

# A New Method Of Minimally Invasive Meniscal Repair With Fibrin Glue (Tisseel®) And ACS (Orthokin®) Under MRI Control

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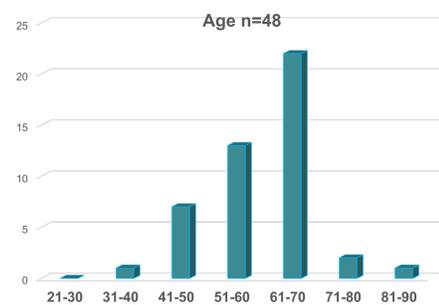
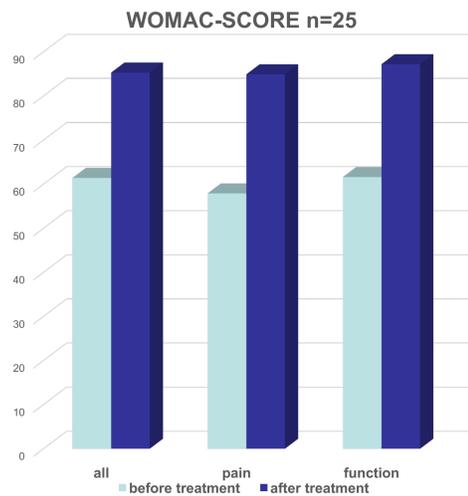
## Abstract

48 meniscal tears were treated with fibrin glue (3) and ACS (4) containing growth factors that was injected into the meniscal tear in local anesthesia under MRI control. Before and 6 weeks after treatment a diagnostic MRI was performed and the outcome was valued by the WOMAC-Score 6 weeks later. 2 Patients were operated after treatment due to persisting symptoms, more than 90 % are widely pain free and returned to normal activity in everyday life and in sports.

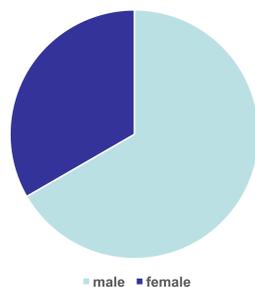
## Background

Meniscal tears are normally treated by arthroscopy, mostly with a partial resection of the torn part. There are several methods of meniscal repair by suturing or similar technics and replacements with collagen implants are performed, because the risk of osteoarthritis following resection is well known. Nevertheless, the repair methods are not very often performed due to greater effort that is necessary. But damaged menisci showed increased expression of ADAMTS5 and MMP3 in the chondrocyte-like cells of menisci, indicating that these enzymes could be involved in meniscal degradation and in addition in enzymatic degradation of cartilage (1) exaggerating the progression of osteoarthritis.

## Objective

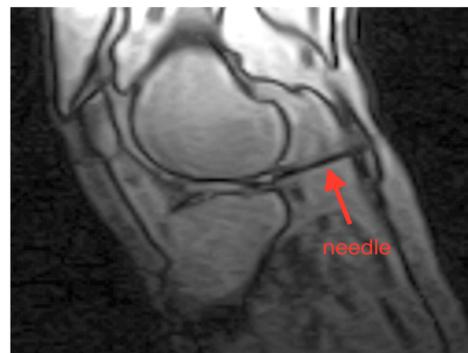


Gender n=48

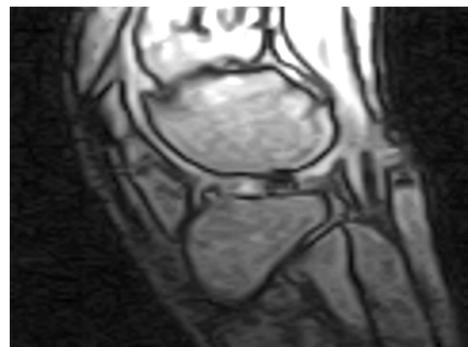


## Methods

A MRI-suitable needle (5) was introduced into the meniscal tear under local anesthesia.

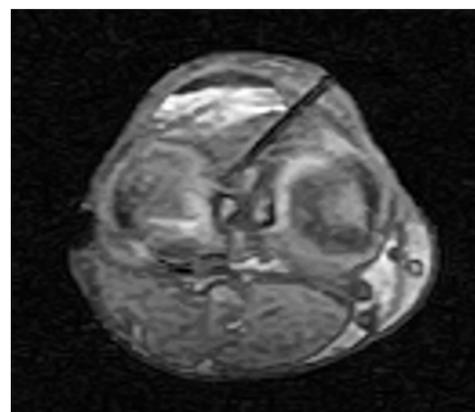


Control of distribution with contrast (6)



Injection of 2 ml fibrin glue (3)

Weight bearing allowed from beginning with a range of knee-motion from 0 till 60 degrees. No active bending of the knee under weight bearing more than 60 degrees. Injections of ACS (4) (2) containing growth factors into the near of the meniscal tear under MRI-control in local anesthesia, in week 1 to 4 after injection of fibrin glue (3).



After 6 weeks MRI-Control and begin with normal activities and muscle training.

## Summary

All patients had pain and some other symptoms like effusion, swollen knee and malfunction of the knee before treatment. All patients lost their pain and obtained normal function of the knee after treatment. 2 patients needed additional surgery so far. All patients had a meniscal tear MRI-proven before treatment, all MRI 6 weeks after the beginning of treatment showed relevant changes of the meniscal signal that we consider as strong sign for a healing process of the meniscal tear. There were no complications during treatment except 1 hematoma.

## Discussion

All patients had a meniscal tear MRI-proven with severe pain and were candidates for an operative treatment. With this new method of treatment we could avoid the operative risks, more than 90 % of the patients became symptoms free and regained normal function of the knee in every day life. The MRI after treatment seems to show a healing process of the meniscus. No severe complications occurred. Only 2 Patients needed additional surgery so far. Of course, these are early results and we have no information about longtime outcome. Further examinations have to be done to prove the results. But we consider this new procedure as a good low risk method to get patients with a meniscal tear pain free without operation.

- Advantages:
- No operative risk
  - No risk of general anesthesia
  - No radiation
  - No need for hospitalisation
  - Meniscus can be preserved
  - Leaks of proteolytic enzymes out of damaged meniscus cells are sealed
  - No immobilisation, therefor no muscle atrophy
- Disadvantages:
- Not all tears are suitable for this treatment

## References

- Ishihara G, Kojima T, Saito Y, Ishiguro N.: Roles of metalloproteinase-3 and aggrecanase 1 and 2 in aggrecan cleavage during human meniscus degeneration. Orthop Rev 2009; 1(2):e14
- Rudolf W. Strümper: Clinical experience with intra-articular injections of autologous conditioned serum in cases of meniscal lesions of the knee. International Symposium for Molecular Medicine 10.+11.6.2016, Düsseldorf, Germany
- Tisseel®
- ACS (Orthokin®)
- ITP®
- Dotarem®