Osteitis of the elbow: a case report

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ABSTRACT

Background: Osteomyelitis of the elbow is a rare but potentially serious inflammatory condition affecting the elbow joint. The condition is characterized by infection of the bone and surrounding tissue, usually caused by pathogenic bacteria. Although less frequent than osteomyelitis seen in other parts of the body, such as the hips or knees, elbow osteomyelitis requires special attention due to its complex localization and the diagnostic challenges it presents.

Case Presentation: We will discuss the case of a 46-year-old patient who presented with an osteosynthesis-treated olecranon fracture and poor follow-up, who subsequently presented to the emergency department with osteomyelitis of the elbow.

Conclusion: Elbow osteomyelitis is a complex and potentially devastating condition requiring a multidisciplinary clinical approach and early management. In light of the case study presented and the review of existing literature, several important conclusions can be drawn to improve the management of this condition.

Keywords: Elbow osteomyelitis, osteomyelitis, soft tissue infection, elbow surgery, elbow prosthesis.

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Background

Elbow osteomyelitis is a rare but potentially serious inflammatory condition affecting the elbow joint. It is an infection of the bone and surrounding tissue, usually caused by pathogenic bacteria. Although less common than osteomyelitis seen in other parts of the body, elbow osteomyelitis requires special attention due to its complex localization and the diagnostic challenges it presents.

Understanding elbow osteomyelitis is of major clinical importance because of its impact on patients' quality of life, as well as the potentially devastating consequences if not treated correctly and in a timely manner.

In this review, we aim to provide a comprehensive overview of elbow osteomyelitis, examining its epidemiology, etiology, pathogenic mechanisms, clinical manifestations, and current diagnostic methods.

Case Presentation

The patient was 46 years old, a chronic smoker (19 packs/year), with a history of olecranon fracture in 1999, treated by staple fixation, then lost to follow-up. In May 2022, the patient presented with osteomyelitis of the elbow, with exposure to the material and bone. He underwent the removal of the hardware and trimming. The evolution was marked by superinfection of the bone with exposure to the olecranon and pus, which motivated his consultation at the emergency department of CHU IBN SINA. Exposed bone with pus and pain on palpation of the posterior elbow joint. Deficit in extension and flexion of the left elbow joint in relation to the contralateral side, and no sensory deficit. Distal pulses were present and symmetrical.

Biological tests

C-reactive protein (CRP) = 94 mg/l
SV = 31 mm at first hour
Procalcitonin: 0.74 ng/ml
Clinical images + radiologies : check Figures 1 and 2.

Treatment administered and patient follow-up

Using a Trans tricipital posterior longitudinal approach, and after dissection of the ulnar nerve, which was spread laterally, the patient underwent trimming with removal of the olecranon process and fossa (Figures 3 and 4). The patient received intravenous antibiotic treatment with ciprofloxacin and amoxicillin & clav ac for 3 weeks. The bone sample was sent for anatomopathological study, and a pus sample was taken for cytobacteriological study:

Figure 1. *Preoperative clinical image.*

Figure 2. *X-ray of the elbow before surgery, front and side views.*

Figure 3. *Per operative clinical image.*

Cytobacteriological examination of pus: direct examination negative, culture negative (note that the patient had been taking amoxicillin & clavulanate acid without a prescription).

Pathological examination: Several fragments communicated, the largest measuring 8 × 2 × 0.4 cm. Histologically, it is a:

- Pseudoepitheliomatous hyperplasia with non-specific chronic inflammatory changes.
- Absence of histological signs of malignancy.

Results and Evolution of the Case

Postoperative management was straightforward.

- A control CRP + Sedimentation Rate assay was performed:

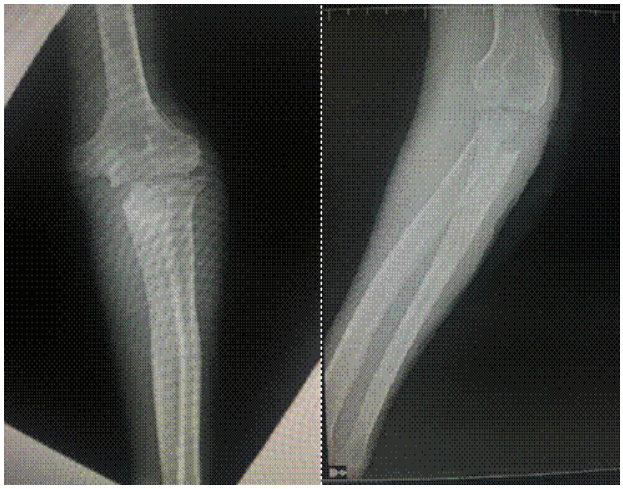

Figure 4. *X-ray of the postoperative elbow, front and side views.*

Day 10: CRP = 25 mg/l, SV = 21 mm at first hour Day 25: CRP = 7 mg/l, SV = 14 mm at first hour The skin healed well 20 days later.

After 2 months, the patient still has a deficit in elbow extension and flexion. He no longer has a purulent discharge. The patient is scheduled for elbow prothesis.

Discussion

Epidemiological data on the overall prevalence of elbow osteomyelitis are limited, partly due to its rarity. However, retrospective studies and case reports have been published in the medical literature. Elbow osteomyelitis accounts for around 2%-10% of all bone osteomyelitis, with rates varying slightly according to the populations studied. Elbow osteomyelitis is often distributed differently across different age groups. In children, elbow osteomyelitis is more common in boys than in girls [1]. In adults, on the other hand, incidence tends to be more balanced between the sexes [2]. Several risk factors have been identified as being associated with elbow osteomyelitis. These include repeated trauma to the elbow, sports injuries, skin infections, and previous elbow surgery. Underlying medical conditions such as diabetes, immunosuppression, and autoimmune diseases can also increase susceptibility to this pathology. Studies have shown that elbow osteomyelitis is more common in industrialized countries, where access to medical care is easier and sports-related elbow trauma may be more frequent [2].

Diagnostic methods for elbow osteomyelitis may include a combination of clinical examinations, medical imaging, and laboratory tests. Here are the main diagnostic methods used to identify elbow osteomyelitis.

Anamnesis and clinical examination

The doctor will usually begin by taking a history of the patient, including an assessment of medical and surgical history, presenting symptoms, and associated risk factors. A thorough physical examination of the elbow will also be performed to look for signs of inflammation, swelling, pressure sensitivity, and limitation of movement.

Laboratory analysis

Laboratory tests can be performed to detect signs of infection and inflammation in the body. Common blood tests include complete blood count, sedimentation rate, CRP and inflammatory markers such as fibrinogen. These analyses can help confirm the presence of a systemic inflammatory reaction, which is common in cases of elbow osteomyelitis [3].

Bacterial cultures

Bacterial culture is essential to identify the specific pathogen responsible for the infection. To do this, a sample of pus or joint fluid is taken with a needle and sent to the laboratory for analysis. This will determine the bacterial species involved and its sensitivity to antibiotics, which is crucial in guiding the choice of antibiotic treatment [3].

X-rays

X-rays of the elbow can be taken to assess bone changes associated with osteomyelitis, such as bone destruction, osteolysis, and intraosseous abscess formation. However, radiographs may not reveal significant changes in the early stages of infection [4].

Magnetic resonance imaging (MRI)

MRI is an advanced imaging technique that enables detailed visualization of the soft and bone tissues of the elbow. MRI is particularly useful for detecting early changes in bone and periarticular tissues, making it a diagnostic tool of choice for osteomyelitis of the elbow [4].

Computed tomography (CT)

CT can also be used to assess bone changes and the presence of intraosseous abscesses. Although less sensitive than MRI for detecting soft-tissue abnormalities, CT is often used when MRI is not available or when MRI is contraindicated [4].

Treatment of elbow osteomyelitis aims to eradicate the infection, relieve pain, prevent complications, and restore joint function. Management of this condition can be complex and requires a multidisciplinary approach involving orthopedists, infectiologists, and physical medicine and rehabilitation specialists. Here are the main treatment options available and current approaches to elbow osteomyelitis.

Antibiotic treatment

Antibiotics are the cornerstone of treatment for elbow osteomyelitis. Once bacterial cultures have identified the specific pathogen and its sensitivity to antibiotics, an appropriate antibiotic regimen is prescribed. Antibiotic treatment may last from several weeks to several months, depending on the severity of the infection and the patient's response. Close monitoring is essential to ensure treatment efficacy and resolution of the infection [5].

Surgical drainage

In some cases, particularly where intraosseous or periarticular abscesses are present, surgical drainage may be necessary. This procedure removes pus and infected tissue, helping to reduce the bacterial load and promote faster healing. Surgical drainage is often performed in conjunction with antibiotic treatment [5].

Intravenous infusion therapy

In cases of severe elbow osteomyelitis or systemic infections, intravenous infusion therapy may be recommended to deliver potent antibiotics directly into the circulatory system, allowing more effective diffusion of drugs throughout the body [5].

Supportive care and physical therapy

Supportive care, such as immobilizing the elbow with a splint or brace, may be necessary to relieve pain and

protect the joint during the healing phase. Once the infection is under control, physical therapy is often recommended to restore mobility and strength to the elbow joint, helping the patient to regain normal joint function. Regular follow-up: Regular patient follow-up is essential to monitor treatment progress, evaluate antibiotic efficacy, and detect any signs of relapse or complications.

Conclusion

Elbow osteomyelitis is a complex and potentially devastating pathology requiring a multidisciplinary clinical approach and early management.

Early and accurate diagnosis of elbow osteomyelitis is essential to avoid serious complications and ensure optimal recovery for patients. Careful selection of antibiotics based on bacterial cultures and close monitoring of treatment response are crucial to eradicating infection and preventing antibiotic resistance. Combined treatment approaches, such as the use of intravenous antibiotic therapy and surgical drainage, can improve therapeutic outcomes, especially in patients with severe elbow osteomyelitis.

In short, the management of elbow osteomyelitis represents a complex clinical challenge, but by integrating current knowledge, adopting a multidisciplinary approach and investing in research and innovation, we are able to make progress toward more effective treatments, improved prevention, and optimal care for patients with this condition.

What is new?

This article provides information about the management of a neglected complicated elbow osteomyelitis by the patient. This is a rare case as the patient is from a rural region that does not allow for proper multidisciplinary care and arrived late, which further complicated the management.

Conflicts of interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

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Consent for publication

Written consent was obtained from the patient.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

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Summary of the case

1	**Patient (gender, age)**	Male, 46-year-old
2	**Final diagnosis**	Elbow osteitis
3	**Symptoms**	Exposed bone with pus and pain + deficit in extension and flexion of the left elbow
4	**Clinical procedure**	Using a trans tricipital posterior longitudinal approach, and after dissection of the ulnar and radial nerves, which were spread laterally, the patient underwent trimming with removal of the olecranon process and fossa. The bone sample was sent for anatomopathological study, and a pus sample was taken for cytobacteriological study
5	**Specialty**	Traumatology and orthopedic