

## Under-meniscal portal: an alternative portal for an easy access to the medial and lateral menisci

Chris Hyunchul Jo · Kang Sup Yoon · Ji Ho Lee ·  
Seung Baik Kang · Jae Hyup Lee · Hyuk Soo Han ·  
Seung Hwan Rhee · Myung Chul Lee

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**Abstract** Approach to the pathologies in the posterior horn of the medial meniscus in a tight knee may be a challenging technique to the arthroscopic surgeon in certain patients. The pie-crusting technique of the medial collateral ligament which can be done percutaneously to open up a tight posteromedial compartment would be a good option in such patients. Here, the authors introduce a useful alternative portal for approaching the posterior horn of the medial meniscus, the under-meniscal portal. The under-meniscal portal is located under the menisci and can be placed safely and easily without any complication. It is also helpful for approaching the unstable underside of the horizontal tear in the anterior horn of the lateral meniscus. The authors suggest the under-meniscal portal as a good alternative portal for managing challenging lesions in the posterior horn of the medial meniscus and the anterior horn of the lateral meniscus.

**Keywords** Under-meniscal portal · Meniscal tear · Meniscectomy · Portal · Arthroscopy

### Introduction

In some patients with tight medial compartment, arthroscopic procedure becomes a challenging job with standard anterior portals even for experienced arthroscopic surgeons because immoderate and forceful approaching to posterior horn may cause articular cartilage scuffing. For such a tight knee, the pie-crusting technique of the medial collateral ligament (MCL) would be a useful option [1]. Another difficult location to be approached arthroscopically is the anterior horn of lateral meniscus, especially lesions in the underside.

In the present study, the authors introduce a new knee arthroscopic portal useful for such challenging knees, the under-meniscal portal. It is placed under the medial and lateral meniscus. Through the under-meniscal portal, the arthroscopic surgeon can approach both antegrade and retrograde for the treatment of medial and lateral meniscal pathology easily and safely without concerns of articular cartilage damage.

### Technical note

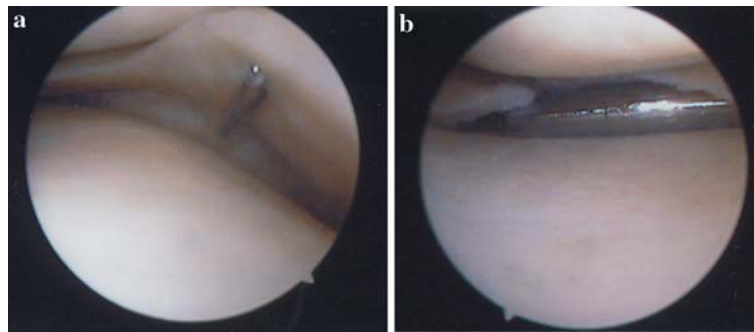
#### Medial under-meniscal portal

Medial under-meniscal portal is placed around the posterior half of the middle one-third of the medial meniscus in a valgus position, which is posterior to the deep MCL. While viewing through the anterolateral portal, a proper site is identified with a finger depression. Then, a 22-gauge spinal needle is introduced inferior to the medial meniscus under direct arthroscopic visualization followed by a 5 mm skin incision (Fig. 1a). A mosquito clamp or straight hemostat is used for blunt penetration of the soft tissue and capsule.

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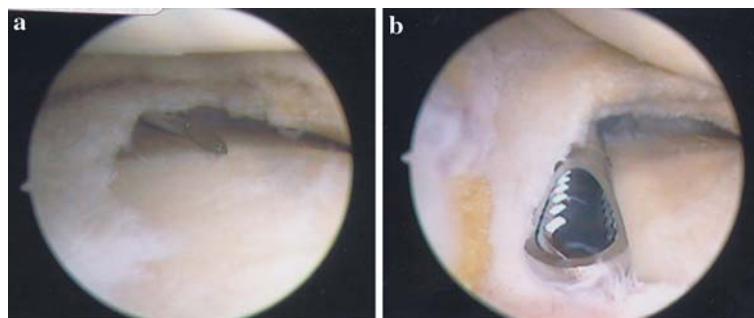
C. H. Jo (✉) · K. S. Yoon · J. H. Lee ·  
S. B. Kang · J. H. Lee · H. S. Han · S. H. Rhee  
Department of Orthopedic Surgery, SMG-SNU Boramae  
Medical Center, Seoul National University College of Medicine,  
425 Sindaebang-dong, Dongjak-gu, Seoul 156-707, Korea  
e-mail: chrisjo@snu.ac.kr

M. C. Lee  
Department of Orthopedic Surgery,  
Seoul National University Hospital,  
Seoul National University College of Medicine, Seoul, Korea



**Fig. 1** Undermeniscal portal for approaching the posterior horn of the medial meniscus in a tight knee. **a** After palpation of the medial joint line, a 22G spinal is inserted inferior to the middle third of the

medial meniscus, followed by blunt spreading with a straight mosquito. **b** Arthroscopic shaver is inserted through undermeniscal portal for resecting a tear in posterior horn of the medial meniscus



**Fig. 2** Undermeniscal portal for approaching the anterior horn of the lateral meniscus. **a** After palpation of the lateral joint line, a 22G spinal needle is inserted inferior to the middle third of the lateral meniscus, followed by blunt spreading with a straight mosquito.

**b** Arthroscopic shaver is inserted through undermeniscal portal for resecting an unstable underside of horizontal tear in anterior horn of the lateral meniscus

If a considerable resistance is felt, the portal is placed too close to deep MCL. In this case, the portal is placed a little more posteriorly. A shaver or resection instrument is then inserted through medial under-meniscal portal toward the posterior horn of the medial meniscus (Fig. 1b).

#### Lateral under-meniscal portal

Lateral under-meniscal portal is useful for the treatment of a horizontal tear in the anterior horn of the lateral meniscus. Once a horizontal tear in the anterior horn of the lateral meniscus is confirmed with preoperative MR and routine knee arthroscopic examination, the knee is placed into a figure four position. The anterior horn of the lateral meniscus is clearly viewed through high anteromedial portal, which is located 1 cm lateral to the margin of the patellar tendon and 2 cm above the medial joint line [4]. While viewing the anterior horn of the lateral meniscus through high anteromedial portal, proper lateral under-meniscal portal site is identified with a finger depression. Lateral under-meniscal portal is made in the middle one-third of the lateral meniscus. A 22-gauge spinal needle is inserted inferior to the middle of the lateral meniscus before a 5 mm skin incision (Fig. 2a).

Just like medial under-meniscal portal, blunt penetration is done with a mosquito clamp. Then, a shaver or resection instrument can be introduced through lateral under-meniscal portal for treatment of lesions in the anterior horn of the lateral meniscus (Fig. 2b).

#### Discussion

The present study describes a new arthroscopic portal, which is located under the both menisci. It is safe and easy to make without significant complications. With this portal, the arthroscopic surgeon could approach more freely to relatively challenging locations, such as to the posterior horn of the medial meniscus in a tight knee and to the anterior horn of the lateral meniscus, both of which might be difficult to be adequately addressed by the standard over-meniscal portals. The authors have successfully used the under-meniscal portal in arthroscopic medial and lateral partial meniscectomy in over one hundred patients without significant complications.

The authors found two studies about a portal made under menisci in English literatures [2, 3]. Although both of the

two articles described the infra-meniscal portals in the tight knees with posterior meniscal pathology that is difficult to address through standard anterior portals, those two portals are not the same. Hershman et al. [3] described infra-meniscal approach located anterior to the leading edge of the MCL. On the other hand, Goebel et al. [2] described an infra-meniscal portal placed posterior to the major component of the superficial medial ligament. The biggest difference between the current description and the two previous articles is that the authors' under-meniscal portal can be used for addressing pathology in the anterior horn of the medial meniscus and lateral meniscus in addition to the posterior horn. Especially, we suggest the lateral under-meniscal portal is very useful for addressing a horizontal tear of the anterior horn of the lateral meniscus, which has been considered as a challenging job.

In conclusion, the under-meniscal portal is especially useful for approaching the posterior horn of medial meniscus in a tight knee and for addressing inferior pathology in the anterior horn of the lateral meniscus

without significant complications. We suggest the under-meniscal portal as a useful tool for knee arthroscopic surgery.

**Conflict of interest statement** The authors report no conflict of interest.

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