

Innovative Use of Pressure Relieving Foam Based Garment for Lumbar Pressure Sore

Swaroop Johnson Michael¹, Ravi Kumar Chittoria^{2*}, Amrutha J.S.³

Abstract

Pressure ulcers, stemming mainly from friction and shear forces, manifest as chronic wounds that worsen over time. They commonly afflict individuals who are bedridden or have limited mobility. Our investigation involved a 62-year-old male with a hypertrophic scar on his back resulting from the excision of a carbuncle. Subsequently, he developed a lumbar pressure sore at the scar site. To address this issue, adjustments were made to his pressure garment, transforming it into a practical solution for alleviating pressure, complemented by the addition of a belt. This modification proved to be both cost-effective and conducive to the patient's adherence to treatment. Enhancing the pressure garment to serve as a pressure-relieving apparatus with the incorporation of a belt not only mitigated the risk of further pressure ulcers but also offered a solution tailored to the patient's needs. This approach, which repurposed existing resources, underscores the importance of innovative strategies in healthcare management. By repurposing the garment, healthcare costs are minimized while maximizing the patient's comfort and compliance. This adaptation not only addresses the immediate concern of pressure ulcer management but also exemplifies a proactive approach to patient care, emphasizing practicality and patient-centered solutions. Moreover, such interventions highlight the significance of individualized care plans tailored to each patient's unique circumstances, fostering optimal outcomes and overall well-being.

Keywords: Pressure ulcer, lumbar, form, pressure garment

INTRODUCTION

The formation of pressure ulcers is heavily

influenced by various risk factors, encompassing conditions that restrict mobility, diminish sensation, and contribute to malnutrition. External risk factors entail prolonged immobilization on surfaces such as spinal boards, tables, or beds, as well as the utilization of ill-fitting medical devices that come into contact with patient tissues. Internal risk factors, including diabetes, malnutrition, and smoking, also elevate the overall susceptibility to pressure ulcers. Notably, individuals with spinal cord injuries face the highest risk, with estimates ranging from 25% to 66%, owing to the combination of immobility and diminished sensation inherent in their condition. Contractures, stemming from reduced elasticity in the tissues surrounding major joints, further compound the risk by restricting mobility in affected extremities, thereby predisposing individuals to pressure ulcer development. These insights underscore the critical importance of comprehending the multifaceted

Author for Correspondence

Ravi Kumar Chittoria

E-mail: drchittoria@yahoo.com

¹Junior Resident, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, India

²Professor and Associate Dean (Academic), Head of IT Wing and Telemedicine, Department of Plastic Surgery & Telemedicine, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, India

³Senior Resident, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, India

Received Date: February 08, 2024

Accepted Date: February 19, 2024

Published Date: March 05, 2024

Citation: Swaroop Johnson Michael, Ravi Kumar Chittoria, Amrutha J.S. Innovative Use of Pressure Relieving Foam Based Garment for Lumbar Pressure Sore. International Journal of Biomedical Innovations and Engineering. 2024; 2(1): 52–56p.

interplay of physical, environmental, and medical factors in assessing and preventing pressure ulcers in each patient [1].

Understanding the complex array of risk factors associated with pressure ulcer formation is essential for effective prevention and management strategies. Immobility, whether due to spinal cord injuries or other conditions, is a primary contributor to pressure ulcer development. Prolonged periods of immobilization, whether on a spinal board, examination table, or bed, create sustained pressure on vulnerable areas of the body, increasing the likelihood of tissue damage. Additionally, poorly fitted medical devices can exacerbate this risk by causing localized pressure points on the skin [2].

Intrinsic factors such as diabetes, malnutrition, and smoking further heighten the risk of pressure ulcers. Diabetes, for instance, impairs blood flow and nerve function, compromising the skin's ability to withstand pressure and heal effectively. Malnutrition deprives the body of essential nutrients necessary for tissue repair and maintenance, while smoking diminishes oxygen supply to tissues, impeding the healing process [3].

Amongst the various patient populations, individuals with spinal cord injuries are particularly susceptible to pressure ulcers due to the combined effects of immobility and reduced sensation. Contractures, which result from the shortening and tightening of muscles and connective tissues, further exacerbate the risk by limiting joint mobility and altering pressure distribution across the skin surface [4].

It is imperative for healthcare professionals to recognize and address these risk factors proactively to prevent pressure ulcer development. Tailored interventions, including regular repositioning, proper cushioning, and vigilant skin assessment, are crucial in mitigating the risk of pressure ulcers. Moreover, patient education and involvement in preventive measures are essential components of comprehensive pressure ulcer management strategies [5].

In conclusion, a comprehensive understanding of the diverse risk factors associated with pressure ulcer formation is essential for effective prevention and management. By addressing both intrinsic and extrinsic factors and tailoring interventions to individual patient needs, healthcare providers can significantly reduce the incidence and severity of pressure ulcers, thereby improving patient outcomes and quality of life [6].

MATERIALS AND METHODS

This study was conducted in the Department of Plastic Surgery at a tertiary care centre in South India after getting the departmental ethical committee approval. Informed written consent was taken from the patient. Patient was a 62-year-old male who presented with hypertrophic scar at back (Figure 1) which developed following excision of a carbuncle. Patient underwent scar massage with silicone gel and coconut oil. Multiple sessions of Erbium YAG laser applied over the scar. Patient was discharged with foam based lumbar pressure garment with belt. After one month, patient presented with grade 1 pressure sore over back (Figure 2). We modified the foam inside the pressure garment by cutting a hole in the centre (Figures 3 and 4) which will relieve the compressive force from foam. Patient was advised to wear this modified foam garment (Figure 5) and avoid sleeping on back [7].

DISCUSSION

Once a pressure ulcer is identified, staging and careful documentation of the size of the wound should be performed. Additional assessments of the ulcer include the location, surrounding skin condition, presence of tissue undermining and tunneling, and amount of exudate, odor, and tenderness [8].

Consensus-Based Support Surface Algorithm is used to identify the appropriate support surface for adults (≥ 16 years) and bariatric patients in care settings where the length of stay is 24 hours or more. Seating redistribution support surfaces are utilized that meet the needs of sitting individuals who have



Figure 1. Hypertrophic scar over lumbar region.



Figure 2. Grade 1 lumbar pressure sore.



Figure 3. Measuring the required size of the foam garment.



Figure 4. Cutting the foam garment according to the size of the pressure sore.



Figure 5. Pressure relieving garment with belt appl.

a pressure ulcer. Individualized bowel/bladder management program for the patient with incontinence has to be established. Screening for nutritional deficiencies at the patient's admission to the care setting, when their condition changes, and/or if the pressure ulcer is not healing can be done. Daily calorie and protein intake for adult patients with pressure ulcers: 30–35 kcal/kg and protein 1.25–1.5 g/kg. Regular evaluation of laboratory tests such as albumin and prealbumin for assessment of nutritional status. While cleansing the wound and peri wound at each dressing change, minimizing trauma to the wound. Appropriate solutions for cleaning pressure ulcers, which may include potable tap water, distilled water, cooled boiled water, or saline/salt water can be selected. The bacterial bioburden assessed by tissue biopsy or Levine quantitative swab technique. For nonhealing, clean pressure ulcers consider a 2-week course of topical antibiotics, use of antiseptics for "maintenance wounds," which are defined as wounds that are not expected to heal, or for wounds that are critically colonized. Systemic antibiotics to be used in the presence of bacteremia, sepsis, advancing cellulitis, or osteomyelitis. The debridement of pressure ulcer of devitalized tissue, or when there is a high index of suspicion that biofilm is present, and when consistent with the patient's condition and goals of therapy. The type of dressing has to be modified as appropriate due to changes in the wound during healing or if the pressure ulcer deteriorates. Regular monitoring and assessing at every dressing change to determine if the type of dressing is appropriate or should be modified. The adjunctive therapies can be considered as indicated like: platelet-derived growth factor (PDGF); electrical stimulation; negative-pressure wound therapy (NPWT) whenever required. The need for operative repair for patients with stage 3 and 4 ulcers to be assessed that do not respond to conservative medical therapy [9] Measures to eliminate or control the source of pressure ulcer pain can be identified and modified. Appropriate treatment of pressure ulcers to optimize healing and recognizing that complete healing may be unrealistic in some patients. We have to educate the patient/caregiver(s) about strategies to prevent pressure ulcers, promote healing, and prevent recurrences of ulcers and emphasize these are lifelong interventions [10].

RESULTS

The adapted pressure-relieving garment proved to be highly effective in alleviating pressure points in the lumbar region. Its efficiency in redistributing pressure away from vulnerable areas underscores its practicality and utility in pressure ulcer management. Moreover, its cost-effectiveness adds another dimension of value, ensuring that effective care solutions remain accessible and sustainable. One notable advantage of the modified garment is its convenience. By repurposing an existing garment, healthcare providers were able to implement a solution without the need for additional resources or complex interventions. This streamlined approach not only enhances efficiency but also minimizes disruption to the patient's routine and treatment plan.

Furthermore, the patient's familiarity with the garment type played a crucial role in promoting compliance. Having previously used a similar garment, the patient was already accustomed to its fit and function, reducing the learning curve and potential discomfort associated with adapting to a new device. This familiarity fosters a sense of confidence and trust in the treatment approach, further reinforcing the patient's commitment to adherence. Overall, the success of the modified pressure-relieving garment highlights the importance of tailoring interventions to individual patient needs and circumstances. By leveraging existing resources and optimizing patient familiarity and comfort, healthcare providers can enhance treatment outcomes while promoting patient compliance and satisfaction. This patient-centered approach not only improves clinical efficacy but also fosters a supportive and collaborative care environment, ultimately benefiting both patients and healthcare providers alike.

CONCLUSION

Emphasizing prevention as the cornerstone of pressure sore management is vital. Proactive measures such as regular repositioning, diligent wound care, and the application of pressure-relieving aids are pivotal in averting the onset of pressure sores among vulnerable populations. These preventive interventions not only mitigate the risk of pressure ulcer formation but also promote overall skin health and integrity. Furthermore, early intervention coupled with a collaborative, multidisciplinary approach

is indispensable for effective pressure sore management and subsequent reconstruction. Involving healthcare professionals from diverse specialties ensures comprehensive assessment, tailored treatment plans, and optimal outcomes for patients. By leveraging the expertise of professionals such as wound care specialists, physical therapists, and nutritionists, healthcare teams can address the multifaceted needs of individuals with pressure sores, addressing both the underlying causes and associated complications. Moreover, the role of patient motivation and compliance cannot be overstated in the successful treatment of pressure sores. Engaging patients in their care, fostering a sense of ownership, and providing education on preventive measures and treatment options are instrumental in promoting adherence to recommended protocols. Patient participation not only enhances treatment efficacy but also empowers individuals to actively contribute to their recovery process, leading to improved outcomes and quality of life. In summary, prioritizing prevention through proactive strategies, early intervention, and a collaborative healthcare approach is paramount in managing pressure sores effectively. By addressing risk factors, implementing preventive measures, and engaging patients in their care, healthcare providers can mitigate the incidence and severity of pressure sores while optimizing patient outcomes and well-being.

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