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Arthroscopic meniscal suture: Correlation between clinical, arthroscopic and CT-scan findings

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Artroskopik menisküs dikişi: Klinik, artroskopik ve bilgisayarlı tomografik bulguların karşılaştırılması

Artroskopi rutin bir işlem halini almışken menisküs dikişinin sık uygulanmaması talihsizliktir. Menisküsün sadece perifer % 25'i vaskülarizedir ve bu bölgede ki yırtıklar ki, red-on-red olarak adlandırılırlar daima dikilerek onarılmalıdır.

1986-88 yılları arasındaki 638 vakamızda menisküs yırtığı tanısı konmuştur. Vakaların büyük bir çoğunluğunda medial menisküs onarılmıştır. Takip amaçlı olarak BT değerlendirme uygulanmıştır. Klinik ve BT bulguları arasındaki uyum şaşırtıcı derecede iyidir.

Anahtar kelimeler: *Artroskopik meniskus dikişi*

Arthroscopy has become a routine procedure but it is disappointing that meniscal suture is uncommon. Only the peripheral 25 % of the meniscus are vascularized and tears on this side, namely red-on-red tears,should aluways be sutured.

A torn meniscus was diagnosed in 638 cases of ours between 1986 and 1988. In the majority of cases the medial meniscus was repaired. A CT evaluation was used for follow-up purposes. The correlation between the clinical and CT findings was suprisingly good.

Key words: *Arthroscopic meniscal suture*

Knee trauma accounts for a large part of the injuries sustained by the physically active population. This probably explains why arthroscopy has become a routine procedure. Yet, it is disappointing that meniscal suture is uncommon (1), the more so as a number of meniscus ruptures are eminently suitable for repair.

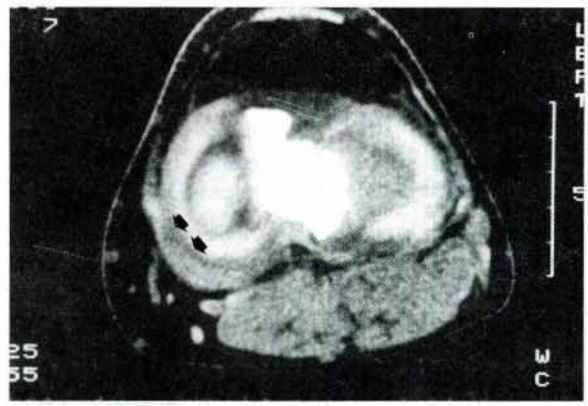
Indications for meniscal suture

Only the peripheral 25 % of the meniscus are vascularized, the remainder deriving its supply from the synovial fluid. In literature, a tear involving the vascularized portion, i. e. at the capsule-meniscus junction, is designated as a red-on-red tear. A tear at the avascular, most central aspect of the meniscus is called a white-on-white tear. A tear located at the junction between the vascular and avascular tear is a red-on-white tear (2). Red-on-red tears should always be sutured (Figure I).

They carry the best prognosis because of the rich vascularity of the meniscus in that area. Conversely, white-on-white tears are absolute contraindications. As for the red-on-white tears, decisive factors are the extent, the location and particularly the aspect of the tear, notably acute or chronic. Acute tears carry a much better prognosis for healing.

Material and methods

Between 1986 and 1988, 981 arthroscopies of the knee joint were performed. A torn meniscus was diagnosed in 638 cases, of which 98, i. e. approx. 15 %, were sutured. Of the 98 meniscal sutures, 75 were reviewed (Table I).



Figur I: Medial meniscal tear posterial horn.

Male / Female =39 /36
Age = 28 yrs. 6 mos.
(17 yrs. 2 mos. -> 53 yrs. 4 mos.)
Follow-up = 16 mos. (7 mos. - > 31 mos.)

Table I: 75 displaceable tears

The male: female ratio was approx imately 50: 50. Mean age was 28 years and the duration of follow-up averaged 16 months (range 7-31 months).

In the majority of cases, the medial meniscus was repaired. Only 3 times was the lateral meniscus sutu-

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red. Indeed, tears involving the posterior horn of the medial meniscus are particularly suitable for repair (Table II).

		N= 75
Medial menisci	:	72 (96 %)
Lateral menisci	:	3 (4 %)
Isolated	:	45 (60 %)
Unstable	:	30 (40 %) 9 repaired
Acute tears	:	51 (68 %)
Chronic tears	:	24 (32 %)

Table II

An isolated injury was observed 45 times; in 30 cases there were associated ligamentous lesions. An acute tear was sutured 51 times, a chronic tear 24 times. The series included 40 red-on-red tears and 35 red-on-white tears Table III).

Type of tear	N= 75
Red / Red	: 40 (54 %)
Red / White	: 35 (46 %)
White / White	: 0

Table III

There were no white-on-white tears

Clinical results

Resorbable sutures were mainly used. In six cases non resorbable sutures were used.

Seventy-five patients were reviewed. The evaluation included a history and physical examination. The patients were questioned about pain, swelling, locking, catching, numbness of the medial calf, and functional restrictions, e. g. in sports activities and at work. Clinically, the ROM and laxity were examined. Meniscus tests were performed and adhesions of the posterior portal were looked for.

From these clinical parameters it could be concluded that 90 % of the sutures had healed. Ten per cent of the cases were failures (Table IV).

CT scan evaluation		N = 75
successful repairs	: 66 (88 %)	
failed repairs	: 9 (12 %)	
Meniscal healing		N = 75
successful repairs	: 67 (90 %)	
failed repairs	: 8 (10 %)	

Table IV

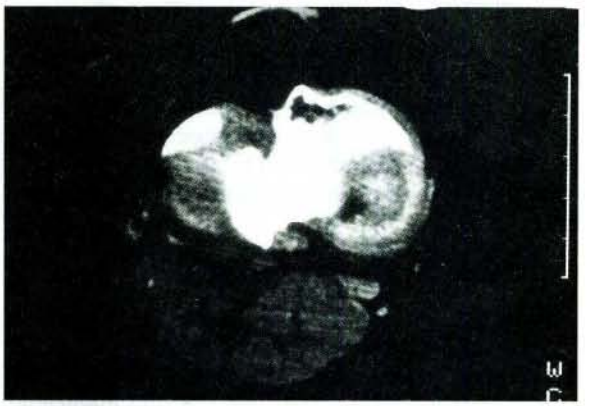
Complications

The most common complications included lesions of the branches of the saphenous nerve, particularly of the infrapatellar portion. Indeed, the posterior horn of the medial menisci is involved in the vast majority of cases. With the "inside out' method, needles are passed from inside the joint throught the capsule, subcutaneous structures and skin near the course of the infrapatellar branch. It is not common for this branch to be injured in the process. This can be remedid by mating a small incision of same 1 to 2 cm and, by blunt dissection, creating a channel which extends to the capsule and through which the knots are tied. However, a branch or even the entire infrapatellar portion is occasionally caught in a loop of suture.

Unfortunately, this resulted in permanent hypesthesia in 3 cases and in transient numbness in 6 cases. Severe adhesion of the posterior scar occurred three times, leaving the patient with an unsightly scar. Particularly female patients find this diffucult to cope with. One patient developed an infection.

CT-scan evaluation and results

Conclusive evidence of healing can only be obtained by performing a repeat arthroscopy on every patient. This is ethically not acceptable. A CT evaluation was used for follow-up purposes: it is a noninvasive technique which can be performed in most departments (3, 4, 5) (Figure II).



Figur II: Status 1 year post Med. meniscorhesis

The results of these meniscal sutures are based on our study correlating CT diagnosis with arthroscopic evidence of a torn meniscus. In 152 patients who underwent subsequent CT and arthroscopic evaluation, the sensitivity for the detection of a torn meniscus was 86 % and specificity was 96 %. The specificity/sensitivity rates were well above the arthrographic accuracy.

Eighty-eight per cent of the sutures were found to be successful whereas 12 per cent were failures (Table V). The correlation between the clinical and CT findings was suprisingly good: 67 cases were rated as clinically successful. The CT scan findings indicated 65 successful sutures and 2 failures. As these patients were completely symptom free, further treatment was not contemplated.

In 4 cases doulbt could be raised as to the outco-

CT scan evaluation		N = 75
Clinical		CT scan
healed	67 ->	65 healed 2 failed
doubtful	4 ->	1 healed 3 failed
failed	4 ->	4 failed

Table V

Rearthroscopies			N = 4	
	Clinical	CT scan	Rearthroscopy	Therapy
A	failed	failed	healed !!	-
B	failed	failed	failed	partial meniscectomy
C	doubtful	doubtful	abnormal mobility posterior horn	resuture
D	doubtful	healed	menisco-synovial adhesions	section of the adhesions

Table VI

me: the CT scan indicated 3 failures and 1 successful suture. Four sutures were definite clinical failures,which was indeed confirmed by the results of the CT examination. In the 8 doubtful or failed cases a repeat arthroscopy could be performed 4 times; the remaining 4 patients refused further treatment. In case A a failed suture was suspected clinically and was indeed confirmed on CT evaluation. Surprisingly, a completely healed meniscus was found on repeat arthroscopy. No treatment was instituted. The patient is presently in an excellent condition. In case B CT and arthroscopic evidence of a failed repair was obtained. Partial meniscectomy was performed.Case C was doubtful. The CT scan still indicated the presence of a tear. On repeat arthroscopy, there appeared to exist abnormal mobility of the meniscal horn and a loose thread was found in the meniscus. We performed a re-suture. The patient is presently doing fine.

Case D was unclear. Although the CT scan indicated healing, a repeat arthroscopy was performed. The meniscus was, however, solidly heald, but a number of meniscosynovial adhesions were detected and sectioned (Table VI).

Conclusion

1. Arthroscopic meniscus suture is a valuable technique with which excellent results can be obtained. A further advantage is its noninvasiveness.

2. CT scanning is a noninvasive technique and a valuable diagnostic tool. The sensitivity and specificity compare favourably with the MRI results. CT scanning is a very useful tool in cases where serious doubts could arise as to the success or failure of the repair.

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