MAR Pathology & Clinical Research (2023) 2:6

Case Report

Pediatric Oral Malignancies of Mesenchymal Origin: Report of Two Cases and Literature Review

Dr. Hirkani Attarde MDS [1],Dr. Harshal Suryavanshi MDS [2] , Dr. Gokul Sridharan MDS *[3]

1. Professor, Dept of Oral and Maxillofacial Surgery, Dr. G. D. Pol Foundation YMT Dental College and Hospital, Kharghar, Navi Mumbai-410210, India.

2. Associate Professor, Dept of Oral and Maxillofacial Surgery, Dr. G. D. Pol Foundation YMT Dental College and Hospital, Kharghar, Navi Mumbai-410210, India.

3. Professor, Dept. of Oral Pathology and Microbiology, Dr. G. D. Pol Foundation YMT Dental College and Hospital, Kharghar, Navi Mumbai-410210, India.

***Correspondence to:** Dr. Gokul Sridharan MDS, PhD, PGD (Medical Law and Ethics) Professor, Dept. of Oral Pathology and Microbiology, Dr. G. D. Pol Foundation YMT Dental College and Hospital, Kharghar, Navi Mumbai-410210, India.

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Received: 20 November 2023

Published: 30 November 2023

Abstract

Oral pediatric malignancies are associated with diagnostic dilemmas and difficulties with respect to treatment and local control measures. Early detection and treatment are a pre-requisite to avoid significant morbidity and also improve the quality of life. The aim of this presentation is to report 2 cases of oral malignancies in a pediatric population which required a comprehensive clinical, imaging and microscopic assessment for accurate diagnosis and subsequent management.

Keywords*: Pediatric malignancies, Oral cavity, Sarcoma*

Introduction

Pediatric neoplasms of oral and maxillofacial region constitute a minor proportion of head and neck tumors but are associated with diagnostic dilemmas and difficulties with respect to treatment and local control measures. While cysts and tumors of odontogenic origin generally account for most of these lesions, emphasis should also be given to the non-odontogenic lesions that may affect the various parts of oral mucosa. Pediatric neoplasms could either be congenital or develop later in course of life and may include hamartomas, benign neoplasms and malignancies such as sarcomas. These neoplasms, especially if malignant pose difficulties in diagnosis and subsequent management thereby needing a comprehensive clinical, imaging and histopathological assessment for accurate diagnosis.

Cancer in children and adolescents represents a group of diseases considered rare, with an incidence of 0.01% in the age range of 0–19 years in developed countries and when compared to adult malignancies, it corresponds to 2–3% of all malignant tumors.[1] Malignant lesions of the oral cavity constitute a small proportion of all oral lesions in children and mainly include lymphomas (especially Burkitt) and sarcomas such as rhabdomyosarcoma, osteosarcoma and fibrosarcoma.[2] In addition, mucoepidermoid carcinomas of the oral cavity have rarely been reported in the pediatric and adolescent age groups. Generally most tumors have a low or intermediate grade and are often cured with surgery alone.[3]

Early detection and treatment are a pre-requisite to avoid significant morbidity and also improve the quality of life. The dynamic growth and development that is seen through the adolescence period should also be taken in consideration while determining the treatment plan. The aim of this presentation is to report 2 cases of oral

malignancies in a pediatric population which required a comprehensive clinical, imaging and microscopic assessment for accurate diagnosis and subsequent management.

Case Report

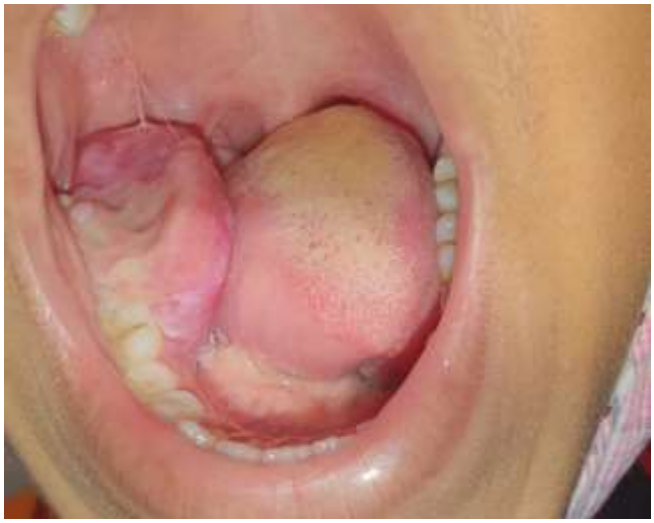

Fig 1: Aggressive soft tissue growth in the posterior mandibular region with displacement of involved teeth.

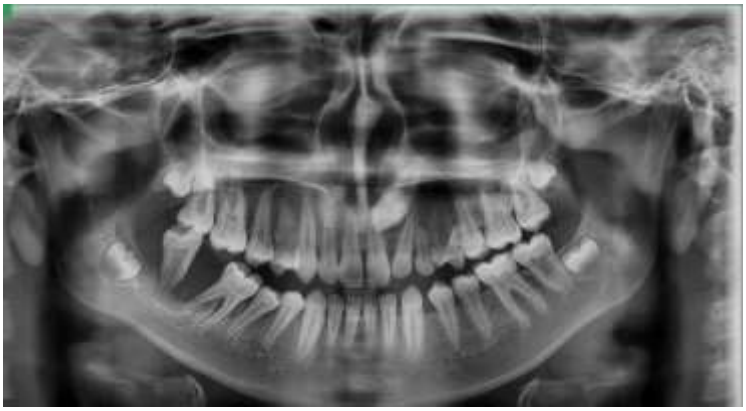

Fig 2: OPG showing large ill-defined expansile osteolytic lesion in relation to 46-48 region

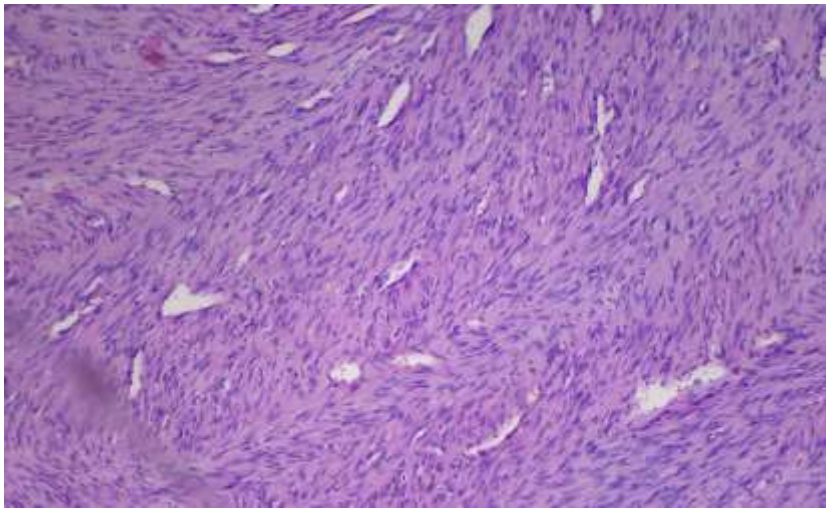

Figure 3: Photomicrograph (10x) showing spindle shaped neoplastic cells in interlacing fascicular arrangement

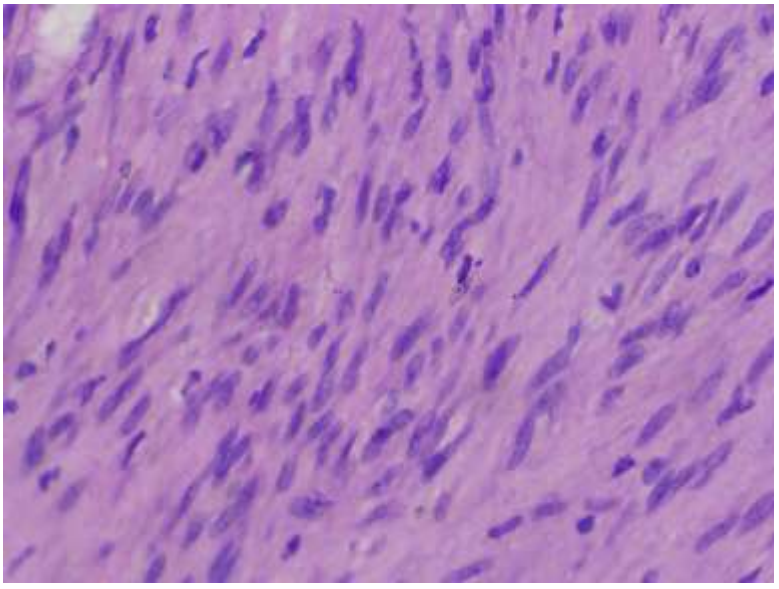

Figure 4: Photomicrograph (40x) showing spindle shaped malignant cells and elongated nuclei with round ends.

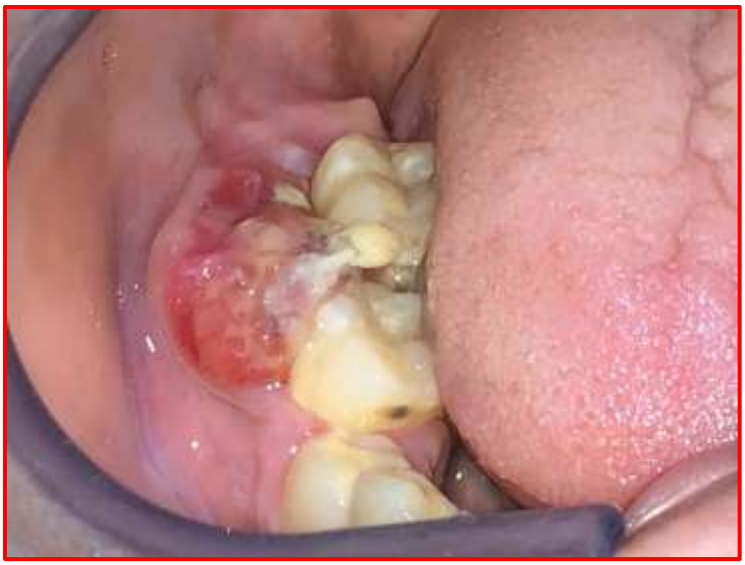

Figure 5: ulcerative lesion of the right posterior region of the jaw

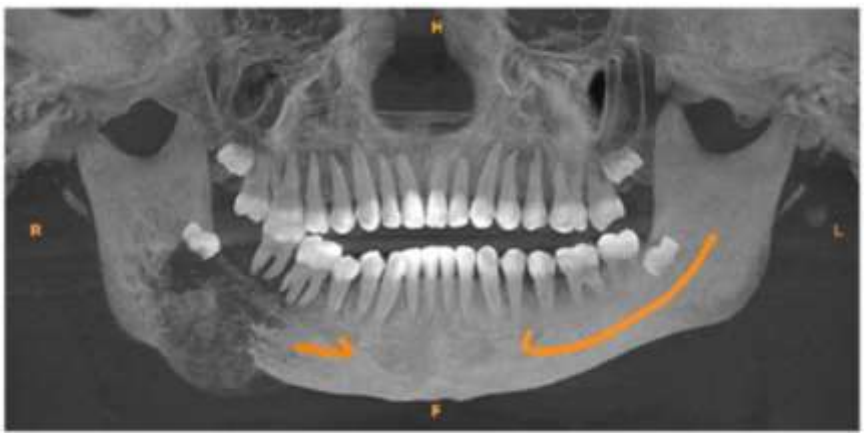

Figure 6: solitary large ill-defined expansile osteolytic lesion of mixed density in the right body and ramus of the mandible

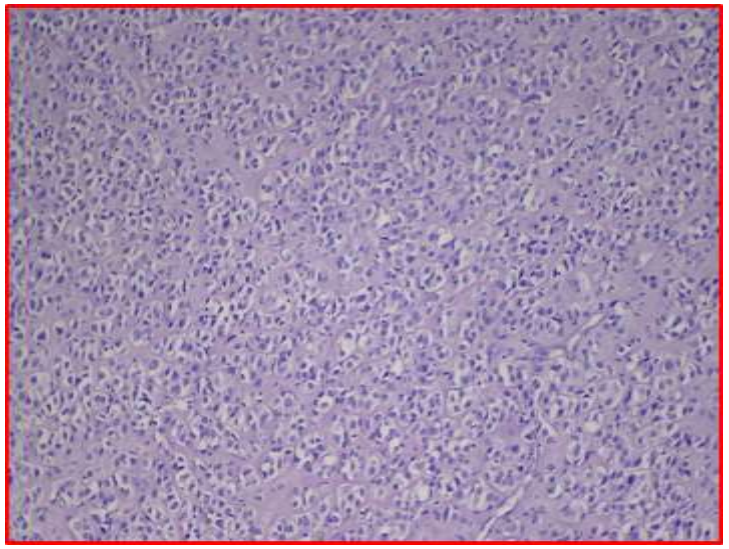

Figure 7: Sheets of malignant tumor cells separated by fibrous connective tissue septae and eosinophilic areas resembling tumor osteoid surrounded by malignant osteoblasts.

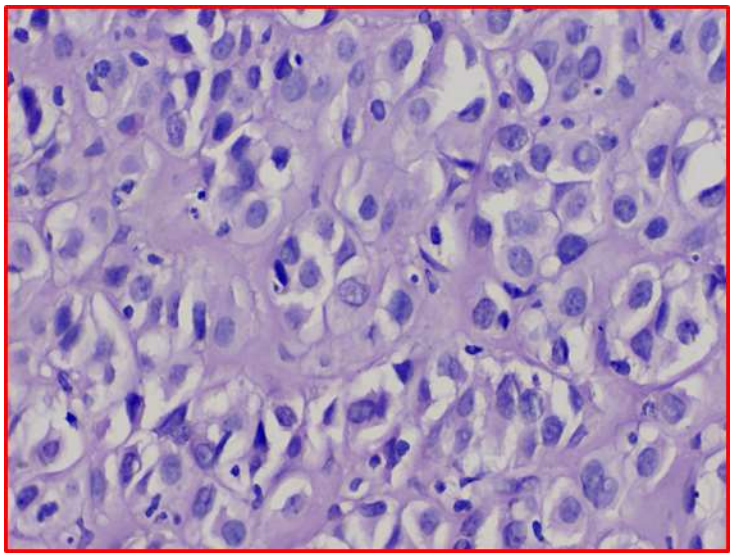

Figure 8: Clear cells- round to oval in shape with vesicular nuclei and clear cytoplasm with some binucleation resembling chondroid like areas

Case 1:

A 13- year old male patient presented with a painless rapidly enlarging growth of the right posterior region of jaw since 2 months. Intra-oral examination revealed a firm, non-tender reddish soft tissue mass in the right posterior mandibular region extending anteriorly from 45 to retromolar region posteriorly involving the buccal and lingual mandibular gingiva. Inferiorly the lesion extended till the floor of the mouth causing displacement of the tongue along with displacement of the associated teeth **(Fig 1).** Radiographically, an ill-defined osteolytic lesion of the right posterior mandible with buccal and lingual cortical plate expansion was noted **(Fig 2)**.

Incisional biopsy was performed which revealed a highly cellular connective tissue stroma composed of atypical spindle shaped cells arranged in streaming and interlacing fascicles interspersed with hypocellular and myxoid areas. The tumor cells were characterized by elongated spindle shaped nuclei with rounded ends and indistinct cytoplasm **(Fig 3 & 4)**. Malignant spindle cell tumor was considered as the diagnosis with differential diagnosis of leiomyosarcoma and malignant peripheral nerve sheath tumor. Immunohistochemical analysis of the lesional tissue showed positive staining for α- SMA and vimentin while being negative for S-100 and neuron specific enolase. Based on the findings, the final diagnosis was leiomyosarcoma. The patient was advised surgical management of hemimandibulectomy and referred to higher centre for further treatment.

Case 2:

A 14-year old female patient reported with an ulcerative lesion of the right posterior region of the jaw associated with mobility of teeth 46 and 47 since 1 month **(Fig 5)**. The patient was apparently normal 1 month back after which the lesion was noted. CBCT shows a solitary large ill-defined expansile osteolytic lesion of mixed density in the region extending from 46 to the right body and ramus of the mandible **(Fig 6)**. A provisional diagnosis of aggressive neoplastic lesion such as odontogenic myxoma and osteosarcoma was considered. Incisional biopsy was performed and the H and E stained sections shows sheets of malignant tumor cells separated by fibrous connective tissue septae. The malignant cells displayed atypical features such as cellular and nuclear pleomorphism, nuclear hyperchromatism and few bizarre shaped cells. Presence of eosinophilic areas resembling tumor osteoid surrounded by malignant osteoblasts was evident. In addition, the sections also showed a sub-population of clear cells which were round to oval in shape with vesicular nuclei and clear cytoplasm with some binucleation resembling chondroid like areas **(Fig 7 & 8)**. Special staining for

PAS and mucicarmine to rule out clear cell odontogenic carcinoma and intra-osseous mucoepidermoid carcinoma was negative. Based on these findings the final diagnosis was chondroblastic variant of osteosarcoma. Hemimandibulectomy was performed and the final diagnosis of the excised specimen was high grade osteosarcoma. Six month follow-up was uneventful.

Discussion

Leiomyosarcoma is a malignant mesenchymal neoplasm of smooth muscle origin accounting for 6 to 7% of all soft tissue sarcomas.[4] This neoplasm is rare in the oral cavity accounting for less than 0.06% of all oral malignancies with mandible being an unusual location owing to the paucity of smooth muscle in that region.[5] Intra-oral leiomyosarcoma occurs predominantly in males around the 4th decade of life with less occurrence in the younger age group.[6] Clinically, the lesion tends to appear as a painless, non-ulcerated mass of the soft tissues with rapid growth and devoid of any characteristic features and may resemble any oral malignancy (Izumi et al, 1995).[7] Microscopically, leiomyosarcoma is characterized by interlacing fascicles of atypical spindle shaped cells with abundant eosinophilic cytoplasm and indistinct cytoplasmic borders. The nucleus is centrally located with blunt cigar shaped ends (Lo Mozio, 2000).[8] Definitive microscopic diagnosis of the lesion is difficult owing to its similarity to other spindle cell malignancies and requires positive immunohistochemical findings for the confirmation of diagnosis. As per the existing literature the ideal treatment option for leiomyosarcoma includes surgical resection (hemimandibulectomy /hemimaxillectomy) with adjuvant radiotherapy and chemotherapy with regular follow up. Overall, the 5-year survival rate for primary LMS in the oral cavity is around 55% and the local recurrence is seen in 34% of cases (Ethunandan et al, 2007).[9]

Osteosarcomas (OS) is the most common primary malignant tumor of bone, nearly 6% of which occurs in the jaw mainly the mandible.[10] The most common histopathologic type is chondroblastic type in head and neck group and osteoblastic in extremity group.[10]. The varied radiographic appearance of this lesion highlights the importance of histopathologic analysis in the diagnosis of osteosarcomas. The diagnosis of osteosarcoma is based on recognition of osteoid production by tumor cells and depending upon the predominant type of extracellular matrix present, osteosarcomas are categorized histopathologically into osteoblastic, chondroblastic and fibroblastic subtypes. [11] Mardinger et al reported the highest prevalence for chondroblastic osteosarcoma (42%) followed by osteoblastic osteosarcoma (33%).[12] Histologic diversity of osteosarcomas

points to the fact that histology alone is insufficient for the diagnosis of osteosarcoma. Therefore, combined clinical, radiographic and histopathologic analysis before definitive diagnosis is necessary. Wide radical resection is the treatment of choice for osteosarcoma of jaws with clearance margins of 1.5–2 cm. Surgery and adjuvant chemotherapy and radiotherapy may be required sometimes. The presence of micrometastases decides the need of adjuvant therapy. In mandible, hemimandibulectomy is commonly preferred.[13]

In general, the treatment options for childhood oral cavity cancer include surgery, chemotherapy and radiation therapy either alone or in combination. The management of malignant tumors of the oral cavity depends on histopathology.[14] Multidisciplinary and multimodal approach to management and local control as well as preservation of the function should be the goal of any therapy.

Conclusion

Pediatric jaw malignancies are an uncommon occurrence that requires a comprehensive multidisciplinary and multimodal approach to achieve the long-term goals which includes tumor surveillance, maintaining normal facial skeletal and dental growth which may not cease until 18-21 years of age, preservation of normal speech and swallowing function and replacement of the missing dentition. Early diagnosis and treatment are a pre-requisite to avoid significant morbidity and also improve the quality of life. It is imperative that a thorough diagnostic work-up be carried out for pediatric oral neoplasms to aid in appropriate management and better prognosis.

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