

A clinical study of surgical management of pelvic girdle pressure sores: a three-year experience

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Introduction

It is critical to categorize pressure ulcers at different stages to establish effective treatment plans. Debridement and excision of the underlying bursa and implicated bone tissue, followed by tissue covering, are the basic surgical procedures. This research examines patient characteristics, results, and complications, reporting on our experience treating pressure ulcers.

Methods

All the 25 individuals had a total of 39 pressure ulcers treated. The sacral ulcer was the most common. Three-quarters of the cases were related to pressure ulcer formation in hospitals. Debridement, primary repair, skin grafts, V-Y fasciocutaneous flap, transverse lumbar fasciocutaneous flap, V-Y tensor fascia lata flap, inferior gluteal rotational myocutaneous flap, and V-Y gluteal myocutaneous flap were among the available treatment options.

Results

Complications happened in 19%. Most of the time, pressure ulcers may be prevented with adequate understanding of their etiology and appropriate patient treatment for those who are at risk. Given the frequency of complications, recurrence, and new ulcers, treatment of individuals with pressure ulcers requires multidisciplinary involvement as well as family involvement. For the best prognosis and appropriate closure of the ulcer, complications and risk factors such as poor hygiene, anemia, diabetes, infection, and hypoalbuminemia should be avoided.

Conclusion

In the medical sector as a whole, pressure sores are a prevalent issue. The pelvic girdle pressure points appear to be the focus of most sores. Medical personnel who are in charge of patient monitoring must be knowledgeable about the main risk factors.

Keywords:

pelvic girdle, pressure, sores

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Introduction

The best strategy to treat pressure sores is prevention. Nowadays, a variety of pressure dispersion techniques are used to try to prevent the formation of pressure sores. Therefore, ulcer development must be prevented by taking proactive steps to remove constant pressure, shear, or friction forces [1]. The categorization of pressure ulcers into phases is crucial for the creation of treatment plans [2,3]. The National Pressure Ulcer Advisory Panel's categorization, which outlines four sequential phases of tissue damage, is the most commonly used one. Stage I: skin that is unbroken, yet more than an hour after pressure release, there is hyperemia. Stage II: damage to the dermis, either infected or not. Stage III: damage to the muscles or subcutaneous tissue. Stage IV: bone and/or joint damage, either infected or not. Since 1956, when Conway and Griffith first described ulcer debridement with excision of the underlying bursa and, if necessary, of the affected bone tissue,

followed by tissue covering [4], the basic principles of treating pressure ulcers have not altered. To maintain future treatment possibilities, the flap preparation should not infringe upon neighboring flap locations. Reconstruction can be accomplished by a variety of techniques, such as skin grafts, fasciocutaneous flaps, musculocutaneous flaps, and muscle flaps [5,6]. All are efficient, but they do not stop recurrence. Despite attempts at patient education and prevention, major surgical operations frequently result in the creation of new lesions or the recurrence of ulcers. The recurrence of pressure sores in these individuals is one of the main obstacles. The usage of ripple mattresses and home-based nursing care is recommended to stop recurrence [7]. However, the

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price of ripple mattresses is far higher than what many families can afford in many nations with limited resources. Furthermore, there are no outreach initiatives offering home-based care. Maintaining adequate blood glucose and hypoalbuminemia control together with a healthy dietary state may increase the likelihood of surgical success. Through the analysis of patient clinical data, surgical method employed, complications, and outcomes, this study reports on the experience in pressure ulcer repair [8–10].

Patients and methods

A descriptive, prospective research was carried out on patients who underwent surgery in the Burns and Plastic Surgery Center at the Al-Gumhori Teaching Authority Hospital in Sana'a between June 2016 and July 2019. The following parameters were included in a protocol with patient data: sex, age, the environment in which the pressure ulcer developed, the number and site of the ulcer (sacral, trochanteric, and ischial), prior surgery, the National Pressure Ulcer Advisory Panel's classification with a focus on the size and type of the ulcer, the surgical procedure, and any postoperative complications, success rate and recurrence following surgery for 1 month. Preoperative laboratory testing included bone radiography to assess the underlying bone as well as complete blood count, blood glucose, serum albumin, urea, and electrolytes. Before the procedure, a prophylactic antibiotic was administered. The following variables were taken into account while assessing the risk factors for the formation of pressure ulcers: patient age, spinal cord injury history, fecal or urine incontinence, involvement of family members, personal hygiene, nutritional status, and related medical conditions. The type of defect, the extent of the wounds, any prior operations, and the experience or preference of the operating surgeon all had an impact on the surgical treatment that was carried out. Only the surgical option for established techniques was described for treatment: V-Y fasciocutaneous flap, transverse lumbar fasciocutaneous flap, classic rotational fasciocutaneous flap, inferior gluteal maximus rotational myocutaneous flap, skin graft, tissue debridement, primary closure, and V-Y gluteal maximus myocutaneous flap. Following the delineation of the ulcer cavity for total bursa removal, debridement was carried out. In the majority of cases, suction drains were utilized and were removed only after they ceased to function. Following surgery, the flaps were examined daily for the first postoperative day. After surgery, the third

postoperative day was spent changing dressings. 1 week after surgery, the sutures were taken out. Following their recuperation, the patients were sent home and saw the outpatient department for follow-up care. Following a month, there was a follow-up appointment every 3 months for a year. Ulcers that healed a month following surgery were included in the calculation of the success rate. In order to calculate the recurrence rate, instances where the injury resurfaced more than a month after healing were included. During the postoperative period, the following problems were examined for presence or absence: flap necrosis, partial or complete wound dehiscence, hematoma, and postoperative infection at the surgical site. The patient's family members were trained in basic hygienic tasks including changing the patient's dirty diapers and turning the patient every two hours. A few times, phone conversations between the patient and their family members were used to track the patient's improvement.

Results

All the 25 individuals, with an average age of 41 years and ages ranging from 11 to 80 years, were evaluated: 17 males and 8 women. 39 pressure ulcers were surgically treated in total. The sacral area had the highest prevalence of pressure ulcers, followed by the trochanteric and ischial regions, in that order (Table 1).

The incidence of pressure ulcer formation was 38% in hospitals and 62% in homes, respectively. Based on the National Pressure Sore Advisory Panel's (1989) assessment, 87% of grade III and IV cases and 13% of grade II cases were reported to have occurred (Table 2).

The surgical approach was determined by the patient's overall health, the location of the occurrence, the categorization, and the availability of donor flap area. Debridement of the bursa and granulation tissue was performed concurrently with surgery for every patient whose tissue covering required the use

Table 1 Distribution of ulcers according to the site

Site	Number of cases (%)	Number of ulcers (%)
Sacral	7 (28)	7 (18)
Sacral and trochanteric	6 (24)	12 (30.7)
Sacral, ischial, and trochanteric	4 (16)	12 (30.7)
Trochanteric	5 (20)	5 (13)
Ischial	3 (12)	3 (7.6)
Total	25 (100)	39 (100)

Table 2 Distribution of ulcers according classification by National Pressure Ulcer Advisory Panel's

Grade	Region			%
	Sacral	Trochanteric	Ischial	
IV	8	7	3	46
III	7	5	4	41
II	2	3	–	13
Total	17	15	7	100

Table 3 The distribution of surgical procedures for each region affected by pressure ulcer

Type of procedure	Sacral	Trochanteric	Ischial	%
Primary closure	–	–	1	2.5
Skin graft	2	1	–	7.8
Classic rotational F.C. flaps	8	9	–	43.5
V-Y F.C. flaps	3	–	–	7.8
Inferior gluteal myocutaneous rotational flaps	2	4	4	25.6
V-Y gluteal myocutaneous flaps	2	–	1	7.8
F.C. flaps of F. lata	–	1	1	5
Total	17	15	7	100

of flaps. Patients with grade III and IV ulcers had partial osteotomies to remove necrosis and/or reduce bone prominences. Table 3 shows the distribution of the different surgical techniques for each pressure ulcer-affected location.

Twenty-one patients were bedridden with spinal cord injury (fall down trauma, fire arm bullets, car accident) and 4 bedridden cases without spinal cord injuries (meningitis, pelvic fracture, neck femur fracture). Just two patients were not incontinent, whereas 17 cases had both urine and feces incontinence. 6 cases solely had urine incontinence. In 21 (84%) cases, there

Figure 1



Case (1-A): Sacral pressure sore.

were no complications. Four (16%) patients had complications: 2 cases had partial dehiscence of the

Figure 2



Case (1-B): Transverse Lumbo-sacral fasciocutaneous flap.

Figure 3



Case (2-A): Sacral pressure sore.

Figure 4



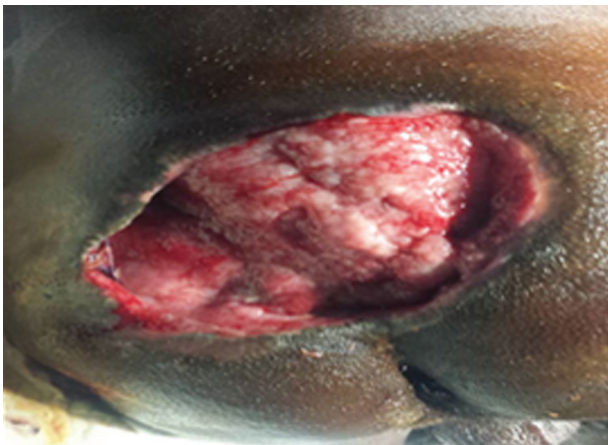
Case (2-B): Bilateral gluteal F.C. flap with transposition of the flaps, one flap to cover the ulcer and the other flap to cover the rest of defect.

incision, 1 case involved infection, and 1 case involved partial necrosis of the flap. the evaluation of each patient's success percentage 1 month following surgery. After an average of 6 months of follow-up, two patients experienced recurrence, one with an ischial ulcer and the other with a sacral ulcer. Two patients were not able to be evaluated after 1 month following surgery due to deaths from other reasons. (Figs 1–7).

Discussion

In environments with limited resources, surgical therapy of pressure sores is likely the best choice for advanced pressure sores [6,11,12]. Although it has been demonstrated that conservative therapy of severe pressure sores may be successful when using contemporary wound dressing materials, such as VAC

Figure 5



Case (3-A): Advanced sacral pressure sore.

Figure 6



Case (3-B): Complete rotation of gluteus maximus flap to cover the defect.

Figure 7



Case (4-A): Advanced sacral pressure sore after debridement.

Figure 8



Case (4-B): Postoperative photography showing gluteal maximus flap in V-Y advanced to cover the defect with complete closure of the flap.

Figure 9



Case (5-A): Sacral ulcer in a 29-years old patient with spinal cord injury from a firearm bullet.

Figure 10



Case (5-B): Bilateral V-Y gluteus maximus flap was advanced and sutured to cover the defect.

Figure 11



Case (5-C): Complete healing with good viability and durability of the flaps.

dressings, many patients in our setting cannot afford these dressings. The majority of bandages used are often made of conventional materials, which frequently leads to extended hospital stays [13–15]. The sacral region exhibited the highest incidence of pressure ulcers in bedridden patients, likely due to the prolonged periods of supine position. This was particularly true for paraplegic cases, elderly patients with debilitated chronic diseases, and those with fractures of the neck or pelvis. Patients who use wheelchairs are more likely to develop ischial pressure ulcers (decubitus posture). Although most ulcers have been found to occur at the pelvic girdle pressure points in several studies, the distribution of

Figure 12



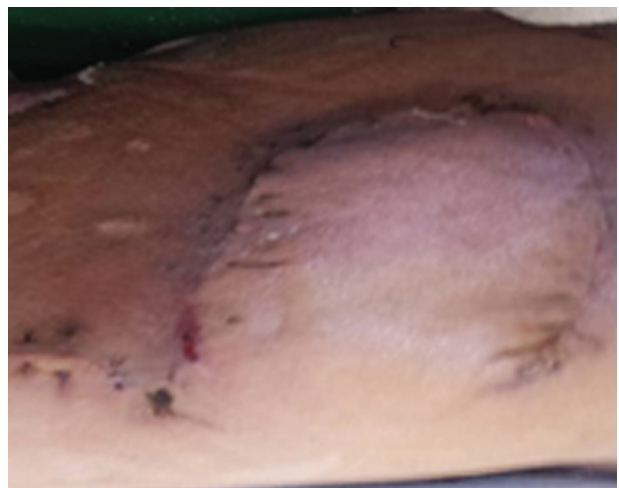
Case (6-A): Left trochanteric ulcer.

Figure 13



Case (6-B): Covered by flap of fascia Lata associated with random flap.

Figure 14



Case (6-C): 1 month later showing complete healing.

ulcers among these locations varies. A common muscle or musculocutaneous flap was the gluteus maximus flap [16,17]. The suture line may be placed distant from the

pressure zone and the contralateral side can be reached thanks to the flap's ease of mobilization. Gluteus maximus musculocutaneous flaps in a V-Y configuration can be used bilaterally if the pressure ulcer is particularly large [18–20]. Sacral and trochanteric ulcers are also commonly treated with traditional fasciocutaneous flaps [21,22]. The extent of spinal cord damage, the location of the ulcer, the history of prior operations and ulcers, the prognosis, daily routines, nutritional condition, and other related medical issues all have a role in the reconstructive method selection [23,24]. It is possible that coming into contact with urine and excrement close to the surgery site contributed to the postoperative difficulties, including infection and wound dehiscence. The remarkable success rate in this research can be attributed to improved preoperative planning, surgical technique, patient education, and

Figure 15



Case (7-A): Right trochanteric ulcer.

Figure 16



Case (7-B): A V-Y gluteus maximus flap was used to cover the defect.

Figure 17



Case (8-A): Left trochanteric ulcer after debridement.

Figure 18



Case (8-B) tensor fascia lata flap was mobilized to cover the defect.

Figure 19



Case (9-A): Right ischial pressure sore.

compliance, as well as involvement from hospital personnel and family members [25,26]. Various writers have given varying success rates. Numerous additional surgical elements, including physical therapy, dietary assistance, pressure dispersion techniques, and patient care systems both at home and in the hospital, clearly have an impact on the overall long-term success rate. Most of our patients are unable to purchase ripple mattresses [9,27]. Regretfully, our facility does not provide any community outreach program for patients suffering from pressure sores.

Conclusion

Even in nations with limited resources, surgical therapy of pressure sores would produce outstanding surgical results. Good surgical technique combined with

Figure 20



Case (9-B): Inferior gluteus maximus rotational flap was used to cover the defect.

Figure 21



Case (10-A): Right ischial pressure sore.

Figure 22



Case (10-B): Inferior gluteus maximus rotational flap was used to cover the defect.

Figure 23



Case (11-A): Left trochanteric ulcer.

Figure 24



Case (11-B): tensor fascia lata flap was mobilized to cover the ulcer defect with partial coverage of donor site with STSG: Split Thickness Skin Graft.

Figure 25



Case (12-A): Left ischial pressure sore.

Figure 26



Case (12-B) Inferior gluteus maximus rotational flap was used to cover the defect.

prudent preoperative care will guarantee successful surgery. When patients who are at risk are properly managed and their pathophysiology is understood, pressure ulcers can be prevented in the majority of cases. Given the frequency of complications and recurrences, patient engagement, family involvement, and/or professional involvement is critical to the successful management of pressure sore patients. For a better prognosis and appropriate pressure ulcer healing, risk factors for complications such as poor hygiene, infection, anemia, and hypoalbuminemia should be avoided (Figs. 8–26).

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Conflicts of interest

There are no conflicts of interest.

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