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Radiology

RADIO PATHOLOGICAL CORRELATION OF PRIMARY BONE OSTEOSARCOMAS

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ABSTRACT

Background: - Radiological evaluation is more accurate in characterization of primary bone osteosarcomas as compared to other malignant lesions affecting human body. However, pathological correlation is always needed from treatment point of view as early diagnosis and staging will directly affect the prognosis of the patient. So correlation of radiology with pathology is of utmost importance.

Methodology: - 50 eligible patients were studied for radio-pathological correlation during period of 35 months at two tertiary centers.

Observations: - Radiological investigations had 86 % diagnostic accuracy as compared to FNAC having 93.3 % & that of CNB – 97.92% for final diagnosis of primary bone osteosarcomas.

Conclusion: - Combined use of Radiology & pathological investigations is recommended in diagnosis of primary bone osteosarcomas.

KEYWORDS : Osteosarcoma, core needle biopsy, aspiration cytology.

INTRODUCTION

Primary bone osteosarcomas are second most common primary malignant bone tumors after multiple myeloma. It depicts two important features namely, production of osteoid matrix & histochemical presence of alkaline phosphatase. Rarely, osteosarcomas will have multi centric origin or they can also occur within the soft tissues. Pleomorphic nature of osteosarcomas will produce tumor bone or extensive calcification depending upon underlying cell type.

The present study was carried out to study radio pathological correlation of primary malignant osteosarcomas & results have compared with final tissue diagnosis.

METHODOLOGY

- Study design: - Prospective observational study.
- Study setting: - 2 tertiary care hospitals.
- Study duration: - 1st November 2011 to 30th November 2013 & 16 September 2015 to 31st August 2016.
- Sample size: Total 50 patients were studied.
- Participant selection:

Inclusion criteria –

- Lesions appearing malignant on imaging.
- Non malignant lesions on imaging but positive on histopathology.

Exclusion criteria –

- Metastatic lesions
- Benign lesions including infections both on imaging as well as pathology.

These patients had undergone multiple radiological investigations & provisional radiological diagnosis was provided from thoroughly studying imaging features.

Procedure / Equipment / Materials:

- Radiography – Uniray 1000 digital radiography machine
- Ultrasonography – Philips HD 11 & IU 22 machines.
- CT – Philips brilliance 256 slices & Siemens 128 slice CT machines.
- MRI – Philips Achieva 1.5 Tesla & Hitachi 0.3 T.
- Contrast media – For CT - non ionic iodinated & for MRI – Gadolinium based contrast media.
- FNAC – 26 G needle & Biopsy -16 G Gun.

Pretested proforma with relevant clinical history & examination findings were noted followed by radiological investigations. FNAC as well as biopsy were then conducted under written informed consent. WHO classification was the applied for radio-pathological findings & final diagnosis was taken in to consideration according to open biopsy or surgical specimen. In few cases, response to chemo or radiotherapy was decisive factor rather than histopathology.

Institutional ethics committee approval was obtained for above mentioned study.

OBSERVATIONS

Radiological evaluation was performed in all 50 cases. Core needle biopsy was also carried out in all 50 patients, but was inadequate in 2 cases. FNAC was performed in all 50 in which 5 samples were inadequate for interpretation.

Osteosarcoma has bimodal distribution of presentation with majority of patients were in under 20 years of age (78 %) followed by 21-30 (14 %) and few patients were presented in more than 50 years (8%). Clinically swelling was there in majority of patients (70 %). Lower end of femur was most common site of involvement (50 %), followed by upper end of humerus (18 %), upper end of tibia (12 %), upper end of fibula (10 %), iliac bones (6 %), 1 involving maxilla & scapula (2 % each). Male predominance was there with Male: Female ratio 1.7 :1.

Involvement of metadiaphysial region was most common (32 out of 45 = 71%) while metaepiphyseal origin was there in rest of the 13 patients. Soft tissue involvement was there is all 50 patients with accuracy of radiograph for detection were 74% while CT as well as MRI had 100% accuracy. 9 patients had distant metastasis, out of which lung metastasis was detected on both radiograph as well as CT scan while bone metastasis accuracy was 25% for radiograph & 100% for CT scan.

Accuracy rate was 86 % for radiology (43 out of 50), for FNAC (42 out of 45 = 93.3 %) & for CNB (47 out of 48 = 97.92 %).

DISCUSSION

Osteosarcoma was most commonly affecting bones around the knee joint in this study. This is in accordance with studies of Santini et al [1] & de Santos et al [2]. Accuracy rate of radiological investigations was found to be 86 % which is correlated well with Alex et al [3], Oudenhoven et al [4] & Tehranzadeh et al [5]. Thus this study further strengthened previous evidences of site of involvement of primary Osteosarcoma.

Accuracy of FNAC and CNB was much higher than Welker et al [6], however was comparable with Santini et al [1] substantiating available evidence.

CONCLUSION & RECOMMENDATIONS

Combined use of Radiology & pathological investigations is recommended in diagnosis of primary bone osteosarcomas. This will help to reduce morbidity as well as mortality of patients.

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