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## Original Article

# Failure of meniscal repair association with late anterior cruciate ligament reconstruction



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## ABSTRACT

**Introduction:** Meniscus injury is associated with ACL (anterior cruciate ligament) injury. It would be ideal to repair all meniscus tears but failure rate is high.

**Aim:** Our objective was to assess the success of meniscus repair.

**Method:** All consecutive patients between Jan 2009 to Dec 2013 were retrospectively analysed.

**Results:** 85 meniscus repairs were performed: 64 patients presented after 3 months (Group 1) and 21 patients had meniscus repair within 2 weeks. The failure rate group 1 was 23%–4.8% group 2 at a mean follow up of 11 months.

**Conclusion:** Early meniscal repair had a higher success rate.

**Level III evidence.**

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## 1. Introduction

Meniscus tears during sports injuries have been reported to be accompanied by rupture of ACL in more than 80% of cases.<sup>1</sup> It has now been well-established that meniscectomy leads to the development of premature osteoarthritis.<sup>2</sup> In recent times hence there has been a shift in focus from meniscus resection to its preservation and repair.<sup>3</sup>

However repair of meniscus tear in association with elective ACL reconstruction remains vogue. Majority of these patients undergo late ACL reconstruction for instability, meniscus tear

are usually asymptomatic and present for a longer period of time before surgery. Due to the chronicity of the tear, meniscus repair may potentially have poor healing.<sup>4</sup> The objective of our study was to assess success of meniscus repair performed in association with elective ACL reconstruction in our department.

## 2. Patients and methods

We performed a retrospective review over 3 years' duration (Jan 2009 to Dec 2013) in a large teaching hospital. Inclusion criteria were all consecutive patients who underwent

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meniscus repair with ACL reconstruction. Exclusion criteria were patients with isolated meniscus injuries, multi-ligamentous injury and associated fractures.

The data was collected through patients' case notes and included demographic details, mechanism of injury, symptoms and their duration, details of meniscus tear (medial or lateral), grade of surgeon, postoperative rehabilitation regimen, concurrent surgical procedure, recurrent symptoms and subsequent surgery performed. Meniscus tear was grouped as per size (>or <3 cm), type of tear (i.e. bucket handle, radial, etc) and location – Zone 1 to 3 (Cooper).

All our patients had arthroscopic meniscus repair performed using FasT-Fix anchors (Smith & Nephew). Only meniscus which were suitable for repair; i.e. not degenerate, reducible, no rolled margins and able to perform a sound repair, underwent meniscus repair.<sup>4</sup>

All-inside technique was used in all our patients. Postoperatively, range of knee flexion was limited from 0 to 90° using an off the shelf knee brace for 6–8 weeks in order to protect the repaired meniscus and gradual rehabilitation with physiotherapy. Patients were followed up at 6 weeks; 3 months and 9 months as a routine post operative follow up after ACL reconstruction.

For the purpose of this study, patients without further clinical symptoms (pain, swelling and locking) or radiological sign (CT or MRI) or arthroscopic evidence of failed repair at follow up were regarded as successful repair.<sup>5</sup> Partial healed meniscus with clinical symptoms were regarded as failed repair. All patients were allowed to perform normal activities including sports at 9 months. We used Fisher's exact test for statistical analysis of our results.

### 3. Results

87 meniscus repairs were performed in association with ACL reconstruction during our study period. 2 patients were lost to follow up (less than 9 months) and were excluded from the study leaving only 85 patients for the purpose of this study. Average age 25.9 years (ranged from 15 to 48 years). There were 66 male and 18 female patients. Average time of follow up from the time of surgery was 11 months average (range 9–16 months) (Table 1).

Off the 85 patients, majority of our patients (75% n = 64) presented late (after 2 weeks) after injury and subsequently underwent meniscus repair with ACL reconstruction (Group 1).

21 patients had meniscus repair with ACL reconstruction within 2 weeks of injury (Group 2-control group) (Table 1). Main symptoms at the time of initial presentation included pain (74%), instability (69%), swelling (68%) and mechanical locking (8%).

Mechanisms of injuries included sports-related accidents in 58% cases (football, rugby, cricket) followed by falls (26%) and road traffic accidents (5%), while 5% had no history of specific trauma.

18 patients had ongoing or recurrent symptoms (pain, swelling or locking). Subsequent radiological investigation (CT arthrogram or MRI) showed failed repair in 16 patients. 14 of these patients later underwent arthroscopic partial resection of the meniscus whilst 2 had partially healed meniscus, which was treated conservatively. Other 2 patients, with negative radiological investigations, subsequently clinical symptoms resolved with physiotherapy (Table 1).

Patients in Group 1 (elective ACL reconstruction) had 23% (n = 15) failure rate compared to Group 2 (control group), which was 4.8% (n = 1). Patients with delayed meniscus repair had a significantly higher failure rate (p < 0.048) (Table 1).

#### 3.1. Medial vs. lateral meniscus repair

71% tears were present in medial and 29% in lateral menisci (Table 1). Failure rate was found to be 25% (n = 15) in cases of medial and 4% (n = 1) in cases of lateral meniscus repairs (p < 0.018).

#### 3.2. Size of tear, type of tear and zone tear

Majority of the meniscus was torn >3 cm (69%). 9% in red–red zone (Zone 1), 48% in red–white zone (Zone 2) and 33% tears were found to be present in white–white zone (Zone 3). Failure rate of meniscus repairs in zone 1 was 25%, in zone 2 was 10% (n = 9) and in zone 3 was 20%. Bucket handle tears comprised the majority of tears (85%) followed by transverse (6%), radial (5%) and longitudinal tears (4%). However the size of tear or type of tear or zone of tear did not have a significant influence on the outcome of meniscus repair.

#### 3.3. Complications

Two patients (2.3%) had postoperative complications, including 1 patient with tense haemarthrosis requiring further washout and 1 patient who developed neuropraxia, which subsequently improved.

**Table 1 – Summary of meniscal repairs performed with ACL reconstruction.**

	Number of meniscus repairs with ACL reconstruction n = 85		
Group	Group 1 n = 64	Group 2 n = 21	
Age	25.44 (15–46)	27.3 (15–48)	
Gender	M – 52; F – 12	M – 14; F – 7	
Side	Medial – 47;	Medial – 13;	p < 0.018
	Lateral – 17	Lateral – 8	
Failed	15 (23%)	1 (4.8%)	p < 0.048

### 4. Discussion

Meniscus repairs performed in conjunction with ACL reconstruction generally are thought to have better healing rate than meniscus repairs in knees with intact ACLs.<sup>6</sup> Warren et al in their study reported that the success rate of meniscus repair with ACL reconstruction could be up to 90% while the failure rates were found to be 30%–40% if the knee remains unstable due to ruptured AC.<sup>7</sup>

With the stabilization of the knee after ACL reconstruction, the inciting cause for the repeated micro trauma of the menisci

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