

Case Report
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A Case Report of Severe Clavicle Fracture and Shoulder Dislocation Resulting in Complete Arm Detachment Following Occupational Accident

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Abstract

Clavicle fractures are common injuries typically caused by direct shoulder pressure from falls, vehicular accidents, or during childbirth. They present with symptoms such as severe pain, swelling, bruising, and limited shoulder movement, and are diagnosed through physical examination and imaging techniques like X-rays, CT scans, or MRI. Surgical intervention, including open reduction and internal fixation (ORIF), is often necessary to stabilize the fracture. This case report describes a rare instance of a clavicle fracture leading to a full arm severance in a 45-year-old male following an industrial accident. The patient presented with severe trauma and was managed through emergency surgical intervention and multidisciplinary care. This report highlights the importance of thorough evaluation and collaboration in managing complex orthopedic injuries, emphasizing the need for effective workplace safety protocols to prevent such incidents.

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Introduction

Clavicle fractures, involving a break in the collarbone, are prevalent injuries in the shoulder region, accounting for about 5% of adult fracture cases. Typically caused by direct pressure to the shoulder, such as from falls or vehicular accidents, these fractures can also occur during childbirth. They are characterized by severe pain and restricted arm movement [1]. Additionally, in occupational settings, clavicle fractures can result from workplace accidents, such as falls from heights, collisions with heavy machinery, or impacts during manual handling tasks. These injuries underscore the importance of workplace safety protocols and ergonomic practices to mitigate the risk of musculoskeletal trauma [2].

Common signs of clavicle fractures include pain, swelling, bruising, inability to lift the shoulder, crepitus sensation upon shoulder movement, and deformity. Diagnosis is usually made through physical examination and X-rays, with additional imaging like CT scans or MRI sometimes necessary [3]. Orthopedic specialists often employ a comprehensive approach to diagnosis, considering the patient's medical history, mechanism of injury, and clinical presentation to determine the extent of the fracture and the most appropriate course of treatment. Moreover, advanced imaging techniques such as ultrasound may also aid in diagnosing clavicle fractures [4].

Surgical intervention is often required to realign and stabilize the fractured bone, with plates or screws used for fixation. The decision to proceed with surgery depends on various factors, including the severity of the fracture, the patient's age and activity level, and the presence of associated injuries [5]. Open reduction and internal fixation (ORIF) is a common surgical technique used to repair clavicle fractures, involving the repositioning of the fractured bone

fragments followed by the placement of hardware to maintain alignment and promote healing. In some cases, minimally invasive procedures such as percutaneous fixation may be considered, offering reduced surgical trauma and quicker recovery times [6].

This case report aims to document a rare occurrence of a clavicle fracture resulting in a full arm break. By detailing the diagnostic process, surgical intervention, postoperative care, and long-term prognosis of the patient, this report adds valuable insights to the existing literature and informs clinical practice in managing such cases. Furthermore, it underscores the importance of thorough evaluation and multidisciplinary collaboration in treating orthopedic injuries. Through the dissemination of case reports and clinical findings, healthcare providers can enhance their understanding of rare complications and refine treatment strategies to optimize patient outcomes.

Case History

A 45-year-old man presented to the emergency department with his right arm severed and profuse bleeding from his right shoulder following an industrial accident. Upon arrival, patient was fully conscious and reported a pain level of 10 on numeric rating scale (NRS) in his right shoulder. The incident occurred abruptly while patient was engaged in work at a heavy machinery company.

Upon initial examination in the emergency department, it was found that patient's right arm had been severed, and his condition was critical. His vital signs indicated a blood pressure of 90/60 mmHg, heart rate of 120 beats per minute, temperature of 38.5°C, and respiratory rate of 25 breaths per minute. His oxygen saturation level was 92% on room air. Physical examination revealed extensive soft tissue trauma and exposed bone in the right upper

arm, with profuse bleeding. The medical team promptly took initial measures to stabilize the patient. Given the severity of the injury, a multidisciplinary approach involving orthopedic surgeons, anesthesiologists, and surgical nurses was essential.

Immediate emergency actions were taken, including debridement and wound re-suturing procedures. It was crucial to ensure Patient's condition remained stable in preparation for urgent surgery. With swift coordination, the medical team devised a comprehensive surgical plan considering all aspects of the complex injury. The patient underwent open reduction and internal fixation (ORIF) of the right arm under the leadership of orthopedic surgeons. Anesthesiologists ensured patient remained stable throughout the operation. Surgical nurses and circulators assisted in the surgical procedure, ensuring necessary tools were available and sterilized.

Throughout this process, the medical team faced several challenges, including pain management, handling severe injuries, and navigating postoperative recovery. However, with excellent coordination and teamwork, the operation proceeded smoothly. Following the surgery, patient was transferred to the intensive care unit for further monitoring and postoperative care. Continuous assessments were conducted to ensure his condition remained stable and to identify any potential complications.

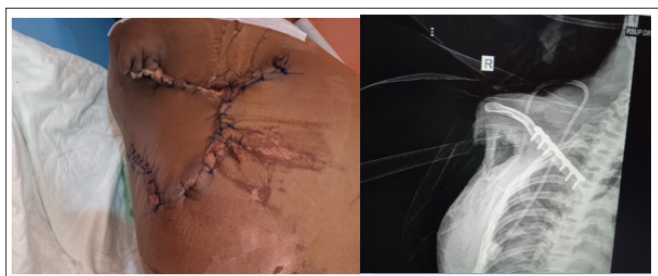


Figure 1: Visual Assessment Post-ORIF Procedure: Surgical Wound Site Post-ORIF Procedure and Chest X-ray Post-ORIF Procedure

Discussion

This case was diagnosed as right shoulder trauma with a closed clavicle fracture, a rare injury often associated with high-energy incidents such as falls, automobile accidents, machine accidents, or physical attacks [7]. High-energy injuries typically require specialized care, often necessitating referral to tertiary hospitals, where up to 20% of patients may also require attention for thoracic or abdominal injuries [8]. Diagnostic tools, including chest X-rays and focused assessment with sonography for trauma (FAST), were employed to evaluate for potential thoracic and abdominal injuries, given the high sensitivity of these tools in detecting internal trauma [9].

The multidisciplinary approach was essential in managing this complex injury. The orthopedic team's decision to perform an open reduction and internal fixation (ORIF) of the right shoulder was critical in stabilizing the fracture and facilitating the potential reattachment of the arm. The patient underwent debridement and wound re-suturing to manage soft tissue damage and control infection risk. The insertion of a lag screw in the right clavicle area was a key aspect of the surgical intervention, aiming to secure the fracture and promote proper alignment and healing. Postoperative imaging, including X-rays, confirmed the correct placement of the screw and assessed the integrity of the surgical repair.

Anesthesiologists played a vital role in maintaining the patient's hemodynamic stability throughout the procedure, managing

anesthesia, and closely monitoring vital signs. The involvement of surgical nurses and circulators ensured that the surgical process was smooth, with all necessary tools prepared and sterilized. The ICU team's role in postoperative care was equally crucial, involving continuous monitoring for potential complications such as infection, hemorrhage, or issues with the surgical site. Pain management was a significant challenge, requiring a delicate balance between effective pain relief and the need to monitor the patient's neurological and respiratory status.

This case highlights the complexities and challenges of managing severe traumatic injuries, particularly those involving high-energy mechanisms. It underscores the importance of rapid and accurate assessment in emergency settings, the necessity of a coordinated multidisciplinary approach, and the value of advanced surgical techniques in improving patient outcomes. Moreover, the case illustrates the critical need for robust safety measures in industrial environments to prevent such catastrophic injuries.

Conclusion

The management of this case required swift, decisive action and seamless coordination among various medical professionals. The successful stabilization and treatment of the patient reflect the effectiveness of modern trauma care protocols and the critical importance of interdisciplinary collaboration in managing complex, high-energy injuries. This case also serves as a poignant reminder of the risks associated with industrial environments and the need for robust safety measures to prevent such devastating injuries [10].

Consent

Informed consent was signed by patient for publication of the case report and image approval from the patient.

Data Availability Statement

All Data was analyzed during this study

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