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Role of Application of SWCR Guidelines in Management of Right Trochanter Pressure Injury

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Abstract

A pressure injury refers to the localized death of tissue resulting from sustained pressure on the skin and underlying tissues. This damage is often compounded by shear forces or direct trauma to the skin. While terms like "decubitus ulcer," "bedsore," and "pressure sore" are commonly used interchangeably, they fail to capture the complexity of the condition as accurately as the term "pressure injury" does. The term "decubitus" originates from Latin, meaning "to lie down" or "recline," reflecting the propensity for these ulcers to develop over bony prominences when a person is in a lying position, such as the sacrum, trochanter, heel, and occiput. The term "pressure ulcer" more aptly describes these wounds, emphasizing the significant role of pressure as a contributing factor to their formation. This case report seeks to evaluate the effectiveness of implementing the Society for Wound Care and Research (SWCR) guidelines in managing pressure injuries. By following these guidelines, healthcare professionals can better address the multifaceted nature of pressure injuries, taking into account factors such as the severity of the wound, tissue blood supply, and individual patient characteristics. The adoption of SWCR guidelines provides a comprehensive approach to assessing, treating, and preventing pressure injuries, with the potential to enhance patient outcomes and alleviate the burden of this debilitating condition.

Keywords: Society for Wound Care and Research (SWCR) guidelines, pressure injuries, wound, management, ulcer

INTRODUCTION

A pressure injury is localized tissue necrosis following pressure injury to the skin and/or underlying tissue for prolonged period. The process of ulceration is aggravated by simultaneous shear or direct injury to skin continuity. The terms "decubitus ulcer," "bedsore," and "pressure sore" are often used interchangeably, but they do not describe the condition as accurately as pressure injury. The word "decubitus" – derived from the Latin "decumbo" or "decumbere", meaning "to lie down" or "recline" – as the ulcer occurs commonly over areas of bony prominences in recumbent position, for example, the sacrum, trochanter, heel, and occiput. The term "pressure ulcer" describes these ulcers better with pressure as an important etiologic factor.

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The precise determinations of incidence and prevalence of this preventable disease is important, but difficult as this varies according to healthcare settings, patient population and nature of primary disease/condition. However, literature reveals incidence in acute care setting 0.4% to 38%, in long-term care (LTC) setting 2.2% to 23.9%, and in home care setting 0% to 17% [1]. In acute care setup, the pressure injury prevalence in pediatric population

has been reported to be 1.4% and the prevalence of hospital-acquired pressure injury (HAPI) is 1.1% [2].

The site of pressure injury depends upon posture. Common sites of pressure ulcer in supine position are occiput, scapula, olecranon, sacrum, and heel; in lateral position are ear, acromion process, greater trochanter, lateral condyle of femur, and lateral malleolus; in prone position are zygoma, acromion process, female breasts, pubis, patella, metatarsal over distal foot dorsum, and toes; in sitting position are shoulder blades, lower back, sacrum, ischial tuberosity and heel. Though common sites of pressure ulcer are over bony prominences, occasionally it develops after prolonged pressure over well-padded areas like buttocks and breasts too. Ulcers mainly due to pressure while walking on insensate foot over weight bearing heel and metatarsal heads are commonly known as trophic ulcers.

Normally intra capillary pressure at the arterial end is 30 to 40 mm Hg [3].

Any pressure above this cuts off oxygen and nutrient supply leading to the tissue necrosis and ulceration due to cessation of capillary circulation for prolonged period. Following ischemia of relatively shorter duration, inflammation, vasodilatation, enlarged capillary pore and fluid leak occurs [4], increased stretching of skin (superficial side) as well as pressure on fascial vessels (deeper side) initiating process of sluggish circulation and finally ending to necrosis. Subcutaneous pressure measurement in a traumatic paraplegia case within 12 hours after the appearance of necrosis patch showed increased pressure the area of necrosis and blisters indicating role of subcutaneous compartment syndrome in causation and progression of pressure ulcer in deeper planes producing undermined edges [5]. Jiang et al. [6], in a rat model, have studied the effect of ischemia using 70 mm Hg pressure on skin for 2 hours and ischemia reperfusion (I/R) injury after 4 hours, and have concluded that hypoxic-ischemic tissue injury occurs early following a period of ischemia and that I/R due to oxidative damage may be an important mechanism in pressure ulcer development (Figure 1). Their findings suggest that a minimum of 4 hours pressure relief may be helpful for pressure ulcer prevention.

Excessive pressure (overweight, inadequate padding over bony prominences in malnutrition), ulceration due to shear and friction, skin micro-environment, for example, excessive moisture, altered skin perfusion (smoking, elderly, hypotension, and children) and neurological injury are risk factors which contribute to pressure ulcer development. The Society for Wound Care and Research (SWCR) is a society of unique blend of academic, clinical, research, and social service. It was founded in the year 2006 with an aim to promote practice of better wound care and research, render community health care related to trauma/wound by bringing out publications in the form of journals, newspaper articles, books/handbills, maintain a web site, establish scholarships, foundations and lectureship and to provide grants and other benefactions either in India or elsewhere which are designed to enhance the learning in, and practice of, wound care and research or to contribute to the establishment of the same [7]. The society released its first guideline, "SWCR Guidelines for Wound Management" in 2nd International and 7th National Annual Conference of SWCR (Wound Care Con 2012–2013) held at JIPMER Pondicherry and was published in the *Journal of SWCR* in 2014 [8]. "SWCR Guidelines for Diabetic Foot Ulcer (DFU)" was released in Wound Care Con-2015 in KGMC Lucknow and published in *Journal of SWCR* 2016 issue [9]. In the executive meeting during the 10th National Annual Conference of SWCR (Wound Care Con 2016) at Amritsar, it was decided to prepare "SWCR Guidelines for Pressure Ulcers" and to release during 11th National Annual Conference (Wound Care Con 2017) to be held in New Delhi, India and publish in next issue of *Journal of SWCR* in 2017.

MATERIALS AND METHODS

This study was carried out in the Department of Plastic Surgery in a tertiary care center in south India after getting written informed consent from the patient and approval from the department. The subject is a 60-year-old male, who is a known case of type 2 diabetes mellitus, systemic hypertension, coronary artery disease status post percutaneous coronary intervention (s/p PCI), with anaplastic oligodendroglioma s/p resection and adjuvant chemoradiotherapy, cerebrovascular disease, lupus

nephritis, and Parkinson's disease with grade 4 pressure injury to right trochanteric pressure injury. Treatment included autologous platelet-rich plasma (APRP) (Figure 2), cyclical negative pressure wound therapy (NPWT) (Figure 3), and foam therapy (Figure 4).

RESULTS

SWCR guidelines helped in the effective wound bed preparation of the right trochanteric pressure injury (Figure 5).

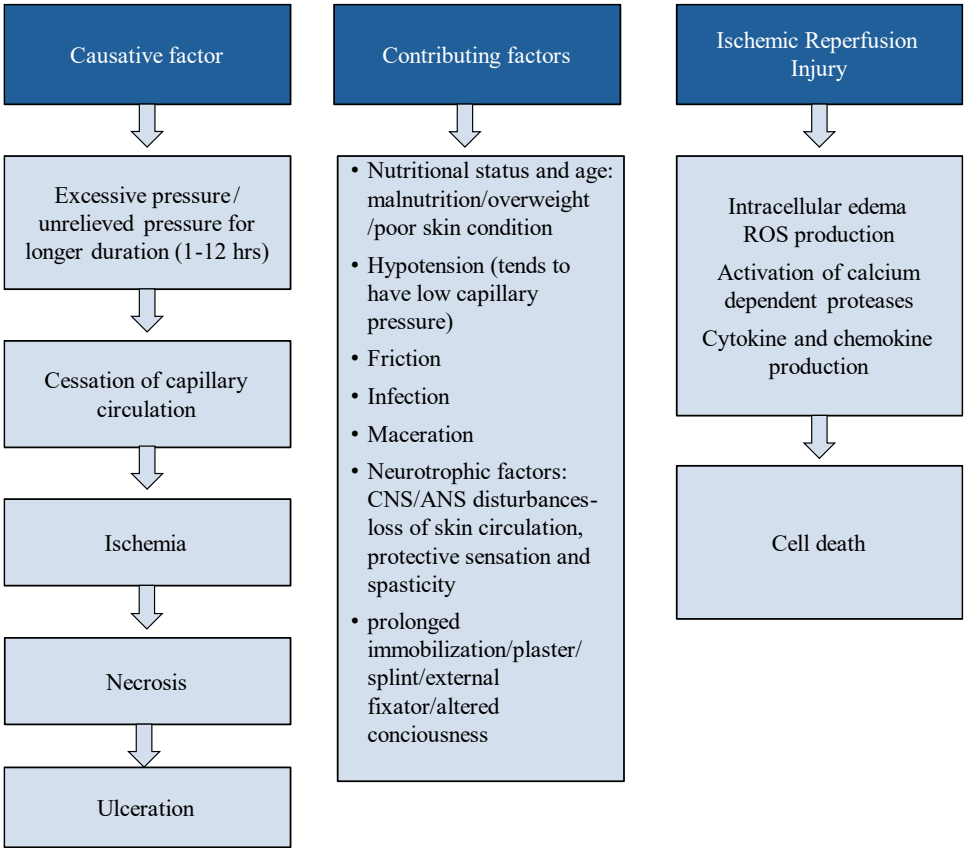

Figure 1. Etiopathology of pressure ulcer.

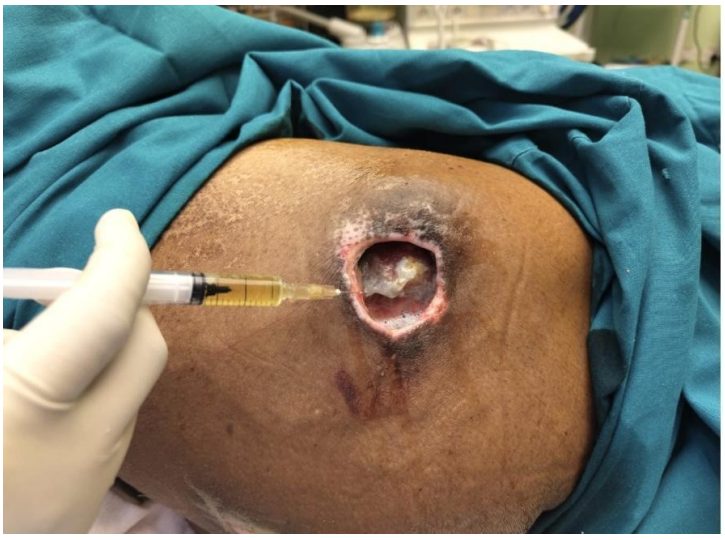

Figure 2. Autologous platelet-rich plasma (APRP) regenerative therapy on pressure injury over right trochanter.

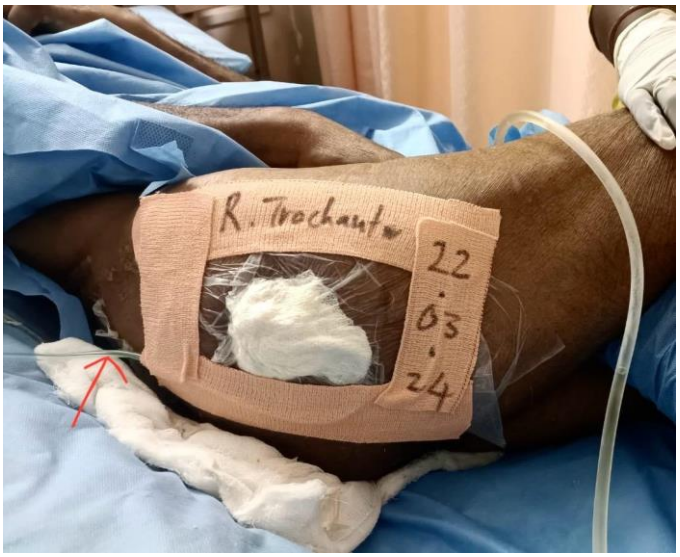

Figure 3. Application of cRONPWT cyclical regulated oxygen negative pressure wound therapyon pressure injury over right trochanter.

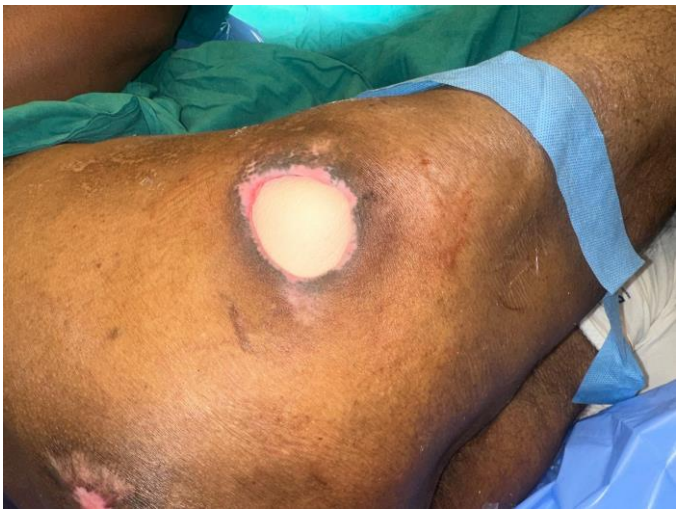

Figure 4. Application of five-layer foam.

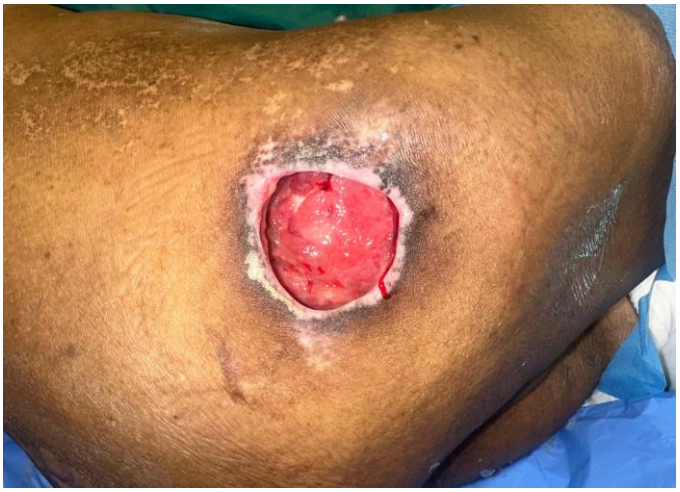

Figure 5. Pressure injury showing improvement after management as per the Society for Wound Care and Research (SWCR) guidelines.

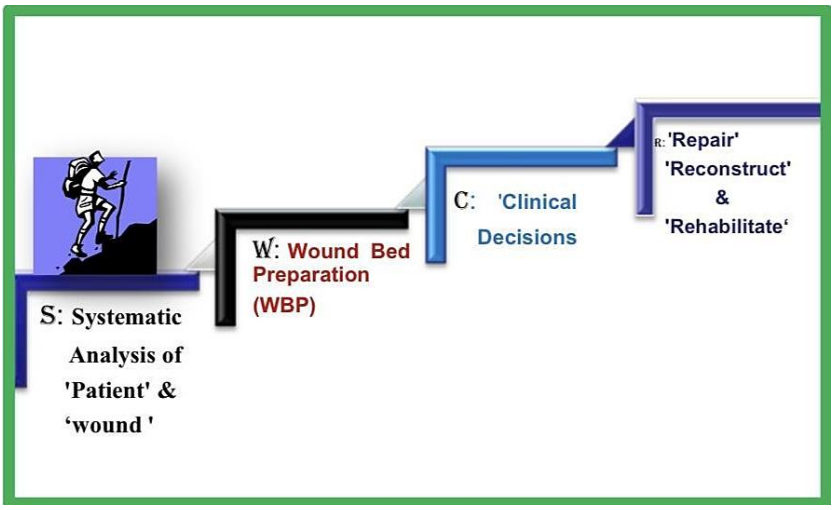

Figure 6. Acronym for Society for Wound Care and Research (SWCR) guidelines.

DISCUSSION

By applying SWCR guidelines [1–3]:

Acronym SWCR Guidelines for systemic approach to Pressure Ulcers

- S – Systematic Analysis of 'Patient' and 'Ulcer';
- W – 'Wound Bed' and 'Patient' Preparation;
- C – 'Clinical Decisions';
- R – 'Repair', 'Reconstruct', 'Rehabilitate' and 'Research' (Figure 6)

A. Systemic Analysis of 'Patient and 'Wound'
   1. *History:* Noted presence of non-healing ulcers over the right trochanter for 1.5 months, insidious in onset, gradually progressive.
   2. *General Physical Examination:* The patient's vitals were stable. No presence of pallor, icterus, edema, or lymphadenopathy.
   3. Systemic examination:
      - *Cardiovascular system:* S1S2 heard
      - *Respiratory system:* Bilateral air entry present, chest clear
      - *Per abdominal:* soft, non-tender
   4. *Psychological health:* could not be assessed due to reduced communication
   5. Local examinations:
      - Inspection:
      - Pressure injury 4 × 3 cm, was noted over the right trochanteric region, (Figure 7), base, unhealthy with necrotic slough present.
      - Features of osteomyelitis present.
      - Palpation:
      - Inspection findings confirmed
      - No local rise of temperature, no edema
   6. *Scoring:* Bates Jansen Wound Assesment Tool BJWATS-54.
   7. *Staging:* National Pressure Ulcer Advisory Panel (NPUAP) Stage IV
   8. *Etiology/risk factors:* long-standing bedridden condition, Parkinson's disease

B. Wound bed preparation
   1. Risk factors identified-immobility
   2. Care of skin:
   3. Assess the patient's skin daily.

4. Friction and scrubbing especially during changing position and transfer to trolley avoided.
5. Minimized exposure to moisture (e.g., incontinence, wound leakage).by frequent of change of dressings or special occlusive dressings and NPWT (vacuum-assisted closure/limited access dressing [VAC/LAD])
6. Used skin barrier product to protect vulnerable skin.
7. Used emollients to maintain skin hydration.
8. Pressure points, temperature and the skin beneath medical devices/nasogastric tube were assessed regularly.
9. Skin was promptly cleaned after episodes of incontinence, skin cleansers that are pH balanced for the skin were used, and soap and water was avoided for cleaning
10. Lying on the area of pressure ulcer should was reduced
11. Pressure relieving measures:
    Hourly switching of positions, with cushioning was given.
12. Nutritional Supplements:

Protein-rich diet, intermittent blood transfusions, and other nutrients were supplemented as required.

Monitoring, training, and leadership support

- Attendants and relatives were trained in use of mattresses, positioning and avoiding shear forces. They were taught to be able to identify deterioration in wound condition. They were trained daily to inspect and identify early signs of appearance of pressure injuries and report at the earliest.
- Multidisciplinary team including dietician, physiotherapist, nurses, physician and other medical specialists like dermatologist, cardiologist, pulmonologist, endocrinologist, neurologist, radiologist, and nephrologist were involved in non-surgical management time to time as and when need arose.

All members of the interdisciplinary team were made aware of the plan of care and all care were documented in the patient's record.

1. *Preventive measures in urinary and fecal incontinence:* Diapers were used to prevent contamination along with sealing of dressing site.
2. *Control of spasticity:* Daily physical therapy was done
3. Pressure relieving measures: intermittent switching of position and cushioning given.

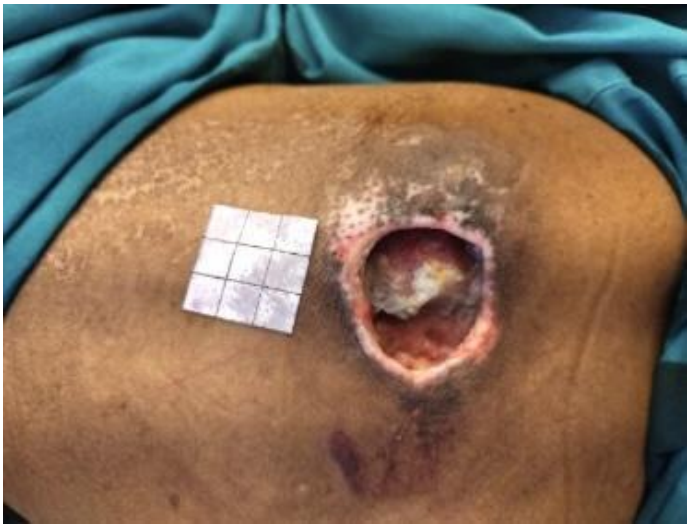

Figure 7. Pressure ulcer over right trochanter.

Wound bed preparation (WBP):

1. Tissue management:

Debridement or removal of devitalized or nonfunctional tissue. Debridement with chemical, surgical, and mechanical methods were done intermittently as and when needed.

Methods used for wound bed preparation:

Wound debridement, dermabrasion with Manekeshaw dermabrader, Regenerative therapy using Amniotic membrane, pineapple extract, feracrylum, collagen ointment, dry collagen dressings, wet collagen dressings, phenytoin application, vitamin D granule application, insulin therapy, hemoglobin spray, APRP injection, were done; gentamicin-collagen ointment application done.

1. Infection and inflammation management:
   - Locally, gentamicin-collagen ointment was used,
   - Silver stream for its antimicrobial action was also used.
2. Moisture management

CRONPWT was applied regularly to maintain the right amount of moisture at the dressing sites.

3. Edge [6, 7]

LLLT (low level laser therapy), phenytoin application, insulin therapy, APRP were used to promote epithelization.

Five layered foam application, LLLT, ETEWC external tissue expansion wound closure, CRONPWT were used intermittently.

Frequent wound inspection, documentation and clinical decisions were made regarding plan of treatment and type of local application of dressings based on progression of pressure injury.

'Repair', Reconstruct', 'Rehabilitate' and 'Research'

The most extensive published experiences with pressure sore treatment are those of Conway and Griffith (1000 cases) and Dansereau and Conway's update of the Bronx Veterans Administration Hospital data (2000 cases). But with new technologies of wound care more research is required to standardized the prevention and management of pressure ulcer. There is need to reduce cost of the care for long-term compliance [8].

For research purpose, more improvements in staging with inclusion of infection, progression of ulcer, and major risk factors in existing staging (four stages) of depth only has been suggested by Kumar. This will have bearing on prognosis of the disease and management protocol and hence, better outcome of research work. The classification has been updated by inclusion of suspected deep tissue injury. The updated classification by Kumar is as below:

1. A. Depth Stages (DS)

Staging for the pressure injury over the right trochanter: [9–12]

2. Suspected deep tissue injury
3. Subcutaneous-exposed fat/granulation forms the floor
4. Ligament/bone exposed with granulation tissue

B. Infection Stage (IS) [13]

5. Systemic signs positive for sepsis (blood culture +)

C. Progression Staging (PS) [14]

6. Regressing/healing (on two consecutive

inspection after 3 days' interval)

D. Risk Category (RC) [14]

7 b. Bed ridden (b)
8. Incontinence present with or without protective sensation/altered consciousness
9. Spasticity and multiple pressure ulcers causing abnormal prominence of pressure points and or changing the position of the patient is difficult due to some or other reason present.

Salient points for management of pressure ulcer in older patients are [5] as follows:

1. Ensure pressure ulcers are correctly differentiated from other skin injuries, particularly incontinence-associated dermatitis or skin tears.
2. Goals of care were established in a legal way particularly as end-of-life approaches. Proper education should be given to all concerned in this regard.
3. Extra care was given to protect from trauma, shearing forces, moisture (barrier products) and during dressing change.
4. An individualized continence management plan was developed and implemented.
5. Regular help was used in repositioning the older adult patient who was unable to reposition independently.
6. Medical devices were checked regularly for pressure effect.

CONCLUSION

SWCR guideline is an effective tool in the wound bed preparation of pressure injury.

Despite plethora of information available clear guidelines focusing the principles of effective wound care are required to ensure that recurrence of pressure ulcer is prevented. 'SWCR Guidelines for Pressure Ulcers' provides systematic approach to a case pressure ulcer for treatment, prevention, are easy to remember because of acronym, and is applicable to all kinds of pressure ulcers irrespective of site, duration, with or without complications.

Conflicts of Interest

This study does not require any institutional approval.

DECLARATIONS

Authors' Contributions

All authors made contributions to the article.

Availability of Data and Materials

Not applicable.

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None.

Consent for Publication

Not applicable.

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