

Evidence in Focus

Systematic literature review and meta-analysis

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Does arthroscopic meniscal repair lead to successful outcomes in a range of tear types?

Vertical, longitudinal tears in the vascularised zone of the meniscus are the most commonly repaired meniscal lesions.¹ However, improved understanding of meniscal pathophysiology and enhanced arthroscopic repair methods² have broadened the indications for surgical repair in a range of tear types.

The purpose of this review was to evaluate the current evidence on the clinical success of repairing the following tear types: horizontal, radial, root and ramp lesions.

Methods

Literature search

A thorough search of the peer-reviewed literature was conducted. The search strategy was as follows:

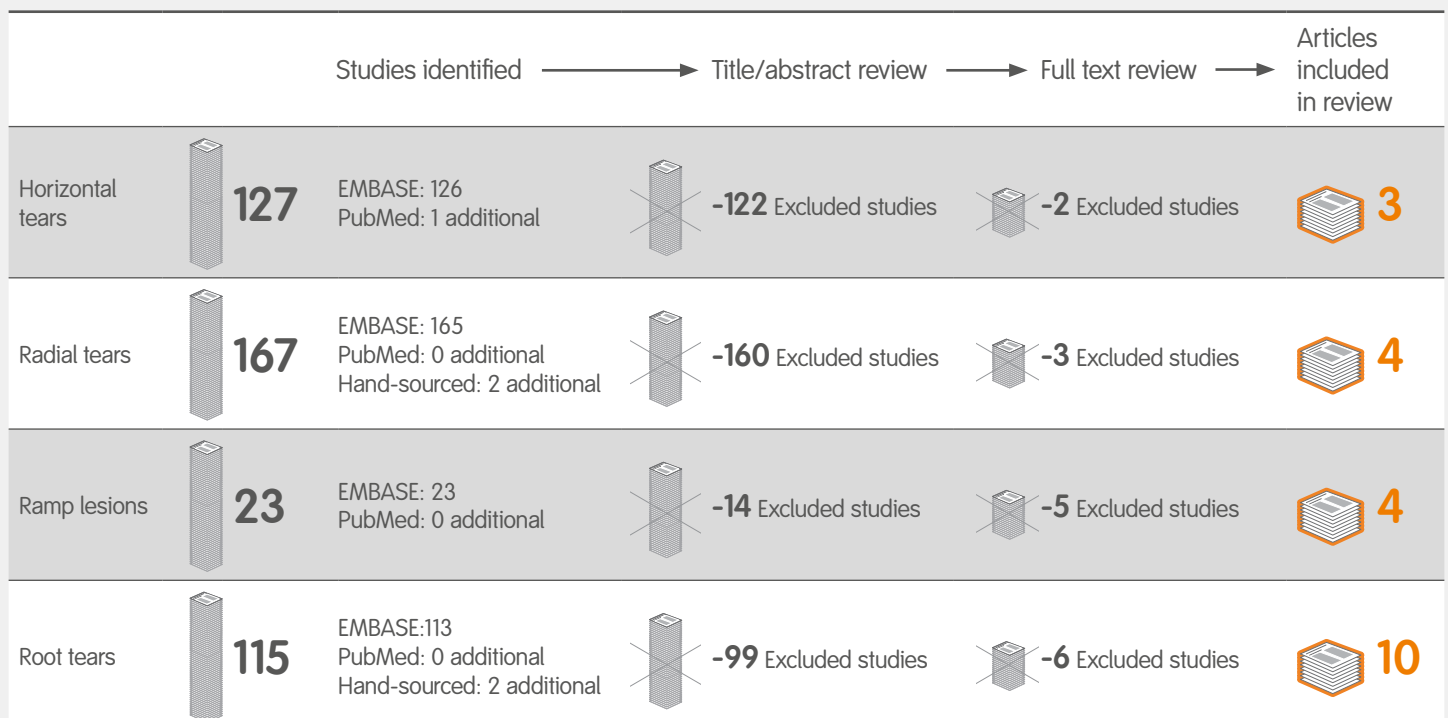
Inclusion criteria

- English-language paper
- Published between 1990 and January 2017
- Reported clinical outcomes following meniscal repair specific to the tear type of interest

Exclusion criteria

- Fewer than 10 patients
- Non-clinical study

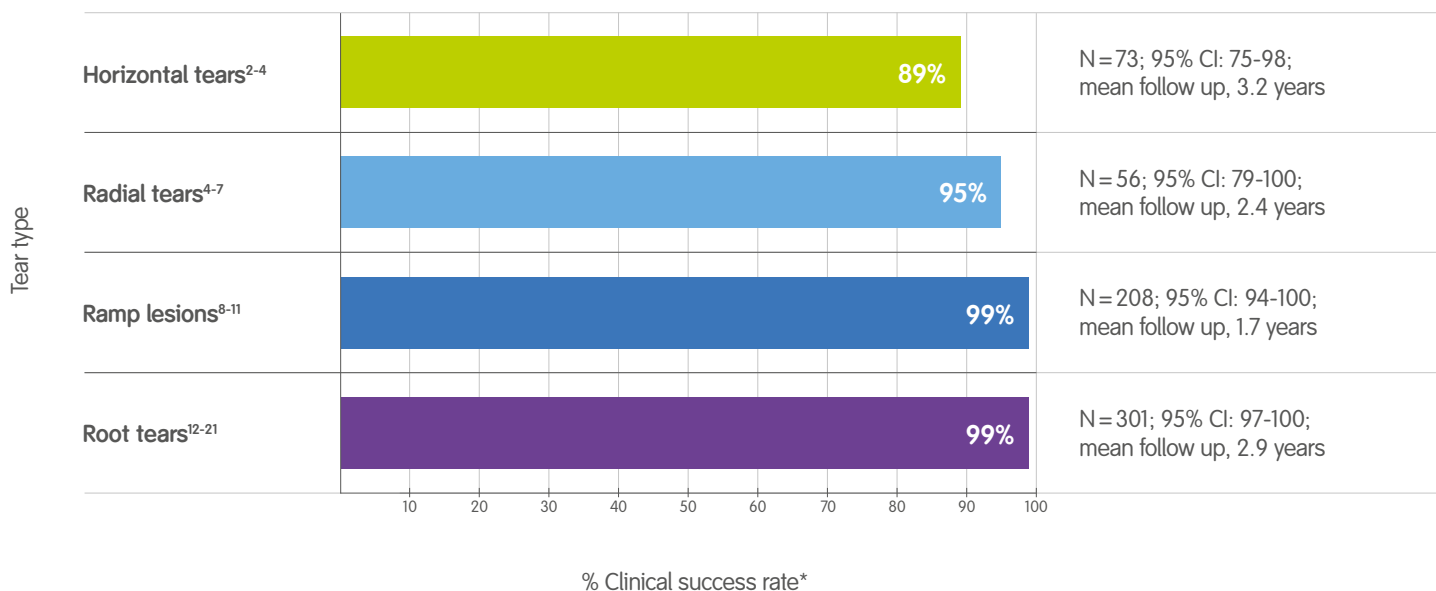
Figure 1: Search strategy for each tear type



Results

Twenty studies reported on success rates following arthroscopic meniscal repair across the tear types described above and met the search strategy criteria. Proportional meta-analyses[†] were performed to allow the results of different studies to be combined. This was done using the random effects model to account for heterogeneity between studies. After pooling the results, the final figures were reported as proportions alongside 95% confidence intervals (95% CIs) [Figure 2].

Figure 2: Clinical success* rate by tear type



Result of the proportional meta analysis demonstrate that in four meniscal tear types which have not traditionally been identified as targets for meniscal repair a clinically successful outcome was reported for between 89% and 99% of patients [Figure 2].

Conclusion

This review demonstrates that high rates of success can be achieved in tear types that may not routinely be considered for repair.

Considerations

There are limited studies reporting on outcomes of meniscal repair in these tear types and follow-up periods are short in some instances. There is no clearly defined measure of success for meniscal repair. The success measure used for this analysis is based on the need for re-operation or resolution of clinical symptoms. In instances where MRI or second-look arthroscopy has shown that the tear is only partially healed or not healed, and no further re-operation or presence of clinical symptoms are reported, the repair is considered a clinical success.

* Measured as no need for reoperation or resolution of clinical symptoms

[†] A proportional meta-analysis is a method that can be applied when there are no or insufficient comparative clinical trials to undertake a standard meta-analysis

Figure 3: Study characteristics

Study, year	Study Level				Study objective	Number of repairs	Mean follow-up years	Clinical success rate (%)
	Level I: Randomised controlled trials	Level II: Prospective, comparative	Level III: Retrospective, comparative	Level IV: Case series				
Horizontal tears								
Ahn, 2015 ²					To evaluate outcomes following arthroscopic repair of meniscal horizontal tears with a marrow-stimulating technique	32	3.8	91
Rubman, 1998 ⁴					To evaluate outcomes following meniscal repair in patients with exclusively single or complex tears that extended into the avascular zone	14	3.5	71
Tiftikci and Serbest, 2016 ³					To evaluate clinical and arthroscopic outcomes following meniscal repair of degenerative horizontal cleavage tears	27	2.4	96
Radial tears								
Choi, 2010 ⁷					To evaluate outcomes following arthroscopic repair of radial tears of the midbody of the lateral meniscus	14	3	100
Ra, 2013 ⁶					To evaluate outcomes following repair of complete meniscal radial tears treated by arthroscopic inside-out repair with fibrin clots	12	0.9	92
Rubman, 1998 ⁴					To evaluate outcomes following meniscal repair of exclusively single or complex tears that extended into the avascular zone	15	3.5	73
Song, 2014 ⁵					To evaluate outcomes following repair of radial tears in the posterior horn of the lateral meniscus	15	2	100
Ramp lesions								
Choi, 2009 ⁸					To compare meniscal healing after inside-out and all-inside repair techniques	16	3	100
Hirtler, 2015 ¹⁰					To evaluate outcomes following repair of acute and chronic menisco-capsular separation	37	0.5	100
Li, 2015 ⁹					To evaluate outcomes following meniscal repair of ramp lesions of the medial meniscus	23	1.2	100
Thaunat, 2016 ¹¹					To evaluate the results of arthroscopic repair of medial meniscal ramp lesions during anterior cruciate ligament reconstruction	132	2.25	93.2

Figure 3: Study characteristics cont.

Study, year	Study Level				Study objective	Number of repairs	Mean follow-up years	Clinical success rate (%)
	Level I: Randomised controlled trials	Level II: Prospective, comparative	Level III: Retrospective, comparative	Level IV: Case series				
Root tears								
Kim JH, 2011 ¹²					To compare medial meniscus root tear repair with meniscectomy	45	2.2	100
Ahn, 2015 ¹³					To compare conservative treatment with arthroscopic pull-out repair of the medial meniscus root tear and to analyze prognostic factors for the determination of repair indication	25	1.5	100
Chung, 2015 ¹⁴					To compare clinical and radiologic results of patients undergoing partial meniscectomy with those undergoing repair of medial meniscus posterior root tears	37	6	100
Kim SB, 2011 ¹⁷					To compare arthroscopic findings of pull-out repair with partial meniscectomy in medial meniscus root tears	30	4	93.3
Laprade, 2016 ¹⁹					To compare outcomes following transtibial pull-out repair for posterior root tears in patients <50 and >50 years of age	45	2.5	93.3
Lee DW, 2014 ²¹					To compare outcomes of a modified Mason-Allen stitch and a simple stitch technique in arthroscopic medial meniscus root tear repair	50	2.1	100
Ahn, 2010 ²					To evaluate outcomes following arthroscopic all-inside repair for lateral meniscus root tear in patients undergoing concomitant anterior cruciate ligament reconstruction	25	1.5	100
Jung, 2012 ¹⁵					To evaluate outcomes after arthroscopic repair of medial meniscal root tears	13	2.5	100
Kim YJ, 2010 ¹⁶					To evaluate the effectiveness of pull-out repair for restoring meniscus function in posterior root tears of the medial meniscus	10	2.5	100
Lee JH, 2009 ²⁰					To evaluate outcomes following arthroscopic pull-out suture repair of posterior root tear of the medial meniscus	21	2.5	95

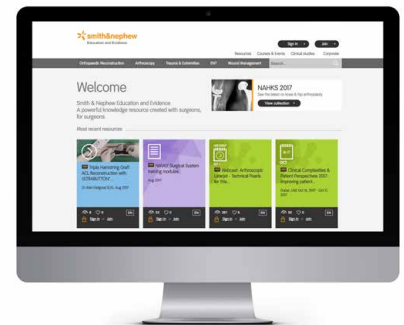
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Notes

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