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Case Report
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Primary Ewing's Sarcoma of Body of Mandible, Multimodal Treatment with Excellent Spontaneous Bone Regeneration: A Case Report

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Abstract

Ewing's sarcoma is an invariable manifestation in facial bones. Primary lesions in head and neck region had come up with better prognosis compared to other primary sites hence management of such jaw lesions is a challenge particularly in pediatric patients during first decade of life as functional impairment and facial disfigurement may affects the quality of life. Here we are discussing a unique case of primary lesion of horizontal region of mandible with special focus on use of radiation therapy, radiation dose related effects and spontaneous bone regeneration.

Keywords: Primary Ewing's sarcoma; Radiotherapy; Spontaneous bone regeneration; Secondary sarcomas

Introduction

Ewing's sarcoma of jaws is a rare primary malignancy affecting children and adolescents [1], initially described by James Ewing in 1921 [2]. Given the rarity of Ewing-s sarcoma it is usually not included in differential diagnosis of radiolucent lesions affecting horizontal region of mandible [3]. Chemotherapy with local control therapy are the main treatment modalities. Role of radiotherapy is limited in pediatric patients due to its deleterious effects on craniofacial growth and induction of secondary sarcomas. Spontaneous bone healing with large mandibular defects even after giving radiotherapy depicts that bone healing capacity is high in growing patients.

Case Presentation

An eight-year-old boy reported to the department of Oral and Maxillofacial surgery GDC Shimla with history of swelling left side of face for 6 months, associated with dull, episodic, non-radiating pain without any discharge and trismus. On intraoral examination a swelling of size approximately 3.5 cm × 4.5 cm, extending from lower left deciduous incisor to lower first permanent molar, obliterating the buccal sulcus, with no change in mucosal color was present. On palpation swelling was tender, non-fluctuant, non-compressible, hard, and adhering to underlying bone and no signs of paresthesia were present. History of spontaneous loosening of tooth following swelling and pain was there. On OPG a mixed radiolucent radio opaque lesion with ill-defined borders involving the tooth bud of 34 extending to the inferior border of mandible was present (Figure 1). Plain computed tomography scan showed a lytic expansile lesion with speculated periosteal reaction in left mandible associated with cervical lymphadenopathy (Figure 2).

Incisional biopsy of suspected lesion was performed and revealed malignant round cell tumor (Figure 3). Further immunohistochemistry of jaw lesion revealed positivity for CD99 and neuron specific enolase giving the probability of diagnosis of Ewing's sarcoma.

Magnetic Resonance Imaging (MRI) of mandible revealed heterogeneously enhancing mass in relation to mandible on left side with erosion, destruction & extension into floor of mouth involving muscles and cheek with cervical lymphadenopathy. X-Ray long bones, PA chest and bone marrow biopsy from anterior iliac crest performed to rule out any primary foci of lesion, the negative report of which proved that lesion is primary in mandible.

After final diagnosis, patient was referred to regional cancer Centre for chemotherapy; there he received four cycles of chemotherapy including injections Ifosfamide, Etoposide, doxorubicin and vincristine, which yielded good clinical response i.e. noticeable size reduction in primary lesion. Then submandibular incision extending from below the tragus up to midline given after

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Figure 1: OPG showing a mixed radiolucent radio-opaque lesion with ill defined borders.

Figure 2: 3D CT scan showing destruction of mandible.

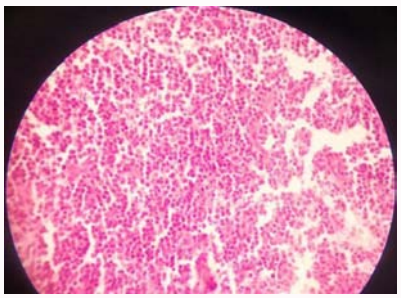

Figure 3: Histopathological slide with small round cells at 40x.

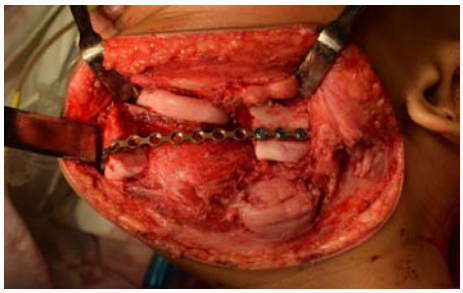

Figure 4: Surgical exposure of primary lesion.

nasotracheal intubation, layer wise dissection done to expose the anteroposterior, superioinferior margin of pathology (Figure 4), segmental resection done from deciduous lateral incisor to first permanent molar, soft tissue excised towards floor of mouth and reconstruction done with 1.5 mm 15 hole adaption plate (Synthase system) to maintain the continuity of lower border by using 3 screws of 10 mm on each side (Figure 5). During the procedure as much of periosteum as possible was preserved. Post-surgery patient received 4 cycles of chemotherapy including injections Etoposide, Ifosfamide

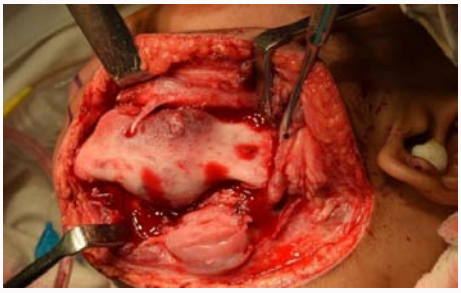

Figure 5: Segmental Mandibulectomy followed by reconstruction with adaption plate.

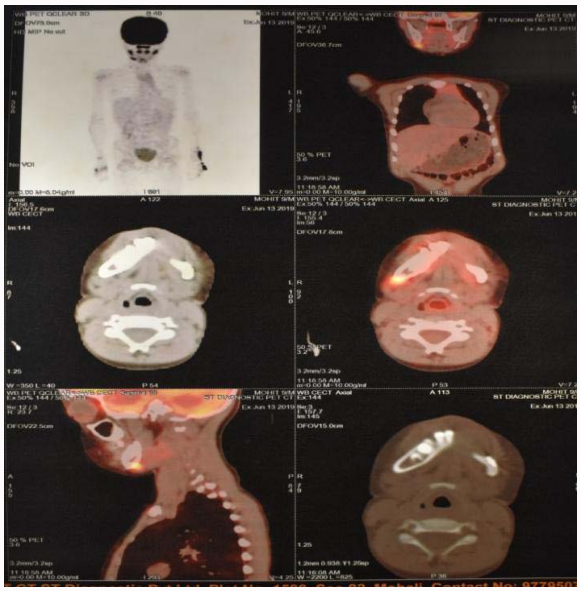

Figure 6: ^{18}F-FDG PET-CT SCAN at one year follow-up.

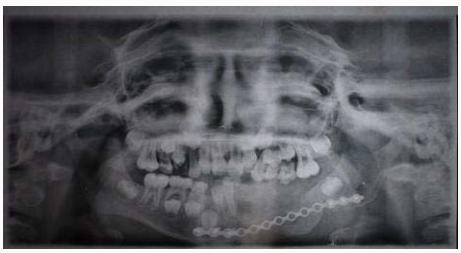

Figure 7: Spontaneous regeneration of bone after 2 years follow-up.

at an interval of 21 days followed by radiotherapy @ 45 Gy in 25#s. At one-year follow-up ^{18}F-FDG PET-CT SCAN done, revealed no recurrence and no secondary metastases (Figure 6). During follow-up b/t 3 to 6 months on (OPG) there was evidence of spontaneous bone formation at the resected margins which was clearer on follow up radiographs (Figure 7). On 2 year follow up there was no functional and esthetic morbidity (Figure 8).

Discussion

Although Ewing's sarcoma is most common in long bones and pelvis but cases of primary lesion have been seen in head and neck region, affecting the bones of the skull or face in about 1% to 4% of the cases. Among jaw bones, mandible is more commonly affected than the maxilla, with an incidence from 1% to 10%. Previous case

Figure 8: Post-operative photograph.

reports of primary lesion of jaws have concluded posterior region of mandible most commonly affected site due to increase in marrow content compared to anterior region [3]. Uniqueness of this case is related to the site of origin of lesion i.e. the body region of mandible.

The clinical signs and symptoms include swelling, pain, loose teeth, paresthesia, ulceration, trismus and toothache. It is observed radiographically as an expansile osteolytic lesion with or without cortical erosion and bone expansion that can be related to the differential diagnosis of following oral lesions such as osteomyelitis, eosinophilic granuloma, giant cell tumor, simple bone cyst, aneurysmal bone cyst [4]. Current case revealed, displacement, root resorption of deciduous teeth and absence of inferior alveolar canal outline.

H/P it is poorly differentiated small round cell tumor, involving various diseases as its differential diagnosis i.e. rhabdomyosarcoma, neuroblastoma, lymphoblastic lymphoma and small cell carcinoma [3]. Therefore, Immunohistochemistry analysis (CD99, FLI1) is necessary for its diagnosis. Based upon degree of differentiation of neuroectodermal cells these tumors may also express Neuron-Specific Enolase (NSE), synaptophysin and S-100 protein [4]. CD99 can also be positive in rhabdomyosarcoma, neuroblastoma, lymphoblastic lymphoma and small cell carcinoma. FL11 is positive for neuroblastoma, lymphoblastic lymphoma. NSE positivity has been seen in neuroendocrine tumors. Synaptophysin positive in EFT/PNET, therefore, FISH or PCR is crucial for identification of EWSR1 translocation t(11;22) (q24;q12) and t(21;22) (q22;q12) but also not specific for ES. Hence combined morphogenic, radiographic and genetic features required for definitive diagnosis [5].

Improved treatment modalities have led to increased survival rate of primary lesions of jaws, therefore its early diagnosis, functional and esthetic rehabilitation of complicated anatomy of face is dare demanding for Oral and Maxillofacial surgeons. Multimodal treatment approach including induction chemotherapy followed by surgical resection and post-operative radiotherapy was planned for this case. As per NCCN Clinical Practice Guidelines in Oncology for bone cancers 2018 [6], chemotherapy is recommended for all patients regardless of the status of surgical margins and the time for chemotherapy should be between 28 to 49 weeks following wide excision.

Chemotherapy with local control therapy should be the mainstay for primary Ewing's sarcoma treatment [2]. NCCN Clinical Practice Guidelines in Oncology for bone cancers 2018 [6], suggests adjuvant radiotherapy for positive Margins. Radiotherapy plays an important role in patients who need functional preservation (Head and neck region) and unresectable tumors (spine, vertebrae, weight bearing bones) [7]. But according to the author, Chatzistefanou I, et al. [2] radiotherapy generally avoided in pediatric patients because of induction of secondary cancers at radiated site and interference with the facial growth. Kuttesh et al. [8] collected data from 266 survivors of Ewing's sarcoma and concluded that evolution of secondary sarcoma is radiation dose dependent. A radiation dose >60 Gy are associated with higher risk compared to dose <60 Gy [8]. Our case is a satisfactory example of this statement that secondary sarcomas do not develop if dose is <60 Gy as such complications has not been seen in two year follow up.

Contemporary reconstruction of surgical defect subsequent to wide surgical resection is an important consideration. Primary goals of reconstruction in Oral and Maxillofacial region should be restoration of excellent functional and esthetic unit. Reconstruction methods which include autogenous and allogenic materials. Autogenous reconstruction methods i.e. free vascularized grafts have revolutionized the field of reconstructive surgery throughout last decades however their use is limited in pediatric patients due to following side effects like flap harvesting, small dimensions of the vessels, airways issue, anesthesia complexities4 and graft site morbidity.

It is not for the first time that spontaneous regeneration of a post resection mandible has reported. Bone regenerating capacity in jaws differs from other tissues which usually heal by scar formation [9]. Reconstruction was performed with Titanium adaption plate and spontaneous regeneration was observed which could be related to high cellular activity, abundant mesenchymal cells in young patients differentiating into osteogenic cells [2]. This regeneration was positively influenced by the intact periosteum [9] as it is a well-known source of osteoprogenitor cells [2]. And its preservation is crucial for spontaneous bone healing.

References

1. Solomon LW, Frustino JL, Loree TR, Brecher ML, Alberico RA, Sullivan M. Ewing sarcoma of the mandibular condyle: Multidisciplinary management optimizes outcome. Head Neck. 2008;30(3):405-10.
2. Chatzistefanou I, Kabesi S, Paraskevopoulos K, Koliouskas D, Antoniades K. Ewing's sarcoma of mandible: An impressive case of spontaneous mandible regeneration. Int J of Clin Pediatr Dent. 2016;9(3):273-7.
3. Ko E, Brouns ER, Korones DN, Pochal WF, Philipone EM, Zegarelli DJ, et al. Primary Ewing sarcoma of the anterior mandible localized to the midline. Oral Surg Oral Med Oral Pathol Oral Radiol. 2013;115(6):e46-e50.
4. Krishna KBB, Thomas V, Kattoor J, Kusumakumari P. A radiological review of Ewing's sarcoma of mandible: A case report with one year follow-up. Int J Clin Pediatr Dent. 2013;6(2):109-114.
5. Owosho AA, Ko E, Rosenberg HI, Yom SK, Antonescu CR, Huryn JM, et al. Primary Ewing family of tumors of the jaw has a better prognosis compared to tumor of extra gnathic sites: J Oral Maxillofac Surg. 2016;74(5):973-81.
6. NCCN Guidelines Version 1. Panel Members Bone Cancer. 2018.
7. Choi Y, Lim DH, Lee SH, Lyu CJ, IM JH, Lee YH, et al. Role of radiotherapy in the multimodal treatment of ewing sarcoma family tumors. Cancer Res Treat. 2015;47(4):904-12.
8. Kuttesh JF, Wexler LH, Marcus RB, Fairclough D, Weaver-McClure L, White M, et al. Second malignancies after Ewing's sarcoma: Radiation

dose-dependency of secondary sarcomas. J Clin Oncol. 1996;14(10):2818-25.

9. Hren NI, Miljavec M. Spontaneous bone healing of the large bone defects in the Mandible. Int J Oral Maxillofac Surg. 2008;37(12):1111-6.