CASE REPORT

Mesenchymal chondrosarcoma affecting the mandible

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ABSTRACT
Mesenchymal chondrosarcomas (MCs) are rare malignant neoplasms that can arise from both soft and hard tissues. They are distinct tumors arising in unicentric or multicentric locations. They reveal unusual clinical behavior, characteristic histopathological features, and poor prognosis with late recurrences. Here is a report of a rare case of MC that was arising in a 23-year-old female patient who was previously diagnosed for odontogenic myxoma. The importance of thorough evaluation and follow-up of the patient is emphasized.
Key words: De-differentiated chondrosarcoma, hemangiopericytoma, mandible, mesenchymal chondrosarcoma, metastasis, recurrent lesion

INTRODUCTION

MC is one of the most unusual, rare malignant cartilaginous tumors with distinct histopathological appearance and biological behavior.[1] Only around 50 cases affecting the jaws were reported in literature.[2,3] It was first described by Lichtenstein and Bernstein in 1958 as a separate entity.[1] MCs develop from pluripotent mesenchymal stem cells and can differentiate into angioblastic, fibroblastic, or cartilaginous structures.[1] MCs arise from soft tissues or bone in the ratio of 1:2 to 1:6.[4] These lesions affect females more commonly than males (4:1).[2] The most affected region is the facial skeleton, especially the jaws. Other bones are also affected.[1,2] Jaw lesions appear in the second and third decades of life.[5] This neoplasm is characterized by sheets or clusters of highly undifferentiated, small ovoid cells that alternate with small zones of neoplastic cartilage.[4] The prognosis of MC is unpredictable. These neoplasms reveal aggressive local behavior and a high metastatic potential.[2] Multiple recurrences in several other bones have been recorded, and there is an unproven view that this tumor may occasionally arise multicentrically.[6] Wide surgical excision is one of the preferred treatments, though radiotherapy and chemotherapy are advised as an adjunct without many advantages.[3]

CASE HISTORY

A 23-year-old female patient was referred from Kashmir to the K. S. Hegde Medical Academy, Mangalore, on December 14, 2004, for a complaint of painless swelling in the left submandibular region that was present since 4 months. Past medical and surgical history revealed similar swelling in the same region 2 years back. Left mandibular resection and marginal mandibulectomy was done on May 13, 2003. There was no record regarding purpose of the previous surgery. Record of incisional biopsy done on March 24, 2004, mentioned 'poorly circumscribed lesion composed of benign spindle cells embedded in a fine collagenous stroma suggestive of odontogenic myxoma.' Past dental history also revealed extraction of multiple painful and firm teeth from left lower jaw at the time of surgery. Family history, personal history, drug history were noncontributory. General physical examination revealed no significant findings. On local examination, a diffuse swelling was observed in left lower third of the face and in the submandibular area measuring around 8 × 10 cm. The swelling extended from lower border of the mandible to 4 cm superiorly in the ramus and body of the mandible. Mediolaterally the swelling extended from symphysis region to angle of the mandible. In the submandibular area, the swelling extended 4 cm from lower border of the mandible towards the midline. Skin over the lesion showed a linear scar [Figure 1]. On palpation the mass was multinodular, nontender with no localized rise in temperature. The swelling was firm to hard in consistency and was not movable. Skin over the mass was tense and unpinchable. Numbness was seen in the lower lip.

On intraoral examination, a diffuse swelling measuring around 6 × 4 cm was seen in the left floor of the mouth and in buccal sulcus, extending from retromolar area posteriorly to the right canine region crossing the midline anteriorly [Figure 2]. Swelling was nontender, nonmobile, and firm to hard in consistency. There were missing 35, 36, 37, and 38 Findings from routine blood investigations were within normal limits.

Radiographically the lesional area revealed a bony defect in the left mandible with missing 35, 36, 37, and 38. The extent of the swelling could not be assessed on radiographs due to previous surgery [Figure 3]. The lesion was thought to be a benign one arising in soft tissue with pushing margins of lingual cortex. Computed tomography (CT) revealed bilobulated hypodense lesion in the left submandibular region

with calcifications [Figures 4 and 5]. The mass appeared encapsulated, with normal adjacent bone. No significant lymphadenopathy was observed. Parotid gland (deep and superficial) lobes appeared normal. The impression from CT findings was of a benign submandibular gland mass (left).

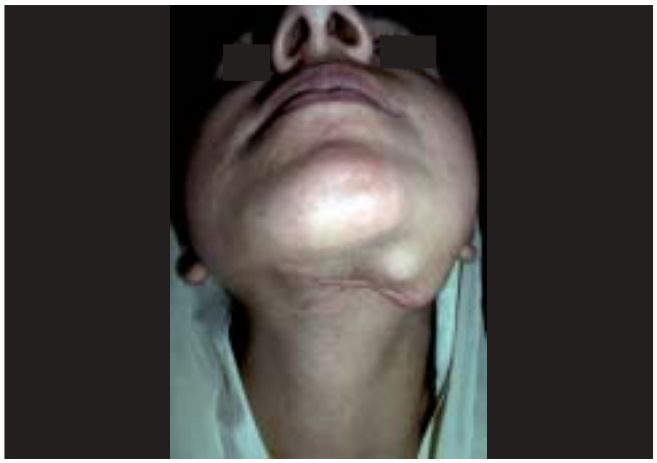

Figure 1: Extraoral clinical photograph showing swelling in left submandibular region

Fine needle aspiration cytology revealed the presence of noncohesive epitheloid cells and spindle-shaped mesenchymal cells in the background of fibrillary chondromyxoid ground substance. These epitheloid cells had regular ovoid nuclei with bland nuclear chromatin and well-defined cytoplasm. In MGG -stained smears, the chondromyxoid matrix was so intense that the cellular component was obscured. There were no hyaline stromal globules seen. Cytological features suggested pleomorphic adenoma.

Biopsy was advised to establish a definitive diagnosis. The mass was enucleated under general anesthesia. Excisional biopsy specimen received was a grayish white mass with nodular appearance and measured 4 × 3 cm. It was smooth to firm in consistency and appeared well delineated. Multiple hematoxylin and eosin - stained sections revealed biphasic pattern of tumor consisting of islands of cytologically benign hyaline cartilage with surrounding hypercellular areas containing small primitive-appearing round and spindle shaped

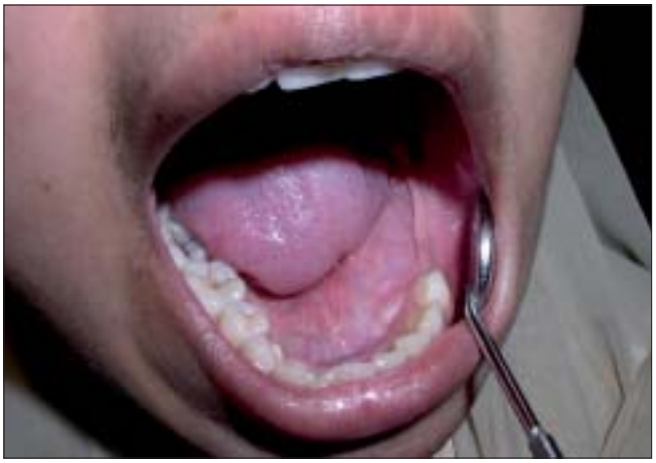

Figure 2: Intraoral photograph showing swelling in the left floor of the mouth extending to the retromolar area in left side to symphysis region in right side crossing the midline

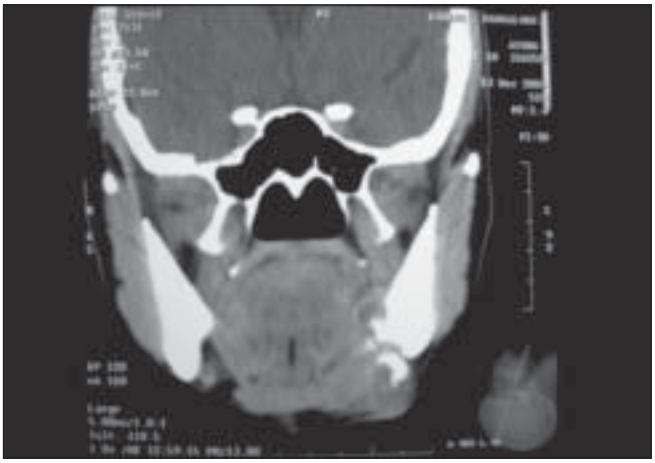

Figure 4: Computed tomography showing hypodense lesion in the left submandibular region with small areas of calcifications

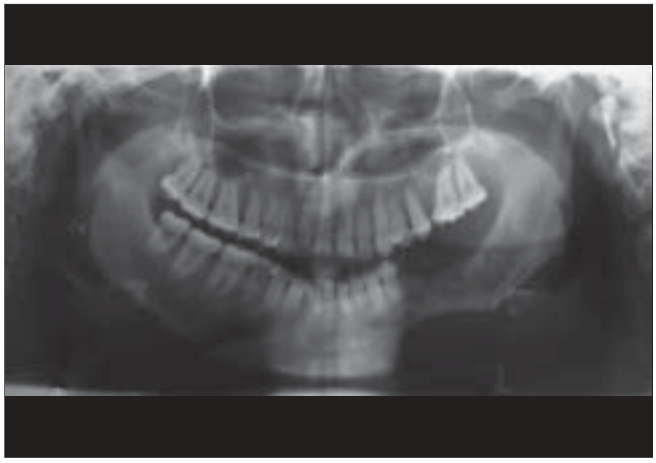

Figure 3: Orthopantamograph (OpG) showing bony defect in the left body and ramus of the mandible

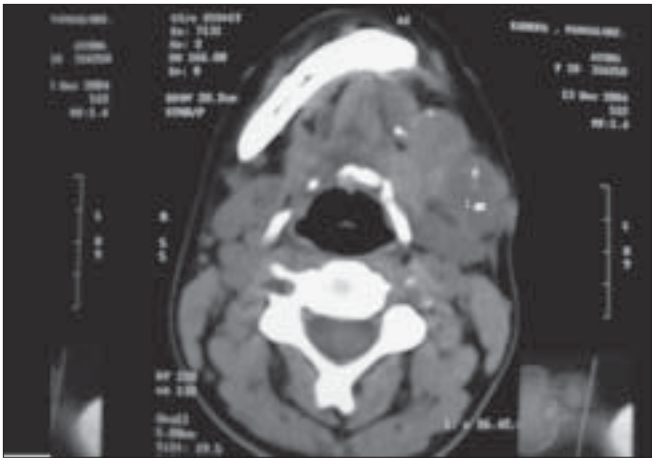

Figure 5: Computed tomography showing hypodense lesion in the left submandibular region with small areas of calcifications

mesenchymal cells [Figures 6 and 7]. Primitive-appearing mesenchymal cells had scanty cytoplasm, mildly pleomorphic nuclei that exhibited irregular chromatin clumping and few cells with small nucleoli [Figure 8]. Mitotic activity was variable. In few areas, these cells were surrounded by delicate branching vessels, imparting a hemangiopericytoma-like appearance [Figure 9]. In some areas, these cells had a pattern mimicking Ewing's sarcoma or embryonal rhabdomyosarcoma. Transitional zone seen between the chondroid foci and the mesenchymal component was more gradual and not sharp. Few chondroid areas showed necrosis [Figure 10]. Based on the clinical, radiographic, and histopathological examination, the final diagnosis of MC was given. After the initial treatment of surgery, the patient went back to her place in Kashmir. She did not return for follow-up. It was later known from one of her relatives that she had expired after 6 months due to lung metastasis.

DISCUSSION

MCs are rarely reported in literature due to their rarity of incidence. Both skeletal and extraskeletal lesions have been reported in the head and neck region.[4] Extraskeletal tumors commonly arise from the orbit,[5] meninges,[6] and nasal[6]

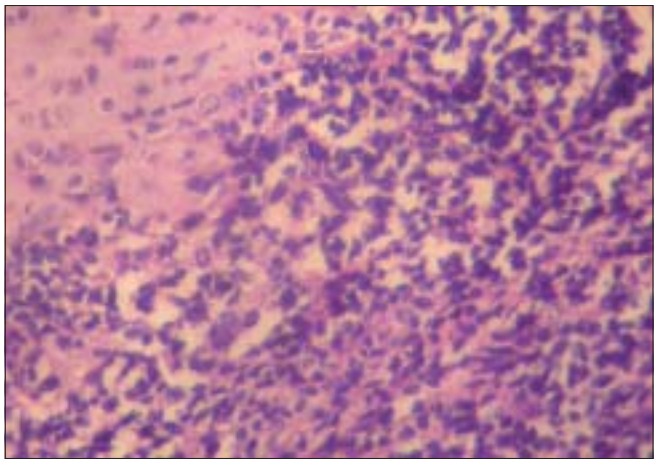

Figure 8: Photomicrograph showing primitive-appearing mesenchymal cells with scanty cytoplasm and mildly pleomorphic nuclei that exhibited irregular chromatin clumping and few cells with small nucleoli. Mitotic activity was variable (H and E, 20×)

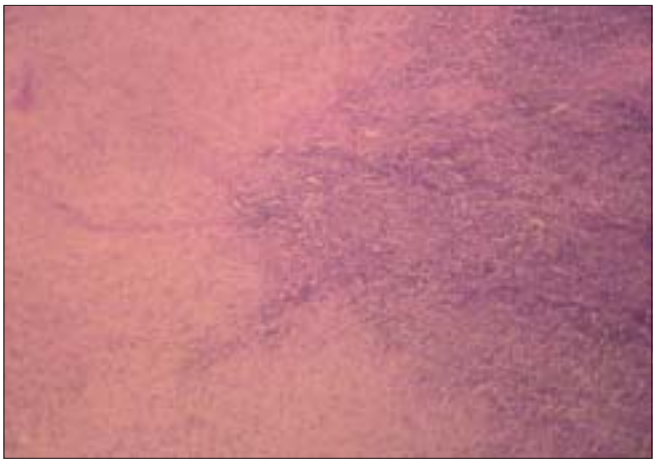

Figure 6: Photomicrograph showing a bimorphic pattern of islands of cartilage surrounded by primitive mesenchymal cellular areas (H and E, 5×)

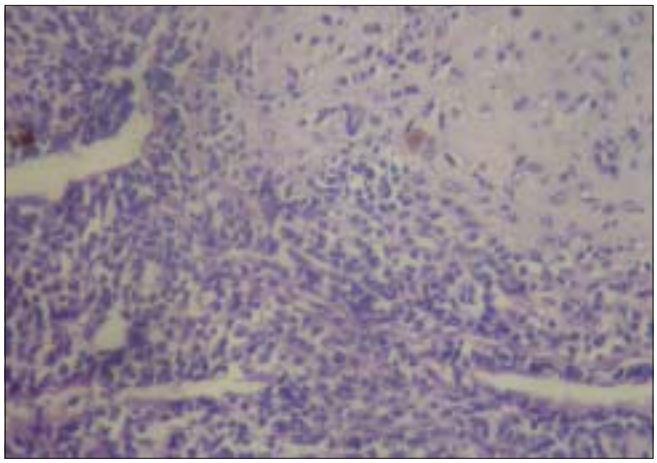

Figure 9: Photomicrograph showing cellular areas containing small primitive-appearing mesenchymal cells arranged around blood vessels (H and E, 10×)

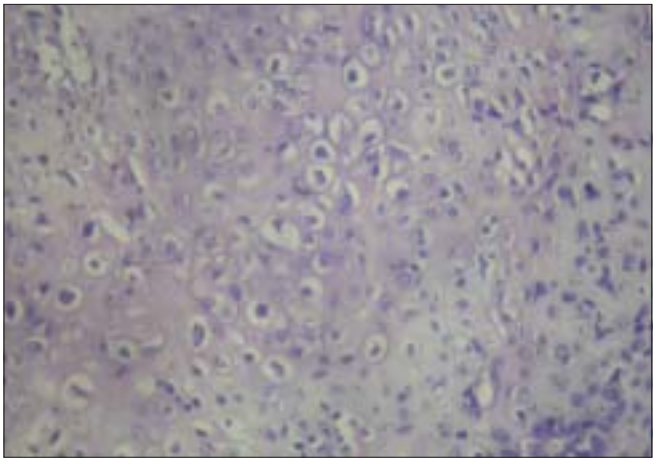

Figure 7: Photomicrograph showing chondroid areas with few atypical chondrocytes (H and E, 20×)

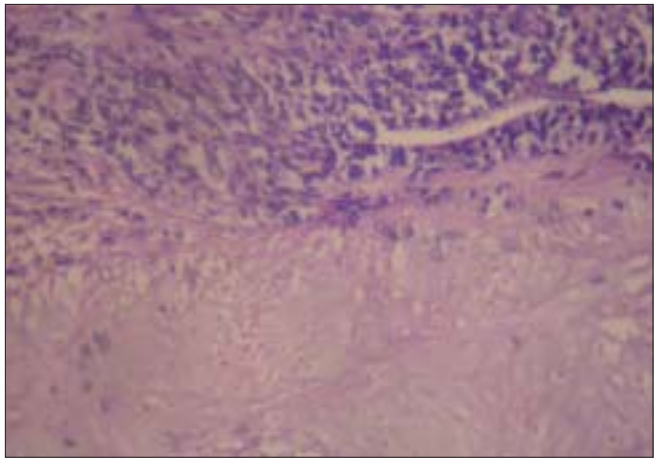

Figure 10: Photomicrograph showing areas of necrosis in chondroid tissue (H and E, 10×)

and paranasal mucosa.[5] Two cases have been reported in the paramandibular area.[5,6] Among the intraskeletal region, jaws are the most commonly involved site, though other bones are also affected.[1,2] When MCs occur in the jaws, maxilla was the more common site in one report[5]; and in another, equal occurrence in both the jaws was reported.[4] In mandible the most common site is premolar and molar area; but the symphysis, coronoid, and condylar processes may also be involved.[2] Though the so-called paramandibular tumors that were reported in the literature[5,6] arose from soft tissue and eroded the bone, in the present case it is hard to suggest the site of origin (intraosseous or extraosseous) due to recurrence. In this case, it is hard to comment on previous biopsy report of odontogenic myxoma since MCs were generally misdiagnosed as odontogenic fibroma,[7] chondromyxoid fibroma,[6] fibrosarcoma,[1] or angiosarcoma[1] on incisional biopsies. The possibility that the lesion could be entirely of soft tissue origin in paramandibular area and that the initial odontogenic myxoma was a separate lesion cannot be overlooked. MCs show no specific clinical signs and symptoms. The predominant symptom was usually a painless mass or swelling (53%), as in the present case. However, painful mass (16%) has also been reported.[4] Few patients developed neurological disturbances such as facial paresthesia and lip pareses.[4] Dental complaint may be an initial symptom. Injudicious local surgery, dental extraction, or even biopsy may provoke more rapid growth.[2]

The most common radiographic appearance of MC of jaw is a radiolucent osteolytic shadow, and it is difficult to distinguish MC from other cartilaginous or osteogenic sarcomas.[4] Soft tissue lesions appear as stippled radiopacity representing small foci of cartilage formation similar to the present case.[3] There have been few articles published describing the appearance of MCs of the oral and maxillofacial region using modern imaging techniques.[3] It is reported in previous literature that on CT, the tumor presents as a well-defined mass with multiple areas of fine and course calcification similar to the present case; whereas on dynamic CT, the tumor reveals delayed contrast enhancement.[3] Previous MRI studies have revealed the tumor signal intensity to be lower than or equal to the brain on T1-weighted images, and is isodense on T2-weighted images with moderate heterogeneous enhancement of the noncalcified component.[3]

FNAC features have been also less described in literature. In the present case, cytology revealed features that were consistent with pleomorphic adenoma.

Gross appearance of MC has been described as a firm whitish mass in one report[6]; and in another, as a spherical nodule.[8] This tumor is usually considered to be a well-delineated mass and can be easily demarcated from the surrounding tissues, as in the present case.[5] On cut section, most of the tumors are reported to possess some degree of mineralization, cartilaginous appearance, and necrosis and hemorrhage.[5]

Histopathological diagnosis of MC is not difficult in view of the characteristic combination of highly cellular undifferentiated zones with islands of chondroid differentiation.[3] A correct diagnosis, however, can be difficult on a small biopsy sample, which may only contain one of the two components.[3] It is important to note that in contrast to some other forms of chondrosarcomas, cellular pleomorphisms and high mitotic activities are not usually seen in MCs.[5] Because of rich vascular component, this lesion has often been confused with hemangiopericytoma.[3] Other cases have been reported as Ewing's sarcoma and osteosarcoma.[4,6] In the present case, histopathologically few areas revealed features that were similar to Ewing's sarcoma, embryonal rhabdomyosarcoma, and hemangiopericytoma. These lesions were differentiated from MC by the presence of chondroid component.[9] The dedifferentiated chondrosarcoma also looks similar, with a relatively well-differentiated chondrosarcoma surrounded by highly malignant stromal cells[9]; but it occurs in older age groups and is more likely to affect the appendicular skeleton. These tumors exhibit abrupt, sharp margins between the chondroid component and the dedifferentiated component, whereas MCs reveal a more diffuse and gradual transition zone between the chondroid foci and mesenchymal component. These tumors also lack hemangiopericytoma-like pattern.[9] Differentiating between osteogenic sarcoma and chondrosarcoma is not difficult, and sometimes alkaline phosphatase enzymatic properties of tumor cells might guide in difficult cases.[5] No mention has been made in the literature on enzyme histochemistry of MCs.[5] Immunohistochemistry is advised for difficult cases. Chondroid areas are positive for S-100 protein, and neurone-specific enolase is focally positive for primitive mesenchymal cells.[9] Electron microscopically, both undifferentiated mesenchymal cells and fibroblast-like elements have been found. These are the elements of prechondral mesenchyme but of course are not confined to that tissue.[6]

There is diversity of opinion in treatment of MCs.[1,8] There have been reports of resolution of MCs with chemotherapy and/or radiation therapy alone without surgical intervention; the effectiveness of this approach is still not clear.[8] The general consensus suggests that surgical excision with wide margins is the preferred treatment.[8] Due to misdiagnosis of initial biopsy, the initial treatment in most of the cases has been conservative.[6-8] In the present case also, the CT, FNAC features and previous incisional biopsy report were suggestive of a benign lesion, which led the surgeon to a less aggressive surgery.

Prognosis of MC is poor because the tumor has a tendency for late recurrence, either locally or as metastasis.[8] Metastasis is primarily by hematogenous spread, with the lungs being the most common site.[8] Recurrent or metastatic disease may take as long as 20 years.[8] Thus there is need for long-term follow-up. Overall, there is a 10-year survival rate of 28%.[8] It appears that survival time is longer with maxillary MCs than mandibular lesions.[4] Because of less information about follow-up in literature, it is difficult to draw conclusion

about prognosis, which may depend upon extraskeletal or intraskeletal location.

CONCLUSION

The present case report emphasizes that any history of a recurrent lesion should be evaluated cautiously. Though MCs are rarely reported, adequate biopsy and multiple sections should be examined properly. As recurrence and metastasis is very frequent with MC, frequent follow-up for a long period should be advised. Because of the reports of lesions occurring at multiple sites, the clinician should properly evaluate the presence of the disease elsewhere in the body. MCs should be considered as a completely separate entity from other chondrosarcomas due to their unusual behavior, distinct histopathology, late recurrence, and poor prognosis.

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