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Case Report

Anterior cruciate ligament and popliteus tendon injuries associated with a cyamella: a rare case report

Mounika N. S. Chodavarapu[1]*, Srinivas B. S. Kambhampati[2], Shyam K. Chinta[1], Harsha Bhogadi[1]

[1]Department of Orthopaedics, Siddhartha Medical College, Vijayawada, Andhra Pradesh, India
[2]Sri Dhaatri, SKDGOC, Vijayawada, Andhra Pradesh, India

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***Correspondence:**
Dr. Mounika N. S. Chodavarapu,
E-mail: cnsmounika@gmail.com

ABSTRACT

The cyamella is a rare sesamoid bone in the popliteus muscle. This small ossicle may alter the biomechanics of the popliteus, potentially affecting knee function leading to instability. We report a 19-year-old male with a right knee injury from an auto rollover accident. Imaging revealed an anterior cruciate ligament (ACL) rupture, an intra-articular loose body, a cyamella, and a popliteal tendon avulsion. ACL reconstruction was performed, and the cyamella and loose body were excised. The tendon avulsion was repaired with a suture anchor. At one-year follow-up, the patient had full knee movement without instability. This case highlights a rare injury combination and excellent surgical outcomes when promptly identified and treated.

Keywords: Cyamella, Popliteus, Sesamoid, Posterolateral corner instability, ACL tear

INTRODUCTION

The cyamella, a rare sesamoid bone found within the popliteus tendon, is an anatomical variant with an incidence of approximately 0.57–1.8%. This small ossicle typically resides within the tendon or at the myotendinous junction, and while often asymptomatic, it can be of clinical significance. The presence of a cyamella may alter the biomechanics of the popliteus, potentially affecting knee function and stability. In some cases, it has been linked to posterolateral corner injuries, either as a contributing factor or as an incidental finding during imaging.[1-4] Additionally, the cyamella can be mistaken for an avulsion fracture or other pathological calcifications, making its recognition essential in radiological assessments. Understanding this variation is crucial for orthopedic surgeons and radiologists to differentiate normal anatomical variants from pathological conditions, particularly in chronic knee pain or instability. The popliteus, a small triangular muscle in the posterolateral knee, plays a key role in knee stability. It is intracapsular but extra synovial and is innervated by the tibial nerve (L4–S1). Its vascular supply comes from the popliteal artery, and its lymphatic drainage extends to the popliteal and deep inguinal nodes.[5]

We present a rare case of cyamella in a 19-year-old male with concomitant anterior cruciate ligament (ACL) tear and posterolateral corner instability following trauma. To our knowledge, this has not been previously documented. This case underscores the importance of considering cyamella in the differential diagnosis of posterolateral knee instability.

Patient consent for submission of the report has been obtained.

CASE REPORT

A 19-year-old male presented with pain and swelling of his right knee following a rollover motor vehicle accident. Physical examination revealed localized tenderness over

the posterolateral aspect of the knee joint, accompanied by difficulty in extending the knee from a flexed position. The clinical assessment demonstrated positive Anterior Drawer and Lachman tests, along with a positive Pivot Shift test, indicative of an ACL tear and concurrent posterolateral corner instability.

Radiographs (Figure 1) showed loose bodies posterolaterally below the joint level. Magnetic resonance imaging (MRI) (Figure 2) and computed tomography (CT) (Figure 3) confirmed a complete ACL tear with an intra-articular loose body laterally.

Figure 1: X-ray of the right knee (a) AP and (b) lateral views showing cyamella below the knee joint posterolaterally. Note the presence of one large rounded sesamoid along with two other small fragments which were avulsed fragments from lateral femoral condyle attached to the popliteus tendon.

Figure 2: (a) MRI right knee sagittal view with ACL tear (yellow arrow) and cyamella in the popliteal tendon (blue arrow), and (b) the coronal view shows cyamella (red arrow) in the posterolateral corner of the knee joint.

During ACL reconstruction, an incision was made over the lateral knee. The capsule was incised, and the Cyamella was excised from the popliteus tendon. It had smooth edges and measured 1.5×1×1.2 cm (Figure 4) and the shortened popliteus tendon after excision was repaired using an anchor suture. Post-operative X-rays (Figure 5) showed successful removal. Histopathology confirmed chondroid and osteoid tissue with surrounding adipose tissue, without malignant dysplasia, identifying it as a sesamoid bone in the popliteus. The patient's symptoms were also relieved, with no signs of instability. He was followed up at six weeks and three months but was lost to follow-up thereafter. At last follow up, he had a stable knee with full range of movements. Although he did not report for clinical checks subsequently, telephone contact was possible and he reported no further symptoms with his knee.

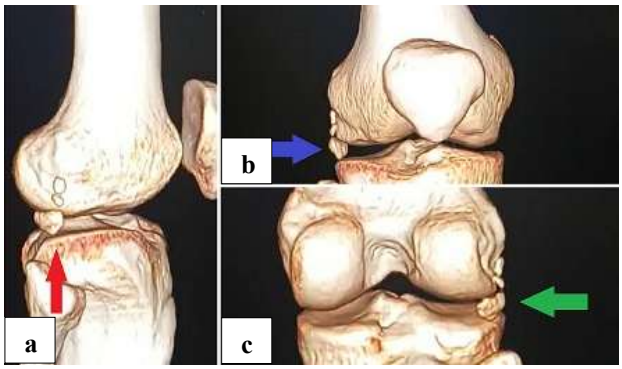

Figure 3: CT scan of the right knee, highlighting (a) a loose body in the lateral view (red arrow), (b) anterior view (blue arrow), and (c) posterior view (green arrow).

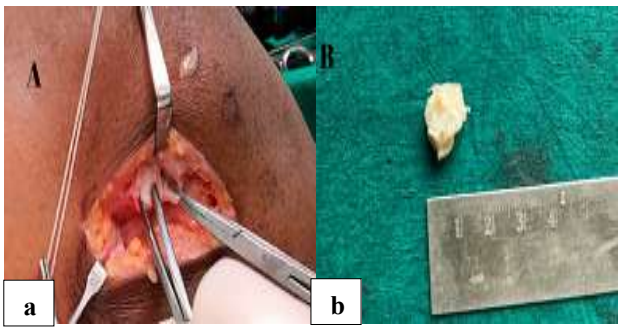

Figure 4: (a) Excision of cyamella from the right knee and (b) its measurement.

Figure 5: (a) AP and (b) lateral views of right knee joint postoperatively after ACL reconstruction and excision of cyamella.

DISCUSSION

Sesamoid bones are small accessory ossicles found within muscles and tendons, playing a role in reducing friction,

modifying pressure, and enhancing the mechanical efficiency of musculoskeletal structures. They are more prevalent in fetuses and typically fuse with skeletal maturity. The largest sesamoid bone in the human body is the patella.[6]

The cyamella, a sesamoid bone located within the popliteus tendon, is a rare anatomical variant in humans but is more commonly observed in quadrupeds such as dogs, cats, and rabbits. It is believed to be a vestigial structure, a remnant from earlier evolutionary stages. While often asymptomatic, the cyamella can sometimes be considered pathological, as its presence may alter knee biomechanics, particularly in humans with an upright posture.[7,8] It can contribute to posterolateral knee pain, be mistaken for an avulsion fracture on radiographs, or interfere with the normal function of the popliteus muscle. In some cases, it has been associated with degenerative changes or mechanical irritation, necessitating further clinical evaluation. Understanding its presence is essential for accurate diagnosis and differentiation from pathological calcifications or fractures in imaging studies.

A literature search on PubMed for cyamella associated with ACL tears yielded no results. Searching for the keyword “cyamella” identified seven papers: six case reports and one article on pathological conditions affecting the popliteus muscle which was a radiology review also.[9-15] Among the case reports, one was letter to the editor.[12] Two cases presented with snapping knee and one with tendonitis, while others were asymptomatic.[9,11,13] One report described cyamella occurring alongside multiple fabellae.[10] It is not clear whether presence of cyamella predisposes to rupture of the popliteus tendon at the time of injury to the knee.

Our case is unique as it has not been previously reported in the literature and had no association with other sesamoid bones, such as the fabella. Additionally, it was linked to an ACL tear and a popliteus tendon rupture associated with a cyamella, resulting in anterior and posterolateral instability following trauma. Initially, we suspected the loose fragment to be a traumatic avulsion, similar to an LCL avulsion. However, its smooth edges and intra-articular location as evident on the CT scans and gross appearance, suggested otherwise. Furthermore, the fragment was retrieved intracapsularly and extrasynovially from within the substance of the popliteus tendon, near the lateral femoral condyle, confirming its sesamoid nature.

CONCLUSION

Cyamella, a rare sesamoid bone in the popliteus tendon, is an uncommon finding in humans and is typically considered a vestigial structure. It plays a role in biomechanical alterations of the knee, particularly in cases of posterolateral instability, underscoring its potential clinical relevance. Our case is unique as it is the first reported instance of a cyamella associated with both an ACL tear and a popliteus tendon avulsion following trauma, without the involvement of other sesamoid bones. This case highlights a rare combination of posterolateral knee instability with an ACL tear linked to a cyamella, demonstrating excellent surgical outcomes when accurately identified and treated.

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