

## Meniscal lesions: Abstension, suture, or meniscectomy. Biomechanical and histochemical considerations

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### Menisküs lezyonları: Haliyle bırakma, sütür veya menisektomi. Biomekanik ve histokimyasal özellikleri

*Menisküs, diz ekleminde mekanik stresleri dağıtan yapıdır. Kıkırdak hasarı ve bunun sonucunda osteoartritten korunmak için ilk adım menisküslerin korunmasıdır. Biz kişisel vakalar kullanarak, kıkırdak lezyonu olup olmasını gözönüne alarak, menisküs lezyonlarının tedavisini araştırdık. Eğer şartlar uygun olursa, diz menisküs dikişliyle menisküsün bırakılmasının en iyi seçenek olduğuna inanmaktayız.*

**Anahtar kelime:** Menisküs lezyonları

### Meniscal lesions: Abstension, suture, or meniscectomy. Biomechanical and histochemical considerations

*The meniscus represents the main structure for distributing mechanical stress in the knee joint. It is easy to understand that preservation of meniscus is the first step to avoid cartilage injuries and consequently osteoarthritis of the compartments. We wanted to check how much a particular lesion treatment of the meniscus behaves, considering the presence and the absence of undamaged cartilage, using personal cases. We concluded that retariment through meniscus suturing is the best choice when conditions allow for such.*

**Keyword:** Meniscal lesions

The meniscus represent the main structure for distributing mechanical stresses in the knee joint. It is very well known how frequently damages and complications occur following total meniscectomy, especially with a long term follow up. On the medial side, 50% of the stresses are transmitted through the meniscus and the other 50% through the cartilage. On the lateral side meniscus is responsible for 70% of the stress transmission with the cartilage responsible for about 30%. Walker (75) reported these observations. It is easy to understand that preservation of the meniscus is the first step to avoid cartilage injuries and consequently osteoarthritis of the compartments. The cartilage components permit this elastic structure to work like a shock absorber; the collage represent a stiff grid able to limit the exiting of proteoglycans which have a great affinity for water. When a normal stress is applied to the cartilage, we have a loss of water, hence a bigger concentration of proteoglycans in the cartilage. Water is redrawn back making the ratio as it was originally. When there is damage of the stiff grid represented by collagen, the balance with the proteoglycans is not maintained, so proteoglycans are free to redraw back more water (cartilage swelling).

Radin ('84), using a photoelastic system, showed the different distribution of the stresses in cases of total meniscectomy, partial meniscectomy, partial meniscectomy, suture or conservative treatment, but it was Baratz (86) who quantified the loss of contact areas and increase of cartilage local stress in the different situations. He revealed that:

-after total meniscectomy, contact areas decrease appoximately 75%, and peak local contact stress increase approximately 235%.

-after partial meniscectomy we have a decrement about 10% of contact areas, and a increment of peak local contact stress of about 65%.

-after meniscal suture we do not have modifications of contact areas and peak local contact stress, while,

-after a longitudinal lesion not treated we have a decrease of about 4% of contact areas and an increase of about 26% of peak local contact stress.

Hence the tissue that receives the greatest damage is the cartilage. In consideration of these studies it is easy to understand how much cartilage and menisci are connected and considering the role of cartilage that works like a shock absorber, how it is important to preserve the integrity of both tissues. We wanted to check how much a particular lesion treatment of the meniscus behaves, considering the presence and the absence of undamaged cartilage, using personal cases: we used 4 groups of patients:

1. Meniscal injuries treated arthroscopically without cartilage damages

2. Meniscal injuries treated arthroscopically with cartilage damages

3. Meniscal injuries without cartilage damages treated arthroscopically by suture

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4. Meniscal injuries not treated and without cartilage damages. We tried to analyse as much as possible similar medial meniscus injuries of the same type, similar age and activity to have homogeneous cases.

We checked the results using the HSS rating scale clinically and radiologically and we obtained:

- group 1: 26.4 points out of 30
- group 2: 24.5 points out of 30
- group 3: 28 points out of 30
- group 4: 26 points out of 30

The follow up for groups 1, 2, 4 was years. In the suture group, in which the out-in technique was always performed, it was 2 years.

### Conclusion

Analysing and comparing the biomechanical and histochemical studies found in literature with the clinical and radiographical results we obtained, we conc-

lude that retainment through meniscus suturing is the best choice when conditions allow for such.

We would like to point out that suturing must be performed in time so as not to permit cartilage damage which has been clearly demonstrated to be negative prognosis for knee joint.

When suturing is not possible arthroscopically conservative treatment is the only other choice, but we have also seen that an untreated little injury of the meniscus does not exacerbate the conditions of the cartilage, especially in a vascular area and in a stable knee.

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