Clinical Evaluation of Autologous Micro-Fragmented Adipose Tissue as a Treatment Option for Meniscus Tears

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Background

Meniscal tears are among the most commonly diagnosed causes of knee pain. They are due to the complex biophysical and biomechanical properties of the meniscus, the essential cartilaginous shock absorber of the knee joint. Tears can occur due to injury or overuse and can lead to degenerative joint disease if left untreated. Various surgical and non-surgical treatment options are available, but the ideal treatment remains uncertain.

Objective

This study investigates the potential benefits of using autologous adipose tissue in helping repair meniscal tears with this minimally invasive technique. As symptoms of degenerative meniscal tears are effectively managed conservatively.

Materials and Methods

This is a single-arm, prospective study which enrolled 20 patients that presented to a private orthopedic spine and orthopedic hand clinic with a history of meniscal tears or meniscal repair. Eligible patients were between the ages of 18 and 55. The mean age of the patients was 60.15 ± 15.93 years. Patients were operated on using an injectable stem cell therapy called Lipogems. The outcome measures included clinical and radiographic assessments, including Knee Injury and Osteoarthritis Outcome Score (KOOS), Numeric Pain Scale (NPS), and range of motion. Follow-up visits were scheduled at one, three, and six months.

Results

Eligible patients for the study: The following criteria: age ≥ 18, meniscal tear confirmed by MRI or arthroscopy, symptoms present for 6 months or more, and no contraindications to stem cell therapy (e.g., diabetes mellitus, immunosuppression, etc.). The mean follow-up was 6.6 months. The mean BMI was 33.23 ± 5.78. Of the 20 patients, 10 (50%) were males. The mean age was 60.15 ± 15.93 years. The patients were followed for an average of 6.6 months.

Conclusion

Preliminary results of this case series indicate that autologous adipose-derived tissue cells may be a promising treatment for degenerative meniscal tears. Further studies with larger samples and long-term follow-up are needed to confirm the efficacy and safety of this treatment. The current literature, consisting largely of case reports, indicates that these therapies may offer potential benefits in managing meniscal tears and improving patient outcomes.

Literature Cited


Acknowledgements

Funding: Supported by the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases (R01 AR061687).

Further Information

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Figure 1: Knee Injury and Osteoarthritis Outcome Score (KOOS) averages over time in patients with meniscus tears treated with resection. This leads to premature joint degeneration. Increased joint health and over the past decade there has been a shift in our approach to musculoskeletal repair, due to their potential to differentiate into cartilage and muscle.

Figure 2: Numeric Pain Scale (NPS) score averages over time in patients with meniscus tears treated with resection. The average pain score decreases significantly from the time of the procedure to one month after the procedure.

Figure 3: BMI values of all participating patients in the study. Average BMI is 29.03, n=20. The line of best fit is achievable is a pain score of zero. Lines on data points indicate standard error.

Figure 4: Ages of all participating patients in the study. Average age is 60.15, n=20. Line of best fit shows average age graphically.

Figure 5: KOOS Average Scores Over Time

Figure 6: Age of all participating patients in the study. Average age is 60.15, n=20. Line of best fit shows average age graphically.

Table 1: Distribution of KOOS scores over time in patients with meniscus tears treated with resection. KOOS scores were noted at an interval of time since the initial surgery, and at one month following the procedure through a survey. KOOS scores were noted at an interval of one month following the procedure. KOOS scores were noted at an interval of one month following resection of the meniscus.

Table 2: Distribution of NPS scores over time in patients with meniscus tears treated with resection. The average pain score decreases significantly from the time of the procedure to one month after the procedure.

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