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Locked knee due to fat pad adhesion

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ABSTRACT

BACKGROUND: A locked knee is defined as a knee that does not move freely after an injury. Most cases of locked knee are due to intra-articular blockade caused by an unstable meniscal tear, anterior cruciate ligament (ACL) tear, or chondral lesion resulting in a loose limb. In this study, we present a rare case of a locked knee caused by fat pad adhesion

CASE PRESENTATION: A 23-year-old male presented with a locked right knee, after sustaining an injury falling one month before. Magnetic Resonance Imaging showed loss of ACL feature, normal posterior cruciate ligament, and meniscal tear of posterior horn. Arthroscopy procedure found fat pad adhesion, immobilizing the knee's rotation. After removing all of the fat pad adhesion, the patient's knee could move freely.

CONCLUSION: Clinical and radiographic examinations are important for early diagnosis of the cause of locked knee, but arthroscopic examination is the gold standard for diagnosis.

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1. Introduction

A locked knee is generally defined as a knee that does not move freely after an injury. This condition indicates an intra-articular disturbance, which can result in a bent knee, movement difficulty, and sometimes pain during motion. Most cases of locked knee are due to intra-articular blockade caused by an unstable meniscal tear, anterior cruciate ligament (ACL) tear, or chondral lesion resulting in a loose bodies. Although they are very rare, benign intra-articular tumors or tumor-like lesions can also cause the knee to lock [1,2]. In this case, we present a rare case of a locked knee that was caused by fat pad adhesion after injury.

2. Case report

A 23-year-old male presented to the orthopedic clinic complaining of his right knee becoming locked. One month before the presentation, the patient was running and then twisted his left knee. Immediately after the fall, he found his right knee to be swollen and locked in slight flexion; this condition remained until he was seen in the clinic. The patient walked with axillary crutches. On clinical examination, there was no swelling in the right knee. The

patella was not displaced on palpation. His right knee was in 20° knee flexion. Q-angles were within normal range bilaterally. Radiographs of his knee (Fig. 1) revealed a normal feature. Magnetic Resonance Imaging (MRI) of the knee (Fig. 2) showed loss of ACL feature, normal posterior cruciate ligament (PCL), and meniscal tear of posterior horn.

Under anesthesia, clinical examination confirmed that the patient had true locking of the knee at 20 degrees knee flexion (Fig. 3). Standard arthroscopy revealed hemarthrosis in the knee joint. The knee joint was filled with fat pad adhesion, immobilizing knee rotation (Fig. 4). After removing all of the fat pad adhesion, we found that ACL, PCL, and meniscus were in an intact condition (Fig. 5). His tibial and femoral condylar cartilages were normal.

After the surgery, the patient was moved to the ward and the limb of the patient was passively and gradually moved from 0° to full degree of flexion using continuous passive motion. Later, physiotherapy was followed by a rehabilitation program in an outpatient clinic. By the third month of follow-up, the patient could move the knee freely with a normal range of motion (Fig. 6). There was no recurrent locked knee, and the patient could participate in sports activities.

3. Discussion

Locked knees can occur suddenly and greatly interfere with daily activities. It can also cause limitation of movement and sometimes pain, precipitated by motion. Bansal et al. introduced the concept of the 'triad' obtained from locked knee cases. It consists of pain

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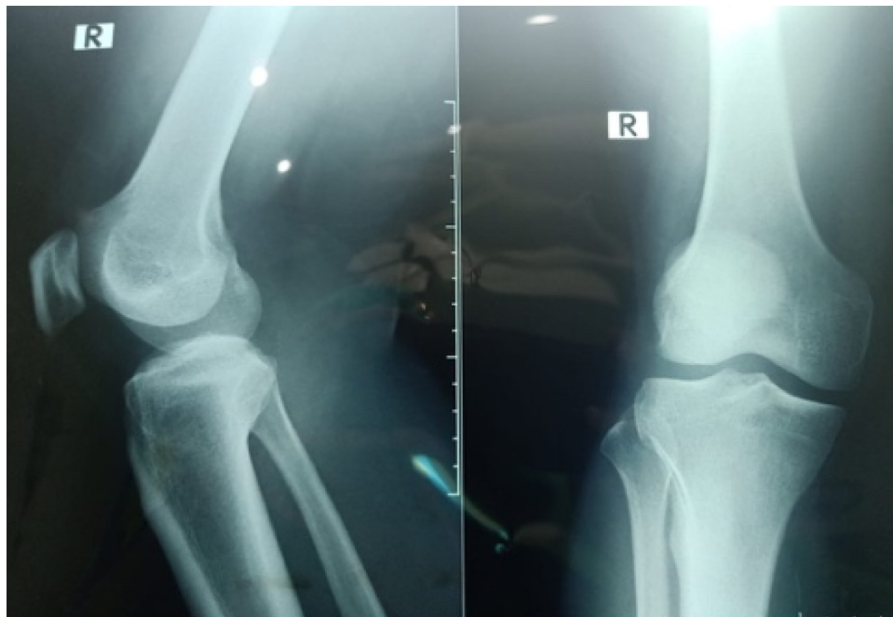


Fig. 1. Knee Radiographic.

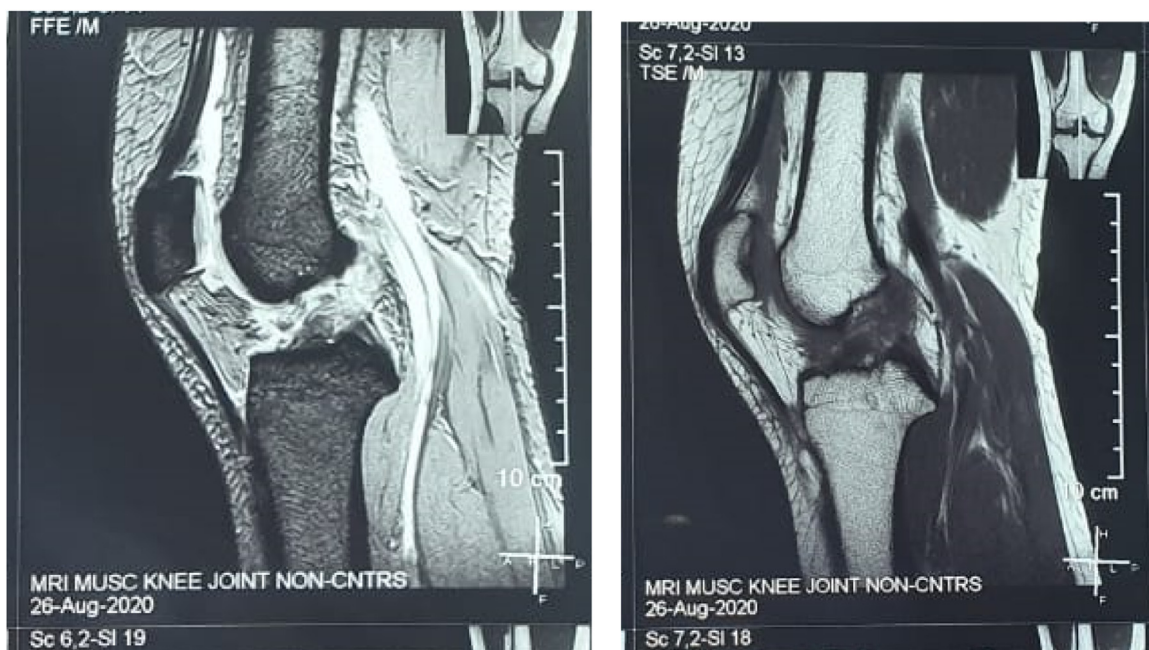


Fig. 2. Magnetic Resonance Imaging of Knee (T1 and T2).



Fig. 3. Clinical Examination Before Surgery.

in the knee joint area, a history of previous injury or trauma, and an effusion in the knee [2,3]. Radiological studies such as knee X-ray, MRI, or arthroscopic procedures can confirm the diagnosis [1–3]. Injuries to the knee, including an unstable meniscal rupture, ACL rupture, and loose bodies due to chondral lesions are common causes of a locked knee. Other rare causes are the presence of intra-articular tumors or pathology such as synovial hemangioma, pigmented villonodular synovitis tumor, arthropathic gout or fat pad adhesions [3,4]. The confirmation of the diagnosis for a locked knee joint is challenging, but a history of previous trauma, as well as a physical and radiological examinations, can guide the diagnosis.

According previously literature, discoid meniscus and unstable meniscus tears are the most common causes of locked knees at a

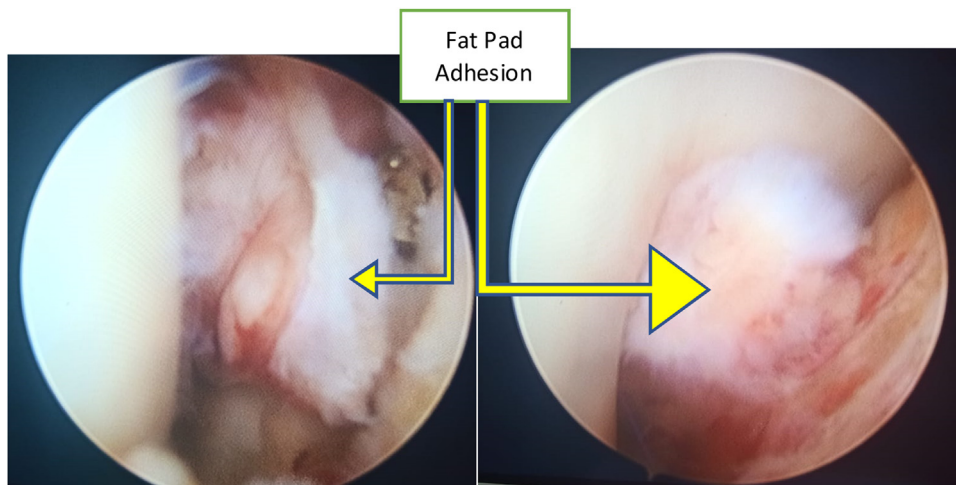


Fig. 4. Arthroscopic Finding (Fat Pad Adhesion).

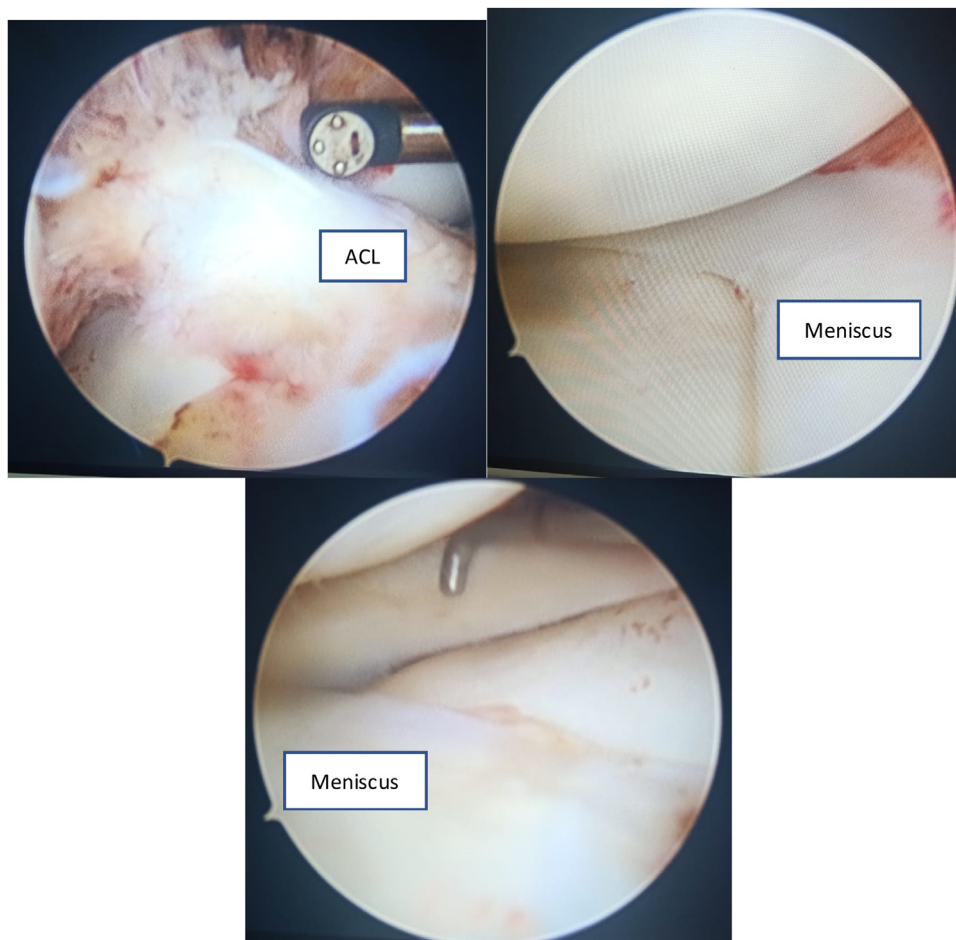


Fig. 5. Arthroscopic Finding (ACL, meniscus medial and Meniscus lateral Intact).

young age. An unstable meniscus rupture which is dislocated or subluxated can be confirmed by MRI examination and arthroscopy [3,4]. The type III or Wrisberg-type of meniscus according to Watanabe and Takeda has a less strong attachment to the meniscotibial ligament which can lead to instability and subluxation of the posterior horn and results in a locked knee [4]. Neuschwander et al. described a variant of the Wrisberg-type in which there is no discoid appearance, and there is thickening of the meniscus seen on

arthroscopy. Six of the 7 patients in the study had thickened lateral meniscus and the other had a complex tear of the lateral meniscus [5].

Our case is very rare and unique because the patient had fat pad adhesion without other intraarticular abnormalities. According to an MRI examination, we found some indications that ACL and meniscus tears had occurred but during the arthroscopic evaluation, we found that the meniscus, ACL, PCL, and cartilage were



Fig. 6. Third month of follow up after surgery.

normal. Only fat pad adhesion was found to be responsible for the patient's locked knee.

Finsterbush et al., explained that this fat pad adhesion occurs because the knee is slightly bent for a long period of time as a response from the pain. After the inflammatory phase subsides, the blood begins to be absorbed and the pain decreases. The retroapatellar fat is attracted by these adhesions and ultimately interferes with knee movement. Trapped fat pads are found in various stages of the process after knee injury, and if the adhesion continues, it will increase the fibrotic tissue in the knee, as found on pathological examination [3]. A similar observation is described by Silver and Campbell, who studied the dancer population. He noted that the delay in returning to activity in the dancer population, due to persistent inflammation of the fat pads, was finally resolved when the inflamed fat pad was removed [6]. Surgical removal of fat pad adhesion and fibrous tissue will result in normal knee motion [5,6].

This work has been reported in line with the SCARE 2018 criteria [7].

4. Conclusions

Fat pad adhesion in the knee is rare, especially when presented as a locked knee. Clinical and radiographic examinations are important for early diagnosis of the cause of locked knee, but arthroscopic examination is the gold standard for diagnosis. Surgical removal of these tissues and the post-operative rehabilitation program are the keys for a successful treatment.

Conflicts of interest

No potential conflict of interest relevant to this article was reported.

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Ethical approval

This Ethical Approval from medical and health research ethics committee, faculty of medicine, public health and nursing, Universitas Gadjah Mada.

Consent

Written informed consent was obtained from the all of the patients for publication of this case report and accompanying images. A copy of the written consent is available for review by the corresponding author of this journal on request.

Author contribution

Sholahuddin Rhatomy and Eko Medio Septiawan:

- conceived the study.
- collected data.
- Analysed data.
- Prepared and drafted the manuscript, edited manuscript and reviewed the manuscript.

Registration of research studies

N/A.

Guarantor

Sholahuddin Rhatomy.

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References

- [1] A. Panagopoulos, P. Tsoumpos, I. Tatani, I. Iliopoulos, D. Papachristou, Giant cell tumor of the patella tendon sheath presenting as a painful locked knee, *Am. J. Case Rep.* 16 (2015) 568–573.
- [2] M.A. Hersekli, G. Özkoç, M. Uysal, Lesions of the knee that cause mechanical symptoms, *Arthroscopy* 21 (1) (2005) 12–18.
- [3] A. Finsterbush I, U. Frankl, Fat pad adhesion to cruciate ligament: a cause of knee locking, *Am. J. Sports Med.* 17 (1) (1984) 92–95.
- [4] M. George, E.J. Wall, Locked knee caused by meniscal subluxation: magnetic resonance imaging and arthroscopic verification, *Arthrosc. J. Arthrosc. Relat. Surg.* 19 (8) (2003) 885–888.
- [5] D.C. Neuschwander, D. Drez Jr, T.P. Finney, Lateral meniscal variant with absence of the posterior coronary ligament, *J. Bone Jt. Surg. – Am. Vol.* 74 (8) (1992) 1186–1190.
- [6] D.M. Silver, P. Campbell, Arthroscopic assessment and treatment of dancers' knee injuries, *Phys. Sport* 13 (11) (1985) 74–81.
- [7] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A. Fowler, D.P. Orgill, For the SCARE Group, The SCARE 2018 statement: updating consensus surgical CASE REport (SCARE) guidelines, *Int. J. Surg.* 60 (2018) 132–136.

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