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Generalized Tetanus Following Traditional Manipulation of an Open Supracondylar Humerus Fracture in a Child: A Rare Case Report

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Learning Point of the Article:

Traditional manipulation and delayed treatment of contaminated open fractures in unimmunized children can result in generalized tetanus, highlighting the importance of timely tetanus prophylaxis and definitive fracture care.

Abstract

Introduction: Tetanus is an uncommon but potentially life-threatening infection in the era of widespread immunization. However, it continues to occur in developing regions, particularly following contaminated injuries and delayed access to appropriate medical care. We report a rare case of generalized tetanus developing after traditional manipulation of an open supracondylar humerus fracture in a child.

Case Report: A 12-year-old boy sustained an open supracondylar fracture of the right humerus following trauma. Before receiving definitive treatment, local manipulation and massage of the injured limb were performed. Initial management at another healthcare facility included wound dressing and Kirschner wire fixation. Subsequently, the child presented to our tertiary care center with severe pain, trismus, and generalized muscle spasms consistent with generalized tetanus. He was admitted to the pediatric intensive care unit and managed with human tetanus immunoglobulin, intravenous metronidazole, diazepam-based spasm control, supportive care, and orthopedic supervision. During hospitalization, he developed autonomic instability characterized by labile hypertension and tachycardia, which was managed medically. He did not require mechanical ventilation. During the course of treatment, the fixation wires loosened and were displaced. Revision surgery and debridement were advised; however, consent was declined by the parents. Conservative treatment was therefore continued. After approximately 2 months of hospitalization, the patient recovered from tetanus, the wound healed satisfactorily, and the fracture united with malunion.

Conclusion: This case highlights the ongoing risk of tetanus following contaminated open fractures, particularly when definitive treatment is delayed, and traditional manipulation is undertaken. Early wound management, appropriate tetanus prophylaxis, timely surgical intervention, and public awareness regarding the hazards of untrained fracture treatment remain essential to prevent such potentially fatal complications.

Keywords: Tetanus, open fracture, supracondylar humerus fracture, traditional bone setting, pediatric trauma, malunion.

Introduction

Tetanus is a potentially life-threatening neurological disease caused by the toxin-producing bacterium Clostridium tetani. Although the incidence of tetanus has declined considerably following the introduction of routine immunization programs, cases continue to occur, particularly in developing countries where contaminated wounds, incomplete vaccination, and delayed medical care remain important risk factors [1,2,3].

Open fractures are especially vulnerable to contamination and require prompt wound care, tetanus prophylaxis, and definitive fracture stabilization to prevent serious complications [4,5,6]. In many regions, however, injured patients may initially seek

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Figure 1: Clinical photograph showing the open wound over the right elbow following trauma.

treatment from traditional healers or undergo local manipulation before presenting to a healthcare facility. Such practices can delay appropriate management and increase the risk of infection and other adverse outcomes [7].

Generalized tetanus developing after an open supracondylar humerus fracture is rarely reported in children. We present the case of a 12-year-old boy who developed generalized tetanus following traditional manipulation of an open supracondylar humerus fracture. This case highlights the continuing burden of tetanus in resource-limited settings and emphasizes the importance of early wound management, timely tetanus prophylaxis, and definitive orthopedic care [8].

Case Report

A 12-year-old unimmunized boy presented to our tertiary care center with an open supracondylar fracture of the right humerus following trauma. Following the injury, he was managed by a traditional healer for approximately 2 weeks with local massage and application of herbal poultices. During this period, he did not receive tetanus prophylaxis or definitive wound care. The open wound over the elbow region at presentation is shown in Fig. 1. Subsequently, he developed fever and poor oral intake and was taken to a local hospital, where wound dressing and Kirschner wire (K-wire) fixation of the fracture were performed. Radiographs obtained at presentation to our institution demonstrated a supracondylar humerus fracture with K-wires in situ (Fig. 2). He was later referred to our institution for further management.

On presentation, the patient was conscious and oriented with normal higher mental functions but exhibited trismus and generalized muscle spasms, raising clinical suspicion of generalized tetanus. There was no opisthotonus. The diagnosis was supported by the history of an unimmunized status, an open contaminated wound, delayed presentation, lack of tetanus prophylaxis, and prior unsterile manipulation of the injured limb.

The patient was admitted to the pediatric intensive care unit and managed jointly by pediatric and orthopedic teams. Human tetanus immunoglobulin and intravenous metronidazole were administered. Muscle spasms were controlled with intravenous diazepam. During hospitalization, he developed autonomic instability characterized by labile hypertension and tachycardia, which was managed with clonidine and labetalol. Additional supportive measures included nursing in a dark, quiet room with minimal external stimulation to reduce spasm triggers. The patient did not require endotracheal intubation or mechanical ventilation.

Orthopedic management consisted of immobilization of the affected limb with an above-elbow slab and serial wound dressings. During the course of treatment, the fracture fixation became unstable, and the K-wires gradually loosened and were displaced. Revision fixation with wound debridement was advised; however, consent for further surgical intervention was

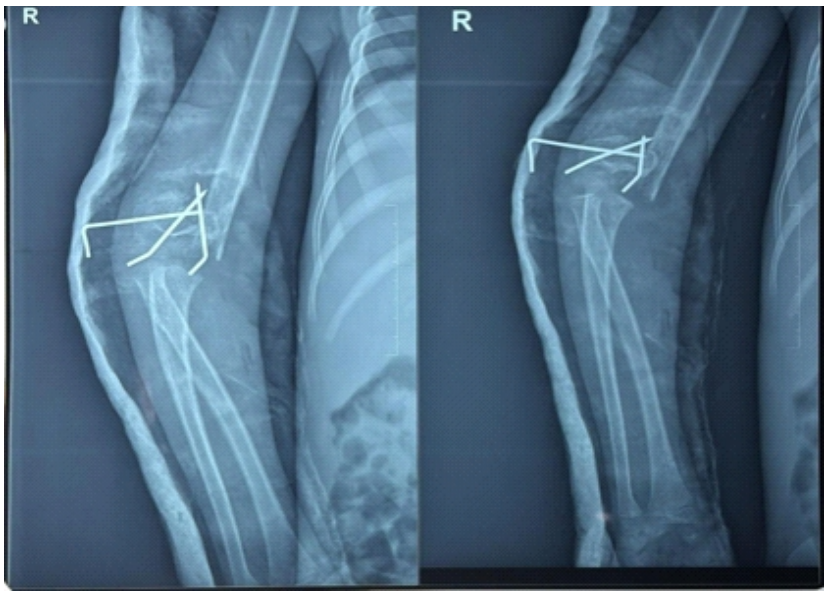

Figure 2: Anteroposterior and lateral radiographs of the right elbow demonstrating a displaced supracondylar humerus fracture with Kirschner wires in situ at presentation.

declined by the parents despite counseling regarding the potential risks and consequences. Conservative treatment was therefore continued.

The patient remained in the pediatric intensive care unit for approximately 2 months until complete resolution of muscle spasms and autonomic instability. At the time of transfer to the orthopedic unit, he was ambulatory, independent in activities of daily living, and free of neurological deficits. The fracture subsequently united with malunion. Before discharge, tetanus toxoid immunization was administered, and the patient was advised regular follow-up for assessment of functional recovery and consideration of future corrective procedures if required.

Discussion

Although tetanus has become increasingly uncommon following the widespread use of vaccination, it remains a serious and potentially fatal disease in unimmunized individuals. Children presenting with contaminated wounds and open fractures continue to be at risk, particularly in resource-limited settings where access to timely medical care may be delayed [1,2,3]. The present case is unusual because generalized tetanus developed following an open supracondylar humerus fracture in an unimmunized child, further complicated by traditional manipulation of the injured limb before definitive treatment. The diagnosis in our patient was primarily clinical and was based on the presence of trismus and generalized muscle spasms in the setting of an unimmunized child with a contaminated open fracture and delayed presentation.

Open supracondylar fractures are uncommon injuries and are generally associated with a higher risk of infection than closed fractures. Present evidence supports early debridement, antibiotic administration, tetanus prophylaxis, and stable fracture fixation to achieve favorable outcomes [4,5,6]. In our patient, however, local manipulation of the injured limb was performed before presentation to a healthcare facility. Traditional fracture treatment practices remain prevalent in many parts of the developing world and often contribute to delayed presentation and increased complication rates [7]. The combination of an open injury, delayed definitive care, and lack of immunization likely played a significant role in the development of tetanus in this case.

Previous reports have highlighted the association between traditional fracture treatment and tetanus. Tchuenkam et al. described generalized tetanus following traditional fracture care, while Boi-Dsane et al. reported tetanus developing after treatment of an open fracture by a traditional bonesetter [8,9]. These reports, together with our case, emphasize that tetanus remains an important preventable complication of musculoskeletal trauma, particularly when wound care is inadequate and prophylaxis is delayed.

The orthopedic challenges in this patient were equally significant. Open supracondylar fractures are usually treated with urgent debridement and stable K-wire fixation, with studies reporting excellent outcomes when managed appropriately [5,6,10]. In our patient, the development of generalized tetanus shifted the immediate priority from fracture management to stabilization of a life-threatening systemic illness. During the course of treatment, the fixation became unstable, and revision surgery was advised. However, consent for further surgery was declined by the parents, leaving conservative treatment as the only feasible option.

The fracture eventually united with malunion. While fracture union was achieved, this outcome is less than ideal in an older child because the potential for remodeling is limited. Previous studies have shown that delayed or inadequate treatment of supracondylar fractures may result in deformity, functional limitation, and the need for more complex procedures at a later stage [11,12]. This aspect of the case highlights the difficult decisions clinicians sometimes face when recommended treatment cannot be carried out because of factors beyond medical control. Despite requiring prolonged intensive care and developing autonomic instability in the form of labile hypertension and tachycardia, the patient recovered without the need for mechanical ventilation and was ambulatory and independent at the time of transfer from the pediatric intensive care unit.

Another important lesson from this case is the continuing importance of immunization. Pediatric tetanus remains largely preventable, and studies from developing countries consistently identify incomplete or absent vaccination as a major risk factor [13,14]. The prolonged hospitalization and intensive multidisciplinary care required in our patient illustrate the substantial burden that can result from a disease that is almost entirely preventable through vaccination.

This case serves as a reminder that tetanus should still be considered in unimmunized children presenting with contaminated open fractures. Early wound care, appropriate tetanus prophylaxis, and timely orthopedic intervention remain essential for preventing serious complications. Equally important is community awareness regarding the risks associated with traditional fracture manipulation and delays in seeking definitive medical care.

Limitations

The exact timeline of symptom onset and details of the initial treatment received before referral were not fully available. In addition, long-term functional follow-up could not be assessed

at the time of reporting. Despite these limitations, the case provides important clinical insights into a rare but preventable complication of an open fracture in an unimmunized child.

Conclusion

Generalized tetanus remains a potentially life-threatening yet preventable complication of contaminated open fractures, particularly in unimmunized children. This case highlights the risks associated with delayed presentation and traditional fracture manipulation, which may contribute to severe infectious complications. Early tetanus prophylaxis, prompt wound debridement, and definitive fracture management are essential to optimize outcomes and prevent avoidable morbidity.

Clinical Message

Delayed treatment and traditional manipulation of open fractures can lead to life-threatening tetanus. Early prophylaxis, wound care, and definitive fracture management are essential for preventing such complications.

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

Conflict of interest: Nil **Source of support:** None

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