



Treatment for symptomatic meniscal cyst associated with meniscal tears: lack of evidence and future perspective

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Meniscal cysts are strongly associated with corresponding meniscal tears, especially horizontal meniscal tears (1,2). That association indicates meniscal cysts are generated by a synovial fluid inflow from the inside of the joint, due to expansion of meniscal tears up to the meniscocapsular junction. In general, as the intra-articular pressure is higher than that of the extra-articular environment and the meniscus is stiffer than the surrounding soft tissues including the capsule. Thus, unidirectional synovial fluid flow toward the outside of the joint by the “check-valve mechanism” could contribute the occurrence and development of meniscal cysts. This theory is supported by the fact that meniscal cysts are frequently located beside (just outside of) the corresponding meniscal tears and contain a fluid like a mucus resembling synovial fluid. Therefore, the key to the success of treatment for symptomatic meniscal cysts is secure closure of the fistulous opening between the meniscal cyst and its associated tear rather than how to remove the containing fluid in the cyst.

The article (3) reviewed the existing studies about outcomes of arthroscopic or open surgeries for meniscal cysts and the associated meniscus tears, focusing on Level of evidence IV and above literature in the last 20 years. From a total of 12 studies included in this review, the authors concluded that both arthroscopic and open

methods can achieve satisfiable clinical outcomes in the mean follow-up duration of 41.4 months. In addition, open cystectomy appears to have a lower recurrence rate as compared to arthroscopic decompression of the meniscal cysts (3.4% *vs.* 10.2%). As the authors referenced, Chang *et al.* (4) compared the recurrence risk of the surgeries for meniscal cysts between open cystectomy and arthroscopic decompression, and demonstrated a lower recurrence rate of open cystectomy (5 out of 112, 4.5%) rather than arthroscopic decompression (27 out of 129, 20.9%). However, the authors described that it may not be accurate to simply conclude open cystectomy is the better choice for the management of symptomatic meniscal cysts.

Most of the meniscal tears (90%) were treated by arthroscopic meniscectomy or debridement for the patients included in this review. That might affect the difference of recurrence rate of the meniscal cysts between open cystectomy and arthroscopic decompression. Open cystectomy can approach the fistulous opening between the meniscal cyst and its associated tear and expect its adhesive closure after surgery, but the fistula would be left in the case of only arthroscopic decompression. Open cystectomy also needs a larger skin incision and could lead to the surrounding neurovascular injury (more invasive) as compared to arthroscopic surgery though almost no

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complications were reported in this review. If both meniscal cysts and the associated meniscal tears could be treated at the same time by arthroscopic surgery with a lower recurrence rate, it would be beneficial for the patients.

Horizontal meniscus tears, which are usually associated with the co-existing meniscal cysts, have been shown to cause a significant reduction in tibiofemoral contact area and a significant elevation in contact pressure (5). These results mean that horizontal meniscus tears cause the loss of the meniscal mechanical function and may accelerate degenerative changes in the tibiofemoral joint. They also demonstrated that a suture-based repair for these tears restored the tibiofemoral contact mechanics to nearly normal level, whereas partial meniscectomy led to a lower contact area and a higher contact pressure within the joint. Therefore, the patients with a symptomatic meniscal cyst should be treated by not only cyst excision/decompression (open or arthroscopic) but also meniscus repair for the corresponding meniscus tears to prevent the progression of osteoarthritis due to the reduction of meniscus mechanical function. As cited in this review, Pujol *et al.* (6) reported the outcomes of open meniscal repair following arthroscopy for horizontal tears in a median follow-up of 40 months. Half of the patients had meniscal cyst removal at the same approach and no meniscal cyst recurrence was reported. Further high-quality studies about the recurrence after arthroscopic decompression for meniscal cysts with repair for the associated meniscus tears are required.

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