Histomorphological Patterns of Malignant Bone Tumors

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Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Keywords: NIL

Introduction

Bone tumors are relatively uncommon constituting 0.5% of all tumors[1]. Thus, orthopaedicians, radiologist and pathologist have less experience with these lesions. An integrated team approach involving radiologist, histopathologist, and clinician is required to form accurate diagnosis and to determine the degree of activity and malignancy of each lesion. Symptoms are of limited value in arriving at a diagnosis, the age of the patient and the exact location of the tumor are extremely important. Symptoms are mostly non specific. Most patients present with progressive pain, swelling, tenderness and in some cases acute pathological fracture. Most of the highly malignant sarcomas, such as Ewings sarcoma, and Osteosarcoma, occur in children. Low grade sarcomas, such as chondrosarcoma occur in adults. Radiographic appearance is of great importance and best way to localize the lesion. A histological diagnosis is more acceptable to the clinician if it correlates with the images. However, if the pathologist is convinced by the histological appearance, the diagnosis should be made regardless of other features. Thus, a proper histopathological diagnosis is important so that further management of the patient can be planned.

Bone consists of cartilage, osteoid, fibrous and bone marrow elements[2]. Each of these components can give rise to benign or malignant tumors. Bone tumors are classified on the basis of cell type, recognized production of proliferating cells and morphological findings including cell type, architecture, and matrix. Most of the primary bone tumor affects children and late adolescent. Osteosarcoma is the most common malignant bone tumor in children followed by Ewings and Lymphomas[1,3]. The aim of the present study is to determine the spectrum of various neoplastic lesions of bone at a tertiary care hospital in Jammu region. Bone tumors are diverse in their behavior from being indolent to rapidly fatal. Therefore, it is important to accurately diagnose, stage and treat tumors appropriately to improve prognosis and reduce morbidity.

Material and Methods

The present study was carried out at ASCOMS medical college and hospital, a tertiary care centre in Jammu region. A retrospective 4 year study in the period between 2015-2019 and prospective one year study from 2019-2020 was done. A total of 84 bone lesions were analyzed. All the relevant information were taken from records and slides were retrieved. For new cases detailed clinical and radiological history was taken. Bone along with attached soft tissue was received, and the thorough gross examination of each lesion was done. Bony tissues were put for decalcification (10% nitric acid) and soft tissue was immediately fixed into 10% formalin and...
processed by paraffin embedding. Sections were then stained by haematoxylin and eosin stain.

**Results**

Out of total 84 bone lesions, 29.76% were non neoplastic (n=25), 70.23% were neoplastic (n=59). Majority of the cases were reported in males 75% (n=63) and females were involved in 25% (n=21). Out of total 63 bone lesions in males, 49 cases were neoplastic and 11 were non neoplastic. In case of females, out of total 21 bony lesions 11 cases were of non neoplastic pathology while 10 cases were neoplastic. Hence, from above results it is concluded that neoplastic lesions were more common in males as compared to females.

Among the 59 neoplastic bony lesions, 57.62% (n=34) cases were reported benign and 42.37% (n=25) were malignant. Out of total 34 benign bony lesions, maximum of 19 cases were reported in less than 20 year of age group. Among malignant bony lesions maximum cases were again seen in less than 20 year of age group constituting 14 cases out of total 25 malignant bony lesions reported.

Among the total 34 benign lesions, 30.50% were reported as Osteochondroma, 22.03% Osteoclastoma, 3.38% Osteoid osteoma and 1.69% as Enchondroma. Out of total 25 malignant lesions, 20.33% were Osteosarcoma, 16.94% were Ewings sarcoma and 5.08% were Metastasis. Hence, Osteosarcoma was reported as the most common malignant bony lesion.

<table>
<thead>
<tr>
<th>Bone lesion</th>
<th>Non neoplastic</th>
<th>Neoplastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>14</td>
<td>49</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>59</td>
</tr>
</tbody>
</table>

**Table 2: Neoplastic Lesions**

<table>
<thead>
<tr>
<th>Age(years)</th>
<th>Benign</th>
<th>Malignant</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>19</td>
<td>14</td>
<td>33</td>
</tr>
<tr>
<td>21-40</td>
<td>12</td>
<td>09</td>
<td>21</td>
</tr>
<tr>
<td>41-60</td>
<td>02</td>
<td>01</td>
<td>03</td>
</tr>
<tr>
<td>&gt;60</td>
<td>01</td>
<td>01</td>
<td>02</td>
</tr>
</tbody>
</table>

**Table 3**

<table>
<thead>
<tr>
<th>Benign</th>
<th>Total</th>
<th>Percentage (n=59)</th>
<th>Malignant</th>
<th>Total</th>
<th>Percentage (n=59)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteochondroma</td>
<td>18</td>
<td>30.50</td>
<td>Osteosarcoma</td>
<td>12</td>
<td>20.33</td>
</tr>
<tr>
<td>Osteoid osteoma</td>
<td>02</td>
<td>3.38</td>
<td>Ewings sarcoma</td>
<td>10</td>
<td>16.94</td>
</tr>
<tr>
<td>Osteoclastoma</td>
<td>13</td>
<td>22.03</td>
<td>Metastasis</td>
<td>03</td>
<td>5.08</td>
</tr>
<tr>
<td>Enchondroma</td>
<td>01</td>
<td>1.69</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The present study is a 5 year retrospective study done in a tertiary care hospital in Jammu region with an attempt to document the spectrum of various neoplastic bony lesions. Our review of cases showed that the age distribution and type of bone tumors are similar to the other studies[4]. Out of total 84 bone lesions, 29.76% were non-neoplastic (n=25), 70.23% were neoplastic (n=59). Among the 59 neoplastic bony lesions, 57.62% (n=34) cases were reported benign and 42.37% (n=25) were malignant. Among the benign lesions, the most common benign tumor was Osteochondroma in 18 cases (30.50%). Osteosarcoma was the most common malignancy seen in 12 cases (20.33%) similar to the other studies[5,6]. In the present study, bone lesions were most commonly seen in less than 20 year of age group. Most tumors of bone showed male preponderance similar findings were also reported in other studies[7-9]. Non neoplastic and benign lesions were more common than the malignant bony lesions[10]. Among the neoplastic lesions, benign lesions were more common than the malignant lesions[11-16]. Neoplastic lesions were found to be more common than non neoplastic lesions similar to studies done by Settakom et al[17]. The haematological malignancies involving the bone was not included in the present study since haematopoietic lesions are dealt by haematology section in our centre. Hence, bone lesions contribute a very small fraction of lesions. The diagnosis of a bone tumor is an integrated approach in which clinical details, age, gender, site and radiological findings are important before giving a histopathological diagnosis. Histopathological diagnosis is the gold standard for exact diagnosis and helps the clinician in further management of the patient.

Conclusion

The present study was an assessment of the case load of bony lesions in our centre as well as to assess the histopathological spectrum of the neoplastic bony lesions. We concluded that histopathology examination is the gold standard for diagnosing bony lesion along with correlation of clinical and radiological details.

References


