EWING'S SARCOMA OF MANDIBLE - A RARE NEOPLASM

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ABSTRACT

Ewing's sarcoma is a highly malignant tumour seen in the age group of 5 to 25 years, primarily afflicts long bones of the extremities followed by pelvis, ribs and vertebrae. The involvement of this lesion in the mandible accounts for only 2% of the reported cases. Ewing's sarcoma particularly in children, poses difficulty in arriving at a diagnosis and could be established only by histopathological and electron microscopic examination. This is a radiosensitive lesion, however, surgery with chemotherapy is the preferred treatment of choice in mandible. A case of Ewing's sarcoma in a 7 year old female patient was managed by chemotherapy and aggressive surgical approach with gratifying results and no recurrence till date.

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KEY WORDS: Chemotherapy; Cytogenetic studies; Ewing's sarcoma; Hemimandibulectomy; Immunohistochemistry.

Introduction

Ewing's sarcoma is an uncommon, aggressive malignant neoplasm occurring primarily in the long bones of the lower and upper extremities followed by pelvis, ribs, vertebrae, skull and jaw-bones. Only 2% involve the mandible and the maxilla is involved one eighth as often as the mandible [1]. This tumour was originally described by James Ewing in 1921 and was believed to arise from undifferentiated osseous mesenchymal cells, however, the cell of origin is not equivocally established [2]. Cytogenetic studies suggest the possibility of neural origin for Ewing's sarcoma [3]. This lesion comprises 4% to 15% of all primary bone tumours and accounts for 3% of all childhood cancers [3,4]. The common presenting signs and symptoms are swelling, pain and paresthesia. Radiographic examination may show "onion skin", "sun ray" or "honey comb" features [2], however, they are suggestive but not pathognomonic.

Ewing's sarcoma, particularly in children, poses difficulty in arriving at a specific diagnosis, however, this can be overcome with the help of histopathological and immunohistochemical evaluation [2]. There is no formal staging system available for the tumour and it is usually classified as localized, metastatic or recurrent [5]. The management of the lesion is by multimodal therapy and depends upon the extent of the disease. In cases of localized Ewing's sarcoma of mandible, surgery with chemotherapy is the treatment of choice [1,6-8]. A case of Ewing's sarcoma of mandible in a 7 year old patient managed by chemotherapy

and aggressive surgical approach is presented.

Fig. 1 : Preoperative view

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Fig. 2 : Intra-oral view of the tumour showing a fleshy overgrowth

Fig. 3 : Occlusal view radiograph showing the sunray appearance and mottled destruction of the involved bone

Case Report

A 7 year old girl presented with a progressively enlarging painful swelling over the left body region of the mandible of two months duration (Fig-1). The swelling was firm, non-pulsatile, measuring 4x5 cm, fixed to the underlying bone with impressions of occlusal surface of upper teeth over its fleshy over growth extending from 32 to 36 (Fig-2). The colour of the swelling was pink with areas of erythematous patches. There was also expansion of both buccal and lingual cortex.

Radiological examination revealed an ill-defined radiolucent region involving the body and ramus of the left side of the mandible. Radiopaque flecks resembling sunray appearance of the periosteal bone and the developing 34 pushed to the inferior border (Fig-3). CT scan revealed lytic lesion in the left body and ramus region of the mandible with associated destruction of the medial cortical plate and adjacent soft tissue mass (Fig-4). Ultra sound scanning and X-ray chest PA view were performed to locate the primary and to rule out neuroblastoma and any metastasis.

Histological examination of biopsy specimen revealed nests and dense sheets of small round cells with round or oval nuclei (Fig-5). The clumps of cells were separated by incomplete fibrovascular tissue. Numerous thin walled blood vessels, with areas of haemorrhage were also seen. The tumour cells show scattered mitotic figures and at places with cytoplasmic clearing. The PAS stain showed granular perinuclear rim of staining of the cytoplasm of other round cells. Reticulin stain was also carried out and the

Fig. 4 : Axial CT scan revealing the lytic lesion in the left body and ramus of the mandible

Fig. 5 : Photomicrograph of tumour reveals small rounded cells with dark staining nucleus

individual tumour cells were not surrounded by reticulin. Immunohistochemistry was performed using vimentin, neuron-specific enolase, factor VIII related antigen, synaptophysin and chromogranin. The tumour was positive for vimentin and neuron-specific enolase (Fig-6).

Patient was managed preoperatively by chemotherapy with 5 pre-operative administrations of cyclophosphamide (150 mg/m^2) on days 1 to 7, and doxorubicin (35 mg/m^2) on day 8, and maintenance chemotherapy. The surgical procedure consisted of extirpation of the involved side by hemimandibulectomy (Fig-7). Intra-operatively, margins of both buccal and lingual soft tissue and bony margins from the labial cortex of the opposite side were sent for frozen section examination and histological examination did not demonstrate tumour cells on any of the specimens and from free margin of the resected specimen. Patient was then referred to department of oncology for postoperative chemotherapy. The post-operative results were gratifying with no recurrence till date.

Discussion

Ewing's sarcoma is a distinctive, small, round cell sarcoma that is among the most aggressive bone tu-

Fig. 6 : Photomicrograph of tumour showing positivism for neuron specific enolase

mours. Only 70 cases have been reported in medical literature with mandibular involvement [9]. This tumour is predominantly a childhood malignancy that occurs most frequently between the ages of 5 and 25 [10]. There appears to be a slight male predilection with a male/female ratio ranging upto 2:1 [2].

The cell of origin is not known. Cytogenetically, Ewing's sarcoma cells have a distinctive reciprocal translocation of chromosome 22 at the q12 locus, a feature shared with peripheral neuroepithelioma, which has a neural phenotype. This would suggest the possibility of a neural origin [3].

The most common symptom of Ewing's sarcoma is the swelling of the involved jaw. Other signs and symptoms include pain of intermittent nature, paresthesia, ulceration, weight loss, fatigue and low grade fever [10].

Radiological manifestations are suggestive but not pathognomonic. There may be formation of new sub periosteal bone having an "onionskin" appearance, "sunray" appearance similar to osteosarcoma, localized "honey-comb" or "moth-eaten" appearance. Mottled, cystic or lobulated destruction with displacement or destruction of unerupted tooth follicles along with cortical erosion and widened periodontal ligament space is also observed [2]. In our case, an ill defined radiolucent region involving the body and ramus of the left side of the mandible and radiopaque flecks resembling sunray appearance of the periosteal bone were observed (Fig-3). CT scan revealed lytic lesion in the left body and ramus region of the mandible with associated destruction of the medial cortical plate and adjacent soft tissue mass (Fig-4).

The differential diagnosis of the lesion includes malignant lymphoma, leukaemia, granulocytic sarcoma, round cell osteosarcoma, mesenchymal chondrosar-

Fig. 7 : Occlusal view of the resected specimen

coma, pigmented neuroectodermal tumour, osteomyelitis, and metastatic diseases such as neuroblastoma and rhabdomyosarcoma [11]. Of these, malignant lymphoma, metastatic neuroblastoma and rhabdomyosarcoma have overlap in the histomorphology with Ewing's sarcoma.

Management of this tumour is by multimodal therapy, depending on the extent of the tumour, using chemotherapy, surgery and radiotherapy. In lesions involving mandible, surgery with chemotherapy is the preferred treatment [1,6-8] because of (a) the localization of the tumour in the mandible, (b) no metastasis, and (c) to avoid late consequences of radiotherapy which include adverse effects on normal growth and development, hormones, genes, psychology, fertility and intellectual impairment [12]. Patient should be evaluated periodically to rule out any recurrence and metastasis.

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