Original Article

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MANAGEMENT OF PRESSURE SORES AT COMBINED MILITARY HOSPITAL RAWALPINDI

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ABSTRACT

Objective: To present the results of surgical management for pressure sores in patients with paraplegia.

Study Design: Descriptive Study.

Place and Duration of Study: Department of Plastic Surgery, Combined Military Hospital Rawalpindi, between Jan 2009 and Apr 2011

Patients and Methods: Patients who reported at our unit for their non healing grade III and IV pressure ulcers due to paraplegia during the study duration were included in the study. All patients were assessed for duration of illness and evaluated for generalized nutritional and neurological status. The pressure ulcers and surrounding skin and subcutaneous tissue were examined in detail for planning of the flap coverage. In most of the patients musculocutaneous flaps were done.

Results: Sixty six flaps were done on 60 patients. Fifty six patients were paraplegic due to spinal cord injury, 2 patients had pressure sore post cardiac surgery, 1 patient had GB syndrome and 1 patient had stroke. Among spinal cord injury patients 52 were earthquake victims 2 had firearm injury and 2 had road traffic accident. For 32 ischial pressure sores 28 V-Y hamstring musculocutaneous flaps and 4 gluteal thigh flaps were done. For 26 sacral pressure sores 14 gluteus maximus musculocutaneous rotational flaps, 05 gluteus maximus musculocutaneous V-Y advancement flaps and 07 gluteal fasciocutaneous rotational flaps were done. For 08 trochanteric pressure sores 08 tensor fascia lata musculocutaneous flaps were done. Minor complications in 18% of the flaps were seen. No recurrence was seen.

Conclusion: Once pressure sores develop timely intervention and an appropriate flap with good post operative care yield satisfactory results

Keywords: Musculocutanoeus flaps, Paraplegia, Pressure sore.

INTRODUCTION

Large natural calamities alter the lives of individuals and nations forever. Neglected patients who develop complications haunt us as reminders of human failings and poor infrastructure long after the disaster is over. This is what we at Combined Military Hospital Rawalpindi are experiencing as the effects of the massive earthquake (7.6 moment magnitude scale epicentre 19 Km northeast of Muzaffarabad) which struck area on 8th October 2005 resulting in 73, 338 deaths and 128, 304 injured patients including spinal injuries[1]. Among them many patients were having spinal cord injuries at the level of T12 to L4 (T12-L1 commonest), who were paraplegic and bedridden[2]. In our department we managed a few of such patients who had spinal cord injury in earthquake and developed pressure sores. Pressure sores are soft-tissue injuries resulting from unrelieved pressure over a bony prominence. Pressure sores are an ancient medical problem as is evident from autopsies on Egyptian mummies. It has affected humans for ages, and addressing the overall management of pressure ulcers is now an important healthcare issue. With increase in mean age and elderly population, increase in high speed accidents and sports related injuries, number of patients with pressure sore has increased. Pressure ulcer prolongs the stay of patients in hospital thus increasing the cost of treatment[3].

Despite current interest and advances in medicine, nursing care, self-care education and surgery, pressure ulcers remain a major cause of morbidity and mortality. This is particularly true for persons with impaired sensations,

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prolonged immobility and advanced age. Areas of body commonly affected are sacrum, greater trochanter, scalp, shoulders, calves, and heels in lying down, and ischium in wheelchair bound patients. Sub-optimal surgical management, persisting aggravating and causative factors, poor infection control and lack of social support are the factors for these chronic wounds[4].

Several theories exist on the aetiology of pressure sores, mostly based on ischemia and hypoxia resulting in decreased oxygen delivery to the tissues. In 1879, Charcot suggested that injury to CNS trophic centres decreases tissue tolerance to local pressure and leads to skin necrosis. However, Brown Sequard demonstrated that pressure ulcers can heal equally well in paralyzed and non-paralyzed animals. Furthermore, studies have demonstrated the pathologic changes caused by pressure to be more severe in muscle than in skin and subcutaneous layers[5].

PATIENTS AND METHODS

A descriptive study was conducted on all patients, who reported at our unit for their non healing pressure sores of grade III and IV due to paraplegia between Jan 2009 and Apr 2011. All patients were assessed and documented on a proforma for the age, sex, duration of illness, generalized nutritional and neurological status. The pressure ulcers were examined in detail for site, size number and stage. Surrounding skin and sub-cutaneous tissue were also inspected for possible flap for coverage.

We performed 6 types of flaps for pressure sore coverage. For sacral pressure sores, we performed gluteus maximus myocutaneous flaps as rotation flaps, V-Y advancement flaps and gluteal faciocutaneous flaps. For ischial pressure sores we performed V-Y hamstring flaps and gluteal thigh flaps. For trochanteric pressure sores TFL flaps were done. Before surgery all patients were investigated for anaesthesia fitness, pus swab for bacterial culture sensitivity was obtained, x-ray and bone scan were done to look for osteomyelitis. All patients were explained about the procedure and its complications. They were also explained about the importance of the conservative management for pressure sores and physiotherapy for the joints of the limbs so that they remain supple, which would continue post operatively. In most of the patients musculocutaneous flaps were done as muscles were not functioning because of paraplegia.

Intra-operatively bursae were marked with methylene blue soaked gauze and whole of the bursae were excised along with underlying bony prominence (osteomyelitis) and then defects were covered with flaps.

Post operatively the complications were recorded and documented on a proforma. Preoperative, intra operative and postoperative photographs were obtained in all patients. Data was analysed using SPSS version 15. Descriptive statistics were used to describe the data.

RESULTS

From Jan 2009 to April 2011 sixt patients with grade III and IV pressure sores, 11 (18.3%) patients with grade III pressure sores and 49 (81.6%) patients with grade IV pressure sores were seen.

Sixty six flaps were done on 60 patients. Among them 38 were female and 22 were males. The mean age was 27.13 (SD±10.03) years. Etiology of the pressure sores is shown in table 1.

Most commonly done flap was V-Y hamstring musculocutaneous flap for ischial pressure sores. Other flaps done for ischial, sacral and trochanteric sores are shown in table 2.

All flaps healed well and showed no major complications. Minor complications in 18% of the flaps were seen. Two flaps had partial necrosis (3%), which required another flap, three flaps had suture line dehiscence (4.5%), which healed by secondary intention. Three patients had minor infection (4.5%) and four patients had seroma (6%) formation, which was aspirated.

Postoperatively all patients were given appropriate antibiotics for 3 to 5 days, all patients were discharged on 3rd to 7th day except for the 2 who required 2nd flap for the same pressure sore.

Drains were removed on the 5th to 10th day. All patients were advised the 2 hourly change

of posture and avoidance of soakage with urine or faeces. Three patients were lost to follow up. In rest of the patients, longest follow up was for 23 months and shortest follow up was for 2 months. There was no recurrence. All patients were alive and doing well until their last follow up.

DISCUSSION

The outcome of pressure sore management depends upon the underlying pathology leading to paraplegia, age, nutritional status, general nursing care and motivation of the patient. Factors such as poor nutrition, incontinence with persistent soilage and moisture, dementia, paralysis, friction, and skin shearing make healing less likely in pressure sores. The best treatment option is prevention which includes frequent change of posture, care of skin, use of air mattress[6], and improved nutrition[7]. Dinsdale demonstrated the ability to counteract the deleterious effects of pressure by

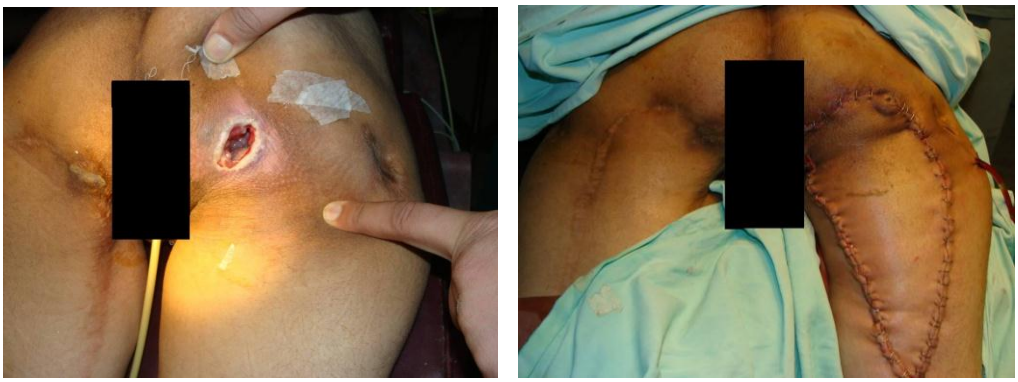

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Fig. 1: V-Y Hamstring musculocutaneous flap.

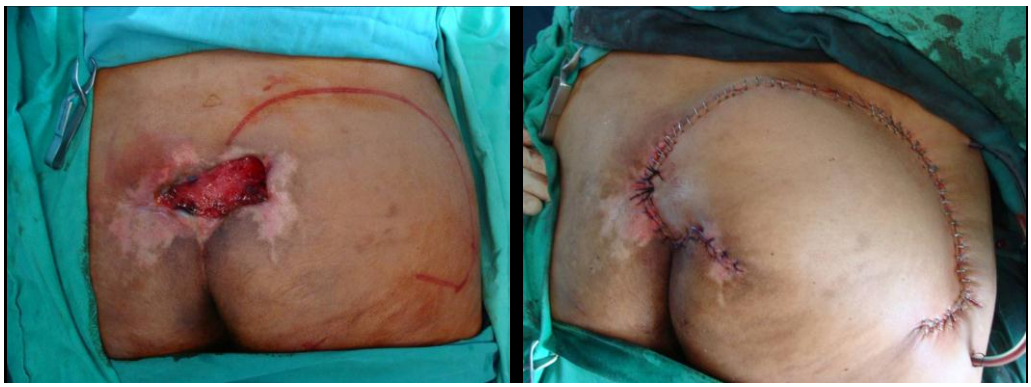

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Fig. 2: Gluteus maximus rotation flap.

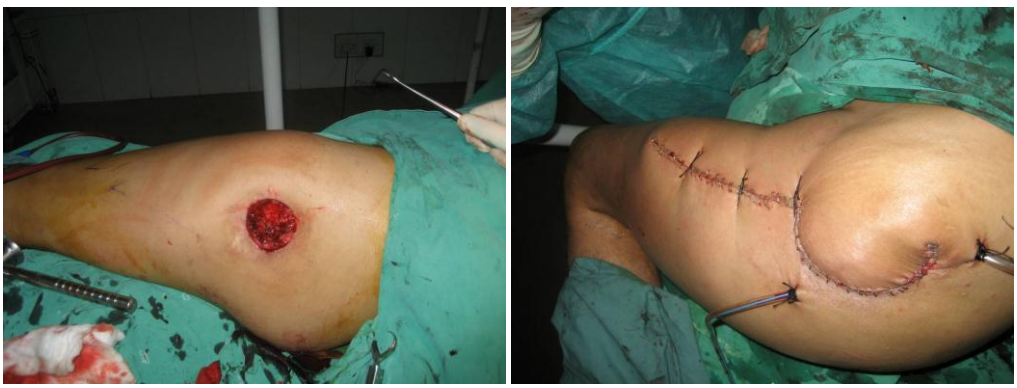

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Fig.3: TFL flap.

Table-1: Etiology of pressure sore (n-60)

Etiology		Number of cases
Trauma (spinal cord injury)	Earthquake victum	52 (86.7%)
	Firearm injury	02 (3.3%)
	RTA	02 (3.3%)
Non – traumatic	Post cardiac surgery	02 (3.3%)
	GB Syndrome	01 (1.7%)
	CVA	01 (1.7%)

Table-2: Site of pressure sore and flap coverage (n=66)

Site of pressure sore	No.	Procedure	No.
Ischial	32 (48.5%)	V-Y Hamstring musculocutaneous flap	28
		Gluteal thigh flap	04
Sacral	26 (39.4%)	Gluteus maximus rotation flap	14
		Gulteus maximus V-Y advancement flap	05
		Fasciocutaeous flap	07
Trochanteric	08 (12.1%)	TFL flap	08

relieving it for only 5 minutes every 2 hours. In our study most of the patients were paraplegic due to spinal cord injury in the 2005 earthquake. They were predominantly young, educated and had no other co morbidity. They understood and followed the instructions for prevention of the pressure sore before and after the surgery.

The most widely accepted pressure sore staging system divides pressure sores into four groups: grade I with persistent erythema, grade II with dermal injury, grade III with subcutaneous injury, and grade IV with involvement of skin, fat and muscle[8]. In 1938, Davis was the first to suggest replacing the unstable scar of a healed pressure sore with a flap of tissue. In 1947, Kostrubala and Greeley recommended excising the bony prominence and adding padding for the exposed bone with local fascia or muscle-fascia flaps.

Most of the patients require conservative management only which includes, two hourly change of posture, cleansing of the whole body, dressing of the affected area and avoidance of contamination by the urine or faecal matter[9]. The choice between conservative management and surgery for pressure sores depend on thorough evaluation of ulcer as well as mental and physical status[10] Pressure sores also occur with a higher frequency in young patients who are neurologically impaired[11].

At our unit we have done 66 flaps on 60 patients. Our results have been comparable with other centres of the world. The complication rate in our study was 18%. Seroma formation was the most common complication (6%) followed by infection (4.5%), wound dehiscence (4.5%) and partial necrosis (3%) of the flap. In a series of 280 patients in 17 years Foster et al had a complication rate of 28%[12]. Disa et al showed a complication rate of 36%[13]. Similarly Schryvers et al showed a complication rate of 42%[14].

The selection of the patients, complete excision of the bursa along with infected bone and selection of the appropriate flap for reconstruction of the defect is very important for good results[14]. We performed six types of flaps, four musculocutenous and two fasciocutaneous flaps. Most commonly performed flap was V-Y hamstring flap (42%) followed by gluteus maximus flap (28.5%), TFL flap (12%), gluteal fasciocutaneous flap (10.5%) and gluteal thigh flap (6%).

The hamstring flap was described by Baker in 1978, while V-Y hamstring flap was described by Hurteau in 1981 (Fig 1). We chose this flap because of its excellent vascularity, good muscle bulk and large skin paddle (15/40 cm). In our study we have seen 100% survival of the flaps as is also described by Hurteau. Gluteus maximus myocutaneous flap was the

second most commonly performed flaps in our study, this was described by Minami in 1977. We did 14 rotational flaps (Fig 2) and 5 V-Y advancement flap. Two rotational flaps had partial necrosis that required another flap and 03 flaps had suture line dehiscence which healed by secondary intention. Gluteus maximus flap is a type III flap with excellent vascularity. Its muscle bulk makes it a better choice for filling of the larger defects[15]. TFL flap was described by Nahai in 1978. We performed 08 TFL flap for trochanteric sores (Fig.3), it is type I flap, has good vascularity and we did not see any complication in these flaps. Fasciocutaneous flaps of the gluteal region are random pattern flaps and have reliable vascularity, we performed this flap when bulk was not required. Gluteal thigh flap was described by Hurwitz in 1981. The flap is based on the branch of the inferior gluteal artery that runs along the posterior cutaneous nerve of the thigh.

In our study we operated on 52 earthquake victims and all of them were admitted at NIHC and AFIRM for more than 2 years and our intervention helped them to be discharged from these hospitals and return to home to stay with the family. All of them including the family members were well educated about the care of paraplegic patients so that they could prevent recurrence and new pressure sore formation.

Four patients were paraplegic due to road traffic accidents and firearm injury. Four patients had pressure sores without any injury as 2 patients had pressure sore after the cardiac surgery, 1 patient had pressure sore as he was on prolonged ventilation due to GB syndrome and 1 patient had pressure sore due to stroke. Out of 60 patients 57 patients (63 flaps) had follow up at our department and we did not see any recurrence in a mean follow up period of 11 months.

CONCLUSION

Timely surgical intervention should be done for early and effective recovery. The reconstructive procedures if chosen carefully and done meticulously are very effective for rehabilitation of the paraplegic patients.

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