



## Intra-articular ganglion cyst of cruciate ligaments of knee : arthroscopic and conservative treatment

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**Anterior and posterior cruciate ligaments associated ganglion cysts of knee are rare conditions. These cysts are generally symptomatic ; painfull and activity limiting. MRI is commonly used for diagnosis of cruciate ligaments associated ganglion cyst, relation to anatomical structures and preoperative assesment. In this study, we present 8 cases with ganglion cysts in the cruciat ligaments detected with MRI and treated conservatively or arthroscopically. Three of these cases were treated conservatively and five of cases were treated arthroscopically. One of the patients treated conservatively had moderate pain and seven patients had no pain or any other symptoms.**

**Keywords :** Intra-articular ganglion cyst ; knee ; cruciate ligaments ; arthroscopic treatment ; conservative treatment.

### INTRODUCTION

Ganglion cysts are ; in gel consistency, viscous and yellowish liquid containing lesions. Their shapes can be round, oval, lobulated and also irregular contoured (1,6). Etiology is unkwon but according to some authors ; trauma related soft tissue injury, sinovium herniation to soft tissues and in embryogenesis phase of life, displacement of sinovial tissue may be reason of ganglion cysts (3,10). These lesions usually arise from tendon sheaths, joint capsules or muscles, and usually are

seen in wrist and ankle. 70% of ganglion cysts are located in wrist. Ganglion cyst of knee is a rare condition (% 0.2-1.3) (2,8,11).

The incidence of intra-articular ganglion cyst is peaking between 20-40 years (3,11). Most of the intra-ligamentous ganglion cysts are localized to the anterior cruciate ligament and more common in males. (75.4%) (10,13). As it may be asymptomatic, non-specific knee pain may cause symptoms such as swelling, limitation of motion, pain in flexion or extension, and the existence of ganglion cyst should be considered as a differential diagnosis in the presence of these symptoms (13). The most common symptom is knee pain (12). MRI is a useful method for confirming the presence of cyst before arthroscopic procedure and for pre-operative planning. In patients with complaints of pain and / or limitation of movement in the knee ; meniscus injury, ligament injury, cartilage lesions, conditions

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such as loose bodies and cysts of the knee meniscus can be present. In the differential diagnosis of intra-articular ganglion cyst; pigmentary villonodular synovitis, hemangioma, fibroma, myxoma, aneurysm and intra-articular lipomas should be kept in mind (5). Contrast-enhanced computed tomography or ultrasound can be applied for differential diagnosis, but CT and USG can be limited to evaluation for knee, so MRI is the primary method of diagnosis (4).

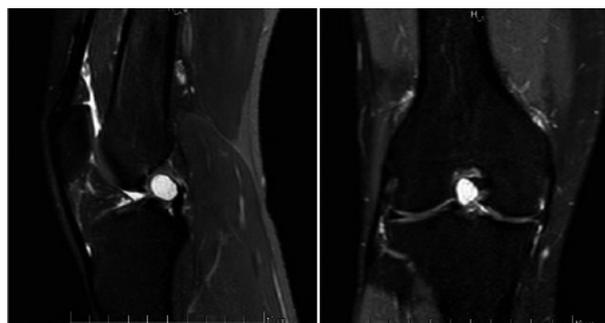
We aimed in this study to evaluate results of operative and conservative treatment of cruciate ligaments associated intra-articular ganglion cyst of knee.

### MATERIALS AND METHODS

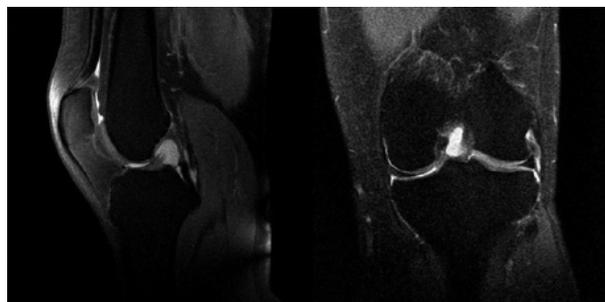
In this study, symptomatically 8 patients with ganglion cyst associated cruciate ligaments of knee between 2013 and 2017 were included. All patients were evaluated with MRI. The patients were questioned in terms of trauma history and examined for concomitant lesions. 5 patients treated arthroscopically and 3 patients treated conservatively. The treatment modality was determined by the clinical status of the patients and the severity of the symptoms. In the conservative treatment; NSAIDs, stretching exercises to knee joint and activity restriction were applied. In surgical treatment; after arthroscopic evaluation of the lesion, total excision or aspiration of the cyst content was performed by considering the adjacent anatomic structures of the lesion. The diagnosis was confirmed histopathologically in all patients treated arthroscopically. After conservative and surgical treatment, physical therapy protocols were performed by the same physiotherapist. Follow-up of the patients was done after treatment 1st, 3rd, 6th and 12th months. Patients were evaluated with VAS and Lysholm scores before and after treatment 12th month.

### RESULTS

In this study 8 patients with ganglion cyst of cruciate ligaments of knee were evaluated. Mean age of patients was 34,1 years (26-45). Seven of the patients were male and 1 was female. All 8



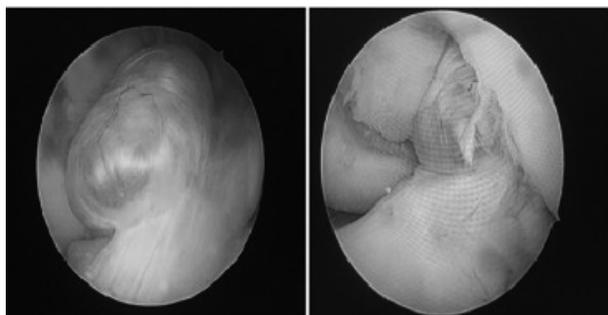
**Figure 1.** — Hyperintense anterior cruciate ligament associated ganglion cyst in a T2-weighted MRI.



**Figure 2.** — PCL associated ganglion cyst with ACL rupture in a T2 weighted MRI.

patients had knee pain. Especially, pain in advanced flexion and extension was the characteristic finding. MRI was obtained in all cases. In all cases, cyst content was found to be hypointense in T1 and hyperintense in T2 images. The size of cysts varied from 8 mm to 19 mm in diameter. 5 of these intra-articular cysts were associated to anterior cruciate ligament (Figure 1) and 3 of cysts were associated to posterior cruciate ligament. 2 of PCL associated cases had concomitant lesions; 1 had ACL rupture (Figure-2) and 1 had meniscal tear and these lesions were treated simultaneously. 1 of ACL associated cases had concomitant partial ACL rupture, after cyst excision ACL has been evaluated intraoperatively and it was decided that there was no need for reconstruction. These three patients also had a history of trauma.

Complaints of 3 cases were less than 3 months and were not sufficient to limit activity. These 3 cases were treated conservatively. At the 1st, 3rd, 6th and 12th months controls, the symptoms of the 3 patients were regressed. Pre treatment VAS score average was 7 (6-8) and decreased to 2,6



**Figure 3.** — Arthroscopic view of anterior cruciate ligament associated ganglion cyst.

(2-3) at post treatment 12th month and Lysholm score increased from 72,6 (68-76) to 81,3 (78-85). In one patient, pain was observed in the activities requiring advanced flexion. Surgical treatment was recommended to the patient but he did not accept the operation because it did not affect his daily activities very much.

Five cases had pain duration longer than 6 months. In addition, pain complaints were prominent in daily activities, in conditions where flexion more than 90° is required, and in terminal extension. In one of these cases, there was extension limitation. These 5 cases were treated arthroscopically (Figure 3). These patients VAS score average was 7,8 (7-9) pre operatively and decreased to 2,4 (0-4) post operatively and Lysholm Knee Score increased from 53 (38-71) to 85,2(66-100).

In four of the patients, the cyst was excised arthroscopically. Cyst content aspiration was performed in 1 patient due to its proximity to anatomic structures. In 1 patient with PCL located ganglion cyst, there was meniscal tear as concomitant lesion and partial menisectomy was performed. In 1 patient with PCL located ganglion cyst, there was ACL rupture as concomitant lesion and ACL reconstruction was performed.

Table 1. — Patients, symptoms and treatments

Sex	Age	Side	Trauma History	Clinical presentation	Concomitant lesion	Location	Cyst size	Treatment	VAS Before/After treatment	Lysholm KneeScore Before/After treatment	Result
Male	36	R	No	Extension pain	No	ACL	15x15x9 mm	Conservative	6/2	74/81	Relieved
Male	45	R	No	Extension pain and block	No	ACL	19x15x10 mm	Arthroscopically Debridmant	8/2	58/90	Relieved
Male	35	L	No	Flexion pain	No	PCL	15x14x9 mm	Conservative	7/3	76/85	Relieved
Male	26	R	Yes	Instability, flexion and extension pain with blocking	ACL rupture	PCL	18x10x12 mm	Arthroscopically Debridmant + ACL reconstruction	9/4	38/84	Relieved
Male	30	L	Yes	Flexion and Extension pain	Meniscal tear	PCL	16x12x12 mm	Arthroscopically aspiration + partial menisectomy	8/3	71/86	Relieved
Male	32	R	No	Extension pain	No	ACL	14x12x11 mm	Conservative	8/3	68/78	Moderate pain
Female	30	L	No	Extension pain and block	No	ACL	19x16x8 mm	Arthroscopically Debridmant	7/0	49/100	Relieved
Male	39	R	Yes	Extension pain and block	ACL partial rupture	ACL	18x18x8 mm	Arthroscopically Debridmant	7/3	49/66	Relieved

Pre treatment mean VAS score of all 8 patients was 7,5 (6-9) and Lysholm Knee Score was 60,37 (38-76). At post treatment 12th month VAS score decreased to 2,5 (0-4) and Lysholm Knee Score increased to 83,75 (66-100) (Table 1). No cyst recurrence was observed in these patients.

## DISCUSSION

Knee joint pathology that can cause symptoms often include meniscal injuries, ligament injuries, cartilage lesions and intraarticular loose bodies (6,10,13). On the other hand, intra-articular ganglion cysts originating from the cruciate ligaments are rare conditions. However, with the increasing use of MRI and arthroscopy in orthopedics, an increasing number of studies have been published on synovial cysts in the knee joint (2,9,10,13). The reported prevalence of the lesion was 1.3% for MRI and 0.6% for knee arthroscopy (2, 6, 13).

Intra-articular ganglion cysts can originate from cruciate ligaments, meniscus, popliteus tendon, subchondral bone cysts and infrapatellar fat pad (10). In differential diagnosis of intra-articular ganglion cysts, pigmented villonodular synovitis, hemangioma, fibroma, myxoma, synovial chondromatosis, synovial proliferation, synovial sarcoma, aneurysm and intra-articular lipoma should be considered (10,13). Intraarticular ganglion cysts may be symptomatic or asymptomatic (6,10,13). When it is symptomatic, the most common finding is knee joint pain (12,13). Other reported symptoms include knee joint flexion loss, extension limitation, mechanical locking, and recurrent effusions (2,6,13). Intraarticular ganglion cysts may sometimes accompany another pathology in the knee joint (10). All of the patients in our study had symptoms and pain was the most common symptom. As concomitant lesions ; two patients, one of them as partial, had anterior cruciate ligament rupture and one patient had meniscus lesion. Diagnosis of intraarticular ganglion cysts is usually performed with MRI or during interventional arthroscopic surgery (9,10,13). In our study, all patients were diagnosed with MRI. Although the frequency of intraarticular ganglion cysts related to the location of cruciate ligaments in the knee joint varied in various studies, the number

of ACL cysts in our study was more than that of PCL (6,10, 3). Intraarticular ganglion cysts can be treated with arthroscopic surgery and patients with short-term complaints and who do not have severe movement restriction in the knee can be treated with conservative treatment (7). The conservative treatment of three patients in our study resulted in clinically satisfactory results. However, one patient's complaints had regressed but he had complaints of pain in the hyperflexion of the knee joint.

It is reported that the results of arthroscopic surgical treatment are good and surgical treatment should be considered in symptomatic cases (2,6,9). In our study, it was seen that after the surgical treatment, the complaints of the patients were passed and there was no recurrence at the end of the follow-up period. Intra-articular ganglion cysts are usually in the 20-40 age range and in males (2,6,10). In our study, the mean age of the patients was 34, 1 and 7 of the patients were male and 1 was female. In most studies, ganglion cysts are associated with trauma (2,10). Three of our patients had a history of trauma. One of these patients had knee pain for about 3 months after a simple fall and a ganglion cyst was detected in the PLC with medial meniscus rupture. One of these patients had PCL associated ganglion cyst with ACL rupture was detected after indirect trauma of the knee. In the other case, there was partial ACL rupture with ACL associated ganglion cyst and a simple fall history. Although the arthroscopic intervention of the intraarticular cysts associated with ACL and those located at the anterior of the PCL is easy, it is difficult to reach the cysts in the posterior of PCL (2,10). In addition, due to the proximity of these cysts to the vascular structures, excision of the cyst with the sheath is difficult and the risk of complications increases (1,2,10). Therefore, aspiration of the cyst content can be performed in these patients (6). On the other hand, although this method is safe, it is reported that the risk of recurrence is higher than surgical excision (9,13). In a case accompanied by meniscus tear, ganglion cyst was located in the posterior of PCL ; considering the risk of complications, only the cyst content was aspirated. No recurrence was observed at the end of the 1 year follow-up.

As a result, cruciate ligaments associated intrarticular ganglion cysts should be considered among the diagnoses that may cause symptoms in the knee joint. Arthroscopic surgery is the most effective treatment in symptomatic patients. In addition to this ; if the patient has acute or short term complaints and patient's complaints are not severe and there is no activity restriction, conservative treatment may be performed in the first place.

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