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Delays in Fracture Care for Pediatric Patients in Saiful Anwar General Hospital: A Case Report of Challenges and Clinical Consequences

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ABSTRACT

Introduction: Delays in medical care for pediatric fractures in Indonesia may result from financial constraints and administrative barriers related to BPJS/Kartu Indonesia Sehat (KIS) health coverage. Such delays can allow initially manageable injuries to progress into complex conditions. This case report describes the clinical and systemic consequences of delayed treatment in a five-year-old child with a neglected elbow fracture and highlights challenges in healthcare accessibility under the national health insurance system.

Case Presentation: A five-year-old boy sustained a right elbow fracture after a fall. Initial symptoms consisted of intermittent pain and mild swelling, but medical treatment was not immediately sought. One month later, an open wound developed with visible bone exposure. Because the patient was not enrolled in BPJS/KIS and the family had financial limitations, definitive treatment was further delayed while obtaining KIS coverage. Approximately four months after the injury, the patient was admitted with osteomyelitis and severe elbow stiffness. Radiographic examination demonstrated a distal humeral fracture. Surgical management included urgent debridement, sequestrectomy, and primary wound closure, followed by additional surgical intervention for extensive tissue damage and joint dysfunction.

Clinical Discussion: This case demonstrates how administrative and socioeconomic barriers to healthcare access may contribute to substantial deterioration of treatable pediatric injuries. Delayed management transformed a fracture into a complex orthopedic and infectious condition requiring multiple surgical procedures.

Conclusion: Timely access to pediatric orthopedic care is essential to prevent avoidable complications. Streamlining insurance activation and improving healthcare accessibility for socioeconomically vulnerable patients may reduce treatment delays and improve clinical outcomes.

Keywords: fracture; healthcare access; pediatric; universal health coverage.

INTRODUCTION

Traumatic injuries have become increasingly widespread on a global scale, with road traffic accidents expected to rank as the third leading cause of global disease burden by 2030. The majority of these incidents occur in low- and middle-income countries (LMICs), where they impose

significant challenges in terms of fatalities, disabilities, and financial costs. Despite the disproportionate impact on LMICs, the existing body of trauma research predominantly originates from high-income countries (HICs), with studies from LMICs being comparatively scarce. [1,2] In Indonesia, delays in medical care for pediatric fractures frequently stem from significant bureaucratic hurdles and financial challenges linked to activating BPJS/Kartu Indonesia Sehat (KIS) health coverage. These issues often begin with the extensive and complex paperwork required to initiate the insurance process. Many families find themselves entangled in a web of administrative procedures that can take days or even weeks to navigate. This delay is critical as timely medical intervention is crucial for optimal recovery in pediatric fracture cases. Although BPJS/KIS is designed to provide health coverage for all Indonesian citizens, many families still struggle with the costs associated with initial treatment before insurance activation. This financial burden can delay the decision to seek medical care, as families may need to secure funds to cover the upfront costs, including transportation to medical facilities and the initial consultations and diagnostics. [3,4]

Elbow fractures are common in children and often necessitate surgical intervention. These fractures can lead to various complications, including neurovascular, ligamentous, and osseous issues, which may be easily overlooked due to the child's young age and the joint's cartilaginous structure. The elbow exhibits minimal bone remodeling, so displaced fractures, particularly supracondylar or lateral condyle fractures, require precise correction, especially in older children. Potential complications include superficial infections, nonunions, malunions, lateral condylar prominence, cubitus varus deformity, nerve damage, and osteonecrosis of the lateral humeral condyle. The timing of treatment for elbow fractures in children has been widely debated. Some experts recommend prompt surgical intervention, while research from high-income countries indicates that surgery can be safely postponed for 8 to 21 hours if there is no neurovascular compromise.[5,6] This case report highlights the clinical and systemic challenges in treating a neglected fracture in a five-year-old child, underscoring the critical need for enhanced healthcare accessibility within the framework of national health insurance. It illustrates both the medical complexities and the broader healthcare system issues that can arise when timely and adequate treatment is not available.

CASE PRESENTATION

A 5-year-old boy was referred from a previous hospital with right elbow pain that had persisted for 4 months following a fall while playing. The pain was intermittent, and an open wound with protruding bone at the elbow had developed approximately 1 month before presentation. His medical history included a hernia diagnosed at birth. There was no history of weight loss, chronic cough, shortness of breath, night sweats, or fever. The patient was in fair general condition, fully conscious, and alert. His vital signs were as follows: heart rate, 83 beats/min; respiratory rate, 18 breaths/min; temperature, 36.4°C; and visual analog scale (VAS) pain score, 4–5/10. Because the patient was not enrolled in BPJS/KIS and his family had financial constraints, formal medical treatment was postponed. The lengthy administrative process required to obtain KIS coverage contributed to a 4-month delay before hospital admission. Clinical examination of the right elbow revealed a chronic wound on the medial side, measuring 0.5x0.5 cm, with exposed bone and swelling (Figure 1). Tenderness was present, while distal neurovascular status remained intact. Range of motion was markedly restricted, with active elbow flexion-extension limited to 0°–45°.



Figure 1. Clinical examination of the right elbow showing the chronic wound with exposed bone

Plain radiography of the right elbow performed on February 21, 2024, demonstrated a chip fracture of the distal humerus (Figure 2). Based on the clinical and radiographic findings, the patient was diagnosed with osteomyelitis of the right distal humerus secondary to a neglected open chip fracture of the distal humerus, accompanied by joint stiffness.

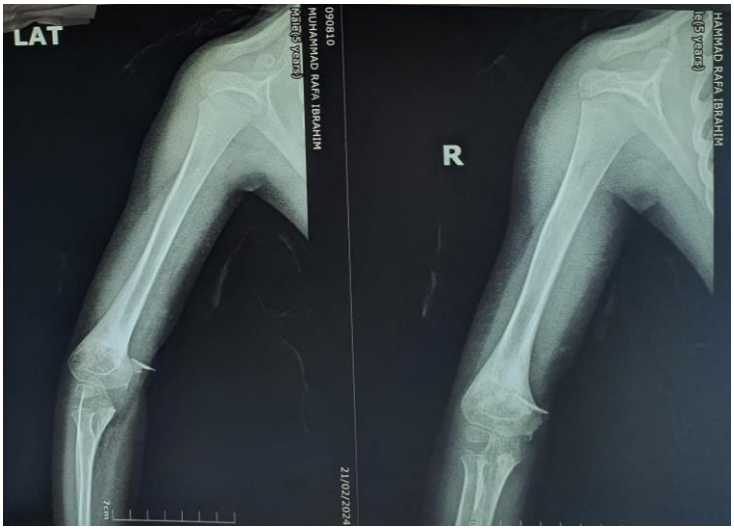


Figure 2. Preoperative plain radiograph of the right elbow

Surgical management included urgent debridement, sequestrectomy, and primary wound closure, followed by further surgical intervention to address the extensive tissue damage and joint stiffness. The postoperative clinical appearance and radiographic findings are presented in Figures 3 and 4, respectively.



Figure 3. Postoperative clinical appearance of the right elbow

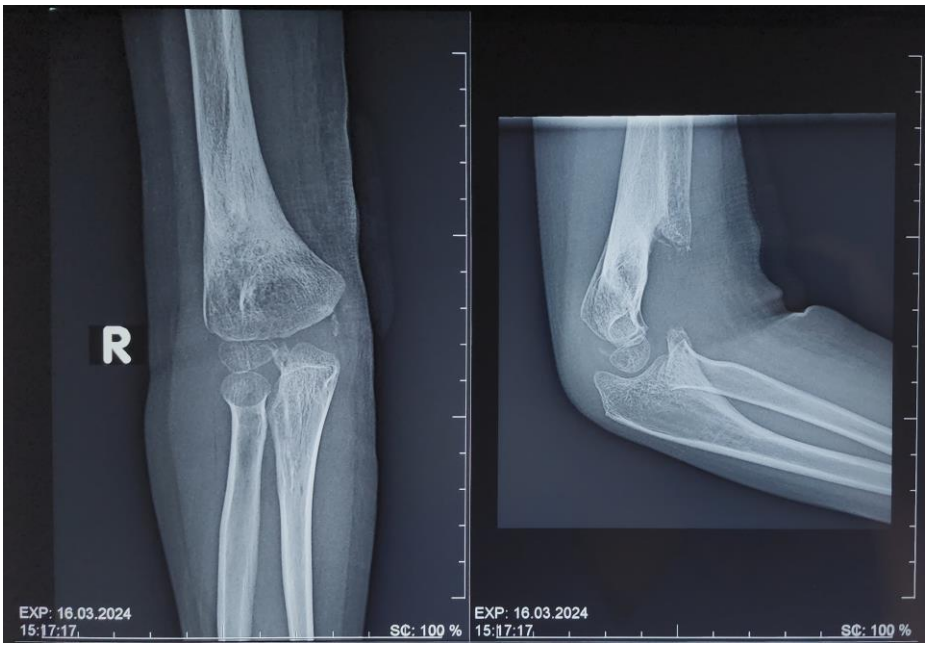


Figure 4. Postoperative plain radiograph of the right elbow

CLINICAL DISCUSSION

Most countries implementing universal health coverage (UHC) initially prioritize economically disadvantaged populations and subsequently expand coverage with the aim of ensuring access to healthcare services without financial hardship. The development of UHC commonly occurs alongside substantial social, economic, and political changes. In Indonesia, the transition toward UHC has been influenced by political developments, local policy experimentation, compromise, and changing socioeconomic priorities. Access to

healthcare coverage has also expanded progressively as different population groups have gained greater sociopolitical recognition.[7] A multivariate analysis of data from approximately 1.1 million individuals included in the 2015 National Socioeconomic Survey demonstrated that participation in the National Health Insurance System (NHIS) was associated with increased utilization of inpatient care. Similarly, an analysis using data from the Indonesian Family Life Survey comparing inpatient utilization in public and private hospitals among NHIS members and non-members showed that NHIS membership improved equity in access to inpatient services. [8,9]

Evidence also suggests that access to higher-quality healthcare has improved following the implementation of the NHIS. A study conducted in the neurology ward of Dr. Cipto Mangunkusumo General Hospital in Jakarta reported that the case-fatality rate for stroke, previously ranging from 20% to 30%, decreased to approximately 15% following implementation of the NHIS. This finding suggests that the NHIS may have facilitated more timely access to advanced medical care, particularly among patients from lower-middle- and upper-middle-income groups. In addition, both the absence of health insurance and concerns regarding treatment-related costs among insured individuals have been associated with delays in seeking emergency care for acute myocardial infarction. These findings emphasize the substantial influence of financial barriers on timely access to emergency medical services and highlight the importance of comprehensive health coverage and strategies to minimize financial concerns during medical emergencies.[7]

Presidential Regulation No. 82 of 2018 regulates the implementation of health insurance administered by the Badan Penyelenggara Jaminan Sosial (BPJS). Under the applicable provisions, newly registered participants may not always be able to access insurance benefits immediately after enrollment. Consequently, healthcare expenses incurred before coverage becomes active may remain the responsibility of the patient.[10] In the present case, the patient's lack of BPJS/KIS enrollment, combined with the family's financial limitations, contributed to delayed access to formal medical treatment. The administrative process required to obtain KIS coverage further prolonged the interval before hospital admission, resulting in an approximately four-month delay.

These findings are consistent with previous retrospective studies showing that timely hospital admission may be difficult to achieve in low- and middle-income countries, particularly among patients with open fractures. Reducing delays in hospital care, including through improvements in interfacility referral systems, may therefore represent an important strategy for facilitating earlier definitive treatment. In one study, interfacility referral accounted for 3,755 (47.7%) of 7,875 delayed cases, while so-called third delays, comprising interfacility referral and delays within the emergency department, occurred in 3,974 cases (50.5%).[11] Another retrospective study demonstrated that patients covered by government-funded insurance experienced significantly longer delays in accessing orthopedic care than patients with commercial insurance ($P < 0.001$). Both the interval from injury to referral and the overall interval from injury to orthopedic evaluation were substantially longer among patients with government-funded insurance. The study also reported a strong association between household income and type of insurance coverage.[12]

Clinical studies have consistently emphasized the adverse consequences of delayed treatment for various fractures. Factors such as delayed diagnosis, prolonged transportation, difficulties in referral, and insurance-related barriers may contribute to delayed management of pediatric fractures, particularly in resource-limited settings. [13,14] A study described several potential complications associated

with delayed treatment of displaced lateral humeral condyle fractures, including avascular necrosis, infection, joint stiffness, and growth disturbances. The authors also suggested that using a 24-hour interval as a practical threshold for early emergency surgery may have clinical relevance.[15]

Previous studies have reported major complications in approximately 22% of patients treated for neglected lateral humeral condyle fractures, with complication rates ranging from 0% to 64% across different studies. These rates are substantially higher than those generally observed in acute fractures.[14] Chronic osteomyelitis may develop following inadequately treated acute osteomyelitis in children or may occur secondary to trauma, particularly in association with open fractures. Trauma is an important risk factor for osteomyelitis because disruption of the soft-tissue envelope and direct exposure of bone increase the risk of bacterial contamination. The pathophysiology of post-traumatic osteomyelitis varies according to the affected bone, characteristics and severity of the initial injury, microbial contamination, and host-related factors.[16] Clinical manifestations commonly include localized tenderness, swelling, increased warmth, pain during movement, and drainage from the affected area.[17] Access to modern medical care remains limited in some rural regions of Indonesia, where socioeconomic barriers, limited health literacy, and delayed recognition of musculoskeletal conditions may contribute to postponement of appropriate orthopedic treatment. This case adds to the literature on chronic post-traumatic osteomyelitis associated with a neglected open fracture and exposed bone and illustrates the potential consequences of delayed recognition and treatment of orthopedic injuries.[18]

The present case highlights important barriers to timely healthcare access within the Indonesian UHC system, particularly for pediatric patients from socioeconomically disadvantaged families. Delays associated with health insurance enrollment and administrative procedures may contribute to deterioration of otherwise treatable conditions, as illustrated by the progression of an initially manageable fracture to chronic osteomyelitis, severe joint stiffness, and the need for multiple surgical interventions. Although the clinical outcome of a single case cannot establish a direct causal relationship between insurance procedures and disease progression, it demonstrates how financial and administrative barriers may interact with delayed presentation and referral. Simplifying administrative procedures, facilitating timely access to emergency orthopedic care, and strengthening referral pathways may help reduce preventable complications among vulnerable pediatric populations.

CONCLUSION

Timely access to healthcare remains an important challenge for pediatric orthopedic emergencies, particularly among patients facing financial and administrative barriers to BPJS/KIS coverage. This case demonstrates how delayed treatment of an initially manageable fracture may contribute to severe complications, including chronic infection and joint dysfunction. Streamlining health insurance enrollment and activation, improving referral pathways, and strengthening access to emergency orthopedic services may reduce treatment delays and prevent avoidable complications. Greater attention to socioeconomic barriers is also necessary to promote equitable and timely healthcare access for vulnerable populations, particularly children requiring urgent orthopedic management.

Declaration by Authors

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