The active principle of MBST therapy

The application is based on the principle of electromagnetic stimulation with the intention of obtaining cell proliferation, calcification and the development of matrixes. The signals stimulate a biological reaction, which can vary, and which is dependent on frequency, amplitude, field strength and the cell structure that is to be treated. The organising matrix of the cartilage tissue consists of conglomerates of muco-polysaccharides and hyaluronic acid. Mechanical stress caused by structures or molecules results in the immediate generation of electric activity (Rothschild, 1996). Tension differences within the collagen structures of the cartilage tissue also cause electric reactions. Accordingly, especially alternating electrical signals, caused by mechanical stress, cause the transport of electrical molecules in and out of the cartilage structures, and accordingly, they have a positive influence onto the metabolism. Additionally, the metabolism is stimulated, causing a positive stimulation of the nutritional balance and an inhibition of the degeneration of cell structures.

The basis is a highly complex treatment apparatus with a specially designed air coil for the generation of a field with a static and a three-dimensional alternating field component using cyclotron resonance and magnetic spin resonance at the site of the tissue that is to be treated. Part of the functional mechanism serves the simultaneous augmentation of the internal energy of the cells within the area of treatment of the intracorpural electrolyte liquid and the augmentation of the energy of a predefined group of ions in order to enhance the transport of these ions at the cell membrane. The main idea behind this method is the transfer of as much energy as possible to the cells while maintaining the lowest possible field strength.

The MBST therapy devices allow maximum targeted transfer of energy into human tissue by means of the generation of magnetic resonance conditions even with low field strengths.

Clinical evaluation:	Treatment centre ReAgil Cologne
Title of project:	Long term evaluation of MBST magnetic resonance therapy
Clinical examiner:	German Sport University Cologne, Institute of Movement Therapy and Movement-oriented Prevention and Rehabilitation, I. Froboese, U. Eckey; University of Munich, Clinic Großhadern, Department of diagnostic radiology, M. Reiser, C. Glaser; University of Munich, Anatomische Anstalt, F. Englmeier; Institute of radiology, Cologne, J. Assheuer; Treatment centre ReAgil, G. Breitgraf
MRI study:	German Sport University Cologne
Title of the study:	Evaluation der Effektivität dreidimensionaler pulsierender elektromagnetischer Felder der MBST auf die Regeneration von Knorpelstrukturen [Evaluation of the efficacy of the three-dimensional pulsating electromagnetic fields of MBST to the regeneration of cartilge structures]
Author:	Prof. Dr. Ingo Froboese

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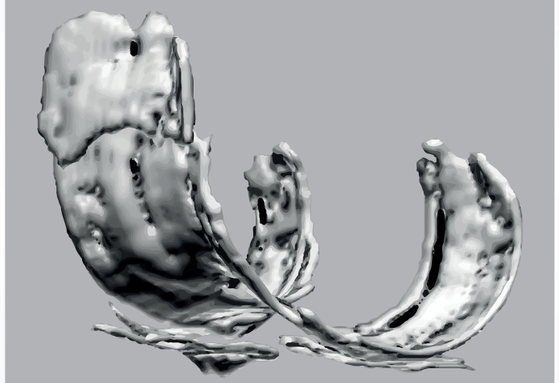
Customer notice: According to the German Drug Advertising Act, we are obliged to point out that it is currently controversial in conventional medicine whether the effectiveness of MBST magnetic resonance therapy is sufficiently scientifically proven. Evidence-based studies have not yet been made for every field of application. Since every human being is different by nature, it is not possible to guarantee the success of any particular method in human medicine. Statements about treatment options, fields of application, efficacy and tolerability of the MBST therapy are based on the experiences gained by the treatment centres and their patients in the application of the therapy. They are no promise of relief or improvement. MBST therapy is an individual health service that is applicated on patient's personal request in an MBST treatment centre after medical diagnosis and comprehensive information. The information contained in this document is exclusively intended as general information about a health topic. It cannot and must not replace professional medical advice, diagnosis, or treatment or be used modification or termination of medical treatments. If you have any health-related questions, always consult a doctor!

References: Froböse et al. 2000, Orthopädische Praxis, 8/2000, 36. Jg., S. 510–515

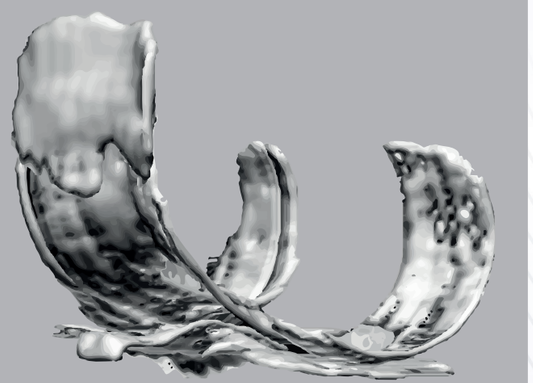
MBST® NMR · THERAPY

Scientific study of the therapeutic applicability of MBST magnetic resonance therapy to cartilage structures in vivo

Before MBST magnetic resonance therapy

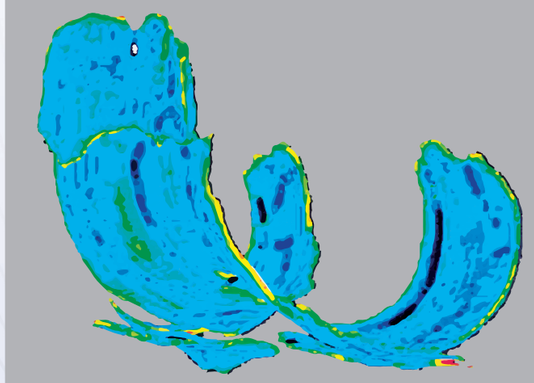


10 weeks after MBST magnetic resonance therapy

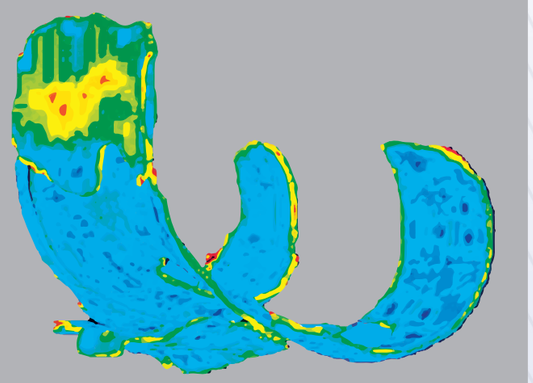


Three-dimensional quantification of cartilage structures · Thickness · Volume · Area

Before MBST magnetic resonance therapy



10 weeks after MBST magnetic resonance therapy



First scientific study about the therapeutical applicability of MBST magnetic resonance to cartilage structures · In vivo!

First scientific study on MBST · Made in Germany

To evaluate the efficacy of MBST magnetic resonance technology on the regeneration of cartilage structures, a scientific study was carried out by Prof. Dr. Froboese et al. already in 1999. It was published in the journal Orthopädische Praxis, 8/2000, vol. 36, p. 510–515.

The patients included in the study had clinically verified gonarthrosis (Wirth stage III or III). The cartilage structures were reconstructed in three dimensions with a method based on magnetic resonance imaging before and after MBST magnetic resonance therapy. In this way, a quantification of cartilage structures in vivo was possible for the first time.

MBST magnetic resonance therapy

The patients were treated with the at this time newly developed MBST magnetic resonance therapy (therapy device by the company MedTec Medizintechnik GmbH, Wetzlar, Germany). The treatment consisted of 9 treatment units on consecutive days. The results showed a distinct improvement in thickness, volume and area.

Distinct regenerative processes of cartilage structures

In discussing the highly significant results, Prof. Froboese explains that the adaptations of the cartilage structures were obviously caused by the specific effective characteristic of MBST magnetic resonance therapy.

He states: **"In the present study, the results obtained in a treatment with complex PEMF on humans in vivo are quantified for the first time. The patients of the MBST study showed more or less distinct cartilage defects. [...]**

It does [...] become clear, that after the therapeutic intervention, these values are closer to the normal reference values, and it is therefore evident, that the MBS therapy has induced positive adaptations. [...] After the treatment, the illustrations show distinct regenerative processes of the cartilage structures. These results of these adaptations are furthermore conform with the subjective information from the patient. [...]

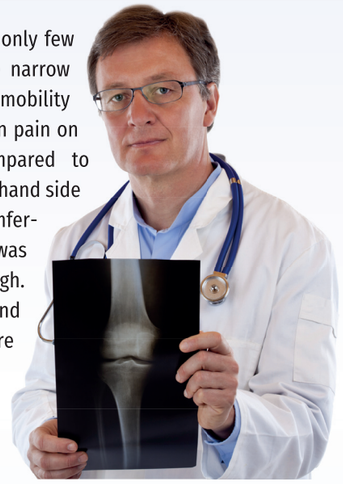
It is possible that the cartilage regeneration process is not even terminated at the end of the 10 weeks duration of this study. This question requires further examination."

MBST®
Molecular
Biophysical
Stimulation

Cartilage regeneration by means of MBST recorded by MRI · Case report of patient no. 5

Dr. med. G. Breitgraf, treatment centre ReAgil, Cologne

A 46-year-old patient had suffered from complaints in her right knee joint for more than 12 years. Most noticeable a severe sensation of pressure and burning after extended walking. According to the Lequesne Index (1982), the following restrictions of every-day activities were present: pain at rest also at night without movement, pain on initial movement for the first 2–3 steps in the mornings, pain at movement after walking distances of more than 4 km, seldom a sharp pain or sudden loss of strength in the right leg, difficulties with squatting.



Physical examination led to only few relevant results: a discrete narrow graded limitation of mobility F/E 140/10/0∞ and extension pain on the right hand side, compared to painless mobility on the left hand side with F/E 140/0/10∞. Circumference of the right thigh was 2.5 cm less than of the left thigh. Tests of patella, ligaments and meniscus on both knees were inconclusive.

The patient's medical history shows that she suffered a fracture of the thigh due to a car accident in 1971. The fracture was treated surgically with Küntscher nailing technique.

In 1985, arthroscopic surgery with abrasion arthroplasty, shaving and meniscus trimming due to continuing discomfort in the right knee joint. Already at that time, a total defect of the cartilage layer at the medial and lateral condyles of the femur, an intense reaction to wear of the cartilage in the area of stress, and damage to the inner meniscus were diagnosed during surgery.

To treat the long-standing symptoms, 9 treatment units of MBST therapy, 1 hour each, were applicated on consecutive week days.

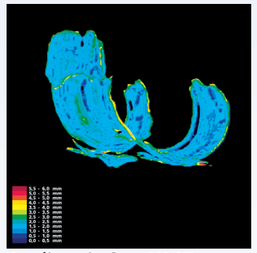
For the first time, parameters of the patient's right knee joint cartilage were measured in vivo by MRT, before and 9 weeks after the MBST-Therapy. The table below shows the measured values of tissue volume.

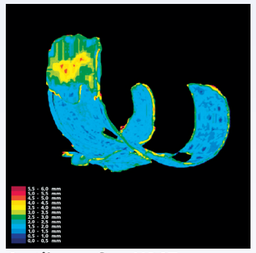
Measured cartilage parameters before and after (Pat. no. 5)

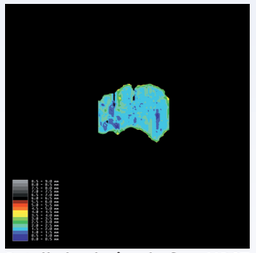
Measured cartilage values before and after MBST, processed with subtractiion method		Before	After	p-value*	Difference (XNT-XVT)	Change in %
Patella	Volume interpolated	1.54 cm^3	1.83 cm^3	p < 0.001	+0.29 cm^3	+18.83 %
	Mean thickness	1.76 mm	2.07 mm	p < 0.001	+0.31 mm	+17.61 %
Tibia lateral	Volume interpolated	0.64 cm^3	0.80 cm^3	p < 0.05	+0.16 cm^3	+25.00 %
	Mean thickness	0.94 mm	1.14 mm	p < 0.01	+0.20 mm	+21.28 %
Tibia medial	Volume interpolated	0.73 cm^3	1.05 cm^3	p < 0.05	+0.32 cm^3	+30.48 %
	Mean thickness	0.96 mm	1.14 mm	p < 0.05	+0.18 mm	+18.75 %
Femur	Volume interpolated	5.87 cm^3	5.89 cm^3	n. s.	+0.02 cm^3	+0.34 %
	Mean thickness	1.25 mm	1.38 mm	n. s.	+0.13 mm	+10.40 %

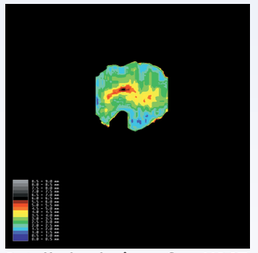
Results of the study show distinct positive adaptations of the cartilage structures (thickness, volume, area). It is presumed that this mechanism derives from the activation of intact cartilage cells as well as an increase of collagen synthesis.

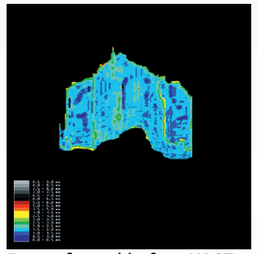
* refers to mean values of evaluation (n = 14)

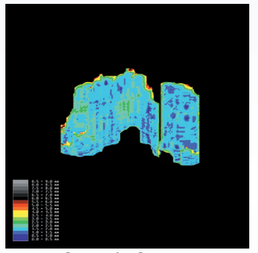

Cartilage before MBST

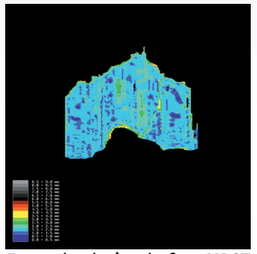

Cartilage after MBST

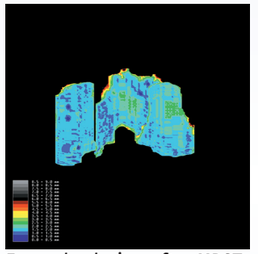

Patella back view before MBST

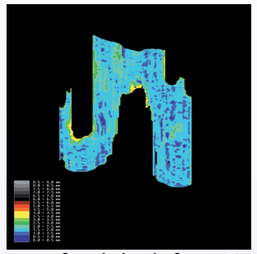

Patella back view after MBST

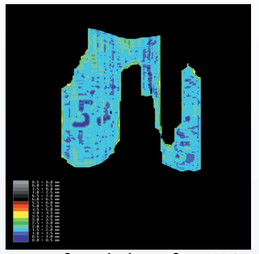

Femur frontal before MBST

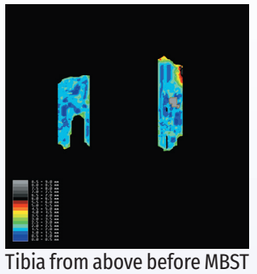

Femur frontal after MBST

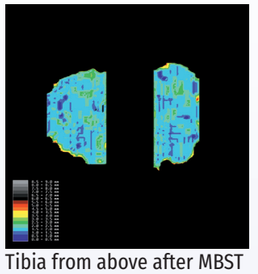

Femur back view before MBST

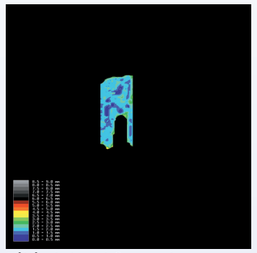

Femur back view after MBST

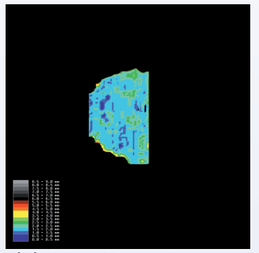

Femur from below before MBST

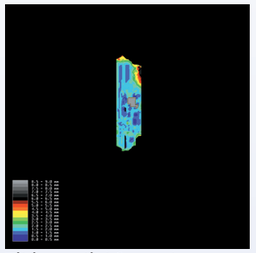

Femur from below after MBST

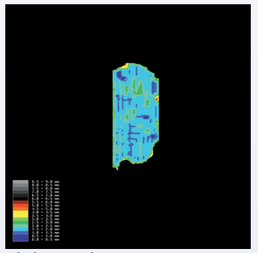

Tibia from above before MBST


Tibia from above after MBST


Tibia lateral from above before MBST


Tibia lateral from above after MBST


Tibia medial from above before MBST


Tibia medial from above after MBST