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Chondrosarcoma of 5th metatarsal – Right Foot: An Unusual Presentation and Review of Literature

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Abstract: *A case of Chondrosarcoma of 5th Metatarsal – Right Foot in a 29 year old female patient is discussed here. The foot is a relatively unusual site for the incidence of Chondrosarcoma. The 29 year old lady presented with a slow growing swelling over the outer aspect of her right foot for the past few months. The x-ray of the involved foot showed an erosive lesion on the 5th metatarsal with significant soft tissue involvement and areas of calcification. Initially a core biopsy was done followed by excision of the 5th toe and 5th metatarsal from the right foot. The specimen was sent for histopathological examination. Microscopic examination revealed well differentiated Chondrosarcoma (Grade I) of the 5th Metatarsal.En bloc excision along with the 5th metatarsal and 5th toe was done. Postoperative Radiotherapy was also given. The patient is, at present, on a 2 year follow up which has been uneventful.*

Key words: *Chondrosarcoma, Metatarsal, foot*

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I. Case history

The 29 year old lady had presented with a swelling over the outer aspect of her right foot. She had initially noted the swelling 1 year back. The swelling was initially painless and she started experiencing pain for the past few months. There was a gradual increase in the size of the swelling and she started having difficulty in ambulation. There was no history of any previous trauma and no other systemic symptoms such as fever and weight loss. There were no histories suggestive of other site involvement, no known comorbidities and she had an insignificant family history. On clinical examination, the swelling was lobulated, about 3 x 2 x 1 cm in size with irregular edges and had a firm consistency. The skin over the swelling was normal. There were no enlarged inguinal lymph nodes.

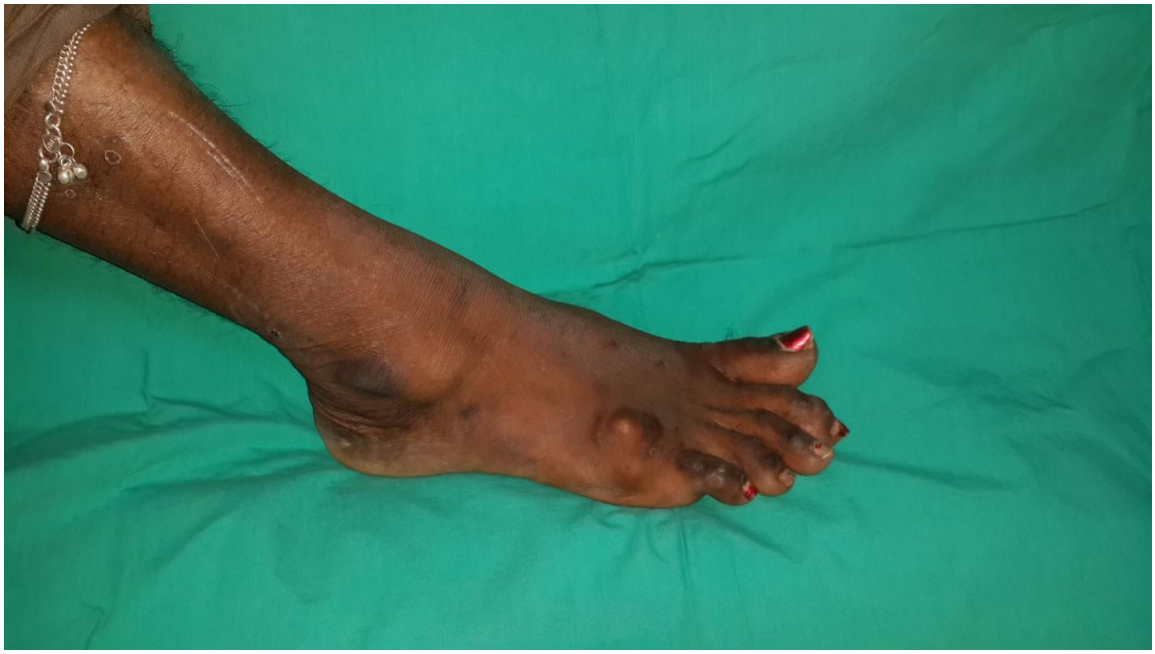

Figure 1: On clinical examination, the swelling was lobulated, about 3 x 2 x 1 cm in size with irregular edges

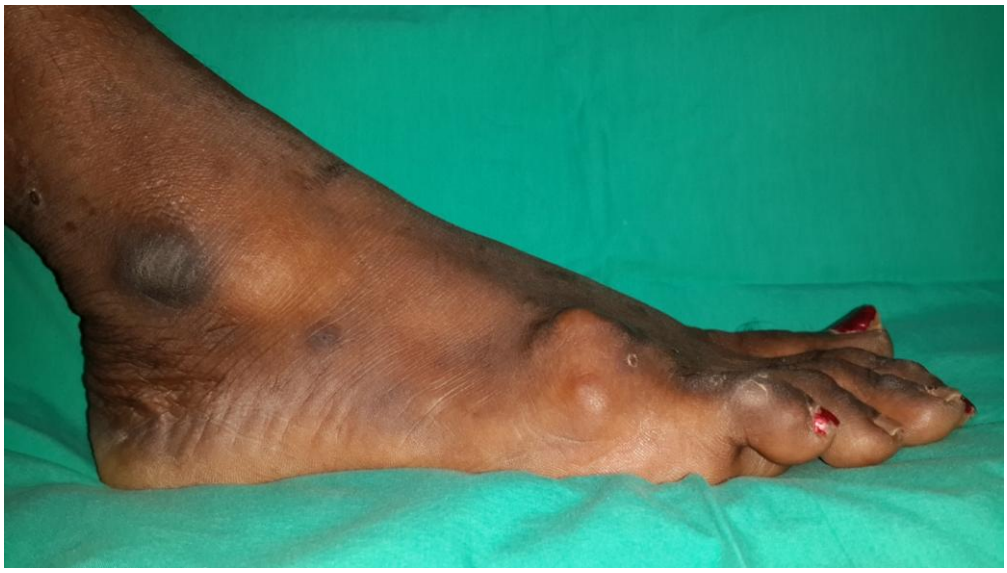

Figure 2: Picture showing the swelling from the lateral aspect

X-rays of the right foot (AP and oblique views) were taken which showed an erosive lesion of the 5th Metatarsal metadiaphysis with a significant soft tissue component in the 4th web space& lateral foot border.

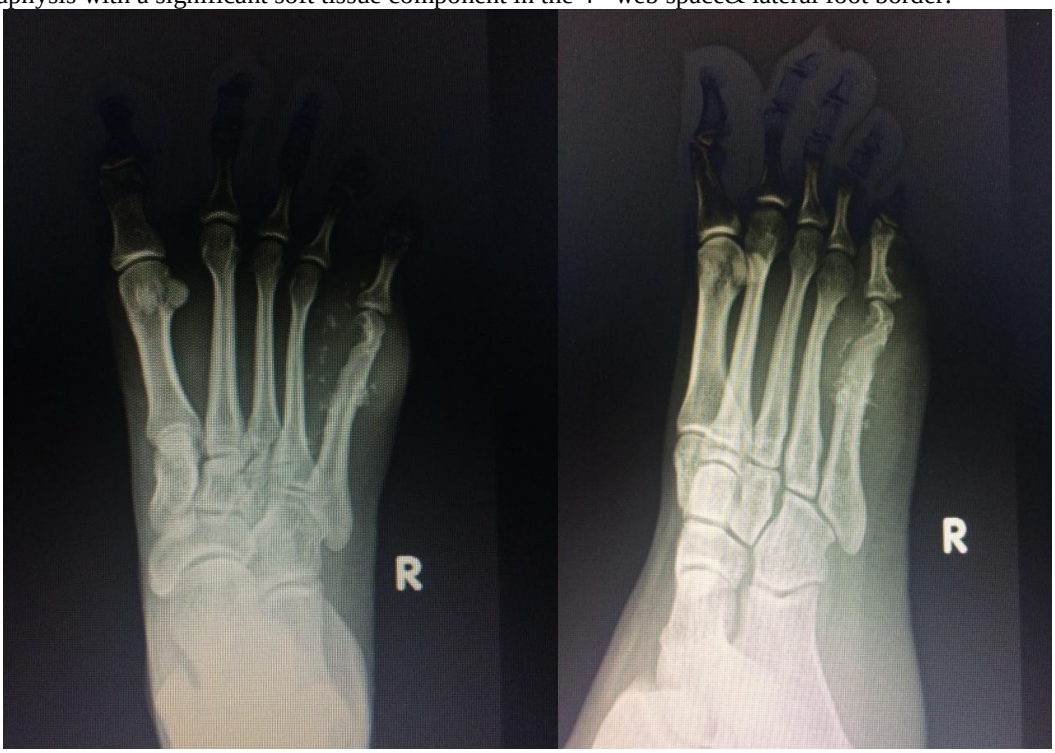

Figure 3: Xray of the right foot AP and oblique showing an erosive lesion, with punctate calcifications in the 5th Metatarsal diaphysis with a significant soft tissue component in the 4th web space and lateral foot border.

An Ultrasound imaging of the right foot revealed an ill definedheteroechoic lesion adjacent to the 5th Metatarsal with cystic and calcified areas causing cortical irregularity in the adjacent bones. An MRI of the right foot was also done which showed a T2 hyperintense lesion with regions of calcifications and cysts along with involvement of the adjacent bone.

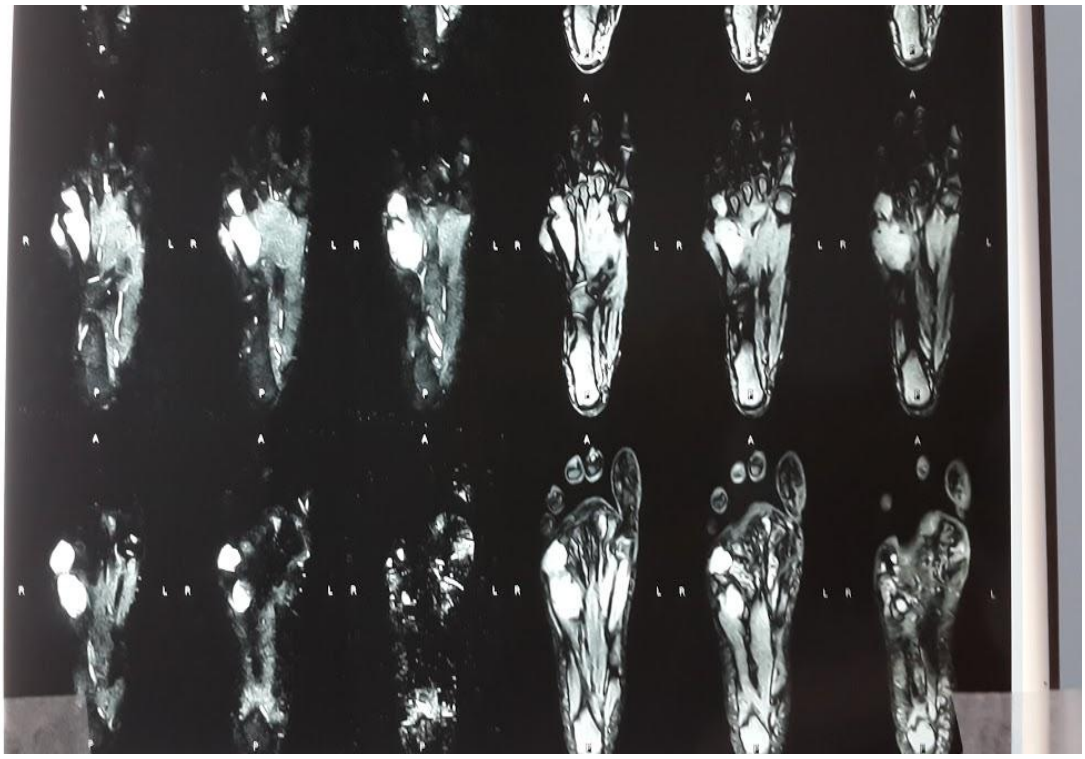

Figure 4: MRI of right foot axial sections

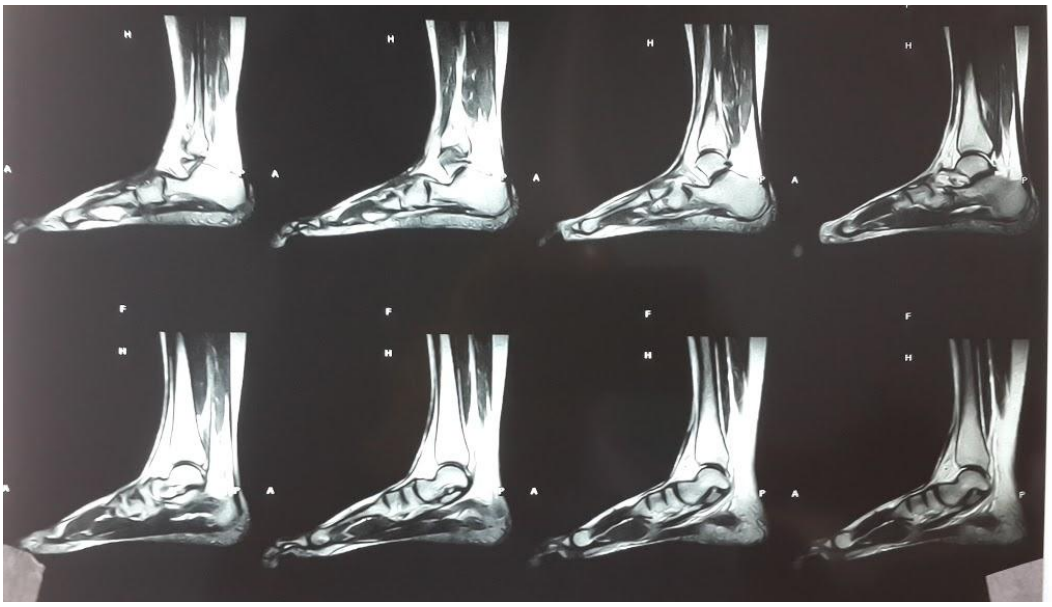

Figure 5: MRI of right foot sagittal sections

Taking into account the clinical findings and the imaging reports, a high suspicion for a malignancy was present. Hence, the need for biopsy was stressed and she underwent a core biopsy.

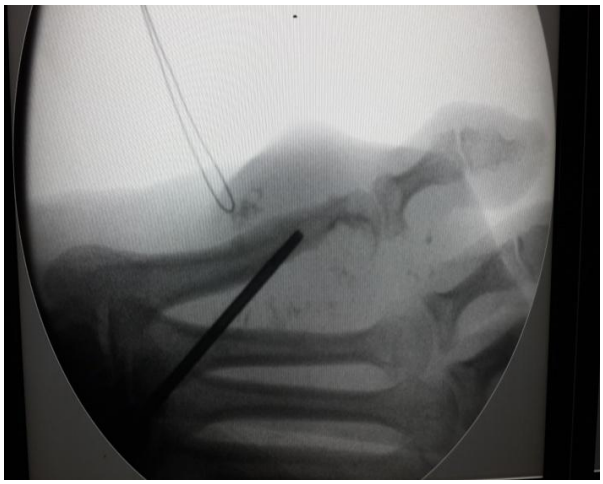

Figure 6: Core biopsy intraoperative radiograph

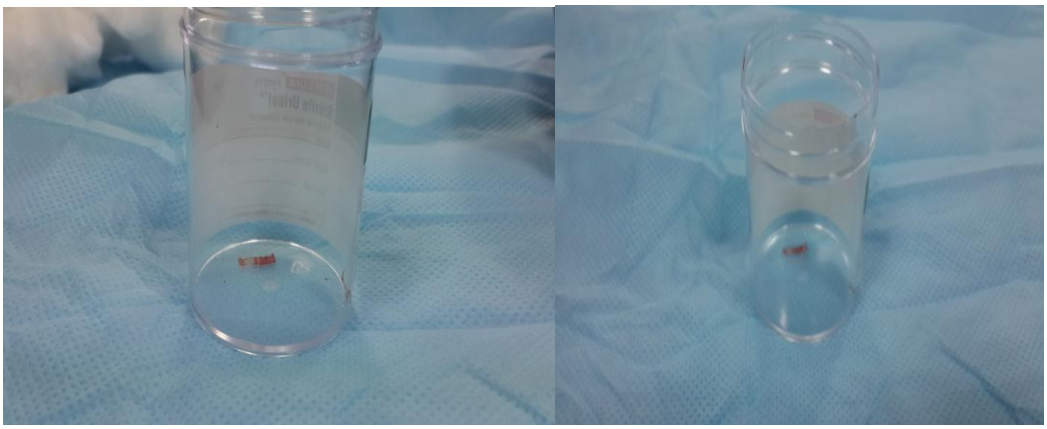

Figure 7: Core biopsy specimen

The postoperative period was uneventful. She was discharged the next day and was asked to review with the core biopsy report. The core biopsy revealed linear fragments composed of lobules of cartilage. A tiny fragment of fibrous tissue with a few capillaries was also seen. There were lobules of cartilage of varying sizes with fibrovascular tissue intersecting in some areas. Possibility of Enchondroma was considered. Differential diagnosis was a well -differentiated chondrosarcoma.

She was advised Excision and biopsy and underwent the same about 2 weeks after the initial procedure. The tumour along with the entire 5th toeupto the 5thtarsometatarsal joint level was excised.

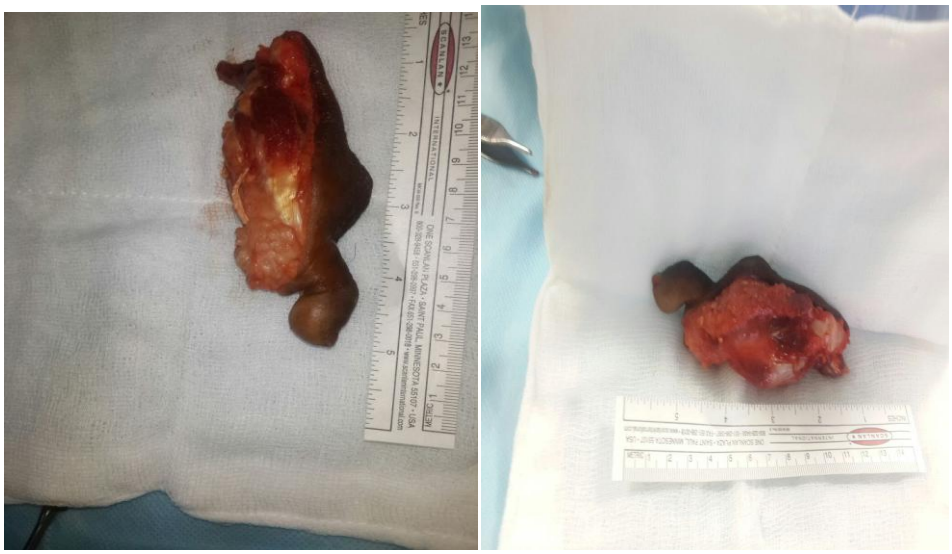

Figure 8: Excision biopsy specimen

The Excision Biopsy report showed a cartilaginous neoplasm composed of chondrocytes arranged in lobular pattern. The cells had mildly pleomorphic hyperchromatic nuclei with irregular nuclear membrane and moderate amount of eosinophilic cytoplasm. Spindling of cells was seen at places. Occasional binucleate cells were seen. Occasional mitotic figures were noted. The stroma showed myxoid changes imparting bubbly appearance to the matrix in occasional areas. Clusters of chondrocytes were seen at places. Tumour lobules were seen just beneath the synovial membrane. Section from the bony cut end was free of neoplasm. Soft tissue margin at the plantar aspect showed neoplasm. All other soft tissue and skin resection margins were free of neoplasm.

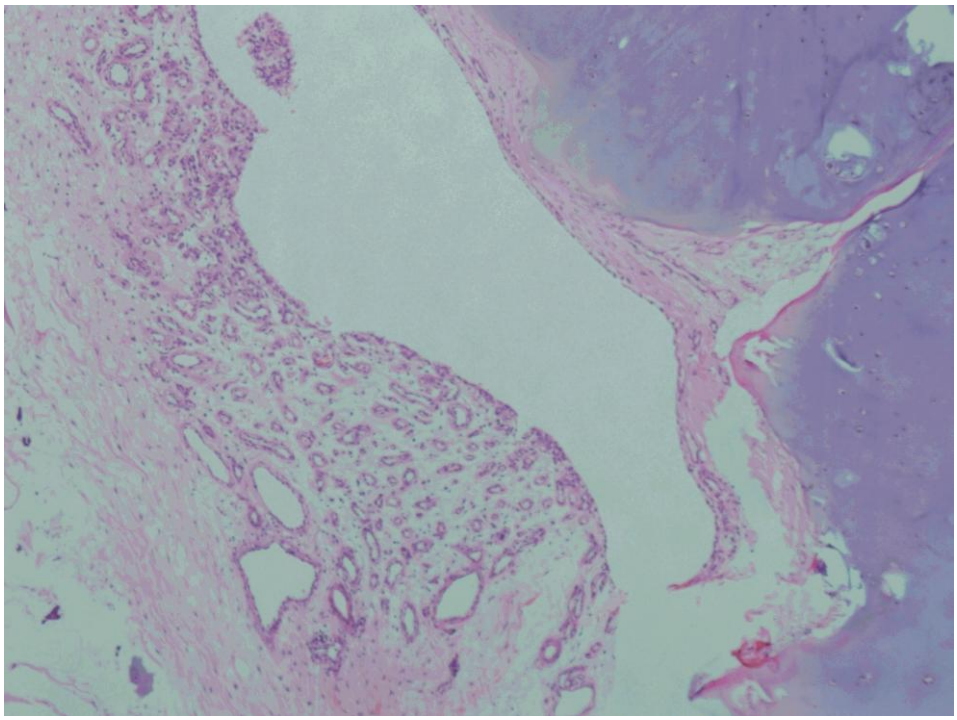

Figure 9: Histopathological evaluation

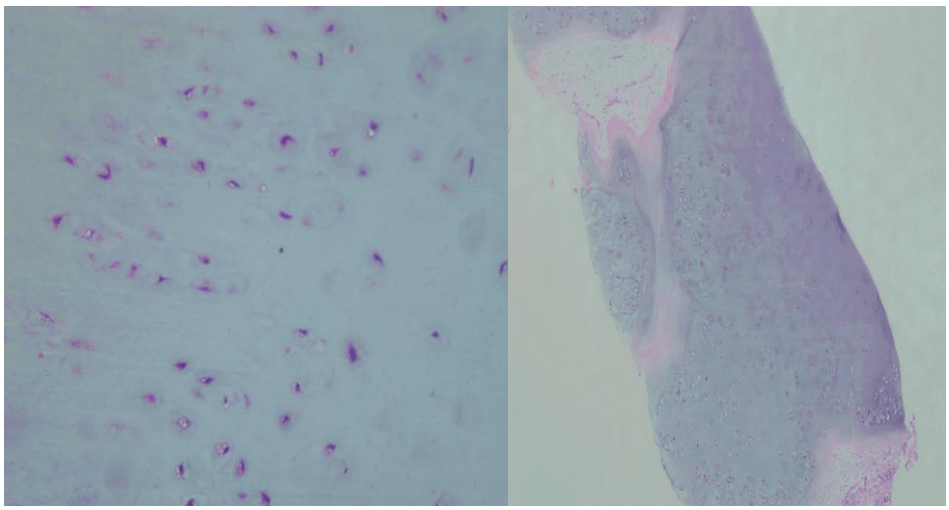

Figure 10 : Histopathological evaluation

A diagnosis of Well Differentiated Peripheral Chondrosarcoma (Grade 1) of 5th metatarsal was made. The surgical site healed well. She was then referred to Medical and Radiation oncology for further management and was reviewed regularly for assessment. She has been on regular follow up for the past 2 years and has been disease free.

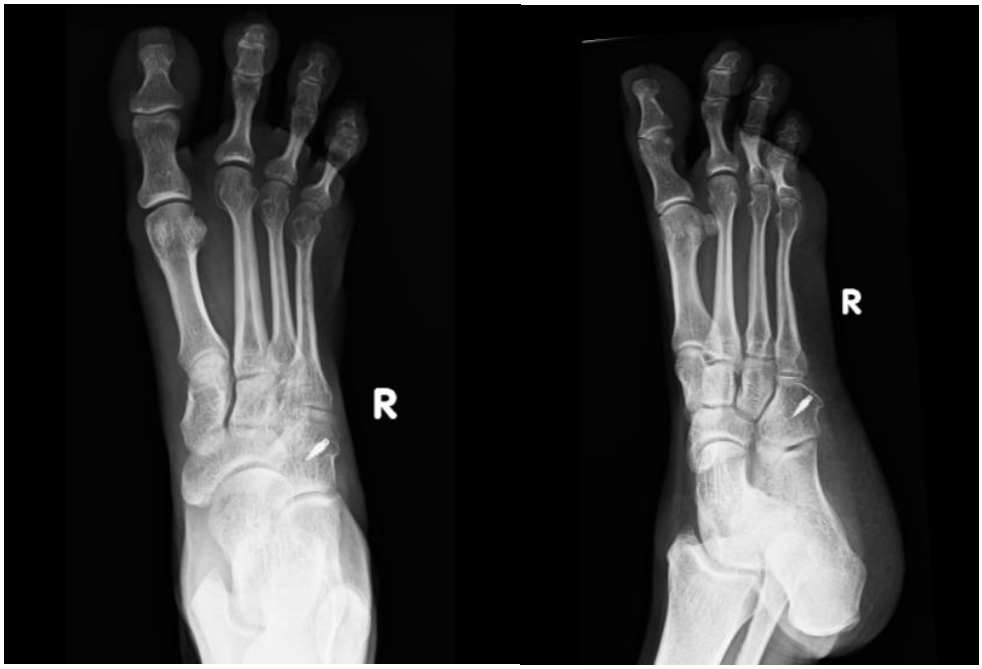

Figure 11 – Xray right foot AP, lat at 2 year follow up

II. Discussion

Primary chondrosarcoma (CHS) is the third most common primary malignancy of bone after myeloma/ plasmacytoma and osteosarcoma, and accounts for 20% of malignant bone tumors in a large series.[1] A common differential diagnosis that has to be kept in mind while diagnosing tumours of the hands and feet is Enchondroma. Patients with chondrosarcoma of the hands and feet tend to be older than patients with enchondroma in these locations. Chondrosarcomas are common in the seventh and eight decades of life, [2, 3] butEnchondromas are rarely diagnosed in patients older than 60 years.[4, 5]

Benign chondroid neoplasms like enchondroma and osteochondromas are common bone tumors affecting hands and feet. As many as 54% of the bone tumors of hands are cartilaginous, < 2% of which are malignant. When a tumor occurs in feet, involvement of toes and especially distal phalanx is extremely rare.[6] Kinoshita *et al*. reviewed 83 cases of bone and soft tissue tumors of the foot. They found 33 benign tumors, one primary CHS and 2 metastatic bone tumors. [7]Patil*et al*. studied 12 CHS of the bones of feet, of which 4 tumors affected the tarsal bones and the rest involved the short tubular bones. The mean age of the patients was 52.3 years (range 17--83 years) and men were predominantly affected.[8]

Synovial chondromatosis and periosteal chondroma frequently show the nuclear pleomorphism mimicking sarcoma. These extramedullary tumors should be excluded by careful radiographic study. However, histopathological examination plays the most important role in differentiating this tumour from the other differentials. CHS are graded according to the system of Evans *et al*.[9] Histologic parameters for grading include cellularity (high/ moderate/low), binucleated cells (<1/1--5/>5 per high power field), cellular distribution (regular/irregular), nuclear pleomorphism (low/moderate/high), bone formation (absent/ focal/diffuse), differentiation (percentage chondroid, mucoid and myxoid differentiation), calcification (absent/focal/diffuse) and cortical destruction (absent/present/unobservable).[10] The most significant histopathological finding was permeation into the cortex to involve soft tissues. This is usually manifested grossly as the tumour "sweating" through the interstices of the cortex. Biopsy should be directed to such areas.

Histologically, chondrosarcomas are categorized as grades 1, 2 and 3 with most being grade 1.[13] The treatment of chondrosarcomas is wide surgical excision.[14] No report of efficient adjuvant chemotherapy has been published. Radiotherapy has a limited role — treatment of inoperable disease or recurrence. A grade 1 tumour has a better prognosis than tumours of grades 2 and 3.[13]Adequate removal of the tumour is the mainstay of treatment and prevention of local recurrence.[13, 15]

Although for all grades and subtypes of nonmetastatic CHS, complete surgical treatment only offers the chance for cure, the most optimal type of surgical management is still debated. Wide, en bloc excision is the preferred surgical treatment of intermediate and high grade CHS.[11] For the low-grade/grade 1 CHS, some prefer extensive intralesional curettage followed by local adjuvant treatment, for example, phenolization or cryosurgery (liquid nitrogen) and filling the cavity with bone graft.[12]

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