

## **Periosteal Desmoid**

Moazzam Murad, Vaqar Bari, M. Zafar Rafique, Kashif Ashraf  
Radiology Department, Aga Khan University Hospital, Karachi.

### **Abstract**

Periosteal desmoid is a benign tumor like reactive fibrous lesion developed by repeated micro trauma. We describe the case of a 14 year old boy with pain in his right knee who underwent plain radiography followed by radionuclide bone scan. The final diagnosis was that of periosteal desmoid.

### **Introduction**

Periosteal desmoid is a rare benign lesion occurring in children and adolescents with an increased physical activity. It is a tumor like lesion developed by repeated micro-trauma of the origin of distal fibers of adductor magnus and aponeurotic origin of the medial head of gastrocnemius. This condition must be given increased attention as the region of the knee joint in children is a location of frequent development of sarcoma and osteomyelitis.<sup>1</sup> The incidence of this lesion has been reported in 11.5% of male and 3.6% of female children between the ages of 3 and 17 years.<sup>2</sup> They are bilateral in up to 35% of cases.<sup>2,3</sup> Resnick and Greenway were the first to

classify this entity into excavations and proliferative cortical irregularities.<sup>4</sup> Synonyms include distal femoral cortical irregularity (DFCI), cortical desmoid and a distal metaphyseal femoral defect.



Figure 1. X ray Right knee shows subtle metaphyseal lucency with cortical irregularity over medial aspect of distal right femur.

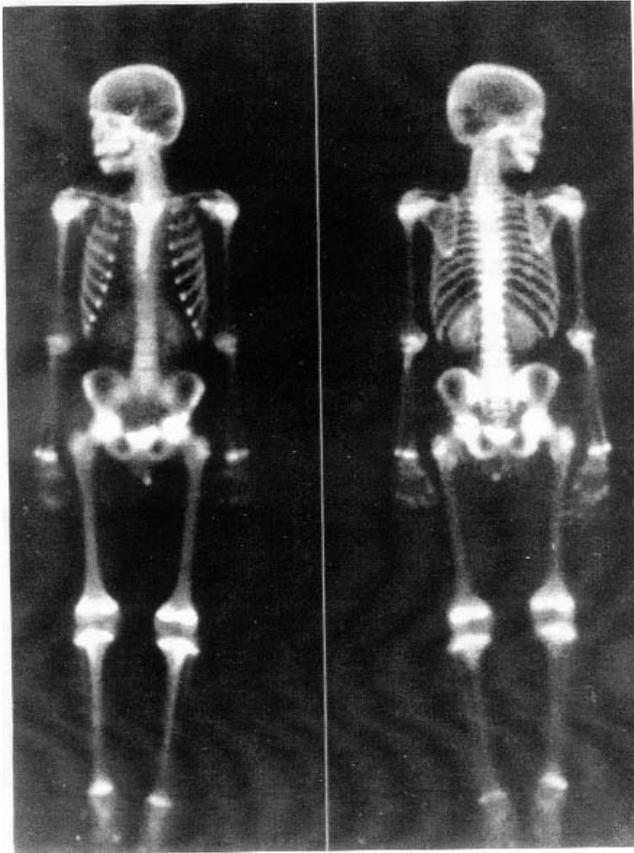


Figure 2. Normal bone scan.

### Case Report

An athletic 14 year old boy presented to the orthopaedic clinic with pain in his right knee for the last 6 months. He was a member of the school football team. Clinical examination was unremarkable except for some tenderness at the knee. Plain radiographs of the right knee showed subtle metaphyseal translucency with cortical irregularity over medial aspect of distal femur (Figure 1). An assumption of malignant bone tumor was made. Patient was referred for radionuclide bone scan prior to a biopsy. Three phase radionuclide bone scan was performed which revealed no abnormality corresponding with the plain film findings (Figure 2). Considering the physical activity of the patient, plain X-ray and bone scan findings the final diagnosis was that of periosteal desmoid

A follow up was done at 6 monthly intervals and complete healing of the lesion was noted at 1 year without any treatment.

### Discussion

Periosteal desmoid is a non-neoplastic, reactive fibrous lesion that occurs at insertion or origin of major muscles and is characterized by focal cortical disruption, sclerosis and thickening.<sup>5</sup> The origin is related to the forces exerted by the muscle on the periosteum and cortical bone in the active adolescents. Patients are often male although

the increase in popularity of girl's sports has made this increasingly common in both the sexes. The lesion may be an incidental finding but an aching pain may occur. The disruption, sclerosis and thickening.<sup>5</sup> The origin is related to the forces exerted by the muscle on the periosteum and cortical bone in the active adolescents. Patients are often male although the increase in popularity of girl's sports has made this increasingly common in both the sexes. The lesion may be an incidental finding but an aching pain may occur. The distal femur is the most common site, either at the insertion of the adductor Magnus on the metaphyseal flare or posteriorly where the gastrocnemius originates.<sup>6</sup> Bufkin expressed the opinion that this is the chronic avulsion injury and has no clinical importance.<sup>6</sup> The humerus at the insertion of the pectoralis major is also a possible site.

Radiographically the lesions are 1 to 3 cm in size, irregular with areas of lucency and areas of sclerosis. There may be some mineralization within the lesion. The margin may be latent or active. Periosteal reaction occurs but without soft tissue extension. A carefully formatted MRI will show the relationship of the muscle insertion to the lesion but the severity of the lesion may be overcalled on MRI and increase the anxiety levels all around. Bone scan may be normal or will show uptake due to the presence of reactive bone, then become cold as the lesion involutes.<sup>7</sup> A negative radionuclide bone scan is important in differentiating a periosteal desmoid from a malignant tumour as in this case CT scan may be helpful<sup>8</sup> in differentiating this lesion from osteoid osteoma and show the complex nature of the lesion with areas of cortical thinning and thickening, some possible cystic areas and the surrounding mild sclerotic reaction. Computerised tomography is an asset in the diagnosis because of its ability to show the anatomical relationship of the lesion with the attachment of the medial gastrocnemius muscle. This relationship is a sine qua non condition for the diagnosis of distal femoral cortical irregularity.<sup>9</sup> Biopsy is not indicated or warranted. A lesion whose nature is in doubt should be referred to an orthopaedic oncologist.

On pathological examination the lesion consists of reactive fibrous tissue, cartilage and bone with a non malignant appearance. The presence of poorly organized osteoid and hypercellularity has led to a misdiagnosis of osteosarcoma or fibrosarcoma for which in past amputations had been performed with tragic results.<sup>6</sup>

Treatment consists of reassurance, observation and occasionally radiologic follow up. The prognosis is excellent and the lesion heals without treatment in early adulthood and can be regarded as a normal variant. An awareness of the entity though rare is important to avoid confusion with a malignant tumor and avoid unnecessary amputation.

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