



## Diffuse synovial hemangioma of the knee: a case report

### *Dizde yaygın sinovyal hemanjiyom: Olgu sunumu*

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Sinovyal hemanjiyom nadir görülen, selim bir eklem içi tümördür. Genellikle çocuklarda ve genç erişkinlerde ağrı ve tekrarlayıcı eklem şişliklerine neden olur. Yirmi beş yaşında ve sağ dizinde 10 yıldan beri aralıklı ağrı ve şişlik yakınmaları olan bir erkek hastada direkt grafi, venografi, manyetik rezonans görüntüleme ve tanısal artroskopik bulguları sonucunda sinovyal hemanjiyom tanısı kondu. Lezyonun yaygın ve büyük çaplı olması, ciltte çok sayıda pigmente alanların varlığı nedeniyle hastada cerrahi eksizyona başvurulmadı; konservatif tedavi ile izlem uygulandı. Bir yıl sonraki kontrolde hastanın yakınmalarında ve kitlenin boyutlarında değişiklik saptanmadı. Yaygın tutulumlu olgularda, sinovektomi sonrası yüksek tekrarlama riski nedeniyle konservatif tedavi ile izlem de bir tedavi seçeneği olabilir.

**Anahtar sözcükler:** Artroskopi; hemanjiyom/tanı/patoloji; diz eklemi/patoloji; yumuşak doku neoplazmları/tanı/patoloji; sinovyal membran/patoloji.

Synovial hemangioma is a rare benign tumor of joint cavities. It may be a cause of pain and recurrent joint swelling in children and young adults. Diffuse synovial hemangioma was diagnosed in a 25-year-old male patient with complaints of right knee pain and swelling of a 10-year history. Direct radiography, venography, magnetic resonance imaging, and diagnostic arthroscopy enabled the diagnosis. Surgical excision was not considered because of diffuse involvement and many pigmented areas in the skin; instead, the patient was monitored conservatively. At the end of a year, the severity of complaints and the size of the lesion did not increase. Since there is a high risk for recurrence following open synovectomy for diffuse synovial hemangiomas, conservative treatment may be an alternative approach in selected cases.

**Key words:** Arthroscopy; hemangioma/diagnosis/pathology; knee joint/pathology; soft tissue neoplasms/diagnosis/pathology; synovial membrane/pathology.

Synovial hemangioma is a rare, benign, vascular, soft tissue tumor mostly seen in children and adolescents.<sup>[1-6]</sup> The hemangioma rarely occur in joints even though they can develop in any part of the body. Although they almost invariably involve the knee joint, it has been reported that they have also been found in the elbow, wrinkle, ankle, tarsometatarsal and temporomandibular joints.<sup>[2,4,5,7]</sup> The number of cases reported to date is less than 200.<sup>[2]</sup> Clinically localized pain, sensitivity, and reduction in joint motion usually develop in cases involving a

single joint. Sometimes, automatic, atraumatic and recurrent hemarthrosis may develop.<sup>[2,3,7]</sup> In this case report, a synovial hemangioma in the knee joint has been presented.

### **Case report**

A twenty-five years old male patient presented with complaints of intermittent pain and swelling of a 10 years history in his right knee. It was acknowledged that the pain, which didn't arise as a result of any trauma, was reduced during rest, but

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increased as a result of motion. The physical examination revealed diffuse swelling and effusion in the right knee. Quadriceps atrophy and skin pigmentation due to venous dilatation were found in the lateral of the knee. The results of meniscus tests were negative. The motion range of the knee joint was normal except for pain in the flexion. The number of platelets, prothrombin time and fibrinogen level were 262.000 mm<sup>3</sup>, 12 sec, and 310 mg/dl respectively. The clotting factor and blood biochemistry levels were normal.

No pathology was found except a slight increase in the intensity of soft tissue in the knee radiography. Venograph revealed packets of venous diffuse in the knee region (Figure 1). The magnetic resonance imaging (MRI) showed a mass of 15x5.5x6 cm, which was fully occupying the suprapatellar bursa in the femur condyle anterior, enhancing the patellofemoral gap, extending upwards through the posterior of the quadriceps femoris tendon, and pervading into the joint in the inferior, and surrounding the femur. That was more remarkable in the medial. In T<sub>1</sub> and T<sub>2</sub> sagittal



**Figure 1.** The packets of venous enlargement exposed in the knee region(29)(using) by venography.

(Figure 2a, b) and axial (Figure 2c, d) views, there were curvilinear regions compatible with the vascular structures inside the mass, which looked more intense compared to the muscle. Dilatation was found in the veins of subcutaneous soft tissues around the popliteal cavity.

The arthroscopy, which was performed under epidural anesthesia and through tourniquet showed a hemangiomatic mass which resembled a bunch of grapes (Figure 3). The histopathological analysis of the biopsy material revealed vascular structures paved with a single layer endothelium (Figure 4). The medial and lateral meniscuses, cross ligament and cartilagenous tissue were in good condition. There was phase 1 chondromalacia in the patella.

Arthroscopic or open excision was not considered because of the large and diffuse involvement and presence of many pigmented areas. The clinical and radiological (MRI) controls carried out after one year showed that the patient had experienced no remarkable bleeding attack; and concerning his complaints, there was no change in range of motion in the knee joint or size of the mass. Nothing related with cartilagenous lesion was found in the magnetic resonance imaging.

Furthermore, no significant change was observed in the blood records, platelet count or fibrinogen levels.

## Discussion

Synovial hemangioma is a rare, benign, vascular lesion; it constitutes less than 1% of entire hemangiomas. Although 60% of the cases develop in the knee joints, they also have been found in other joints.<sup>[7]</sup> In terms of age groups, 75% occur during childhood; but it may develop in young adults and sometimes at advanced ages.<sup>[3,6,8]</sup> Intermittent localized pain, sensitivity, recurrent effusion, reduction in the range of motion and quadriceps atrophy can develop in the joint involved.<sup>[2,3,5,8]</sup> Delays or misdiagnoses are possible due to interactions of periods without symptoms.<sup>[2,6]</sup> In some patients, the presence of hemangiomas in other parts of the body or superficial nevi are noteworthy.<sup>[5,6]</sup> Our case, who was an adolescent, had intermittent pain in his right knee which decreased during rest, and swelling and quadriceps atrophy. The range of motion in joints

was normal. Many pigmented nevi were observed in the femur and tibia.

The knee hemangiomas are called juxta-articular, synovial or intermediate depending on their location, where in juxta-articular the lesion is located outside the joint capsule; in synovial, inside the capsule; and in intermediate both inside

and outside the joint.<sup>[1,2,4,5]</sup> Our case was defined as intermediate because of its location in the joint and its extension into both the muscle groups and skin.

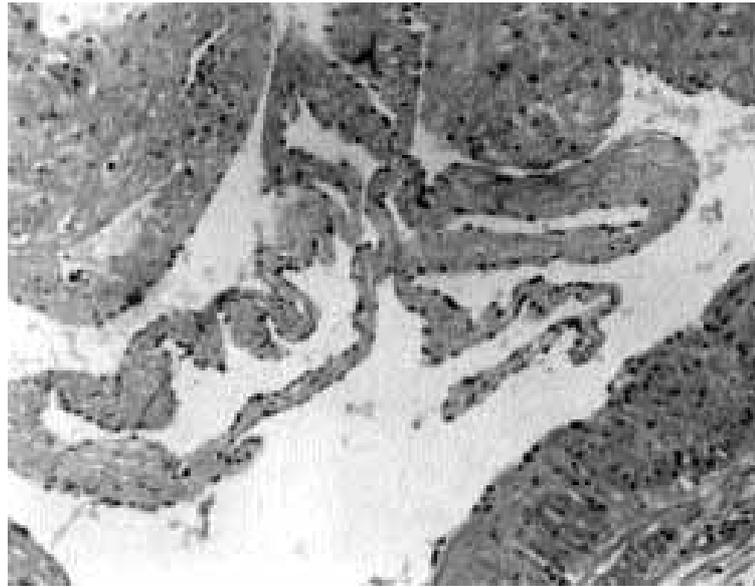
Synovial hemangioma can be confused with other joint disorders. Particularly meniscus tears and hypertrophic plica have been reported to imitate this lesion.<sup>[3,5]</sup> However, diagnosis is also



**Figure 2.** The magnetic resonance images. Lesion is evident in the sagittal section **(a)** T<sub>1</sub> (TR: 820 msec, TE: 20 msec), which is less intense than the muscle; **(b)** T<sub>2</sub> (TR: 5100 msec, TE: 130 msec), which is remarkably more intense and includes curvilinear regions in compliance with vascular structures. The mass lesion at axial section **(c)** T<sub>1</sub> (TR: 510 msec, TE: 16 msec) is more intense than the muscle, and **(d)** at T<sub>2</sub> (TR: 4000 msec, TE: 117 msec) it is intense.



**Figure 3.** An arthroscopic view of the mass with evidence of lesions in the shape of a bunch of grapes.



**Figure 4.** An histopathological view of the vascular structures paved with single layer endothelium.

required for pigmented villonodular synovitis, osteochondral fractures, discoid meniscus, osteochondritis dissequens, juvenile rheumatoid arthritis, hemophilia and sickle cell anemia.<sup>[1,3]</sup>

The diagnostic arthroscopy showed a mass lesion which resembled a bunch of grapes. No pathology was found in the menisci, cross ligaments, cartilaginous surfaces and synovial tissue, which constitute the other structures of the joint. He was diagnosed with synovial hemangioma, after taking into account the arthroscopic findings and presence of pigmented areas in the knee, popliteal region and tibia. Methods used for the diagnosis of synovial hemangiomas are arthrography, arteriography, venography, directography, computed tomography and MRI.<sup>[2-5]</sup> In directography, some non-specific changes like thickening in the capsule, increased intensity in the soft tissue and rarely bone erosion may be seen. However, half of the cases have normal graphies.<sup>[1]</sup> Computed tomography is usually non-specific; clear imaging of the borders between the mass and muscle tissue is very difficult.<sup>[2]</sup> Angiogram provides more information than directography, and it is useful in detecting vessel-rich structures; but, it is invasive and insufficient in determining the relation of the lesion with the neighbouring structures.<sup>[2,6]</sup> The MRI with three dimensional views is

not invasive and has no radiation risk; and it is also very useful in determining the type and spread of the lesion.<sup>[2,3,5]</sup> For our case, directograph showed a slight increase in the intensity of soft tissue and venograph showed venous packets in the knee region. Magnetic resonance imaging gave an idea of the size and structure of the mass. We think that arthroscopy following MRI would be beneficial in the diagnosis and treatment planning in such cases.

Although methods like radiotherapy, synovectomy, sclerosing agents, embolization, cotterization and freezing are used for treatment, at present arthroscopic excision is recommended for pediculate local lesions and open surgery excision and partial synovectomy is preferred for diffused cases.<sup>[1,3,4]</sup> The radical arthroscopic synovectomy is very challenging in unlocalized lesions.<sup>[5,9]</sup> Akgun et al.<sup>[2]</sup> didn't perform excision in one case with widely spread, many skin lesions following the synovectomy due to the high recurrency risk; instead they followed up the case, and found no progress at MRI six months later. They reported that the complaints of the patients hadn't changed during the follow-up period, and that conservative treatment was safer in diffuse lesions without progression.

At one-year follow-up stage, we found no change in the size of the lesion and complaints of

the patient in our case for whom we didn't prefer surgical excision due to diffuse and large lesion and presence of many pigmented areas in the skin. Furthermore, we didn't find any erosion of bone cortex, cartilage or periost reactions, which had been previously reported in progressed cases. [4,7,9]

In conclusion, MRI and arthroscopy can be used for the diagnosis of synovial hemangioma, which doesn't arise as a result of trauma, and leads to pain accompanied with recurrent effusion during childhood and adolescence. Even though treatment options are still controversial, arthroscopic total excision can be performed in pedicellate localized lesions, and open localized resection in diffuse lesions of single compartment. The large and widely diffused lesions should be followed-up and conservatively treated until the detection of any progressive change in the symptoms of the patient

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