



Do periarticular dense bone islands cause cartilage destruction?

Periartiküler dens kemik adaları kıkırdak yıkımına neden olur mu?

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Articular cartilage problems of the knee are common.^[1] There are several conditions causing cartilage defects, and there are many options for management.^[2,3]

An enostosis or bone island represents a focus of mature compact (cortical) bone within the cancellous bone.^[4] The "dense bone island" (DBI) is a radiopaque lesion referred to in the literature as idiopathic osteosclerosis, enostosis, focal osteosclerosis, periapical osteopetrosis, and bone scar.^[5] The DBI is probably congenital or developmental in origin, and reflects failure of resorption during endochondral ossification.^[4] The lesion is usually asymptomatic. It is accidentally found in routine X-rays of bones, anywhere in the skeleton; pelvis, spine, femur, and other long bones.

Radiography reveals a homogeneously dense, sclerotic focus in the cancellous bone. A bone island appears as a low-attenuation focus on computed tomography (CT) scan, it shows low signal intensity like cortical bone on MRI sequences, and is usually "cold" on skeletal scintigraphy.^[4]

Histopathologically, DBIs are composed of dense calcified tissue without marrow spaces and generally no inflammatory cell infiltration.^[6] They are generally small in size and do not change over time.^[7] It is recommended that an open biopsy of a bone island should be obtained if the lesion's growth exceeds 25% of its diameter within six months or 50% within one year.^[8]

Bone islands may be differentiated from more aggressive or malignant bone lesions by one of the following:

- Absence of a primary tumor,
- Slow growth over a period of years,
- A clearly demarcated margin with thorny radiations from the sclerotic lesion, or
- Absence of pain.^[6]

The erosion of cartilage has recently been challenged as the primary pathological mechanism of osteoarthritis and the subchondral bone has been suggested to play a key role. The subchondral bone plate is in direct contact with the cartilage, and could influence its degradation.^[9] There is strong evidence that bone marrow lesions and bone cysts have an important role in the pathogenesis of knee osteoarthritis.^[10] Bone marrow lesions consist of a number of heterogenous histologic abnormalities including bone marrow necrosis, trabecular abnormalities, bone marrow fibrosis and edema.^[11] Bone marrow lesions including dense bone islands may cause decrease of the elasticity in subchondral bone.

In conclusion, we suggest that dense bone islands may play a key role in the initiation and progression of erosion in cartilage. This effect may be increased when the bone marrow lesion (dense bone island) is bifocal as seen in Figure 1.

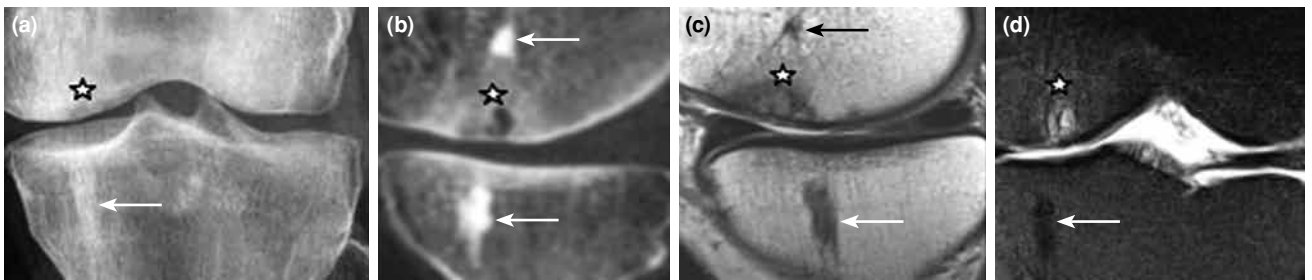


Figure 1. Anteroposterior radiograph of the left knee (a) shows a focal radiolucent area (star) in the medial femoral condyle which is suspicious for osteochondral lesion. There is also a sclerotic, ovoid intramedullary lesion (arrow) in the medial proximal tibial subchondral region consistent with dense a bone island. Computed tomography scan (b), T₁-weighted (c), and fat-suppressed T₂-weighted coronal (d) MR images reveal the sclerotic bone islands (arrows) on both sides of the medial knee joint, and the osteochondral lesion (star) which is “sandwiched” between these lesions.

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