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Review Article

A review of literature: Mosaicoplasty as an alternative treatment for resection of patellar osteoid osteoma and cartilage reconstruction

Motasım K. Bavaneh[a,*], Gorkem Kiyak[b], Tevfik Balikci[c]

[a] Dept. of Orthopaedic Surgery, Atasehir Avicenna Hospital, kayısdagı cad. No. 47, Atasehir, Istanbul, Turkey
[b] Dept. of Orthopaedic Surgery, Academic Hospital, Nuhkuyusu cad. No: 94 34664, Üsküdar, Istanbul, Turkey
[c] Dept. of Orthopaedic Surgery Medistate Hospital, Kavacık, Istanbul, Turkey

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ABSTRACT

Osteoid osteoma is an uncommon benign tumor and causes severe pain, being worse at night, that responds dramatically to nonsteroidal anti-inflammatory medications. An osteoid osteoma of the patella is very rare and if it arise close to chondral surface differential diagnosis may be challenging. In three patients the osteoid osteoma was completely excised by nidus removal by mosaicoplasty set with open surgical technique. The patients were followed up in average for 31 (16–48 months) months with annual clinical and radiographic evaluations. There were no relapse of the pain and no residual recurrent tumor. The aim of the treatment for osteoid osteoma is to remove entire nidus by open surgical excision or by percutaneous procedures such as percutaneous radiofrequency and laser ablation. Mosaicoplasty is a good alternative for treatment of osteoid osteoma of the patella in the subchondral bone.

1. A review of literature: mosaicplasty as an alternative treatment for resection of patellar osteoid osteoma and cartilage reconstruction after that

Osteoid osteoma is a bone lesion which is surrounded by dense sclerotic bone and consists of loose vascularized tissue in the middle and also characterized by a small nidus that includes variable amount of calcific osteoid tissue [1,8]. Pathologically; variable osteoid tissue and immature bone trabeculation are observed in vascular mesenchymal tissue. As a rule, reactive bone is more vascularized than normal bone, and the periost, which takes place on it, become thick. It is observed between the ages of 10–25 and in men, two times more. Although the lesion is seen in fibula, humerus, vertebra, talus, and calcaneus at times, it is frequently located in femur and tibia. This lesion, which presents typically with pain, was first described by Jaffe, in 1935 [1,9,10]. The disease has a characteristic, typical pain clinically. The pain is a beginning symptom, and it may reach a degree worsening the patients at nights. If the pain answers prostaglandin inhibitors, diagnosis can be made quickly. When the diagnosis was delayed; lesions close to the joints may cause contractures, or in spinal column region pseudo scoliotic sagittal plane deformities may be observed. Mostly, it is possible to make the diagnosis by a careful anamnesis, detailed examination and necessarily two-way radiographies at least. However; clinical and radiological examination is not sufficient in some locations such as hip joint and vertebral colon at times; it is necessary to perform the other diagnostic procedures such as scintigraphy, computed tomography (CT) and magnetic resonance (MR) [1,11,9,12,10]. In the young society, anterior knee pain is one of the most important musculoskeletal system disorders of pain and limitation of movement ability [2,13]. Most common Reasons of the anterior knee pain without trauma story, are known as patellofemoral malalignment, tibial apophysitis, patellar tendinitis, SCFE, osteochondritis dissecans and less frequently- septic arthritis, synovial impingement and tumors [2,14]. In this study; three cases of patellar osteoid osteoma, which is rarely seen as the anterior knee pain, and the preferred treatment have been presented. Patellar tumors represent special management problems because of their subcutaneous location,relationship of the extensor mechanism and difficulties in interpretation of radyographs [15]. Children less than 6 years of age with recurrent nocturnal pain and limb swelling should be investigated for osteoid osteoma [16].

In the treatment of osteoid osteoma within this area; open curettage and excision of the nidus, and -if technical opportunities are sufficient-, percutaneous nidus excision by CT or radiofrequency ablation can be applied [1]. CT-guided radiofrequency ablation should be the first treatment for intramedullary osteoid osteoma because of the high success rate and reduced invasivity [16].

Surgical excision provides stopping the pain immediately and relieves the symptoms. When excision was made completely, and it was

* Corresponding author.
E-mail addresses: drbawaneh.ort@gmail.com (M.K. Bavaneh), drgorkemkiyak@gmail.com (G. Kiyak), tevfikbalikci@hotmail.com (T. Balikci).

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removed by peripheral bone tissue, the risk of recurrence was also decreased. Showing the nidus in the excised lesion and confirming this after pathologic examination may give a future prediction about the success of surgery [4].

2. Case presentations

We present 3 cases diagnosed with osteoid osteoma of the patella and treated in the same method using mosaicplasty for reconstrate the cartilage surface of the patella with follow up for 31 (16–48 months) months with annual clinical and radiographic evaluations.

The first patient is 26 years old and male. The pain started in his left knee averagely 1 year before his first hospital visit.(follow up for 48 months) The complaint was thought as chondromalacia patella at the first hospital that the patient applied. Then, medical treatment and quadriceps exercises were suggested. The patient's complaints were decreased a little but the patient referred to his doctor for a second time because of that the complaints started again after one month. No abnormal finding was detected after direct radiography, hemogram, crp, and sedimentation. For this reason, knee MRI was requested. It was reported that common signal changes, which are compatible with the bone marrow edema, exist in all sections of the patellar bone (Fig. 1). An appearance, which is consistent with the bone marrow edema-contussion, exists in average seven mm-scaled area in the subchondral bone of anterolateral medial femoral condyle, and also signal changes, which are compatible with the edema, exist in the Hoffa fat pad. For diagnosis; arthroscopic intervention was made, a biopsy was taken from the synovial tissue; and for the purpose of decreasing the intramedullary bone pressure, drilling was applied in the patellar bone by K-wire under scope control. As post-operative, the complaints decreased, and the pain ended. Physical treatment was started for the patient who had quadriceps strength loss and limitation of range of motion. The patient, who stated that his complaints started again in the third post-operative month, the pains increased at nights and that his pains ended by NSAID, applied to our clinic.

Edema and effusion existed in the left knee. Serious sensibility existed on the patella by palpation. The Patellofemoral grinding test could not be made. Passive and active motions of the joint were painful and limited; active extension was −70 degree, and flexion could reach to 130 degrees. When the hip was in flexion, passive knee extension was −50 degree. When the hip was in neutral position, and the leg was at the table, the knee could not reach to the full extension. −15-degree extension existed. The neurovascular symptom was not detected.

In MRI analysis made; chondral irregularity was detected in the medial facet of the patellar cartilage, and 7 mm sized osteochondral lesion was observed at this level. Mosaicplasty was suggested for the osteochondral defect. Patient, then applied to another center for the cartilage repair and the pathological analysis of the below tissue, was directed to the physical treatment and psychiatry by consulting orthopedic surgeon. The patient applied our hospital again to after 3 months.We repeated MRI imaging of the knee; it was reported that 8 × 7 mm sized and hypointense lesion existed on T1 and T2-based sequences, in the subchondral bone at the level of medial facet within the patellar bone. Edema was observed commonly in the patella of adjacent bone marrow. The irregularity was observed in the anterior contour of the patella. The findings gave rise to thought the grade 4-chondromalacia patella, in the first plan. However, lesion contours and signal characteristics gave rise to suspicion of osteoid osteoma, in the differential diagnosis. Thin-section computed tomography images taken and sclerotic nodular formation was observed in subchondral bone of medial facet. (Fig. 2)

The second patient was 21 years old and male, the pain started in the right knee about 29 months ago. The complaints were thought as antherior knee pain upon quadriceps mechanisim week due to the weights which taken lately. The patient complaints were started again espically at night and decreasing by NSAID. In radiography, MRI and thin-section CT lesion contours and signed characterisitics gave rise of suspicion of osteoid osteoma measured as 6 × 6 mm size lesion. Edema and effusion existed in the right knee. Serious sensibility existed on the patella by palpation. The Patellofemoral grinding test could not be made. Passive and active motions of the joint were painful and full.

The third patient was 49 years and female. Complaints started 2 month before her first physician visit (follow up for 16 months). Her physical examination was serious sensibility in knee and patellofemoral joint. Passive and active motion of joint was full and with pain in the medial part of the knee, medial mc murray test was positive. In MRI there was dejeneration in the medial meniscus and effusion of the knee. There was no any radyological findings ine the direct radyographs. Diagnostic arthroscopic intermention was made and meniscal debridement was done. Postoperative the complaints decreased and the pain ended. Physical treatment course was maintained but in the post-operative 6th month pain started again espically with flexion of the knee and increased at night, her pain was give answer to NSAID. New radiography and MRI were taken, there was no any significant sign in x-ray but there was chondral irregularity about 7 × 6 mm detected in the medial facet of patellar cartilage. Thin section CT image taken and sclerotic noduler formation was observed in subchondral bone of medial facet of patella.

2.1. Surgical technique

We used the same surgical technic in the 3 patients and the

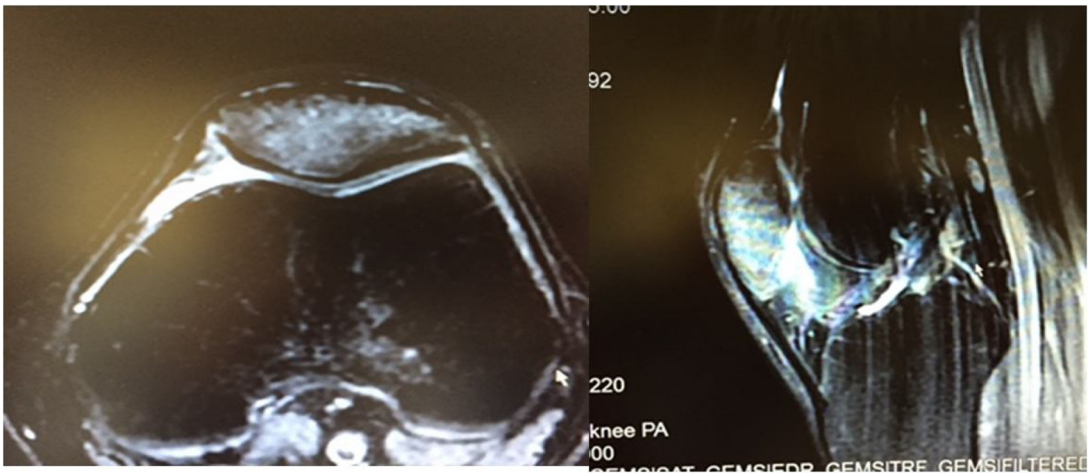

Fig. 1. MRI in the first application.