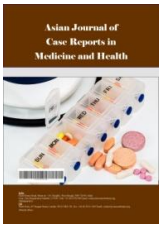

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Pressure Ulcer on Wrist Post Synthetic Fracture Cast: A Case Report

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

With evolution of technology and materials, new synthetic substances like fiberglass are now available and used for the casting of fractures. Though these offer advantages for both patient and physician, the possibility of developing a pressure ulcer needs to be kept in mind, which should be treated timely and effectively. The family physician can play an important role in imparting such awareness, as well as in treating, and regularly monitoring such cases, with the support of telephonic and video digital health platforms.

Keywords: Pressure ulcer; synthetic cast; digital health; wound healing.

1. INTRODUCTION

The presentation of this case aims to stimulate awareness on two important points of clinical practice. Firstly, the development of pressure ulcers is a possibility in any patient undergoing bandaging or casting, even if no predisposing factors or pointing symptoms exist. Secondly, prompt intervention along with meticulous monitoring and documentation through the use of digital visualization health platforms can lead to effective management of such cases.

2. PRESENTATION OF CASE

2.1 History

A 30-year old male presented with pain, tenderness and swelling on the extensor side of his right hand, through digital video consultation.

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He gave history of banging his right hand hard against the wall some days prior, and having applied ice on it thereafter a few times. However, the pain and swelling continued to be present. An X Ray (anteroposterior and lateral view) of the right hand and wrist was ordered, which revealed a shaft fracture of the right 5th metacarpal. He was sent for an orthopedic referral, and a synthetic fiberglass cast was applied for 14 days from below the elbow enclosing 4 fingers, excluding thumb (see Fig. 1). Patient was also started on an anti-inflammatory and analgesic medication (Etoricoxib 90 mg) for a week, and a multivitamin-mineral supplement with calcium and vitamin D3 for a month. The patient had no medical co-morbidities.

The patient reported reduction in pain, and improved overall comfort on telephonic follow-up. He complained of a slight feeling of itching in the right lower forearm, but was not unduly disturbed by it. His cast was removed after 2 weeks, and a skin ulcer was seen on the ulnar side of the extensor surface of the wrist. The ulcer was circular, measured approximately in diameter, and was shallow with a red-pink base. Its margins were well defined, and the surrounding skin showed a reddish-blue discolouration. There was minimal serosanguinous discharge, no slough present, and the ulcer did not appear infected. Patient did not complain of any pain, but only mild irritation. A diagnosis of a stage II pressure ulcer was made [1].

2.2 Management

The patient was managed and monitored by video calling. This was done in accordance with ethical principles and guidelines of the *Ministry of Health and Family Welfare (Government of India)* Telemedicine Practice Guidelines on using Tele/Video/Online platforms for patient diagnosis, prescribing medicines, monitoring and documentation (released on March 25, 2020).[2]

Patient was advised daily dressing with povidone iodine 10% ointment, gauze and bandage. He was also advised guided arm raising and gentle wrist exercises. He was monitored daily for the first week through video calling, for healing and improvement, and was instructed to avoid wetting the dressing. The ulcer showed steady healing and reduction in size. After a week, the povidone iodine and gauze dressing were discontinued, and the patient was asked to apply a gel formulation containing amorphous hydrogel (Propylene glycerol IP 4.96% w/w and Carbomer IP 0.76% w/w) and colloidal silver (32 ppm), once a day. He was also simultaneously started on physiotherapy for hand and wrist. The ulcer showed complete healing at the end 12 days. (see Fig. 2)

Fig. 1. Initial patient presentation – a) Swelling on first consultation. b) Arrow shows 5th metacarpal fracture. c) Synthetic fiberglass cast

Fig. 2. Progressive healing of pressure ulcer

3. DISCUSSION

During the period of the COVID pandemic, digital/online or teleconsultations have played a big role in the care and management of patients, limiting the number of clinical visits, preventing possible risk of exposure, and also facilitating more meticulous monitoring and documentation [3,4]. In this patient, a synthetic fiberglass cast was chosen for immobilization and expedited healing of the metatarsal fracture, instead of a conventional plaster of Paris (POP) cast. Synthetic fiber glass casts have the advantage of weighing less and being more porous than POP casts, making them 'breathable' and more comfortable to wear [5,6]. Such casts are also supposed to make the underlying skin less vulnerable to irritation and sweating. Taking effective X rays is also facilitated with such casts on.

However, in any kind of skin bandaging, including synthetic casts, pressure ulcers represent a possible risk [7]. In this case the patient was largely comfortable, and did not proactively complain of bandage tightness, or pain. Therefore, the possibility of a pressure ulcer should be considered in patients when synthetic fiberglass casts are used, even if any suggestive symptoms, or predisposing risk factors (like immobility, malnutrition, and comorbidities affecting vascular, nerve or skin function), do not exist. Even though pressure ulcers have been reported in leg casts especially at the heel, such ulcers in the upper limb are rare [8]. Avoiding wrinkles, uneven ridges or focused pressure on a specific small area, can cause even pressure distribution throughout the casting area [9]. Patients should be instructed to report any sense of pressure, irritation, itching or feeling of wetness anytime during wearing of the cast.

Povidone iodine is an effective antiseptic agent and the one of choice due to its bactericidal activity against both gram-positive and gram-negative organisms as well as spores and biofilms, with a lack of bacterial resistance. It also does not impede wound healing, and has both therapeutic and prophylactic effectiveness in all kinds of acute and chronic wounds including pressure sores [10,11]. Thereafter when healing was progressing satisfactorily, patient was switched to amorphous hydrogel with added colloidal silver, for patient convenience and to begin physiotherapy. The hydrogel facilitates wound protection from water and environmental agents, at the same time helping in moisture retention and effective healing, while the colloidal silver imparts antimicrobial action [12,13].

4. CONCLUSION

Pressure ulcers should be kept in mind while using synthetic fiberglass casts for fractures. An intermediate clinical visit may be recommended with opening and appropriate re-application of cast if even mild irritation or tightness is reported. Any resulting pressure ulcer should be managed with povidone iodine gauze dressings. Switching to antimicrobial hydrogels to maintain effective healing without additional dressing can be considered for patient convenience and commencing appropriately physical activity. Digital online consultation, which has evolved due to the current COVID-19 (Coronavirus disease), can be well utilized for more regular and effective clinical inspection, monitoring and documentation of patients developing pressure ulcers.

CONSENT

As per international standard, informed consent was obtained for the publication of this report

ETHICAL APPROVAL

The patient was managed and monitored by video calling. This was done in accordance with ethical principles and guidelines of the Ministry of Health and Family Welfare (Government of India) Telemedicine Practice Guidelines on using Tele/Video/Online platforms for patient diagnosis, prescribing medicines, monitoring and documentation (released on March 25, 2020).2

COMPETING INTERESTS

Author has declared that no competing interests exist.

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