

## Delayed Diagnosis of Osteosarcoma in an Adolescent: A Case Report

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### Abstract

**Background:** Osteosarcoma is the most common primary malignant bone tumor in adolescents. Early recognition and intervention are essential to improving outcomes and preserving function. Misdiagnosis or delayed diagnosis is common in resource-limited settings due to nonspecific early symptoms and limited access to diagnostic tools.

**Case Presentation:** A 16-year-old girl presented to an orthopedic clinic with a history of left shoulder pain and swelling following a fall. She was initially diagnosed with a closed proximal humeral fracture and managed conservatively. Further history revealed a prior, slowly progressive swelling and nocturnal pain for several months, managed empirically with antibiotics and analgesics at multiple primary care facilities. On examination, she was pale and had a firm, tender, warm swelling with prominent superficial veins. Radiographs revealed a destructive lesion with a sunburst periosteal reaction and a pathological fracture, consistent with osteosarcoma. Biopsy confirmed the diagnosis. The patient underwent limb disarticulation and was referred for chemotherapy.

**Conclusion:** This case highlights the consequences of delayed diagnosis of bone tumors in low-resource settings. Persistent limb swelling and pain, especially in adolescents, should raise suspicion for malignancy. Early imaging and specialist referral are crucial for timely diagnosis and management.

**Keywords:** Osteosarcoma; Bone tumor; Adolescents; Delayed diagnosis; Pathological fracture; Limb disarticulation

### 1. Introduction

Osteosarcoma is the most common primary malignant bone tumor in children and adolescents, with peak incidence during the second decade of life. It commonly affects the metaphyseal regions of long bones, especially around the knee and proximal humerus [1]. Despite advances in treatment, prognosis depends significantly on the timing of diagnosis and initiation of therapy. In many developing regions, delayed diagnosis due to limited healthcare access, lack of clinical suspicion, and socio-cultural beliefs remains a challenge [2]. We report a case of delayed diagnosis of osteosarcoma in a 16-year-old girl, which led to advanced disease requiring limb disarticulation.

### 2. Case Presentation

A 16-year-old female presented to the orthopedic clinic in May 2018 with pain and swelling in the left upper arm following a fall during dance practice one month prior. Initial evaluation by an intern revealed a closed fracture of the proximal humerus, and the limb was immobilized with a triangular bandage. She was prescribed analgesics and scheduled for follow-up in three weeks.

Further enquiry revealed that the patient had been experiencing a slowly growing, painful swelling on the left shoulder for several months before the fall. The pain was worse at night and progressively limited her activities. She had visited

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several primary healthcare facilities, where she was treated with analgesics and antibiotics without improvement. Due to persistent symptoms, she later sought help from a spiritual healer.

At presentation to our facility, she appeared pale and reported easy fatigability and palpitations. Physical examination revealed a firm, tender, warm swelling extending from the mid-arm to the shoulder, with visibly distended superficial veins. There was no fluctuation, and shoulder joint motion was severely restricted.

Radiographic evaluation (Figure 1a) demonstrated a permeative pattern of bone destruction in the proximal humerus, a pathological fracture, and a "sunburst" periosteal reaction with new bone formation extending into the soft tissue—radiographic hallmarks of osteosarcoma.



**Figure 1a** X-ray of the left humerus displaying a sunburst periosteal reaction

The clinical and radiologic findings were highly suggestive of an advanced bone tumor. The patient and her family were counseled on the suspected diagnosis, and after extensive discussion involving social workers and spiritual leaders, consent was obtained for open biopsy and limb disarticulation. The biopsy specimen was sent to the national referral hospital and confirmed high-grade osteosarcoma three weeks later.

She was referred to Ocean Road Cancer Institute for initiation of chemotherapy. One month later, she returned to express gratitude and reported being on chemotherapy with improved systemic symptoms. No formal treatment feedback was received from the oncology center.

This case was presented at a grand clinical meeting to raise awareness about early signs of bone tumors among clinicians, nurses, support staff, and medical students.

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### 3. Discussion

Osteosarcoma often presents with insidious pain, swelling, and occasional joint limitation, which may mimic benign conditions or trauma. Delayed diagnosis is common, particularly in low-resource settings, due to limited diagnostic resources, inadequate training at primary healthcare levels, and cultural barriers to seeking specialized care [3].

In this case, repeated visits to primary facilities resulted in empirical treatment without imaging. The pathological fracture following minimal trauma further delayed accurate diagnosis, initially misleading clinicians toward a traumatic etiology.

Radiographic features such as the sunburst periosteal reaction and permeative bone destruction are characteristic of aggressive bone tumors like osteosarcoma [4]. Unfortunately, by the time these features appear, the disease is often advanced.

Standard treatment for osteosarcoma includes neoadjuvant chemotherapy, surgical resection (ideally limb-sparing), followed by adjuvant chemotherapy. However, in cases with extensive soft tissue involvement or limited local resources, amputation or disarticulation may be necessary [5].

This case underscores the need for greater awareness and education about early tumor signs. A high index of suspicion, particularly for persistent or atypical limb pain and swelling in adolescents, is critical. Early referral to orthopedic and oncology specialists and appropriate imaging can significantly improve outcomes.

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#### **4. Conclusion**

This case illustrates the tragic consequences of delayed diagnosis of osteosarcoma. It emphasizes the importance of early imaging and referral in cases of persistent limb swelling or unexplained pain in adolescents. Strengthening clinical awareness, health education, and diagnostic capabilities at primary care levels is vital for early detection and improved outcomes in bone tumors.

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#### **Compliance with ethical standards**

##### *Disclosure of conflict of interest*

The authors declare no conflicts of interest.

##### *Statement of ethical approval*

Ethical approval was sought from the hospital ethical review board.

##### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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#### **References**

- [1] Mirabello L, Troisi RJ, Savage SA. International osteosarcoma incidence patterns in children and adolescents, middle ages and elderly persons. *Int J Cancer*. 2009;125(1):229–234.
- [2] Widhe B, Widhe T. Initial symptoms and clinical features in osteosarcoma and Ewing sarcoma. *J Bone Joint Surg Am*. 2000;82(5):667–674.
- [3] Elledge R, Aboulaflia A. Osteosarcoma: The challenges of diagnosis and management in low-resource settings. *Clin Orthop Relat Res*. 2018;476(10):1972–1979.
- [4] Musculoskeletal Tumor Society. Imaging characteristics of primary bone tumors. *Clin Orthop Relat Res*. 2003;415(Suppl):S68–S75.
- [5] Bielack SS, Kempf-Bielack B, Delling G, et al. Prognostic factors in high-grade osteosarcoma of the extremities or trunk: An analysis of 1,702 patients treated on neoadjuvant cooperative osteosarcoma study group protocols. *J Clin Oncol*. 2002;20(3):776–790.