig. (5): Sacral bed sore reconstructed by O-Z flap.



Fig. (6): Sacral bed sore reconstructed by bilateral V-Y flap.





Fig. (7): LT trochanteric bed sore reconstructed by tensor fascia lata.

In majority of cases healing was accepted except in 8 patients had wound complications: 6 of them was flap dehiscence and two was partial loss of split thickness graft within two weeks of the operation because of infections in 4 cases, post-operative hypo-protenemia in 2 cases and hematoma in 2 cases. However the overall clinical outcome was accepted in 49 cases of 57 bed sores.

## DISCUSSION

Documented wound care goes back 4,000 years. Pressure sores have been found in Egyptian mummies and wound craft has progressed from potions, salves, and ointments to modern science-based dressing technology and advanced surgical techniques [9].

Increasing age has been found to be significantly associated with pressure ulcer development although 70% of ulcers occur in persons older than 65 years but also younger patients with neurologic impairment or severe illness are also susceptible with rates range from 4.7 to 32.1 percent in hospital settings [9], and from 8.5 to 22 percent in nursing homes [10].

The risk of pressure ulcer development is compounded when the patient is older and has concurrent illnesses that impair mobility or activity. Standard mattresses are filled with springs and low-density foam. Pressure Reduction Support Surfaces (PRSS) are filled with alternative materials such as gel, fiber, and air. Several clinical guidelines recommend that all people at risk for pressure ulcers should use pressure reduction support surfaces. However, the evidence to support the effectiveness of PRSS is limited [11]. The long-term exposure to many other risk factors among elder persons may also account for the increased probability of developing pressure ulcers. Skin moisture from incontinence can be a risk factor for pressure ulcer development. The etiology of the incontinence should be identified and eliminated if possible [12].

Pressure ulcers are absolutely preventable with care, compassion, and dedication towards the care of patients. It's essential to take care of the extrinsic and intrinsic factors. The overall long term success is obviously influenced by many other nonsurgical factors such as physiotherapy, nutritional support, pressure dispersion methods, and patient support mechanisms both at home and in hospital [13].

Surgical management of pressure sore is probably the best option for management of advanced pressure sores in resource constrained environment. While conservative management of advanced pressure sore has been shown to be effective with the use of modern wound dressing materials such as VAC dressings, these materials are way beyond the reach of many patients in such environment. Most dressings employed are usually the traditional dressing materials which in many instances would result in prolonged hospital stays with long durations before the wounds heal [14].

The sacral pressure sores of our study were the most frequent type that operated and it were about 40% of all types and that it was shown in many series that sacral bed sores was the commonest pressure sore and the majority were closed with either the rotational fasciocutaneous or V-Y flap [15]. Our study showed that the best flap for reconstruction of sacral, ischeal or trochanteric bed sores was rotational flap that was used in 32 cases of different types of bed sores (42%) of 57 cases. Good results were obtained in 26 cases, complete dehiscence in 2 cases and partial dehiscence in 4 cases.

Finally a multidisciplinary approach is essential in prevention of pressure ulcers and a large part of the responsibility falls on nurses in this approach. Nursing staff are responsible in the institute they work in for identifying patients at risk for pressure ulcers and carrying out the preventive measures [9].



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