

# Hemorrhagic Cyclops Syndrome

## —A Cause of Recurrent Hemarthrosis after ACL Reconstruction: A Case Report

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**How to cite this paper:** Espiritu, W.P.A. (2025) Hemorrhagic Cyclops Syndrome. *Open Journal of Orthopedics*, 15, 15-21. <https://doi.org/10.4236/ojo.2025.151002>

**Received:** November 21, 2024

**Accepted:** January 6, 2025

**Published:** January 9, 2025

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### Abstract

Cyclops lesion is a fibrous nodule on the tibial side of the knee and it is one of the common complications that arises after anterior cruciate ligament (ACL) reconstruction, causing loss of knee extension. A presentation dominated by recurrent hemarthrosis is a rare presentation of this lesion. In this case report, we have discussed about a male patient who presented with recurrent hemarthrosis and inability to extend the knee joint fully 8 months after ACL reconstruction. Cyclops lesion was identified by clinical examination and magnetic resonance imaging (MRI). Recurrence after initial excision of the lesion occurred and complete resolution happened during the second operation when cauterization was done. It is imperative that treatment should include coagulation of the vascularized stump to avoid any recurrence.

### Keywords

Cyclops Syndrome, Hemarthrosis, ACL Reconstruction, Hemorrhagic Cyclops

## 1. Introduction

Anterior cruciate ligament (ACL) is one of the most important ligaments that consist of a band of dense connective tissue that courses from the femur to the tibia. It functions mainly for mechanical support of the knee. Rupture of ACL is one of the most common ligament injuries to the knee [1]. However, as in every other surgery, this ACL reconstructive surgery also has its own complications [1].

In 1990, Jackson and Schaefer [1] described cyclops syndrome lesion for the first time as a mass of dense fibrous connective tissue rich in newly formed vessels, with the presence of cartilage [2]. The cyclops lesion is a fibrous nodule with central granulation tissue located anterolateral to the tibial tunnel after intra-articular

reconstruction of the anterior cruciate ligament (ACL) [3].

The nodule was named in this way due to its arthroscopic appearance resembling an eye. It is a proliferation of dense fibroelastic polypoid nodules with microscopic findings of a proliferation of dense connective tissue, fibroelastic, hyaline, coated with flat epithelial cells similar to synoviocytes [2]. There are several hypotheses regarding the pathogenesis of cyclops nodule formation, including bone and cartilage residue in the joint following tibial tunnel drilling and preparation for graft passage [4], repeated graft impingement on the notch, postoperative hamstring contracture [5], and narrowing of the femoral inter condylar notch [6].

A presence of a cyclops lesion with loss of extension of the knee with or without an audible or palpable clunk in terminal extension constitutes the cyclops syndrome [7].

The incidence of cyclops syndrome has been reported to be between 1% and 10% of all ACLRs, whereas magnetic resonance imaging (MRI) studies have reported an incidence of 25% to 47% for cyclops lesions [8].

It is generally suspected by an early post-operative extension deficit, but other symptoms may be present such as anterior pain, painful cracking, blockage, stiffness, instability, or an audible clunk near full extension [9]-[11]. However, recurrent hemarthrosis post operatively has rarely been reported as a consequence of a cyclops lesion.

Management of cyclops syndrome requires arthroscopic excision followed by intensive physiotherapy to regain knee extension [4]. We reported a case of hemorrhagic cyclops syndrome treated successfully with arthroscopic excision and cauterization followed by aggressive physiotherapy which showed good to excellent result with no recurrence.

## 2. Case Presentation



**Figure 1.** Ultrasound guided aspiration of hemarthrosis.

A 19 years old male patient had undergone ACL reconstruction using the ipsilateral Bone patellar bone graft and Lateral Extra articular tenodesis using the ili-tibial band on November 23, 2023. After 9 months, he presented with swelling

and stiffness of his knee joint especially on extension. Patient also complained of progressive sensation of fullness on the affected knee. Rehabilitation doctor did an ultrasound guided aspiration of the knee joint and 55 cc of blood was aspirated (**Figure 1**). Hematological and coagulation studies were examined and revealed normal results. Patient improved and felt significant relief after aspiration.

8 months post op, patient again started to feel a progressive swelling and fullness of his knee and repeat aspiration was done with a 50 cc of blood aspirated. Rehabilitation doctor then refers the patient back to our institution.

Upon arrival in our institution, repeat assessment of the Prothrombin and Partial Thromboplastin time, Clotting and bleeding time were requested and done to rule out any bleeding abnormalities. All results revealed normal. We did not repeat the arthrocentesis since it was already documented that the aspirate was blood hence infection was ruled out in our differential diagnosis.

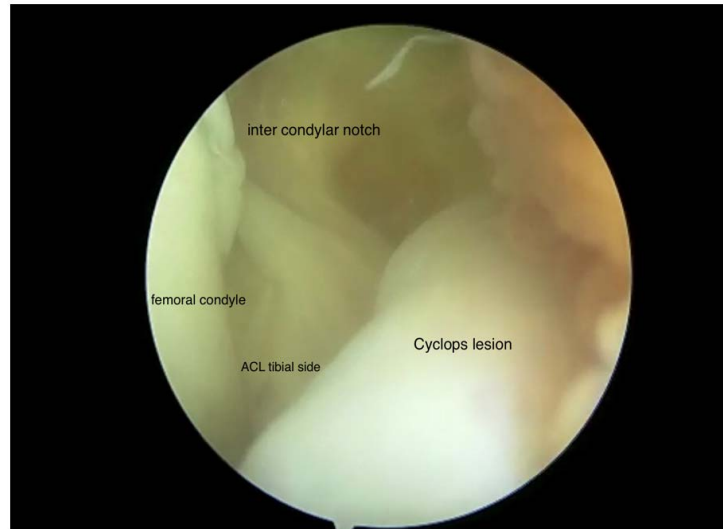
MRI was done to evaluate the cause of knee stiffness and persistent swelling. MRI revealed the following findings: ill-defined and heterogeneous, nodular soft tissue thickening in the intercondylar notch, anterior to the tibial insertion of the ACL graft, suggestive of progressing arthrofibrosis (**Figure 2**).



**Figure 2.** MRI findings of ill-defined and heterogeneous, nodular soft tissue thickening in the intercondylar notch, anterior to the tibial insertion of the ACL graft, suggestive of progressing arthrofibrosis.

On arthroscopy, the lesion appeared as a whitish soft tissue mass with areas of reddish discoloration and hemorrhages (**Figure 3**). Arthroscopic shaver was used to resect the cyclops lesions up to the base. Soft tissue specimen was sent for histopathological examination. Histopathological results revealed proliferation of dense fibroelastic tissues with areas of hemorrhages and siderophages. Based on clinical examination, radiological, arthroscopic assessment, and histopathological examination, cyclops lesion was the definite diagnosis for this case. He was then

advised to continue physiotherapy based on our ACLR + LET protocol.



**Figure 3.** Arthroscopic findings of a whitish soft tissue mass with areas of reddish discoloration and hemorrhages.

3 weeks post op our patient returned again complaining of fullness and pain on the affected knee. Aspiration was done and 45 cc of blood was aspirated. Repeat diagnostic arthroscopy was done revealing a bleeding on the stump of the previously resected cyclops lesion (**Figure 4**). Cauterization was done using a radio frequency probe and the surgery went uneventful.



**Figure 4.** Arthroscopic findings of a bleeding on the stump of the previously resected cyclops lesion.

After the repeat surgery, a routine post op physiotherapy was done by the patient to mobilize the knee joint focusing on quadriceps and hamstring strengthening. Patient regained full knee range of motion and patient was very satisfied

with the result with no recurrence. Following our ACL reconstruction + LET post op protocol, the patient will be cleared to go back to sports 12 months post surgery.

### 3. Discussion

Cyclops lesion or localized anterior arthrofibrosis, an arthroscopically treatable complication of anterior cruciate ligament (ACL) reconstruction, is a fibrous nodule located in the intercondylar notch anterior to the ACL graft [7] [12].

A 2.6-fold increase in the risk of cyclops syndrome was seen in young females [13] [14], also a narrow intercondylar notch is another risk. Taking into consideration the graft choice, BPTB autograft is a significant risk factors for the presence of cyclops lesions and syndrome. [13] During the immediate post-operative period, loss of active knee extension and atrophy of the quadriceps were also associated with a higher risk [15].

Post-operative hemarthrosis can occur in up to 4.4% of operated patients [16]. Usually, it resolves in about 1 - 2 weeks and the post operative course will be unremarkable. However, if the patient presents with recurrence of hemarthrosis/effusion, infection should be considered. It is the first cause to be eliminated in view of its seriousness and the risk of potential functional and vital complications [4]. Bleeding/Coagulation abnormalities should be considered and can be excluded by doing coagulation studies like Prothrombin and Partial Thromboplastin time, Clotting and bleeding time.

The diagnosis of cyclops syndrome rests on the post-operative clinical and MRI findings [17] [18]. MRI has sensitivity, specificity, and accuracy of 85.0%, 84.6%, and 84.8%, respectively, for diagnosing cyclops lesions [3]. When the size of the lesion increases to more than 10 mm, the specificity and accuracy increase to 100% and 91%, respectively [18].

Arthroscopically it is a fibrous nodule that appears like a head with an area of reddish-blue discoloration of venous channels giving the appearance of the eye of a cyclops [12].

The general consensus is to leave asymptomatic cyclops lesions undisturbed, whereas cyclops syndrome requires intervention to recover the normal biomechanics of the knee [8].

Tonin *et al.* reported good results after excision of the lesion if done within 12 weeks of presentation and did not report any recurrence after successful surgical excision [8].

The prognosis is good with these lesions after excision. The symptoms completely resolve within a few weeks after excision of the lesion, and patients regain full ROM [19]. However, if the patient presents with a hemorrhagic cyclops syndrome, this paper suggests the use of radio frequency probe to cauterize the base of the lesion to prevent recurrence.

### 4. Conclusion

In conclusion, it is essential to identify the underlying cause of recurrent

hemarthrosis in any ACL injury patient treated operatively or non operatively. The more common differential diagnosis like infection and Coagulation abnormalities should be excluded by doing arthrocentesis and coagulation studies respectively. Cyclops lesion should be one of the considerations after ruling out other possible causes. Confirmatory diagnosis is made using MRI [18] and surgical excision is the management of choice for symptomatic lesions. In addition, treatment must include careful hemostasis of the lesion to prevent any recurrence. Outcomes after excision are very good, and lesions almost never recur after excision.

### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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