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REVIEW ARTICLE

GANGLION CYST OF ANTERIOR CRUCIATE LIGAMENT: A CASE REPORT AND REVIEW

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ABSTRACT

Ganglion cyst of Anterior cruciate ligament (ACL) is rare and is lack of specific symptoms and signs, as a result, it is not easy to be diagnosed. In this study, we reported a 35-year-old male with presumed ganglion cyst of ACL, the case was demonstrated by MRI and further confirmed by arthroscopy and pathology. In order to avoid recurrence, complete resection of cyst and cyst wall is highly recommended. Autograft Hamstring Tendon Augmentation was performed improve the stability of the knee .18 months postoperatively, the patient was asymptomaticand clinical examination was normal, Therapeutic result is satisfactory. After the resection of cyst, it is advised to test the strength of the ACL, if the stability of the knee is reduced significantly, The auto graft augmentation of ACL repair surgery may be necessary.

INTRODUCTION

A ganglion cyst is yellow fluid-filled sacs, which commonly found near the joint, especially the wrist (Andrikoula, 2007). however, it associated with anterior cruciate ligament (ACL) is uncommon. The ganglion cyst in joint was firstly reported in 1924 **(**Caan, 1997) thereafter, there was increasing reports of ganglion cyst for the development of magnetic resonance imaging (MRI). In this study, we reported the treatment of a patient with ganglion cyst of ACL.

Case Report

A 35-year-old male had noticed the pain in his left knee after sprain four months ago, although the symptom of pain were relieved on the next day, butthe symptom was getting worse day by day, hence, he came to our department of orthopedics, affiliated hospital of Chengde Medical College, China for treatment in May 2016. He had no medical history of locking or giving wayof the knee before this incident, he felt the pain and tightness when standing, and he could not move his left knee freely. McMurray's test, patellar movements and Plain radiograph showed no abnormal findings, and the collateral and cruciate ligaments were clinically stable. The result of MRI represented as well-defined cystic multioculated masses, They have uniformed low signal intensity on T1-weightedimaging and high signal intensity on T2-weighted imaging.

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The standard knee arthroscopy was performed through anteromedial and anterolateral portals, and its results revealed that the ganglion cysts were located in the antero-medial bundle of ACL (Figure a,b). There was no continuously with ACL and there was no meniscal or chondral pathology reported. The ganglion cyst is yellow fluid-filled sacs, the first step was to puncture using forceps, the second step was to remove the cyst wall piece by piece. The results of histological examination showed that cystic lesion was consisted of dense fibrous connective tissues but without synoviallining cells. Hence, he was diagnosed as ganglion cyst of ACL. Articular cartilage and meniscus injury were excluded during arthroscopic exploratory. Complete arthroscopic resection of the cyst and cyst wall was performed, be careful not to damage the fiber bundles of ACL (Figure c,d,e). The contents of incised cysts were dark red or white transparent viscous liquid. The cystwalls were resected completely by a planning blade orplasma knife before intraarticular irrigation with sufficient Ringer's solution. After resection of cyst,it we test the strength of the ACL and Lachman test and drawer test were positive. In this case, we perform autograft hamstring tendon augmentation for ACL after the resection of cyst. Aslanted incision of 3 cm was made at 1.5 cm from the posterior medial side of tibial nodule and along the direction of dermatoglyph. Skin and subcutaneous fascia were gradually cut open to expose the distal ends of semitendinosus muscle and gracilis muscle, and cut off the distal end on the side of tibia. The tendon grafting apparatus was used to harvest 2 complete strands of tendon, while the residual muscles at the muscular end were removed, and then, both ends of tendon were respectively knit-sutured

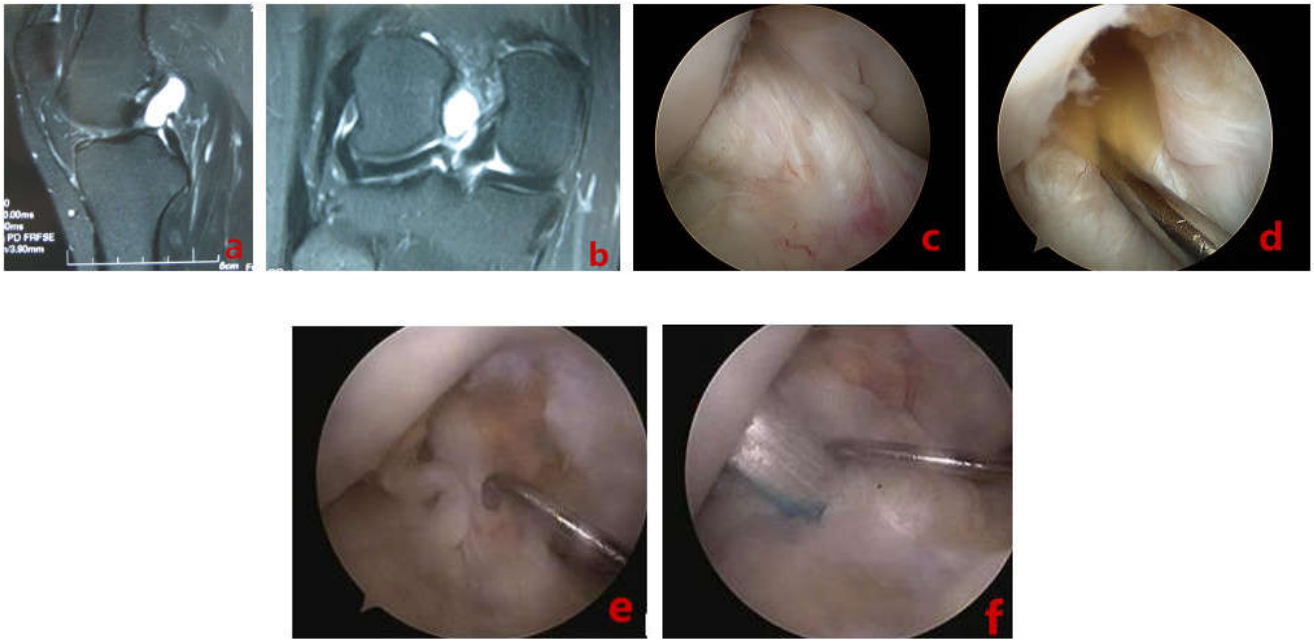

Figure a,b–magnetic resonance imaging shows area of high signal intensity, represents a ganglion cyst
Figure c –Arthroscopy shows a cyst between the anterior cruciate ligament and the medial femoral condyle
Figure d, e –Arthroscopic decompression with debridement of the cyst
Figure f– Arthroscopic view of reconstructed AMB: location of transplanted material is well placed and is close to anatomical reconstruction

for a length of 3 cm. After folding back on each other, the diameter was measured at 7 mm and the length of complete tendon was measured at approximately 12 cm. Tibial frame was set up. Along the original incision for removal of tendon, tibial tunnel was created. The tunnel's inner portal was located at the anterior medial side of lateral tibial crest, in which the tibial tunnel formed an angle with the tibial platform (45°) and an angle with the sagittal plane (30°), before it was fixated. Along the fixating pins, a tibialtunnel with diameter of 7 mm was created. The knee was at flexion position of 90°when the femoral frame was set up. Fixating pins were used for fixation (It was the central point in the elongation line starting from the lowest point of femoral condyle and perpendicular to the plane of tibial joint, which passed through the adhesion region of ACL and over the anterior distal end of apex point by 10mm; Femoral tunnel was made along the fixating pins (diameter:7 mm and depth:30mm). Prepared tendon was implanted into the tunnel. For the femoral end, Endo Button fixation was used while the leg was in flexed 30°. Intrafix was blown up to force pressure on screws to fix the tibial end when the graft was at full tesion (Figure f). Compression dressing was used to reduce the swelling after operation, under the protection of orthotic devices, early exercises of postoperative rehabilitation were recommended. Moreover, during the operation, the joint mobility and stability were evaluated by the Drawer test and Pivot shift test, and no positive signs were found in this case The patient was very satisfied with the treatment results, including no pain and no recrudescence after surgery, moreover, the motion range of the knee was normal up to 18 months post-surgery, hence no MRI scan was performed.

DISCUSSION

The ganglion cyst is yellow fluid-filled swelling, it usually presents around the joint, especially in wrist, however, it is not commonly found near the knee. Previous studies on knee MRI and knee arthroscopy reveal that the incidences of ganglia cyst of knee are 0.20% - 1.33% and 0.6% - 2.0%, respectively (Bui-Mansfield, 1997). Among ganglia cyst of knee, more than 60% are associated with ACL. While it is unclear how or why ganglion cystsoriginate, the pathogenesis of ganglion cyst of ACL is still unclear. There are many possible hypotheses, including displacement of synovium into the surrounding tissue, which may occur during development, herniation of synovium into the surrounding tissues, or degenerative and proliferative changes of pluripotentialmesenchymal cells following trauma. The age of ganglion cyst is ranging from 19 to 60 years, and more common in male than female (Mao, 2012). The most common factor associated with ganglion cyst of ACL may be trauma (Plotkin, 2009). For the development of MRI, more cases of ganglion cyst of knee were reported. Currently, MRI is used as the gold standard in the diagnosis of ganglion cyst of ACL, it has lots of advantages including sensitive, specific, noninvasive, and useful in planning operative treatment. An ACL ganglion cyst appears as fusiform, or rounded, with a clear boundary extending along the course of the ACL orinterspersed within the fiber of the ligament. ACL ganglion cyst exhibits hypointense signals onT1 weighted images and hyperintense signals on T2-weighted images. Clinical symptoms of ganglion cyst of ACL include pain, swelling, decreasing joint mobility, joint effusion and limited joint mobility, if the cyst is larger enough, it may mechanically obstruct the knee during motion. Decreased ROM was secondary to a mechanical block caused by the ganglion cyst (Sayampanathan, 2016). In this case, the primary symptom is pain, it is related to Nociceptors which is located in joint capsules, ligaments and fat bodies. Nociceptors are distributed in the joint capsules, ligaments and fat bodies. Many nociceptors were detected in the joint capsules and synovia around the sites attached to themeniscus and surrounding attachment sites with the central and peripheral ligaments. Nociceptors in the jointrespond to changes in internal pressure, nonphysiological stress, physical stimulation and inflammatory products, resulting in pain (Kosei Ishigaki,

2016). If the cyst is asymptomatic, conservative treatment should be strongly considered (Huang, 2002). If symptomatic, these lesions are often suitable for the treatment. The preferred treatment for ganglion cyst of ACL is arthroscopic resection, although it still have the possibility of postoperative recurrence, but fortunately, the recurrence rate is very low (Krudwig, 2004). Arthroscopic decompression with debridement of the cyst is the treatment of choice for instantrelief of pain. Aspiration under CT scan (Sonnery-Cottet, 2016), and an ultrasound-guided approach (Krill, 2014), have also been reported with excellent results. When dealing with a cruciate ligament cyst, even if you are very careful, the integrity of the cruciate ligament will be more or less damaged, and the secondary rupture of the ligament may occur in the later stage, which may require more attention for cases with high exercise intensity (Rolf, 2006). After the resection of cyst, it is advised to test the strength of the ACL, if the stability of the knee is reduced significantly, The autograft augmentation of ACL repair surgery may be necessary. In this case, we perform autograft hamstring tendon augmentation for ACL after the resection of cyst, Therapeutic result is excellent.

Conclusion

A ganglion arising from ACL is rare. Arthroscopic resection is the most common and preferred approach for removing ganglioncyst. After the resection of cyst, it is advised to test the strength of the ACL, if the stability of the knee is reduced significantly, The autograft augmentation of ACL repair surgery may be necessary.

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