

ACTA SCIENTIFIC MEDICAL SCIENCES (ISSN: 2582-0931)

Volume 9 Issue 7 July 2025

Emergency Management of Soft Tissue Injury in Forearm Compartment Syndrome - A Case Study

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Abstract

In this case, a 46-year-old man suffered a high-energy trauma and arrived at the hospital two hours after the injury. He had severe swelling in his left cubital area, numbness in the areas supplied by the median nerve, and no detectable radial or ulnar pulse. X-rays revealed a Monteggia fracture-dislocation (BADO type IV). Recognizing the urgency, we immediately took him to the operating room for surgical decompression. A fasciotomy was performed on the distal brachial region and forearm, successfully restoring blood flow. Given the significant swelling, we left the wound open and used a stepwise closure approach. Three adaptive sutures with wires and two Nelaton catheters were placed to allow slow, atraumatic wound approximation. An external fixator was applied to stabilize the fracture temporarily. The wound was kept moist with daily saline dressings, and over the course of 15 days, the sutures were gradually tightened until complete closure was achieved.

Keywords: UTIs; Pregnancy; Postpartum Period

Introduction

Compartment syndrome represents a critical medical urgency, distinguished by elevated pressure within an enclosed anatomical region that leads to disturbance in normal blood circulation and tissue perfusion and nerve conduction impairment. If not treated it can be life threatening.

Case Presentation

46-year-old male patient is admitted to the "Heart and Brain Hospital", Pleven, Bulgaria, few hours after having had an incident of a log falling his hand during work and suffering a fracture.

- **Symptoms:** Severe pain on the left forearm region due to the compartment syndrome after a high trauma Monteggia fracture graded BADO 4.
- **Past Medical History:** Otherwise healthy and an active male.
- Showed excessive swelling and absence of radial and ulnar pulses.
- Hemocultures negative
- **X-Ray:** Showed clear signs of BADO 4 Monteggia fracture as given below in the pictures.

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Treatment

- External fixation was done to temporarily reduce the fracture
 26/12/2022
- External fixation removal performed 24/03/2023
- ORIF with LC-DCP 04/05/2023
- Saline solution were used for daily dressing to provide moisture.
- Decompression was done with distal brachial and forearm fasciotomy.





Discussion

Compartment syndrome is a surgical emergency that demands quick action to save both the function and viability of a limb. In this case, the patient's severe swelling, numbness in the hand, and absent pulses signaled a dangerous loss of circulation. Given the high-energy nature of the injury and the presence of a Monteggia fracture-dislocation, there was no time to waste; immediate surgical decompression was the only way to prevent permanent damage.

Performing a fasciotomy relieved the pressure and restored blood flow, but the challenge did not end there. Leaving the wound open was necessary to allow the swelling to subside, but closing it safely without causing further damage required a careful, staged approach. Using adaptive sutures and Nelaton catheters allowed us to bring the wound edges together slowly and gently over time, reducing the risk of complications. Regular saline dressings helped keep the tissues healthy, and after 15 days, the wound was fully closed without infection or breakdown.

Since the fracture was managed few weeks later, the movement had to be compromised a bit. However, considering the situation of risk vs benefit a little of compromise over the movement is much better than have a situation of no very limited to no movement situation.

This case highlights the importance of not only acting fast in compartment syndrome but also thinking ahead about wound healing and long-term function. It is not just about performing a fasciotomy, it's about making sure the patient recovers with the

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best possible outcome. A well-coordinated approach between surgical intervention and careful wound management makes all the difference in preserving both limb function and quality of life.

Conclusion

Emergency decompression is crucial for preserving a vital and functional limb. Wound closure is challenging and has to be done with patience and precision. We should consider that we are not only closing the wound but also managing a potential infection.

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