Efficacy of intra-meniscal polynucleotide injections for degenerative meniscus: preliminary clinical findings up to 24 months follow-up

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INTRODUCTION:
Degenerative meniscal lesions manifest as knee discomfort in people over 40 years of age, frequently without a clear history of recent trauma. They may, but rarely, also present with mechanical symptoms (popping, clicking), joint line soreness, pain on deep knee flexion and positive results on meniscal provocation tests Though it is more frequently seen in cases of acute traumatic meniscal rupture, knee effusion may be present. On the magnetic resonance imaging (MRI)degenerative meniscal lesions show up as linear hyperintensity patches. Degenerative meniscal tissue is believed to have a poor healing potential and its association with chronic pain leads to the need of therapeutical management. Given the high risk of accelerating osteoarthritis performing meniscectomy in these patients, conservative management is often invoked, even if there is a paucity of therapeutical options. The goal of this study is to evaluate the clinical effect of the ultra-sound guided intrameniscal cycle of three injections of a polynucleotides gel solution in patients with degenerative meniscal lesions.
METHODS: Data regarding 25 patients originally included in the conservative arm of a multicentric non-randomized clinical trial were included in this paper. A cycle of 3 ultrasound-guided injections of Condrotide® were performed over the course of 2 consecutive weeks. The third injection was considered the time zero for defining the subsequent follow-up visits. This product is a gel composed of polynucleotides (20 mg/ml) of controlled natural origin (fish gonads) and highly purified, that are capable of binding a high concentration of water molecules and to reorganize their structures and orientate water molecules in order to create a 3D gel that undergoes an enzymatic cleavage, releasing oligonucleotides of progressively smaller sizes into the articular cavity. The final products of this enzymatic degradation are simple nucleotides, nucleosides, and nitrogen bases which, as known from the literature, are physiologically present in the extracellular environment and which constitute fundamental substrates for cells. Patients were investigated before the procedure and at 3-, 6-, and 12, and 24-months after the last injection. An MRI was performed at basal time and after 6 months. A plan radiograph of the knee was performed at basal time and after 12 and 24 months. Symptoms were investigated by KOOS, VAS, IKDC and Tegner score. Statistical analysis: General linear Mixed Models (GLM) was used. If the results were significant, the coupled post hoc Sidak test was performed.
RESULTS: 25 of the treated patients have reached the 24 months of follow up. Statistically significant improvements on all KOOS subscales were registered from baseline (Pain: 68,16; Symptoms: 75.18; Sports: 42.8; Activities of daily living, ADL: 78,88; Quality of Life, QOL: 49.72) to the 24 months' follow-up (Pain: 92.12; Symptoms: 74.88; Sports: 72.2; ADL: 96.88; QOL: 87.76). VAS for pain decreased from 6,1 at baseline to 1.21 at 24 months of follow-up ($p<.0005$). Tegner score mean delta between baseline and 24-months follow up was 2.48($p<.0005$). IKDC score increase from baseline (47.32) to 24 months follow up (78.24), ($p<.0005$).
DISCUSSION AND CONCLUSION:
The results of this study suggest that a cycle of ultrasound-guided intrameniscal injections of polynucleotides may offer a valuable, minimally invasive symptomatic treatment option for patients with degenerative meniscal tears. Sustained symptom relief and functional improvements observed up to two years post-treatment indicate a potential role for this strategy in the conservative management of meniscal pathology, particularly in cases where surgical intervention is not immediately indicated or desired. These findings are consistent with emerging evidence on the role of viscoelastic supplementation and targeted biological therapies in modulating joint homeostasis and promoting tissue preservation. The use of ultrasound guidance ensures accurate intra-meniscal delivery, which may enhance therapeutic efficacy and minimize risks. However, further controlled studies with larger patient populations and comparative arms are warranted to confirm these promising outcomes and better define patient selection criteria and treatment protocols. In conclusion, a cycle of ultrasound-guided intrameniscal injection of Condrotide® showed promising results in providing relief of symptoms and functional improvements in patients with degenerative meniscal tears up to 2 years of follow-up. However, further controlled studies with larger patient populations and comparative arms are warranted to confirm these promising outcomes and better define patient selection criteria and treatment protocols.