



Osteosarcoma of the Right Proximal Tibia: A Case Report

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Osteosarcoma occurs mostly in adolescence, this being the primary bone tumor (malignant) formed by the production of immature bone. Immature bone cell's production occurs from the premature bone cells. The commonly used treatments form is lesions removal. Chemotherapy is also used to treat metastasis of the osteoid cells (cancerous). Sometimes the micro metastasis can't be diagnosed in time to can be cured with neoadjuvant chemotherapy. Pulmonary metastatic disease is the most common complication of the osteosarcoma (musculoskeletal cancer). I have presented a case of osteosarcoma of right proximal tibia in an 18 year old boy who come to the hospital for swelling and pain which were increasing during walking. Before that he hadn't any complaints in his knees. Magnetic resonance imaging was done by which the diagnosis was confirmed. After that, tumor resection was performed and post-operative chemotherapy was administered. The case report states that the adolescents age group should be properly monitored because they have the highest risk of suspicion by premature bone growth of osteoid.

Keywords: *Osteosarcoma; tibia; chemotherapy; cancerous tumor.*

1. INTRODUCTION

Osteosarcoma are uncommon malignant bone tumors, which can develop with the formation of immature bone or osteoid. The incidence has bimodal distribution, this tumor can appear in adolescence and in elderly people. Osteosarcoma accounts for about three percent of total childhood cancer in children [1-4]. The peak incidence is during the growth spurt of adolescence. Osteosarcoma is frequently seen as secondary neoplasm in adults. Paget's disease and/or any other cancer can cause osteosarcoma. In adults, multiple risk factors of osteosarcoma such as Paget's disease, genetic disorders, benign bone tumors and previous radiation or chemotherapy are known [5,6]. The patients with osteosarcoma have the most of complaints regarding lesions, restrained joints and other movements; palpable mass including regional pain are observed as physical findings. I am presenting a case of swollen knee pain that emerged as osteosarcoma of high degree.

An 18 year old male was come to our hospital with complaints of mild knee pain on right leg and swelling in the last 5 months. He did not suffer any pain before this. Patient has not any history of weight loss, fever and an accidental injury or trauma. On examination painful swelling on proximal end of tibia was noted; it was warm, tender on palpation [7-9]. The symptoms such as palpable mass and pain increasing on walking were present. He did not have any medical history. The weight was 43 kg, the height was 155 cm and BMI 17. 89 kg per meter square. No any significant history of malignancy was observed. The vital signs for observe within normal limits. The level of serum alkaline phosphate was not increased and the level of lactate dehydrogenase, Potassium Chloride and albumin were within normal range. Function in the liver and renal was also observed to be normal [10-13].

On the metaphysis region of the right proximal tibia the tumor was removed by surgical

resection. Absence of osteoid was indicated in the histological findings of this lesion.

2. DIAGNOSTIC EVALUATION

Metaphysical osteolytic lesion of the right proximal tibia was observed in the radiograph. The MRI of his knees was taken in which increase bone density in proximal tibia and sclerosis was observed. Some part of the right tibia was covered by the mass, the lesion surrounded by the soft tissue were edematous. Computed tomography of the lungs was taken and it was normal. The lesion was diagnosed with osteosarcoma by performing the biopsy.

3. THERAPEUTIC INTERVENTIONS

The therapeutic decision was surgery and neoadjuvant chemotherapy which includes Injection doxorubicin, Injection cisplatin and a massive dose of Injection methotrexate as follows (Table 1).

Adverse effects of the cytotoxic drugs observed was headache, bone pain, nausea and vomiting, neutropenia, anorexia, oral mucositis, fatigue, alopecia, etc. The limb salvaging involved resection of affected bone and surrounding muscle and tissue. He was mobilized the day after, knee flexing wasn't permitted. The stitches were stripped away after two weeks of postoperative treatment. Since suture removal, post-surgical (chemotherapy) was begun [14-16]. The skin around the scar was noted to be healthy. He was permitted to bend his knee after 4-5 weeks with a better return to daily routine. Patient was routinely inspected. The pulmonary CT was done and it was normal.

According to altered necessities, diagnosis was prioritized according to a NANDA taxonomy. These are impaired physical mobility, chronic pain, risk of injury (pathological factors), anxiety, risk of developing infection, low self-esteem and knowledge deficit.

Table 1. Cycle: 1 to 4, Frequency: 35 days

| Sr. No. | Drug | Dose | Route |
|---------|------------------------|--------------------------|--------------|
| 1 | Injection Doxorubicin | 37.5 mg/m ² | IV |
| 2 | Injection Cisplatin | 60 mg/m ² | IV Infusion |
| 3 | Injection Methotrexate | 12,000 mg/m ² | IV Infusion |
| 4 | Injection Filgrastim | 6 mg | Subcutaneous |

4. FOLLOW UP AND OUTCOMES

Individuals with elevated grade osteosarcoma have a life expectancy of around 70% if it is managed effectively. The life expectancy for an individual with a poor grade tumor is greater, although it is poorer for someone whose cancer has spread across the body tissue and whose tumors have low chemotherapy response. The outcome criteria showed a favorable evaluation after regular interventions for a specific time with disappearing symptoms.

A non-infectious adverse reaction or event was associated with the administration of neo-adjuvant drug (doxorubicin, cisplatin and methotrexate) before surgical intervention which was the great risk to the patient which accounts for significant morbidity is leukopenia with WBC count decreased up to 3000 cubic millimeter which was managed by the drug "Filgrastim" and prevented from being infected.

5. DISCUSSION

In males the frequency is higher than in females. The most common side effect occurring with osteosarcoma is pain specially during exercise, sufferers may experience of sprain, arthritis also called may pain. When a lower extremity is affected by pain, this could result in limping. Depending on the extent of the lesion and its position; the client could have a swelling. Systemic symptoms such as diaphoresis and pyrexia are unusual. Other signs are uncommon as the metastasis at different locations are exceedingly rare.

The incidence of metastasis is observed in 15 to 20% of patients which can also impact certain bones and the lungs. The possible symptoms are mass of soft tissue, immobilization, pulmonary findings with lymphadenopathy. It is unspecified what exactly causes osteosarcoma. There are a variety of established risk factors, the high prevalence of long bones near the metaphyseal growth plate caused by the exponential development of the bone during teenage growth spurt. Radiation exposure is the ultimately recognized risk factor in the environment. Retinoblastoma, Paget's disease, bone dysplasia and multiple inherited exostoses, etc. increases the chances of developing osteosarcoma. Most preferred laboratory test corresponding to chemotherapy use. Hence it is essential to assess the function of the organ previously, during and after the chemotherapy. Diagnosis

can't be done by the single radiographic characteristic. The lesion of the osteosarcoma may be predominantly osteolytic and osteoblastic or a combination of both. The sunburst appearance can be noted in the 60% of the patients because of tumor extension through the periosteum. CT scan of the chest and primary lesion must be performed for the pulmonary metastasis assessment.

In this major component of MRI should be joined to join imaging. Initially, it is possible to determine the type of tumor by analyzing the biopsy samples. Analyzing the excised tissue after chemotherapy can evaluate the response to treatment. Osteosarcoma is marked by the appearance of osteoid in the lesion also at distance sides of the bone (ex. the lungs). In preadolescence and adolescence, the traditional form is typically a grade 3-4 tumor including nuclear atypia with increase mitosis and hypochromasia. The prognosis can be affected by the function of organising tumors by stratifying risk groups. These include concentration of LDH and alkaline phosphatase, primary tumor site, histologic reaction to chemotherapy, and disease source. Osteosarcoma was typically treated with surgical intervention, generally amputation prior to the use of chemotherapy.

Consequently, the use of adjunctive (postoperative) systemic chemotherapy is critical for the treatment. In addition to promoting concurrent surgical resection by diminishing the tumor, neo adjuvant (preoperative) chemotherapy often represents an essential factor for oncologists. The better prognosis can be observed in the patient with better histopathological response than who do not react in favorable manner.

As the osteosarcomas are not relatively sensitive to radiotherapy, the only alternative is resection. Chemotherapeutic drugs such as cisplatin doxorubicin and massive dose of methotrexate are most effective in osteosarcoma. After finishing therapy, patient must obtain periodic echocardiography follow-up. Chemotherapy, specifically with alkalizing agents, can give rise to secondary malignant neoplasms. Alkalizing high-dose medication used to treat osteosarcoma leads to infertility as a universal consequence. Patients who are taking treatment for the osteosarcoma have the emesis which is a clinically relevant adverse effect of chemotherapeutic drugs, who often needs various antiemetics. Patients receiving parenteral

nutrition or those with the history of organ toxicity (specially nephrotoxicity and hepatotoxicity) should be monitored for blood chemistries with renal and liver function test (LFT and KFT). Patients will continue to undergo routine blood checkup and radiographic screening on an ambulatory basis after undergoing chemotherapy, with the intensity declining over time. These visits are usually every three months during first year, every six months for the second year and third year and annually afterwards. They are viewed as being five years or longer after patients have completed treatment.

Open biopsy is recommended, as it eliminates sampling error and offers significant tissue for biological studies. Patients' survival is the main objective of definite resection. Surrounding margin of tumor should involve normal tissue (i.e. broad/wide margin). Rather than amputation, the patient tends to prefer Limb Salvage Reconstruction, but current late research shows that amputated patients can maintain long term life quality equivalent to that of patients with limb salvaging.

6. CONCLUSION

In this case report, we presented a case of traditional osteosarcoma of right proximal tibia that had been managed with multicentric approach. Patients with extremity osteosarcoma are treated with limb salvaging as an established standard of care along with the pre and post operative chemotherapy. It has enhanced the prognosis and help to prevent limb loss leading to patient outcome and recovery. In adolescent age group, any case of knee pain must be thoroughly assessed with the high skepticism index for malignant lesions in order to prevent delayed diagnosis and diagnostic errors.

CONSENT

Before taking this case, information was provided to the patient and his relatives and informed consent was obtained from the patient and his relatives (parents).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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