

Focus on meniscal horizontal cleavage tear (HCT) repair: findings of a systematic literature review with meta-analysis

Summary

- Horizontal cleavage tears (HCTs) are a common type of meniscal tear and have typically been treated with total or partial meniscectomy, despite associated long-term risks
- A systematic literature review and meta-analysis evaluated the clinical outcomes and survivorship of meniscal repair as an alternative to meniscectomy in HCTs¹
- Results showed significant improvements in patient-reported outcomes (PROMs) after HCT repair, high levels of return to sport and low reoperation rates, demonstrating the potential of meniscal repair as an alternative to meniscectomy in HCTs¹

Introduction

Meniscal tears have historically been surgically treated with either a total or partial meniscectomy. However, meniscectomy, even in part, is associated with a long-term risk of osteoarthritis (OA) development and subsequent total knee arthroplasty (TKA).^{2,3} Evidence suggests that in some cases meniscectomy fails to correct, or exacerbates, biomechanical consequences of meniscal tears, such as decreased contact area and increased peak contact pressure within the knee.^{4,5} This is thought to put patients at greater risk from chondral degeneration and subsequent arthritic changes.⁵

Meniscal repair is an effective alternative to meniscectomy and has been shown to offer improved long-term outcomes.^{3,6-8} It is thought that by restoring contact area and peak contact pressure to levels equivalent to an intact meniscus, repair may reduce the risk of further knee degeneration⁵ and subsequent development of OA.³ However, repair has traditionally been considered by surgeons as less suitable for certain tear types. HCTs are a common form of meniscal tear,^{9,10} and one such example of a tear type usually treated via meniscectomy¹¹ due to perceptions that HCT repair is technically difficult and at risk of poor healing and failure.^{1,11}

In recent years, innovations in techniques and devices have expanded the potential for HCT repair.¹¹ A systematic literature review, published by Morris et al, from the Ohio State University Wexner Medical Center, was conducted to analyse the clinical outcomes and survivorship of HCT repairs in published literature.¹

Study methods¹

Articles were screened for suitability according to the inclusion and exclusion criteria outlined in Figure 1. Data including study and patient characteristics, procedural information and clinical outcomes were extracted from relevant articles. Key outcomes of interest included PROMs, return to sport, reoperation rate and complication rate.

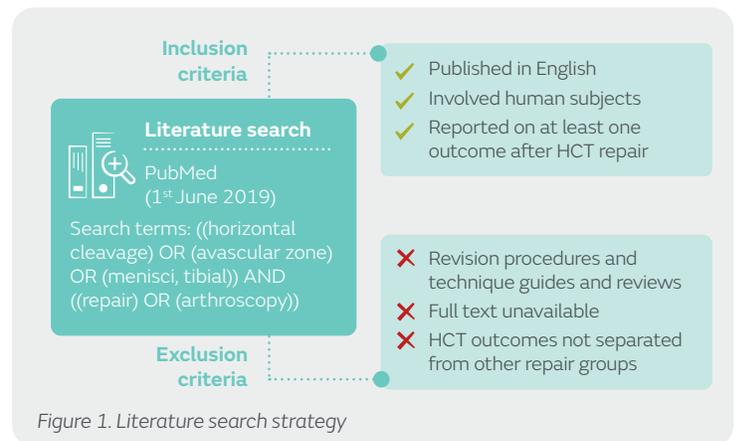
Results¹

Literature identified

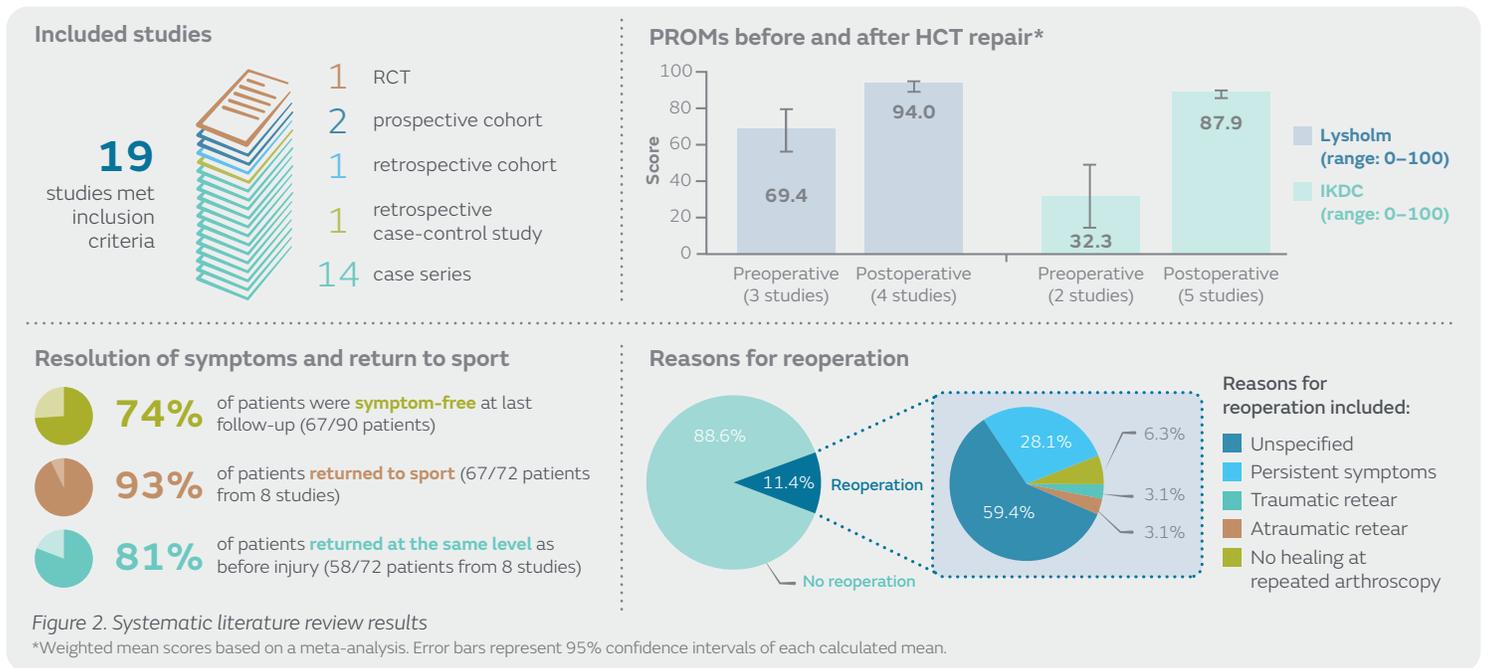
Initial searches identified 3,580 articles. Following screening, 19 relevant studies were included in the analysis (Figure 2). Mean follow-up ranged from 12 to 102 months. Most patients were young (range of study means: 17–42 years), and the majority were male (69.5%). HCT repair was carried out on a total of 289 knees (273 patients), with 30.9%, 16.4% and 52.7% of tears located in the anterior, middle and posterior portions of the meniscus respectively. In total, 39% of repairs were open and 61% were arthroscopic, with all-inside repair being the most commonly used repair type (42% of all repairs). In 7 of the 19 studies, adjunct procedures and therapies were used alongside meniscal repair.

PROMs¹

Substantial postoperative improvements in PROMs, including Lysholm and IKDC scores (Figure 2), were observed across studies. One study reported pain scores and found a postoperative reduction in visual analogue scale (VAS) pain score versus preoperative levels (1.9 vs 6.7, respectively; $p < 0.001$).



+ Evidence in focus



Return to sport¹

Patients were highly likely to return to sport following HCT repair, with most patients being at the same level as before injury (Figure 2), across studies reporting these outcomes. The majority of patients (74%) were also symptom-free at last follow-up, and 80% were satisfied with their overall result (Figure 2).

Reoperation rate¹

Across all studies in this systematic literature review, an overall reoperation rate of 11.4% was reported (32/281 knees; Figure 2), with 100% of these knees undergoing partial or subtotal meniscectomy. The most common reason for reoperation was unspecified among studies, although the most common definable reason was persistent symptoms.

Complication rate¹

The overall complication rate was 20.3% (57/281 knees). However, after excluding patients who experienced repair failure, either with or without reoperation (56.1% [32/57] and 15.8% [9/57] respectively), this decreased to 5.7% (16/281 knees).

Conclusions¹

HCT repair leads to **favourable short- to intermediate-term outcomes**, including substantial postoperative improvements in PROMs and a similar reoperation rate to that which has been reported for other more commonly repaired meniscal tear types. Following HCT repair, the **majority of patients returned to sport at the same level as pre-injury**. Together these findings highlight that, despite previous perceptions, meniscal repair can be a suitable treatment for HCTs.

Considerations

The proposed benefits of HCT repair largely pertain to restoration of native knee biomechanics and subsequent prevention of arthritic changes,^{3,5,11} which may not become apparent until long-term follow-up. As mean follow-up ranged from 12 to 102 months, further long-term studies may be required to fully reflect the potential long-term benefit of HCT repair.

The authors noted that the reoperation rate reported in this review was lower than has been reported in studies evaluating other tear morphologies, which have reported rates ranging from 15.3–23.1%.^{1,12–15} However, it is difficult to make direct comparisons between the reoperation rate reported in this literature review and those reported in previous studies, as the latter include repairs of all morphologies and report on specific patient populations.

Limitations of the review include its reliance on small studies, including a case report and numerous case series, due to a lack of available studies with a high level of evidence. Several of the included studies were also published by the same authors or centres, meaning that it is possible some of the patients analysed in this review were overlapping or duplicates.

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