Severe Pressure Ulcer Following an Acute Depressive Episode in a Patient with Spinal Cord Injury

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Abstract

Study design: Literature review and case report.

Objectives: To review the topic of pressure ulcers in spinal cord injury (SCI) and present an unusual case of severe pressure ulcer in a patient with SCI.

Setting: Outpatient assistive technology clinic in the United States.

Results: A 39-year-old community-dwelling man with significant medical history of incomplete cervical SCI, spasticity, depression, and bipolar I disorder presented with the chief complaint of a need for mobility device evaluation. Only upon screening did the patient divulge that he had developed wounds on his hips. Additional history revealed that he was not taking his medication for bipolar disorder, was depressed, and had spent significant time lying in bed not taking care of himself. On physical examination, a Stage IV 1x1x2 cm wound was noted over the left greater trochanter with exposed bone, active drainage of purulent material, and surrounding erythema. The patient was sent to the Emergency Department for wound treatment. He was seen by plastic surgery and surgical debridement was required.

Conclusion: In this case, it appears that the development of a severe pressure ulcer was caused by an acute depressive episode during which self-care was neglected and significant time was spent in bed. This actual patient case is used to highlight a previously proposed conceptual model of depression and pressure ulcers, and a brief literature review on the topic is presented. Routine SCI care should include a formal risk assessment, and level of risk should take into consideration concurrent psychiatric conditions.

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Introduction

Pressure ulcers are one of the most common secondary complications in patients with spinal cord injury (SCI). They are the most expensive complication, contributing to approximately 25% of the total health care cost for SCI.[1] Pressure ulcers can lead to adverse outcomes including loss of function, rehospitalization, amputation, and fatal infections.[2] The purposes of this paper are to review the topic of pressure ulcers in SCI and to report and discuss an unusual case of severe pressure ulcer in a patient with SCI and depression.

Literature Review

Pressure ulcers have been defined as localized damage to the skin and underlying tissues that are caused by unrelieved pressure alone or in combination with shear and friction forces.[3] The continuous unrelenting application of pressure on the skin causes decreased blood supply to the underlying soft tissues, which can result in tissue ischemia and necrosis.[4,5]

Table 1. Summary of Significant Risk Factors for Pressure Ulcers[8]

Sociodemographic	1. Ethnicity
Neurological	2. Completeness
	3. Level of lesion
Functional	4. CHART independence
	5. FIM self-care
	6. FIM motor independence
Clinical	7. Comorbidity
	8. Previous PU surgery
	9. Same site failure
	10. Ischial wound
	11. PU during rehabilitation
	12. Pulmonary condition
Biological	13. Albumin
	14. Poor diabetes control
Medical care management	15. Self-report of PU
	16. Daily skin inspection
	17. Salzberg Risk Score
	18. Sitting time at discharge

Abbreviations: CHART, Craig Handicap and Assessment Reporting Technique; FIM, Functional Independence Measure; PU, pressure ulcer

Unfortunately, pressure ulcers are more likely to occur in individuals with SCI due to the inherent nature of the condition. Changes that commonly occur after SCI may include paralysis, sensory impairment, muscle atrophy, and altered circulation – all of which makes an individual more prone to developing pressure ulcers.[6] Therefore, it has been suggested that all people with SCI should be considered to be at risk of developing pressure ulcers.[7] A systematic review, published in 2013, identified and summarized the risk factors for pressure ulcers for people with SCI (Table 1).[8]

Pressure ulcers are one of the most common secondary complications in patients with SCI. It has been found that approximately one-third of people with SCI living in the community have pressure ulcers.[9] More recently, an observational study of 3,789 people with traumatic SCI reported an incidence of pressure ulcers of 71.8%.[10] However, this high incidence may be due to biases in the study that limited data collection to participants with low income and complete injuries.1 According to aggregated data from the United States SCI Model Systems, pressure ulcers were one of the most common complications at annual follow-ups, even at 20 years post-SCI.[11]

Pressure ulcers are also the most expensive complication, contributing to approximately 25% of the total health care cost for SCI.[1] The National Pressure Ulcer Advisory Panel (NPUAP) has reported that the overall cost of pressure ulcers is $9.1 billion to $11.6 billion in the United States.[12] The average cost to care for and treat one complex full-thickness pressure ulcer has been estimated to be $70,000.[13]

Pressure ulcers can lead to adverse outcomes including loss of function, rehospitalization, amputation, and fatal infections.[2] Moreover, pressure ulcers can interfere with the daily activities of an individual with SCI, including rehabilitation, work, school, and community involvement.[14] Therefore, it is important to aggressively treat developing pressure ulcers and adhere to preventive practices.

The goals of treating pressure ulcers are to prevent worsening and to expedite healing.[1] It is important to refer to and utilize updated clinical practice guidelines for the treatment and prevention of pressure ulcers.[15,16] Clinical management starts with assessing the patient's general medical condition and evaluating the pressure ulcer, specifically noting its dimensions, association with necrosis or sinus tracts, and presence of granulation.[17] After obtaining the characteristics of the pressure ulcer, it can then be staged using a recognized pressure ulcer staging system. One such staging system is described in Table 2.[18]

The stage of the pressure ulcer is used to plan treatment and follow its progression. The general principles of wound care are applicable across all stages; however, there are also recommended treatments of pressure ulcers specific to its stage (Table 3).[17] Finally, it is important to closely monitor the status of the pressure ulcer, ensure adequate pain relief, and assess the nutritional status of the patient.[17]

Table 2. NPUAP Pressure Ulcer Staging System[18]

Stage	Description
Stage I	Non-blanchable erythema of intact skin
Stage II	Partial thickness skin loss; ulcer extends down to epidermis and/or dermis
Stage III	Full thickness skin loss; ulcer extends down to subcutaneous fat and fascia
Stage IV	Full thickness skin loss with extensive destruction and tissue necrosis; ulcer extends down to muscle, bone, tendon, or joint capsule

Table 3. Treatment of Pressure Ulcers by NPUAP Stage[17]

Stage	Treatment
Stage I	Wound protection with transparent film, preventive measures
Stage II	Dressings to maintain a moist wound environment
Stage III	Debridement of necrotic tissue, coverage with appropriate dressings, treatment of infection if present
Stage IV	Debridement of necrotic tissue, coverage with appropriate dressings, treatment of infection if present, surgery if necessary

The prevention of pressure ulcers is the optimal approach, as prevention practices cost only one-tenth of what is required for treatment interventions.[1] Evidence-based recommendations on the prevention of pressure ulcers from the Spinal Cord Injury Rehabilitation Evidence (SCIRE) Team have been summarized (Table 4).[1] However, it is important to note that these prevention strategies require people with SCI to take responsibility for their skin care.[19] The responsibilities of health care professionals are to prescribe individualized and realistic strategies for each patient, assist with integrating strategies into patient's daily schedules, and emphasize the importance of prevention.[20,21] Pressure ulcer prevention remains an active focus of SCI research, with studies looking at the applicability and efficacy of modalities such as electrical stimulation, pressure mapping, and telerehabilitation.

Table 4. Recommendations for Prevention of Pressure Ulcers[1]

Examining skin daily to allow for early detection
Shifting body weight in bed and wheelchair on a regular basis
Keeping moisture accumulation to a minimum
Cleaning and drying skin promptly after soiling
Having an individually prescribed wheelchair, pressure redistribution cushion and power tilt mechanism if manual pressure relief is not possible
Ensuring all equipment is maintained and functioning properly
Decreasing or stopping smoking
Limiting alcohol intake
Structured education on pressure ulcer prevention

Case Report

A 39-year-old community-dwelling man with significant medical history of incomplete cervical SCI, spasticity, depression, and bipolar I disorder presented to an outpatient assistive technology clinic with the chief complaint of a need for mobility device evaluation. He had been using a power wheelchair for several years, but it was currently in disrepair.

His past medical history was significant for an incomplete cervical SCI from a motorcycle accident in 2002, and two surgeries for C5-7 anterior cervical decompression and fusion. He subsequently developed worsening low back pain at midline. Later, he developed acute worsening of bilateral leg weakness and underwent an emergent L2-S1 laminectomy and fusion. He had an indwelling baclofen pump for spasticity. His medical record indicated that the diagnoses of bipolar I and depression were made in 2011. However, there had been no reports of suicidal ideation or behaviour. His medications included baclofen, divalproex, gabapentin, oxycodone, and quetiapine.

The patient was single and lived alone in an accessible home with no attendant care. He had a high school level of education and was unemployed. He did not smoke or drink. He used a power wheelchair (Pride Q600) equipped with a captain seat (no specialized cushion) because he had good sensation and was able to do pressure relief maneuvers and transfers in and out of the chair on his own. The patient also used a regular mattress at home. He was able to move his bowels volitionally without any medications. He attended the outpatient SCI clinic on an ongoing basis for refills of his baclofen pump and SCI care at least every 3 to 6 months.

Upon a review of systems and screening, the patient divulged that he had developed wounds on his upper lateral thighs. Additional history revealed that he was not taking his medication for bipolar disorder and was depressed. Due to this depressive episode, he stopped taking care of himself as per usual (including taking his medications for bipolar) and had just spent significant time lying in bed. The patient had not sought professional treatment for his wounds. Instead, he had been packing the wounds with cotton balls covered with antibiotic ointment and was taking doxycycline that had been prescribed for a prior urinary tract infection. He was waiting to raise this issue at his outpatient SCI clinic appointment in two weeks.

On physical examination, a Stage IV 1x1x2 cm wound was noted over the left greater trochanter with exposed bone, active drainage of purulent material, and surrounding erythema (see Figure 1). The patient also had a superficial erythematous Stage I wound over the right greater trochanter.

Our assessment was that the cause of the pressure ulcer was a prolonged period of depression and time spent in bed. He was able to transfer in and out of his wheelchair and perform pressure relief maneuvers independently while in his wheelchair. No portions of the wheelchair contacted his greater trochanters. For these reasons, no modifications, except for repairs, were made to his wheelchair. The patient was sent to the Emergency Department for wound treatment due to significant risks of osteomyelitis and sepsis. He was seen by plastic surgery and surgical debridement was required. He was provided counselling on pressure relief and skin integrity, taking medication as prescribed, and not taking medication left over from other medical issues. He was also referred to the wound clinic for ongoing wound care and received home nursing care for dressing changes.

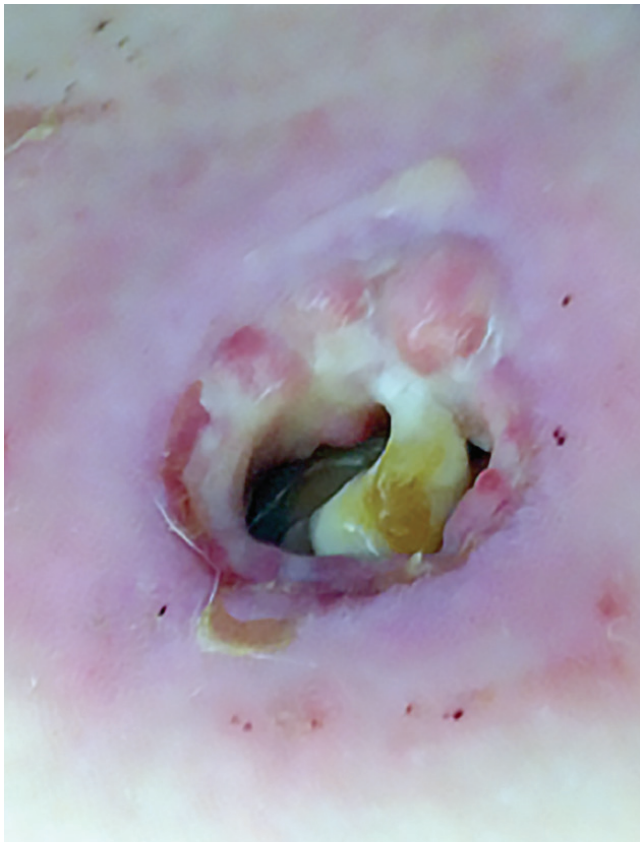

Figure 1. Stage IV pressure ulcer on the patient's left greater trochanter

Discussion

There is limited research on the relationship between depression and pressure ulcers in patients with SCI. The few studies available have demonstrated that a significant association between depression and pressure ulcers exists; however, they are limited by their observational nature and reliance on participant self-report.[22,23] A systematic review conducted in 2009 concluded that depression is only a potential risk factor for the development of pressure ulcers in people with SCI due to insufficient evidence.[24]

In this particular case, it appears that the development of a severe pressure ulcer was caused by an acute depressive episode during which self-care was neglected and significant time was spent immobile and side-lying in bed. Krause found that suicidal ideation increases the risk of developing pressure ulcers in people with SCI and suggested that affective disorders could undermine one's motivation and interest in self-care.[19] In 2013, Krueger and his colleagues proposed a

conceptual model explaining the relationship between depression and secondary physical SCI complications (including pressure ulcers), whereby depression was purported to cause decreased compliance with self-management behaviours.[22] Supporting the limited literature available on this topic, this is the first report to demonstrate the aforementioned explanation of the association between depression and pressure ulcers in a patient with SCI. Further prospective and longitudinal studies on depression and pressure ulcers are needed to determine if a causal relationship exists.

After studying the risk and protective factors of pressure ulcers after SCI, Krause and Broderick concluded that an overall healthy active lifestyle was more effective than simply focusing on specific preventative behaviours such as weight shifts and skin checks.[25] This is important and relevant because depression can significantly impact a person's active lifestyle and pattern of healthy activities. Moreover, performing specific health maintenance behaviours to prevent pressure ulcers requires a patient to be motivated and cooperative.

Depression and other psychosocial risk factors for pressure ulcers are often overlooked.[26] In their three-year longitudinal study of depression in patients with SCI, Dorsett and Geraghty concluded by emphasizing the importance of treating the whole person-in-environment, as opposed to only the medical condition (e.g. pressure ulcers).[27] This case serves as a reminder of the importance of proactive screening for depression concurrently with pressure ulcers, especially in patients with multiple risk factors. It should be noted that although the prevalence of depression in people with SCI is 20-30% (two to three times greater than the general population), depression is undertreated in the population with SCI.[28]

The preservation of skin integrity in individuals with SCI should be guided by updated clinical practice guidelines, and generally involves four steps.[15,16] The first step is to conduct a comprehensive pressure ulcer risk assessment, which begins by using a standardized risk assessment tool; several have been described in the literature with limited validity testing on each for the SCI population.[29-31] This should be followed by applying clinical judgment for additional assessment of other risk factors that are not part of the formal tool but which may change clinical judgment about level of risk. These may include advanced age, prior history of pressure ulcers, level and completeness of SCI, and restraint use. Based on our literature review and case report, depression and psychiatric symptoms may be other factors that should also be considered in determining risk. The second step is to conduct a comprehensive skin assessment by physical examination. The last two steps consist of providing education on pressure ulcer treatment and prevention to the patient and to the health care team.

Conclusion

We have reported a case of a patient with SCI and untreated bipolar disorder presenting with severe pressure ulcer following an acute depressive episode. This case report supports a previously proposed conceptual model of depression and pressure ulcers with an actual patient case, but further research is needed. Routine care should include screening for concurrent psychiatric conditions and wounds. If present, these conditions should be treated and managed. Time should be taken to educate the patient on the appropriate use of medication, pressure ulcer prevention, and when to seek health care.

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