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**Original Research Article**

# The outcome of arthroscopic meniscal repairs: are we doing it right?

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## ABSTRACT

**Background:** The main aim of our study was to evaluate the outcome of arthroscopic meniscal repairs for all isolated meniscal tears.
**Methods:** A total of 60 patients were included in our retrospective analysis, including all patients with isolated meniscal tears undergoing arthroscopic meniscal repairs from January to December 2015. All those patients who underwent menisectomies were excluded. Outcome measures involved location and type of tear, technique of repair, KOOS scoring system to analyse presence of post-op symptoms as well as the need for repeat surgery.
**Results:** Of the 60 patients, 46 (76.6%) had successful repairs with no post-op repeat symptoms at 6 and 12 months follow up. The remaining 14 patients (23.3%) underwent repeat surgery out of which 5 (35.7%) underwent partial menisectomies, 4 (28.6%) re-repairs, 3 (21.4%) re-repair and partial menisectomy and the remaining 2 patients, MACI procedure.
**Conclusions:** Arthroscopic repair of meniscal tears has shown to be an effective method of treating this surgical entity, meeting success rates comparable to published results. However, the gold standard repair method still needs to be identified.

**Keywords:** Arthroscopy, Meniscal tear, Repair, Menisectomy

## INTRODUCTION

The menisci optimise knee function by providing an important biomechanical and structural role in joint load bearing and distribution. Stability, congruence, as well as articular cartilage homeostasis are other important properties.[1] The aim of maintaining maximal meniscal integrity would allow us to prevent the pain and impairment associated with osteoarthritis, a condition that is radically accelerated with any loss of this tissue.[1,2]

Unfortunately not all meniscal injuries are reparable. Meniscal healing depends on the blood supply and only tears in circumferential zones are expected to heal adequately. Repair is more suitable in younger patients with reducible tears that are peripheral (e.g. nearer the capsular attachment) and horizontal or longitudinal in nature.[3]

Furthermore, there is evidence to suggest that in this population, an attempt at repair should be made for tears that extend to the avascular zone of the meniscus or even complex tears that may have been historically treated with menisectomy.

Careful patient selection and optimal repair techniques are required with compliance to post-operative rehabilitation.[4]

The objective of our study was to analyse the overall outcome of meniscal repair surgery at our hospital and assess the possible factors involved in failure of preserving menisci following injuries.

## METHODS

Our study involved a retrospective analysis of all patients diagnosed with isolated meniscal tears who then underwent arthroscopic repairs from January 2015 to December 2015. All those patients who underwent menisectomies or concomitant ACL repairs were excluded. This was a single surgeon case series.

Outcome measures involved location and type of tear, technique of repair (all inside repair or inside out repair), the KOOS functional outcome scoring at 6 and 12 months post-op and lastly the need for repeat surgery. The five different performance measures which form part of the scoring system was tabulated on a calibrated excel sheet for each subject and a mean score calculated for the entire study population. Paired t tests were used to check for statistical significance at 6 and 12 months post-operatively.

An MRI scan in addition to a standard clinical examination was used to confirm the diagnosis of meniscal tear in all patients. The scans were all reported by a musculoskeletal radiologist. An arthroscopy of the knee was performed without a tourniquet or side supports. A total of 20 milliliters of 0.5% Bupivacaine with adrenaline 1/100 000 was used to infiltrate the portal sites and the knee joint for all patients.

The type of tear, length, stability, reducibility and viability were all assessed as well as the presence of an intact anterior cruciate ligament.

Standard anteromedial and anterolateral portals were used in all cases. Additional portals were made as required throughout the procedure.

Medial meniscal repairs were performed with valgus stress applied to the knee in varying degrees of flexion, whilst lateral repairs were performed with the patient's leg in a figure-of-four configuration.

The tear was reduced and edges matched to ensure that an appropriate reduction could be obtained especially with unstable bucket handle tears. A provisional reduction was achieved using an 18-gauge spinal needle inserted either in an inside out or an outside-in fashion.

Preparation of the tear site was done by gently debriding the meniscal tear site and edges as well as the peripheral meniscal–capsular junction using a motorized shaver blade. A low-profile meniscal rasp was used to prepare the peripheral junction.

We assessed the length and vector geometry of the tear site to provisionally select the number of sutures or fixators to be used. As a standard, sutures were inserted at 4 mm intervals as far as the size of the patient, size of the meniscus and the distance of the tear from the periphery analysed.

In cases undergoing inside out repair (all medial menisci), multiple longitudinal incisions were made along the medial joint line deepened down to the capsule to allow knots to be tied efficiently.

Stability of the repair was checked by placing the knee through a full range of movement before the scope was removed.

The zone specific Linvatec meniscal repair system was used for the inside out technique and fast fix anchors (Smith & Nephew) were used for all inside repairs.[5-7]

The post op rehabilitation protocol consisted of mobilising toe touch weight bearing in a hinge knee brace locked to 90 degrees for six weeks followed by free mobilisation.

All patients were reviewed at 2 weeks for wound checks followed by a standardized 6-week, 6-month and a 12-month post-op follow up.

## RESULTS

A total of 60 patients were included in our study with a mean age of 32 years (17- 46 years). There were a total of 39 medial and 21 lateral tears with different subtypes given in Figure 1. The majority (75%) i.e. 45 patients had repairs using the all inside method with the remaining 15 (25%) having inside out fixation.

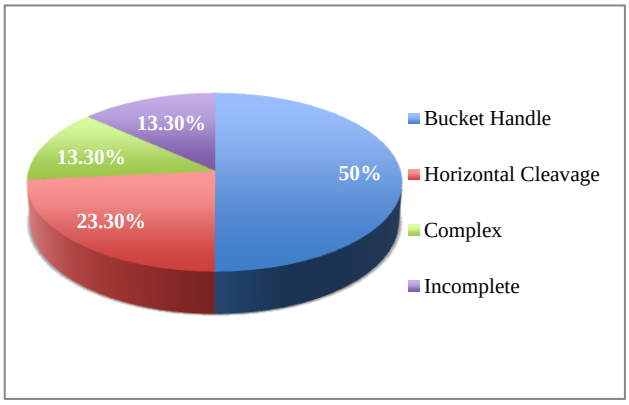


**Figure 1: Type of tears.**

Of the 60 patients, 46 (76.6%) had successful repairs with no post-op repeat symptoms at 6 and 12 months follow up.

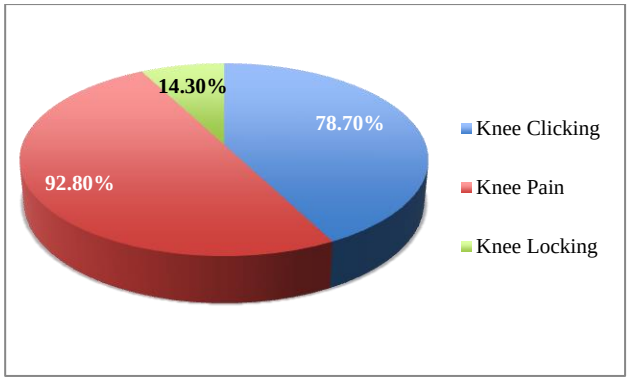


**Figure 2: Repeat symptoms at 6 and 12 months post-operatively.**

The remaining 14 patients (23.3%) attended clinic with a wide range of persistent symptoms within the 6 and 12 months post-operative interval as described in Figure 2.

They all underwent repeat surgery out of which 5 (35.7%) underwent partial menisectomies, 4 (28.6%) re-repairs, 3 (21.4%) re-repair and partial menisectomy and the remaining two patients (14.3%) were found to have an additional diagnosis of an osteochondral lesion. Those patients subsequently underwent MACI (Matrix-induced autologous chondrocyte implantation) procedure.

**Table 1: KOOS outcome scores and analysis at 6 and 12 months post-operatively.**

| KOOS outcome | 6 months post-op | 12 months post-op |
|---|---|---|
| **Pain** | 92 (±11) | 94 (±11) |
| **Symptoms** | 86 (±17) | 86 (±16) |
| **Activities of daily living** | 97 (±9) | 98 (±9) |
| **Sports and recreation function** | 89 (±16) | 88 (±15) |
| **Quality of life** | 71 (±21) | 71 (±21) |

The average KOOS score was calculated in all five domains of the standardised scoring system at 6 and 12 months post-operatively. Details of each domain are given in Table 1. Further statistical analysis was performed using the paired t test, which yielded a two-tailed p value of 0.4766 and was deemed not to be statistically significant at 6 and 12 months post-operatively at a 95% confidence interval of -1.82 to 1.02.

## DISCUSSION

There have been many different meniscal repair techniques and implants described in literature with varying success rates but the gold standard for meniscal repair still remains the inside-out meniscal repair first described by Scott et al.[8]

Our results show that meniscal repair using both techniques is an effective method of treating young patients with an isolated meniscal tear. Although we did not reach statistical significance, patients seemed to improve by 12 months especially with regard to pain levels and ADLs.

Noyes et al published the results of meniscal repairs in the avascular zone of the meniscus in patients younger than 20 years of age and in another series of patients older than 40, which highlighted a clinical success rate of 75% and 87% respectively.[9]

Our failure rate of 23.3% is in keeping with other published studies. Many patients suffered a re-tear requiring a partial or a total meniscectomy. The age or type of tear size was not seen to play a part in the overall failure rates.

A small number of active patients however, did attend with an additional diagnosis in the follow up period such as an osteochondral lesion or a new meniscal tear.

Our analysis showed that at least 40% percent of the patients with repeat symptoms had not been compliant with the postoperative plan in the first 6 weeks and this might have been a large factor in leading to postoperative problems.

It is difficult to perform menisectomies on patients who are young with a previously successful repair but the re repair or menisectomy decision lies with the assessment of the meniscal tissue during the operation and the overall state of the knee.

The contact area of the tibiofemoral joint surface may decrease by up to 20% following a partial meniscectomy and by 50–70% following a total meniscectomy. Hence, the resultant increase in contact stresses accelerates the progression of degenerative arthritis following a meniscectomy.[2] The development of arthritis following meniscal resection surgery may take up to 10–15 years in the case of a medial meniscus, but it may happen within 2 years in the case of a lateral meniscus.[3]

Some studies have reported success rates for meniscal repair to be up to 60–90% depending on the region of meniscal repair.[8-12] Meniscal repairs performed in conjunction with ACL reconstruction are generally thought to have a better healing rate than meniscal repair in knees with intact ACLs.[8]

The limitations of our study include a limited 12-month follow up post meniscal repair and inability to score the patients pre operatively. We have also not provided a comparison with meniscal repairs undergoing simultaneous ACL reconstruction.

## CONCLUSION

In our study, we can conclude that isolated meniscal repairs have a comparable and favorable prognosis when

compared to patients undergoing simultaneous ACL repairs as seen in various other studies. Moreover, our analysis is unique because it has focused on a group of young patients with an intact ACL and isolated meniscal tear.

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