



## CASE REPORT

# Hyoid bone chondrosarcoma with cervical nodal metastasis: A case report



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### KEYWORDS

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**Abstract** *Background:* Hyoid bone chondrosarcoma is a very rare condition. This study presents a case report of low-grade chondrosarcoma of hyoid bone with cervical nodal metastasis. The study also presents preoperative radiological investigations, pathological examination and the follow-up of the case.

*Case presentation:* A 42 years old female had a hard mass in the left submandibular region of the neck. The mass was 5.5 cm × 7.5 cm and mobile with deglutition.

*Conclusions:* Although the tumor was low grade, it showed cervical lymph node metastasis months after its surgical excision. This shows the importance of scheduled CT scan of the neck during follow-up of these cases.

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## 1. Introduction

Chondrosarcoma is one of the most common types of primary bone tumors in adults, second only to osteosarcoma.<sup>1</sup> It constitutes around 11% of all bone tumors. It mostly arises in the pelvic bones, proximal femur, proximal humerus, distal femur, and the ribs.<sup>2</sup> A small percent of the cases of chondrosarcoma arise in the head and neck region (1–12% of cases), where it

usually involves the nose and paranasal sinuses, mandible, temporal bone, and larynx.<sup>3</sup>

Chondrosarcoma rarely involves the hyoid bone with only 20 cases reported in the literature.

This is a description of a case of hyoid chondrosarcoma treated in our institute, and a review of the literature.

## 2. Case report

42 years female patient presented with painless left sided submandibular neck mass for 1 year.

On examination the mass is about 5.5 cm × 7.5 cm hard, not fixed to the surrounding structures, mobile with deglutition non-tender and without any inflammatory signs.

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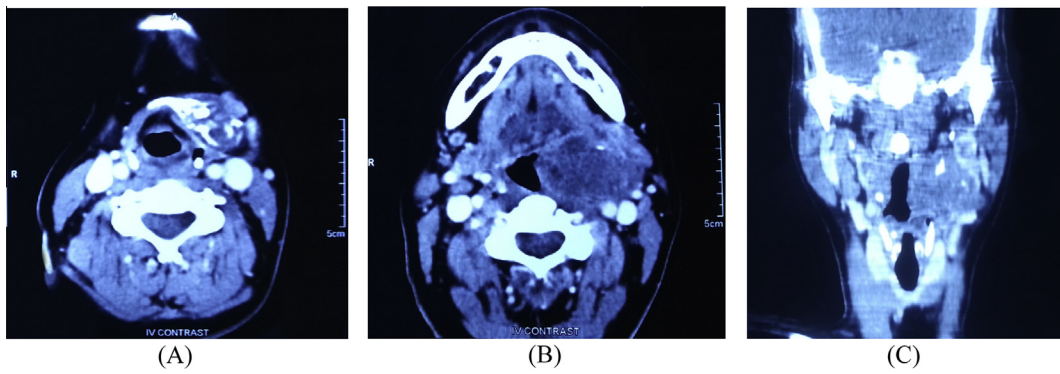
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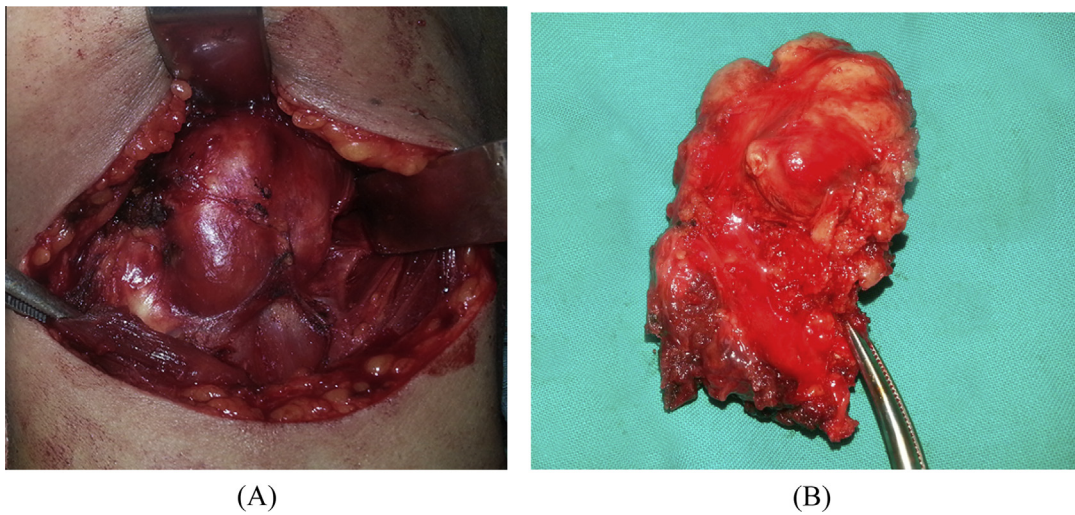
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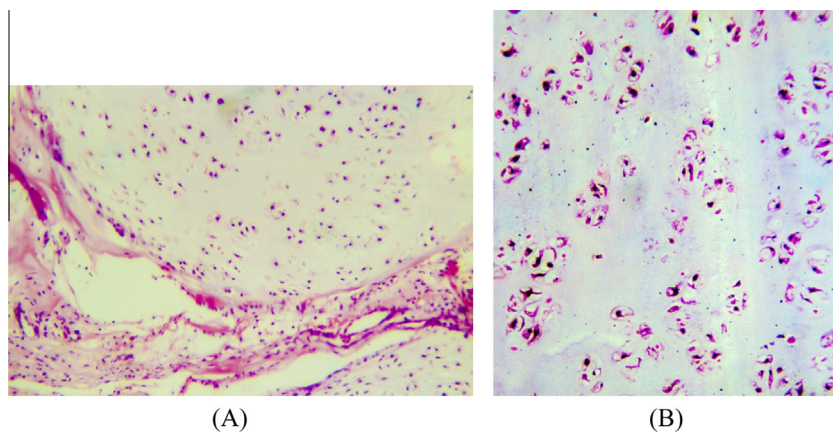
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**Figure 1** Preoperative CT scan of the patient contrast enhanced CT scan axial view of the neck showing the chondrosarcoma of the hyoid bone on the left side with heterogeneous consistency and peripheral calcification (A), (B) axial view and (C) coronal view.



**Figure 2** Operative demonstration of the tumor (A) showing the mass attached to the left side of hyoid bone deep to the sternomastoid muscle and (B) the surgical specimen.



**Figure 3** Histopathological examination of the tumor (A) part of a nodule of malignant cartilaginous growth made up of crowded hyperchromatic chondrocytes lying on a chondroid matrix. H&E 200 $\times$ . (B) Closer view of the hyperchromatic multiple chondrocytes residing in their lacunae and lying on a basophilic chondroid matrix. H&E 300 $\times$ .

**Table 1** Histopathological grades of chondrosarcoma.

Grade	Histology
1	Lesion exhibits a preponderance of small, densely stained nuclei
2	Lesion contains areas with moderate-sized nuclei but with a low mitotic rate
3	Lesion has large nuclei, with foci of dense cellularity and a high mitotic rate

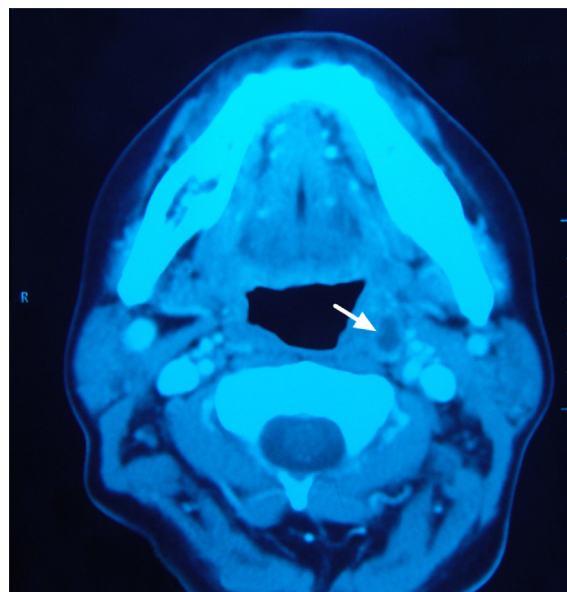
Contrast enhanced CT scan was done and demonstrated that the mass is based on the region of the left greater and lesser cornua of hyoid bone (Fig. 1). Associated destructive changes were noted in the hyoid bone. The matrix showed ossous density ossification foci. The mass was encroaching upon the oropharyngeal, left pyriform fossa, and supraglottic larynx and laterally reaching the submandibular and carotid space.

It was resected with the whole body of the hyoid bone as a safety margin, measuring  $8 \times 6 \times 4$  cm in dimensions (Fig. 2).

Histopathological examination of the mass revealed lobules of atypical cartilaginous tissue (Fig. 3). The cartilaginous matrix included numerous chondrocytes in their lacunae, having slight hyperchromatic nuclei, with focal areas of myxoid changes. Fibrous stromal tissue was intersecting the growth with few scattered bony spicules.

The patient developed, 5 months later, left upper deep cervical nodal enlargement level II and III. Selective neck dissection of these levels was done. Histopathological examination of these lymph nodes revealed reactive lymphoid hyperplasia with no tumor tissue.

Surprisingly, follow-up enhanced CT scan after 3 months showed ring enhancing lymph node in the left parapharyngeal space (Fig. 4). Transoral excision was done. Pathological examination revealed metastatic deposits of low-grade chondrosarcoma in the lymph node, with large areas of hyaline material incorporating numerous islands of chondroid tissue formed of trabeculae and nests of cartilaginous cells exhibiting nuclear pleomorphism and mild hyperchromatism embedded in chondroid matrix (Fig. 5).

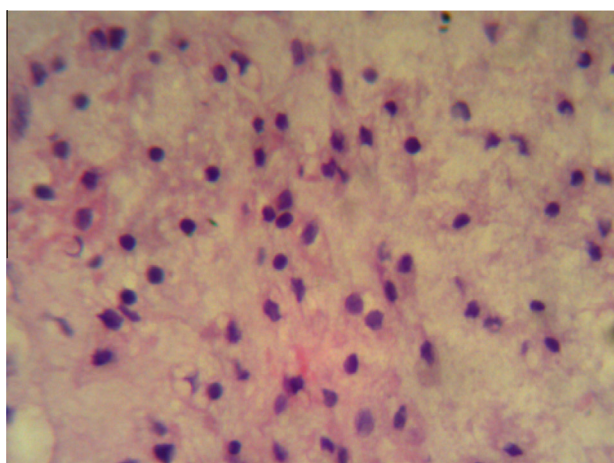


**Figure 4** Postoperative imaging contrast enhanced CT scan axial view showing left parapharyngeal metastatic lymph node (white arrow).

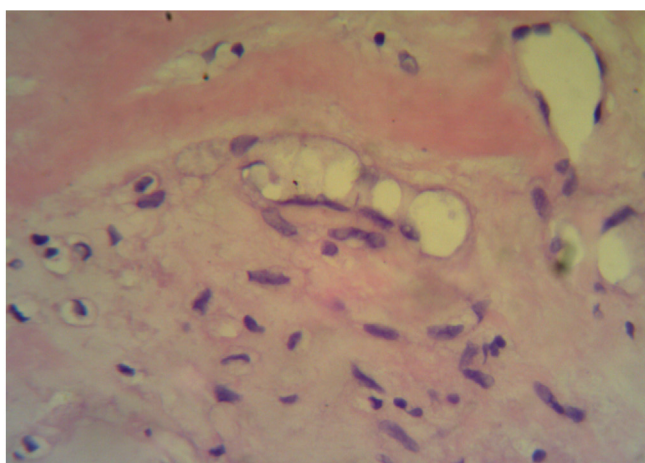
### 3. Discussion

Hyoid chondrosarcoma is an infrequent condition with 20 cases reported in the literature till now. The diagnosis of chondrosarcoma is usually suspected after radiological investigations. Yet, it is not possible to differentiate chondroma from low-grade chondrosarcoma based on radiological criteria only.<sup>4</sup> The diagnosis is confirmed histopathologically after surgical excision. Other tumors of the hyoid bone include osteoma, chondroma, osteosarcoma, plasmacytoma, giant cell tumor, aneurysmal bone cysts. Chondrosarcoma may arise from any part of the hyoid bone.<sup>4,5</sup>

Hyoid chondrosarcoma usually presents with painless mass and sometimes dysphagia. It is more common in males. The



(A)



(B)

**Figure 5** Histopathology of metastatic lymph node (A) showing deposits of chondroid tissue with chondrocytes showing nuclear pleomorphism and mild hyperchromatism in chondroid matrix H&E 300 $\times$  (B) with higher magnification H&E 400 $\times$ .

age of presentation ranges from 28 to 82 years. Most of the cases reported were grade 1.<sup>6</sup>

Unlike the present case, which showed lymph node metastasis after 8 months, previous studies did not show nodal metastasis in cases of hyoid chondrosarcoma (although some cases showed distant metastasis to the lung in most of the cases).<sup>7</sup> In Lee et al. study, there was a case of tonsillar recurrence in a case of thyroid cartilage chondrosarcoma.<sup>8</sup>

Generally speaking, chondrosarcoma shows distant metastasis in 6.7% of cases.<sup>8</sup> Ozaki et al. studied intermediate and high-grade chondrosarcoma and found that the incidence on distant metastasis was 21% and 60% respectively.<sup>9</sup> There are 2 published case reports of humeral chondrosarcoma with nodal metastasis in the literature.<sup>10,11</sup> In another report, among 46 cases of chondrosarcoma only 1 case showed lymph node metastasis.<sup>12</sup> It worth mentioning that, chondrosarcoma shows a relatively higher rate of local recurrence.<sup>8</sup>

Contrast enhanced CT scan is the radiological investigation of choice for assessment of the nature and extension of the tumor. In most of the cases it shows bone destruction, and intrinsic calcification.<sup>4</sup> Other lesions that may show similar CT scan features include enchondroma and osteoblastoma, but they are very rare in the head and neck.<sup>13</sup>

MRI gives a better idea regarding the surrounding soft tissue involvement. Chondrosarcoma appears heterogeneously hypointense in T1 weighted images, with strong peripheral enhancement. On T2 weighted image the lesion shows hyperintensity, with areas of signal voids due to intrinsic calcifications.<sup>5</sup> Other lesions that may show similar MRI characteristics include osteogenic tumor and aneurismal bone cysts. PET scan does not have a role in the diagnosis of chondrosarcoma as it cannot differentiate between chondroma and low-grade chondrosarcoma, but it may predict the grade of the tumor before surgery.<sup>14</sup>

Pathologically chondrosarcoma is graded 1–3 based on the mitotic rate, cellularity, and nuclear size.<sup>15</sup> (Table 1)

The treatment of choice in this condition is surgical resection. During surgery it is very important to ensure safe margins, because leaving residual disease is a well known cause of recurrence. Elective neck dissection is not indicated because of low incidence of cervical lymph node metastasis.

Postoperative complications may include dysphagia or dysphonia, but these sequelae did not happen in our case, and she returned back to her normal lifestyle after recovery from surgery. Postoperative radiation does not have a specific role in the treatment plan till now. It may be indicated if the patient is unfit for surgery.

The prognosis of this condition depends on the adequacy of surgical resection, and the histological grading of the tumor. Throughout the body 5 years survival rates are 90%, 81%, and 29% for grade 1, 2, and 3 respectively.<sup>15</sup> The rates of distant metastasis from chondrosarcoma are 0%, 21%, and 60% for grade 1, 2, and 3 respectively. Distant metastasis from chondrosarcoma frequently affects the lung.<sup>9</sup>

The current NCCN guidelines for the follow-up of these patients are that, for the low-grade tumors CT of the chest and primary site should be done every 6–12 months for 2 years, then every year as appropriate. For the high-grade tumors CT chest should be done every 3–6 months for 5 years,

and regarding the primary site CT should be done as clinically indicated.

#### 4. Conclusion

The present study adds the 21st chondrosarcoma of the hyoid bone with an exceptional course. Although it was a low grade, the patient developed a positive parapharyngeal node, an unusual site after and usual period of time. The present case dictates obeying the NCCN guideline literally (regular CT scan neck every 6 months at least).

#### Conflict of Interest

Author states that there is no conflict of interest.

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