

Arthroscopic treatment of meniscal tears: with all-inside suture technique: 1 years follow up results

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Abstract. *Background:* In the last years meniscal repair surgeries have evolved to less invasive all-arthroscopic technique. *Purpose:* To determine the short-term success rate and reoperation rate of all-inside meniscal sutures with a concomitant anterior cruciate ligament reconstruction. *Methods:* Eighteen meniscal repairs were performed using an all inside suture technique. A concomitant anterior cruciate ligament reconstruction was done in all patients. The mean follow-up was 14 months (range 12-18). The success rate was determined by the presence of normal or nearly normal parameters of the Henning Classification based on magnetic resonance imaging. *Results:* Sixteen (89%) of the meniscal repairs had normal or nearly normal characteristics according to Henning Classification. Two patients (11%) required partial arthroscopic meniscectomy. *Conclusions:* Current techniques do not require accessory posteromedial or posterolateral incisions and significantly reduce the incidence of complications and pain associated with more invasive surgery. The short-term evaluation of the meniscal repairs with concomitant anterior cruciate ligament-reconstruction shown good results with satisfaction of the patients. (www.actabiomedica.it)

Key words: meniscus, suture, all-inside, arthroscopic

Introduction

Meniscectomy is a surgical procedure generally used for the treatment of meniscal tears (1-3). Several studies have demonstrated how meniscectomy promotes osteoarthritis and as the degree of severity of osteoarthritis is directly proportional to the amount of meniscus removed (7,8).

This concept has stimulated the development of surgical techniques to repair meniscal tears in order to restore correct joint biomechanics.

In front of the heterogeneity of meniscal tears, the indications for meniscal suture are restricted (Table 1). The site of the lesion is an important aspect: lesion must be in more vascularized peripheral region of the meniscus (red zone) in order to facilitate the healing process (4-7,10).

In recent year, different suture techniques have been proposed in literature (25-27).

In our study we present the clinical and radiological results using the all-inside technique called Fast-fix (Smith & Nephew).

Materials and methods

In our study 18 patients (12 males and 6 females) were evaluated, treated in arthroscopy for meniscal tear in our clinic from January 2008 to May 2009. In all patients, in addition to the treatment of meniscal tear, there was also an ACL lesion that was reconstructed with autologous tendons of gracilis and semitendinosus in 16 cases and in with allograft in 2 cases. Mean age patients was 22 years old.

Table 1. Indications and contraindications to meniscal suture

Indications to meniscal suture	Contraindications to meniscal suture
Meniscal tear with pain at articular rim	Lesion in the white-white zone
Active patient <60 years old	Patient > 60 years old and sedentary
Concomitant ligament reconstruction or osteotomy	Patient who doesn't have the opportunity to follow a rehabilitation program
Possibility of meniscal suture: good tissue integrity	Degenerated tissue and poor quality tissue
Single longitudinal peripheral lesions in a single plane (in the red-red zone)	Lesions longitudinal length less than 10 mm
Lesion in the red-white with vascular supply present	
Lesions in the red-white in a single plane (longitudinal, radial or horizontal)	
Complex lesion in multiple planes (longitudinal or flap) in the red-white zone	

Meniscal tears found:

- 2 cases lateral meniscus and 16 cases medial meniscus
- Lesion localization: meniscus posterior horn in 16 cases, meniscus body in 4 cases
- Affected vascular areas: red-white zone in 10 cases, red-red zone in 8 cases
- Type of injury: longitudinal: 10 mm in 10 cases, 15 mm in 6 cases and 20 mm in 2 cases
- Suture used: all-inside technique Fast-Fix: 1 horizontal suture in 16 cases, 2 horizontal sutures in 2 cases

Clinical examination and MRI were performed to diagnosis: all patients had clinical and radiographic images positive for anterior cruciate ligament lesion. 14 of them also showed clinical and MRI suggestive for contextual meniscal tear, while in 4 cases associated injuries have been found intraoperatively.

All patients came to our attention as a result of a knee sprain. The average time between the time of trauma and surgical procedure was approximately 1.5 months, with MRI performed on average 2 weeks after the trauma.

Post-operatively, patients started a rehabilitation program characterized by a first phase more cautious than patients treated just for ACL reconstruction in order to protect the meniscal suture. Our rehabilitation protocol provides of walking with touch down weight-

bearing, with a range of 0-90° passive joint motion for the first 4 weeks. Afterwards, patients follow the normal protocol of rehabilitation as well as patients treated just for anterior cruciate ligament reconstruction, with exercises dedicated to restore and improve muscle tone. Run is granted not before 4 months and return to competition is allowed after 6 months. If just meniscal tear treatment is performed, return to sports is possible after 12-16 weeks, avoiding squat in the first 12 weeks. In literature, similar rehabilitation program are reported (4-5).

A 1 year clinical and radiological (MRI) follow-up was performed.

Results

In 16 of 18 patients, a negativization of meniscal test was observed and we obtained an MRI scan showed good healing of the meniscal suture. After surgery and specific rehabilitation program, these patients started again their normal daily activities. Only two patients manifested persistent pain at the joint line about 10 and 12 months after meniscal suture. Both patients had a longitudinal lesion of 10 mm in a red-white zone of medial meniscus posterior horn, sutured with an horizontal stitch. There wasn't a new trauma and clinical and radiographic examination showed

positive signs for meniscal pathology. In these 2 cases a further knee arthroscopy was performed. During the surgery, a suture failure was found that required selective meniscectomy.

According to the radiological classification based on Henning MRI studies, which provides for the determination of meniscal repaired healing, we obtained the following results: 9 out of 18 patients had a cleft <10% (lesion healed), 7 of 18 patients had a cleft <50% (partially healed lesion), 2 of 18 patients with a cleft >50% (lesion healed) (22).

In our experience of meniscal suture with all inside Fast-Fix technique, with 1 year follow-up, we have had good results in 89% of cases and we found only two failures (11%)

No further postoperative complications were found in our study.

Discussion

The results of our study are in line with those reported in literature: several studies of patients with meniscal suture performed with all-inside Fast-Fix with contextual or not ACL repair, showed success rates average around 80% and suture failure in 20% of cases (9-13).

Literature shows that results of arthrotomic meniscal suture are similar to arthroscopic sutures (22). These have the advantage of limiting neurovascular complications and local infections. In this regard, we found that the all-inside system with Fast-Fix is fairly simple to use, allows to treat the majority of meniscal tears (can not be used to anterior horn injury). With this procedure there aren't neuro-vascular complications.

There are several factors that can influence the results of meniscal suture as ligamentous stability (14), type of lesion (horizontal or complex lesions have success rate lower than the longitudinal ones, while small lesions have better results) (15, 16), lesion site (better results in peripheral vascularized lesions) (14, 20, 21), suture type (vertical sutures have higher breaking load of 30-60% compared to horizontal sutures), (21) the age of patient (greater chance of success if the patient is young) (15, 18) and the age of lesion (better prognosis if suture is performed within 2 weeks) (19).

Conclusions

The number of patients enrolled in the study and the short follow-up does not allow to draw any definitive conclusion and certainly further studies with long-term follow-up will be useful. However, considering the satisfactory results obtained in our small specimen and supported by the data reported in the literature, we believe that, if you comply with the correct indications, it is advisable to opt for meniscal repair rather than meniscectomy. There are no doubt that meniscal suture takes a longer recovery in the first phase of rehabilitation, but it has long-term benefits: it preserves the meniscal integrity and articular biomechanics therefore, protecting the joint from injury resulting from degenerative meniscectomy.

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