Case Report

Primary Extraskeletal Ewing's sarcoma of the posterior neck

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Abstract. The Ewing's sarcoma family of tumors is an uncommon group of malignant neoplasms that may be located in both skeletal and extraskeletal regions. Extraskeletal Ewing's sarcoma (EES) is quite rare and predominantly involves the soft tissues of the trunk or the extremities. There are few patients reported as EES involving the head and neck, from previous studies. We present a case of EES involving the posterior cervical neck and its subsequent surgical excision.

Key words: Ewing's sarcoma, neck, treatment

1. Introduction

Ewing's sarcoma (ES) is a malignant small, round, blue cell tumour. This is a rare disease in which cancer cells are found in the bone or in soft tissue. The most common areas it occurs are the pelvis, femur, humerus, ribs and clavicle. Extraskeletal Ewing sarcoma (EES) is a rare soft tissue malignant neoplasm of primitive mesenchymal cells. Tefft et al in 1969 introduced the first case of ES without skeletal involvement, and since then, several cases of extraskeletal ES have been reported (1).

There is a common chromosomal translocation responsible for a large percentage of Ewing's sarcoma and primitive neuroectodermal tumors. These lesions grouped together in a category known as the Ewing family of tumors. It is considered that the standard treatment for Ewing sarcoma can achieve a good therapeutic effect in EES in present (2,3).

These diseases should be considered different: Ewing sarcomas are most commonly related to bone, Ewing's sarcoma occurs most frequently in teenagers and young adults, with a male/female ratio of 1.6:1, while peripheral primitive neuroectodermal tumors are generally not associated with bones (4). Its classification is difficult because, Ewing's sarcoma can have characteristics of both mesodermal and ectodermal origin (5). The principal sites of EES are the chest wall, lower extremities and paravertebral region. Although the clinical and pathologic features of EES have been documented, the head and neck region is an unusual primary site for this type of tumor.

We report a patient with extra skeletal Ewing's sarcoma presenting with a left posterior cervical mass. Fine needle aspiration biopsy (FNAB) pathology result of the mass is lipomateous fibrocollegeneous tissue and soma focuses includes skeletal muscle tissue. After we totally excised the mass and diagnosed as extra skeletal Ewing's Sarcoma the patient referred to medical oncology department for adjuvant chemotherapy.

2. Case Report

A 29-year-old male patient with an asymptomatic painless progressive enlarging swelling on his left posterior cervical region with one year of history referred to our otorhinolaryngology department in university hospital. The patient used several medications such as antibiotic therapy and NSAIDs in other medical centers. Despite these therapies there is no clinical regression on size of the mass. Clinical examination revealed a discrete, solid, elliptical 7-8cm fixed mass below the low third of the left sternocleidomastoid muscle reaching out the sub occipital area. This was separate to the surrounding muscles and not tethered to the overlying skin. There was no other palpable

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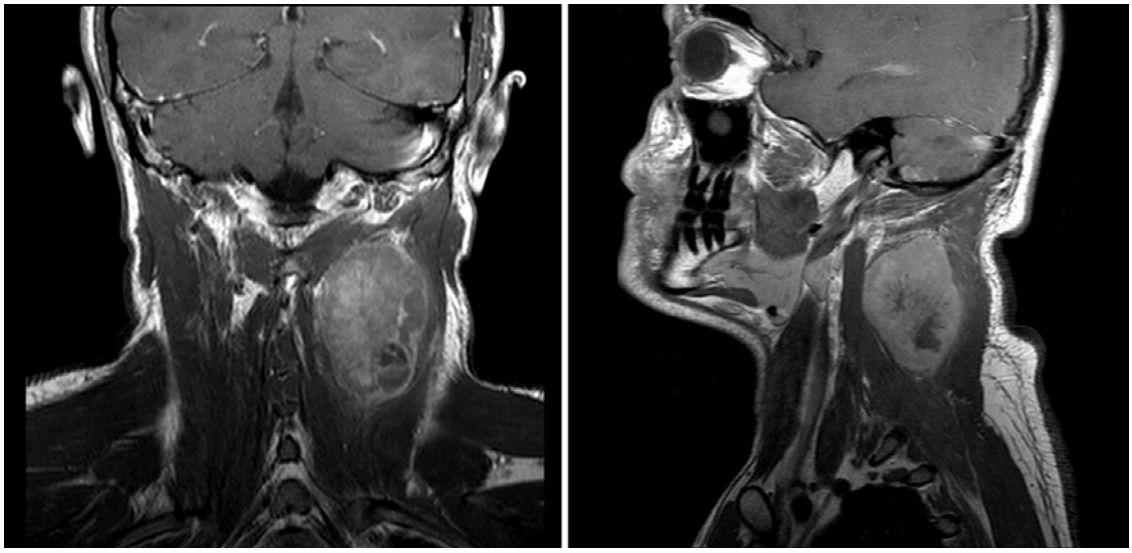

Fig. 1. MRI: T1W-TSE-C Coronal and sagittal section, showing well isolated mass, no infiltration to peripheral tissues and close relationship with vertebrate.

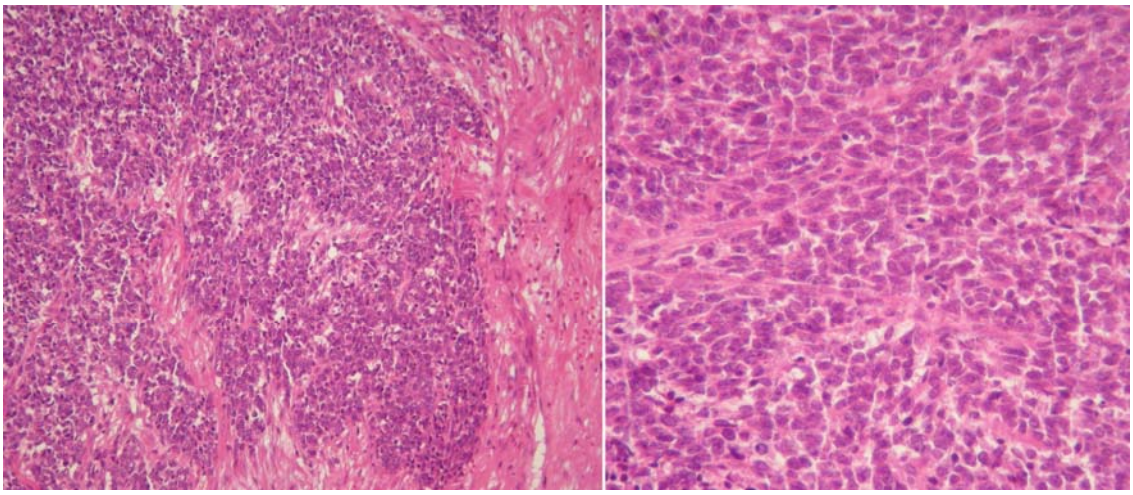

Fig. 2. Pathologic Samples; Hematoxylin and Eosin staining of the tumor under low and high power microscopic fields.

lymph node founded on the neck, no gross lesion visualized with endoscopy of the nasopharynx and oropharynx. All other examinations of the head and neck were normal. Whole body physical examination revealed nothing significant.

Neck ultrasonography reported a 76x47mm well capsulated hypo echoic heterogeneous mass located at left posterior cervical region. Computed tomography (CT) scan illustrated a large well circumscribed heterogeneous with a diameter of 70x50mm soft tissue density solid mass located at left posterior cervical region close to the spinal tract. Magnetic Resonance Imaging (MRI) showed us a mass that was well isolated from peripheral tissues with heterogeneous intensity and no invasion to adjacent structures (Figure 1). We consulted the FNAB preparation to our pathology department and they reported their suspicion for its malignancy but for exact diagnosis total excision of mass was advised. The blood tests, other clinical and laboratory tests revealed nothing significant.

We totally excised the left posterior cervical located mass. There was no invasion to peripheral tissues such as muscles, nerves or vessels but the mass was spread to vertebrates. Mass was solid and well isolated with a capsule from peripheral tissues. There was no cystic component. After resection we realized a slight temporary Horner's Syndrome after ophthalmologic examination. Preparation was sent to pathology department for frozen section analysis during operation and they reported us that it is malignant but they need some special immunohistochemical markers for exact diagnosis.

Mass preparation was evaluated with immunohistochemical markers (LCA, CD3, CD20, pancytokeratin, CK20, ttf-1, Desmin, Synaptophysin, chromogranin, CAM52, S100 and CD99). They showed a positive CD99 antigen (Cluster of differentiation 99) also known as MIC2 or single-chain type-1 glycoprotein. It is a heavily O-glycosylated transmembrane protein that is encoded by the CD99 gene in humans (6,7). It is found on the cell surface of Ewing's sarcoma tumors (8). Exact Pathological diagnosis was reported as “Extraskeletal Ewing's Sarcoma / Primitive neuroectodermal tumor” related findings from posterior cervical mass excision preparation (Figure 2).

A bone scan and a bone marrow biopsy showed this to be an isolated lesion and patient referred to oncology department for a curative treatment regime involving adjuvant chemotherapy and radiotherapy. At the six-month outpatient review including MRI, CT and PET-CT scanning he showed no recurrence of disease.

3. Discussion

Ewing's sarcoma is more common in males and usually occurs in childhood or early adulthood, with a peak between 10 and 20 years of age. Histological pattern of ES/PNET consists of solid sheets of small uniform “primitive” cells with round nuclei and scanty cytoplasm that lack significant differentiation in classical form. Homer-Wright rosettes may be identified in more differentiated ES/PNET. ES/PNET is difficult to distinguish from histologically similar small round-cell tumors including rhabdomyosarcoma, desmoplastic small round-cell tumor, poorly differentiated synovial sarcoma, mesenchymal chondrosarcoma, neuroblastoma and lymphoma due to the lack of characteristic morphologic features. Immunohistochemical expression of the MIC2 gene product (CD99) is useful in distinguishing this entity from other small round-cell tumors (9,10).

It can occur anywhere in the body, but most commonly in the pelvis and proximal long tubular bones, especially around the growth plates. The diaphysis of the femur are the most common sites, followed by the tibia and the humerus. Thirty percent of the patients are overtly metastatic at presentation and usually experience extreme bone pain.

Osseous and extraosseous subtype of Ewing's sarcoma also exists. The osseous type accounts for most cases of Ewing's sarcoma and it has a predilection for the long bones (i.e., femur, tibia, humerus) and pelvic girdle. Extraskeletal sites of Ewing's sarcomas (EES) such as chest wall, lower extremities, retroperitoneum and paravertebral region have been observed in about 15% of cases. These tumors are aggressive with a high incidence of local recurrence and distant metastases.

Some clinical studies are available in literature due to the rare nature of ES/PNET. The overall prognosis of ES/PNET seems to be favorable. A retrospective study showed an overall 5- year survival rate of 61% in 24 patients with extraskeletal ES (11). Multi-agent chemotherapy after wide resection margins is necessary for good clinical outcomes. Immunohistochemistry, cytogenetic analysis and other molecular tests are useful to identify chromosomal translocations, but they are invaluable to establish specific diagnoses.

The treatment of ES/PNET involves combined modality therapy with chemotherapy and local therapy offered by surgical resection, radiation or both. Three recent series in the literature have supported the effectiveness of combined modality chemotherapy on patient prognosis (12-14).

The consistent use of more effective chemotherapy regimen in the treatment of localized Ewing's sarcomas during the past two decades increased the rate of 5 and 10-year survival rates until 50 to 60%. Although Ewing tumors are radiosensitive malignancies, RT does not seem to be curative as a primary local treatment. Significant progress has been made in the treatment of Ewing's sarcoma with effective chemotherapy which has increased the 5 year survival of 5-10% twenty years ago to the current 5 year survival in excess of 70% (15,16).

EES is an uncommon yet distinct clinicopathological entity that should be considered in the differential diagnosis of a soft tissue tumor occurring in adolescents and young adults. The major differential diagnoses include Ewing's sarcoma of bone with extensive soft tissue extension and an inapparent intraosseous component, undifferentiated or primitive soft tissue sarcoma (including rhabdomyosarcoma), metastatic neuroblastoma, and, rarely, other tumors, such as peripheral neuroepithelioma, mesenchymal chondrosarcoma of soft tissue, hemangiopericytoma, synoviosarcoma, and metastatic oat cell (small cell) carcinoma of the lung. The natural history of EES also appears to the light and electron microscopic features to be identical to the more common Ewing's sarcoma of bone.

In the base of curative treatment in EES relies on wide surgical excision (17). Surgeons raised particular challenges for wide resection margins, putting a further emphasis on early diagnosis and

the setting up of strong regional links between head and neck. Our case shows that prompt referral to the head and neck surgeons are important in establishing early histological tissue diagnosis and treatment in EES. The use of adjuvant multi-agent chemotherapy and radiotherapy after total excision of the tumor is sufficient for the surgeon to avoid a radical resection.

In our case we have an atypical presentation for Ewing’s sarcoma, the patient has no pain and also there was no typical skeletal bone involvement, furthermore patient’s age is a bit elder than usual for typical Ewing’s sarcoma cases. Location of ekstraskeletal Ewing’s sarcoma in this case is mostly atypical, posterior cervical region involvement is not an expected situation. The majority of cases have been reported in the lower limb and paravertebral region, with a few cases reported in the neck. We report a patient with extraskeletal Ewing's sarcoma presenting with just a left sided posterior cervical mass with no further symptoms or findings, so EES should be considered in differential diagnosis of cervical masses. Extraskeletal Ewing's sarcoma has a tendency to occur in a lower paravertebral location, being found rarely in the cervical region especially at posterior cervical region. Computed tomography and magnetic resonance imaging are helpful in the diagnosis of this rare tumor. FNAB may not be helpful for exact diagnosis. Total excision is recommended for diagnosis.

4. Conclusion

The treatment of ES/PNET involves combined modality therapy with chemotherapy and local therapy offered by surgical resection, radiation or both. Due to limited evidence regarding the therapeutic aspects of these tumors, no definite protocol can be formulated for their treatment and the best mode of therapy should be individualized for each case. However, our review supports the fact that total tumor removal followed by adjuvant chemo-radiation is associated with the best clinical outcome. We performed total surgical excision, than patient referred to oncology department for adjuvant chemotherapy and radiotherapy. We thought the treatment involving both chemotherapy and radiotherapy after total excision is necessary for this patient. But long-term results of this patient will show us the sufficiency of this therapy and necessity to other modalities. Future studies should mainly focus on finding evidences denoting the best treatment strategies for these tumors.

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