



RESEARCH ARTICLE

RARE CASE OF ACUTE LOCALIZED EXANTHEMATOUS PUSTULOSIS OVER FOREARM UNDERNEATH FIBERGLASS CAST FOR LOWER END RADIUS FRACTURE

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Abstract

Plaster casting is the most important tool in the practice of orthopedics. It is used to operate on fractures to treat them either permanently or afterward. Although there are disadvantages including stiffness, pressure sores, and compartment syndrome, orthopedic casting is nevertheless beneficial. Early warning indications include skin lesions like bullae and ecchymosis, as well as pain, soreness, itching, and systemic sickness that is out of proportion to the localized physical signs. The development of ALEP/AGEP is commonly within days after beginning a drug. We present a case of an uncommon orthopedic cast complication involving a previously healthy patient who developed an acute localized exanthematous pustulosis over forearm inside a fibreglass cast applied for treatment of lower end radius fracture. A less common, more localized variation of AGEF is acute localized exanthematous pustulosis, or ALEP. With the right casting procedure and routine cast reviews, all of these issues may be avoided.

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Introduction:-

An essential tool in the practice of orthopedics is plaster casting. It is used to treat fractures either definitively or afterwards by operating them. Orthopedic casting is useful, although there are drawbacks, such as stiffness, pressure sores, and compartment syndrome [1]. The immobilization caused by padded plaster of Paris casts affects and impairs the normal skin cycle and functions and/or results in pathological alterations. Regardless of age, sex, the location of the lesion, or the placement of a cast, xerosis and its aftereffects, such as pruritus, exfoliation, and fissuring, are prevalent. The severity of this sort of lesion can also be influenced by factors including skin type, general health, and environmental factors such as extreme heat and humidity.

With the right casting procedure and routine cast reviews, all of these issues may be avoided. We present a case of an uncommon orthopedic cast complication involving a previously healthy patient who developed an acute localized exanthematous pustulosis over forearm inside a fibreglass cast applied for treatment of lower end radius fracture.

Case report

A 66-year-old Asian woman who had fallen four weeks prior arrived with such a history and sought out an orthopedic surgeon. The results of the radiography revealed the distal end radius fracture. At another hospital facility, a fibreglass cast was put in below the elbow.

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The patient complained of rubbing against cast edges and redness upon visiting our hospital for follow-up care. When the cast was taken off, we saw numerous little nonfollicular pustules, as well as clusters of pustules, beneath an erythematous and oedematous base in the forearm, wrist, and hand (figure 1). The lesion was circumferentially reaching close to the forearm. At the fracture location over the left wrist, there was edema and discomfort. Movements of the wrist were very limited and uncomfortable. Forearm pronation and supination were difficult and limited.

There was no prior history of fever, and there were no lesions on the body's mucous membranes, nails, or joints. No adjacent lymphadenopathy. After the cast application, she was instructed to take two Ibuprofen tablets every day for five days at the primary hospital.

After being transferred to our hospital's dermatology department, they confirmed our observations of forearm swelling with many non-follicular pustules, some of which coalesced into lakes of pus, and dispersed vesicles throughout the left forearm, which circumferentially covered the wrist and hand.

Acute localized exanthematous pustulosis (ALEP) was supported as the most likely diagnosis by the combination of all these clinical features.

Figure 1:-



Figure 2:-



Figure 3:-

The clinical challenge in managing the established skin lesion and the fracture in this case must be noted. If not treated properly, the lower end of a radius fracture is susceptible to malunion. However, skin care was given priority due to the severity of the patient's suffering brought on by the extensive cutaneous involvement. Since a splint or cast could not be used to immobilise the fracture, they were abandoned.

Figure 4 & 5:-

The patient improved significantly after removing the cast below the elbow and taking some anti-inflammatory drugs and antibiotics (amoxycillin and clavulanic acid 625 mg twice daily for 5 days) and topical steroids and calamine lotion.

Figure 6:-



Discussion:-

Padded POP immobilization alters and impairs the skin's normal cycle and functions and/or leads to actual pathological changes. Xerosis and its consequences - itching, scaling and cracking are common regardless of age, sex and location of the lesion and cast. The severity of this type of damage can also be influenced by skin type, personal health and climatic conditions such as excessive heat and humidity. The use of oil-based emollients before immobilization has no long-term effect on its prevention. Itching of varying severity in all patients can be considered as a generally recognized problem related to cast fixation [2].

We determined that the patient had acute generalised exanthematous pustulosis. Other possible diagnoses include early Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN), pustular psoriasis, drug reaction with eosinophilia and systemic symptoms (DRESS), and early necrotizing fasciitis.

Beylot et al. published the first description of acute generalised exanthematous pustulosis (AGEP) in 1980. This cutaneous eruption caused by medication is uncommon and severe. It is still necessary to fully explain the pathogenesis, clinical, and histological findings. A less common, more localized variation of AGEP is acute localized exanthematous pustulosis, or ALEP. The area covered by the cast, including the forearm, wrist, and hand, has numerous small nonfollicular pustules, single, and occasionally clusters of pustules beneath an erythematous and edematous foundation. Proximally on the forearm, the lesion was expanding circumferentially(Figure 1). All cases of AGEP in which lesions are localized to specific locations are referred to as "acute localised exanthematous pustulosis" (ALEP), according to Prange et al[3].

The development of ALEP/AGEP is commonly within days after beginning a drug. Time to onset is not one of the suggested diagnostic criteria for this cutaneous reaction, which leaves us wondering why it was longer in this particular instance [5].

Pustular psoriasis was unlikely because the woman had no prior history of the condition and had no additional symptoms on her skin or nails.

SJS/TEN was effectively excluded because there was no mucosal involvement and just a small region of involvement. DRESS was ruled out as a diagnosis due to the absence of a fever, lymphadenopathy, internal organ

involvement, few skin lesions (50% body surface area), and quick remission of lesions with therapy [4]. Necrotizing Fasciitis is difficult to detect in its early stages since it mimics cellulitis. Early warning indications include skin lesions like bullae and ecchymosis, as well as pain, soreness, itching, and systemic sickness that is out of proportion to the localized physical signs. A high degree of suspicion is required, and cases that are suspected should be sent to a surgeon right once for quick debridement. To avoid this life-threatening rare complication of plaster casts, the author recommends careful precleaning of the limb, use of sterile water, and enough wrap for gypsum plasters.[6].

Typically, limb washing is not taken into account before applying any cast below the elbow. The skin condition may have been hampered by severe swelling or oedema. The casting substance was synthetic plaster. The swollen extremity is predisposed to xerosis and its sequelae (pruritus, exfoliation, and fissuring) by the thermogenic effect of synthetic material and an insufficient cotton padding, in addition to excessive heat and humidity that cause perspiration and contribute to skin lesions and/or ibuprofen-induced skin eruptions.

Since the artificial plaster used in the patient's cast was thrown away, it was impossible to recover it for microbial culture.

Most of the pathophysiology of AGEF is unknown. The patch test and the lymphocyte transformation test to the drug have shown that drug-specific activation of CD4 + and CD8 + T-cells results in the production of pro-inflammatory cytokines and the creation of vesicles that cause apoptosis [7].

These tests have come back positive in ALEP, showing a similar pathomechanism to AGEF, but because pro-inflammatory cytokines are only weakly activated, there is only localised involvement. Mutations in the Interleukin-6 (IL-36) receptor antagonist (IL36RN) gene have also been linked to a genetic predisposition[8].

ALEP is a self-limited condition that progresses favourably over many days. The method of treatment focuses on removing the triggering substance right away. Strong topical steroids can be used to alleviate itching and inflammation[9].

Drug usage has been thought to be the only plausible trigger for ALEP, an unusual skin condition, for a long time. However, contact with plants has also been implicated as a potential factor. Frequent facial involvement may be a sign of photo-aggravated allergic contact dermatitis or exposure to airborne plant-based chemicals [10]. In cases with persistent symptoms, supportive therapy include oral corticosteroids and antibiotics may be necessary. There aren't many randomised controlled studies available for the treatment of these disorders, and much of the management strategy is based on individual case reports.

Conclusion:-

In our scenario, the patient's immune system was not weakened. Her advanced age, related diabetes, the hot and humid climate, synthetic casting, and ibuprofen could have all contributed to the skin lesion. When patients with an orthopedic casting visit the emergency room with ongoing pain or other inexplicable symptoms, a strong index of suspicion should be maintained. It frequently results from the underlying fracture itself or the oedema that follows in the affected limb, but on rare occasions it could be more serious. While radiographic evaluation is crucial, cast removal must be done immediately in any patient who complains of unexplained pain, persistent burning, or neurovascular symptoms in order to allow for a thorough evaluation and make sure there is no sign of compartment syndrome.

The use of synthetic casting material with thin cotton padding and a hot, humid environment in a patient with uncontrolled diabetes may be predisposing variables contributing to this problem. The treatment of this illness is not standardized, and the pathogenic pathways are still not fully understood. Along with systemic antibiotics and NSAIDs with antihistamines, standard therapeutic procedures, including cast removal, basic cleaning, and local application of steroid ointment with calamine lotion, plays a crucial role.

Sr. No.	Figures	Description
1	1	Left forearm dorsal surface immediately after cast removal

2	2	Left forearm volar surface immediately after cast removal
3	3	Left forearm dorsal surface immediately after cast removal
4	4	Left forearm skin condition after 3 weeks of removal
5	5	Left forearm skin condition after 3 weeks of removal
6	6	Xray left forearm showing distal radius fracture

Abbreviations:

ALEP: Acute Localized Exanthematous Pustulosis

AGEP: Acute Generalized Exanthematous Pustulosis

DRESS: Drug Reaction with Eosinophilia and Systemic Symptoms

SJS/TEN: Stevens-Johnson Syndrome/Toxic Epidermal Necrolysis

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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