Discoid Lateral Meniscus Shape-Preserving Repair for Peripheral Longitudinal Tear with Intact Body

Kazutaka Kinugasa[1], Tomoki Ohori, Ryohei Uchida[2]
[1]Osaka Rosai Hospital, [2]Kansai Rosai Hospital

INTRODUCTION:

Discoid lateral meniscus (DLM) has been widely treated with total or subtotal meniscectomy in the past due to its susceptibility to injury compared to a normal meniscus. However, there has been a shift towards preserving joint function, and currently, the standard treatment is meniscal reshaping with repair to mimic a normal meniscus. On the other hand, it has been reported that some individuals with DLM remain asymptomatic and functional throughout their lifetime. Therefore, for cases where the injury is limited to the peripheral region without any damage to the body of the meniscus, we have attempted to preserve the discoid shape of the DLM and repair the peripheral tear using a DLM shape-preserving repair technique. This study aims to present our current experience with this surgical procedure.

METHODS:

Twenty-one cases of discoid lateral meniscus with painful meniscal symptoms, an intact meniscal body without injury, and a longitudinal tear limited to the peripheral region were treated by preserving the discoid shape and repairing the peripheral tear. This accounted for approximately 3% of all DLM surgeries performed at our institution. The cohort consisted of 11 males and 10 females, with a mean age of 13.8 years and a mean Tegner activity scale score of 4.7. There were 16 cases of complete DLM and 5 cases of incomplete DLM, with a mean follow-up period of 3.8 years (range: 2-8 years).

Regarding the surgical technique, the injured area was freshened with a rasping instrument, and a fibrin clot was inserted. For tears in the posterior segment, an inside-out repair technique was performed, while tears in the anterior segment were repaired using an outside-in or all-inside technique. Postoperative rehabilitation involved brace immobilization for 2 weeks, followed by range-of-motion exercises and partial weight-bearing. Full weight-bearing was allowed at 3 weeks, jogging at 3 months, and return to sports activities at 6 months.

All cases underwent MRI evaluation preoperatively and at 6 months, 1 year, and 2 years postoperatively to assess the repaired meniscus. The evaluation parameters included the location of the DLM tear during surgery, the presence or absence of re-tear on postoperative MRI (MRI success), and the need for revision surgery (Clinical success). For cases with re-tear, it was further evaluated whether the tear was a re-tear at the previously repaired site or a new tear.

RESULTS:

The location of the DLM tear was in the anterior region in 48% of cases and in the posterior region in 52% of cases. The MRI success rate was 62%, while the MRI failure rate was 38%. The clinical success rate was 76%, and the clinical failure rate was 24%. MRI success rates differed by tear location, with 40% success in anterior tears and 82% in posterior tears, suggesting a higher failure rate for anterior tears. The pattern of injuries in cases of MRI failure showed that 25% were re-tears at the previously repaired site, while 75% were new tears in the body of the discoid lateral meniscus.

DISCUSSION AND CONCLUSION:

The indications for the DLM shape-preserving repair technique are limited, accounting for approximately 3% of all DLM surgeries performed. However, even for the discoid lateral meniscus, known for its susceptibility to injury, 62% could be preserved by maintaining the peripheral region when the body of the meniscus was intact. A limitation of this technique is that, even when repair is successful, there is a possibility of re-tear due to the inherent tissue vulnerability characteristic of DLM. Nevertheless, for cases meeting the indications where the discoid shape can be preserved, there is a higher likelihood of maintaining load transmission function compared to the currently accepted gold standard of meniscal reshaping with repair. Although only short-term follow-up data is available at this point, the DLM shape-preserving repair technique could be a potential treatment option for DLM.