

TREATMENT OF HALLUX RIGIDUS BY AUTOLOGOUS MICROGRAFTING TECHNOLOGY (AMT) – A PROSPECTIVE COHORT STUDY

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Hallux rigidus is a common deformity in older adults over 50 years, in rare cases, it can occur also in younger individuals. Hallux rigidus is characterized by a painful and stiff arthritic joint of the big toe [1]. The condition limits mobility, independence, daily activities and thus, quality of life [2], [3]. In Germany, it is estimated that 2-3 % of the over-50-year-old population is affected by Hallux rigidus [1], [2]. There is a wide variety of treatment options for Hallux rigidus either conservative- by surgery [1], [4], [5]. However, surgical options such as cheilectomy, phalangeal osteotomy, resection Arthroplasty or metatarsal osteotomy may not always deliver satisfactory results for the patients [1], [4], [5]. Here, we present a novel option for the treatment of Hallux rigidus by Autologous Micrograft technology.

Methods

A prospective study, including 20 patients with Hallux rigidus, was carried out between March 2025 and July 2026. The study participants were aged 55 to 79, with an average age of 62,75 years. The median age was 65 years. The study participants were classified by Caughlin & Shurmas scale and ranged between stage 1 and 3. Shoe conflict was present in 11 cases (55%). At baseline, pain-free walking distance as limited in 14 patients (70%) and ranged from 100 to 2000 meters and eight study participants (40%) relied on regular intake of painkillers. The intervention consisted of an Autologous Micrografting, while tissue samples were obtained from the concha bowl, completely sparing the anterior part.



Fig 1: Shown are a syringe containing 4 ml of lidocaine for anesthetizing the ear, a syringe containing 4 ml of NaCl (to be added later to the Rigereracon), forceps, and a 2.5 mm dermatological punch.



Fig 2: First, the auricular nerve is anesthetized with lidocaine, followed by anesthesia of the ear itself; then, three cartilage cylinders are harvested using a 2.5 mm punch. To minimize bleeding, our practice has found it effective to apply a swab soaked in adrenaline to the wound. The ear is then dressed under sterile conditions. Finally, the three cylinders are minced and mixed with 4 ml of water to prepare them for application.

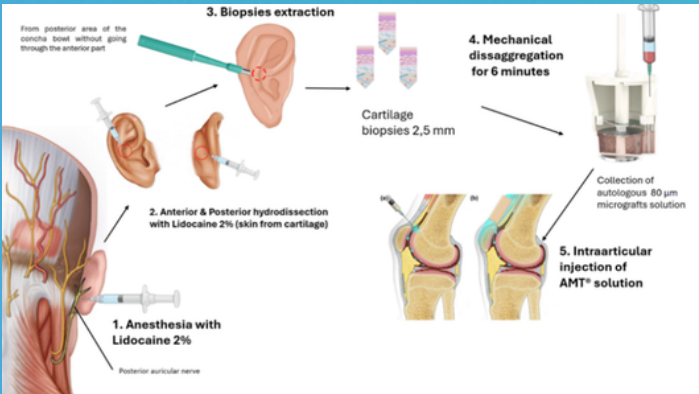


Fig. 3: Autologous Micrograft Technology using the Rigenara® protocol - In this example, the intra-articular injection was administered into the knee joint.

The study subjects received an anesthetic solution of 2 % Lidocaine, injected into the posterior auricular nerve. Then, hydrodissection of the tissue was performed. The sample was filtered with a cut-off of about 80 microns, followed by mechanical disaggregation. We usually collect 4 ml of micrograft solution for intraarticular injection .The exact application volume varies from joint to joint; typically, 4 ml of micrograft solution is obtained. However, due to the small size of the big toe, only 1.5–2 ml is actually injected. We used the Rigenara® protocol, described in detail elsewhere [6].

Radiologic results – Hallus Rigidus



Fig. 9-11:The images show the condition before and after the injection; a distinct widening of the joint space is visible, with good intra-articular distribution of the mixture. The MRI 12 months post-intervention showed good widening of the joint space.

Radiologic results – Hallus Rigidus

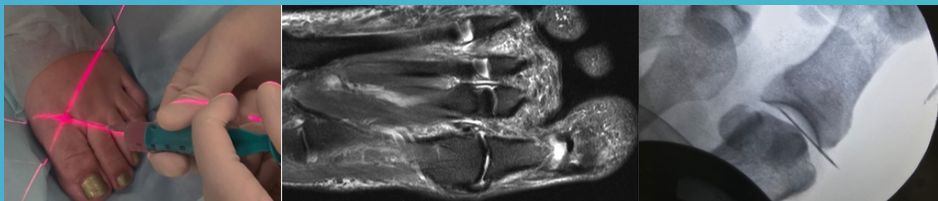


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Results – Pain Relief

Fig. 6: Decrease in average VAS during the course of the study

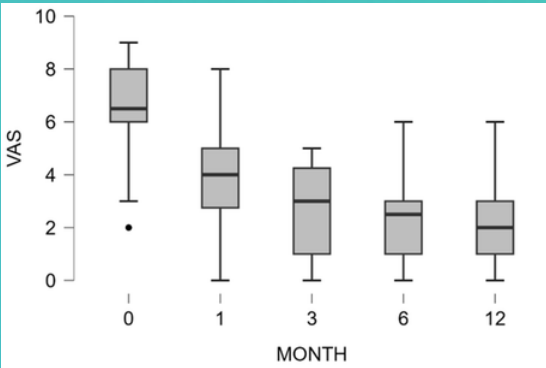
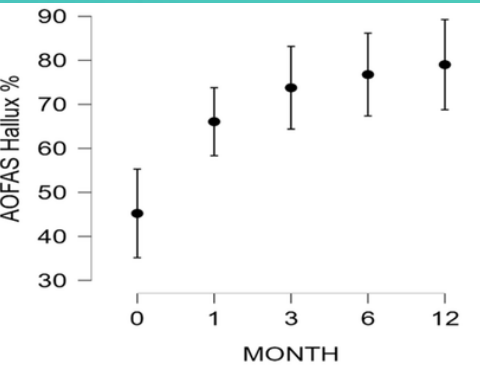
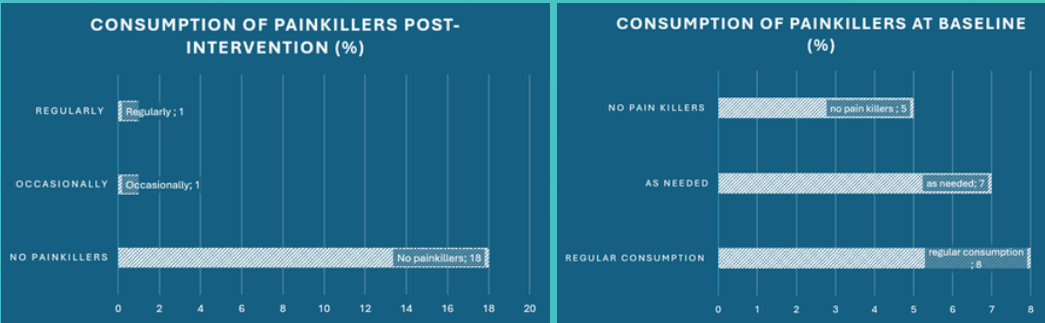


Fig. 7: Increase in AOFAS % during the course of the study



Reduction in painkiller intake

Fig. 8: Pain killer consumption pre- and 12 months post intervention



Painkillers had been consumed by eight patients (40%) regularly at baseline. This number decreased by 12 months post treatment to one patient (5%). Pre-intervention, seven patients (35%) had used painkillers as needed, post treatment only one patient reported to use pain medication as needed (5%). In total, at baseline, 75% of the patients had relied on pain medication, at least occasionally. 12 months post treatment, this number had decreased to 10%.

Radiologic results - Rhizarthrosis

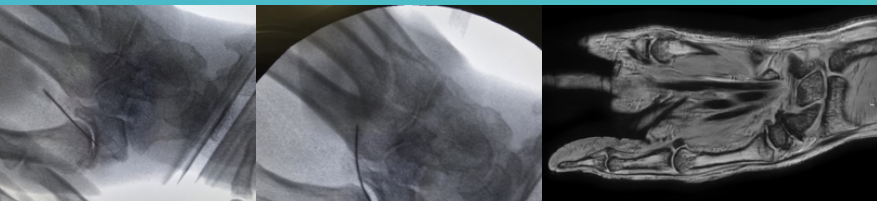


Fig. 12 -14: Pre- and post-interventional X-rays are also shown, as well as the 12-month MRI follow-up. There is insufficient data regarding the treatment of rhizarthrosis to draw a meaningful conclusion.

At baseline, an average AOFAS of 45,22 % was observed. On the other hand, 12 month post-intervention average AOFAS had increased to 79 % (p < 0,001, Cohen ´s d = 0,359).

Reference

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