THE CARTILAGE IMPLANT
FOR BIOLOGICAL CARTILAGE REPAIR
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BioTissue is a leading company in the field of biological products for orthopedics. Extensive research and development activities have now brought forth another innovative product for the treatment of cartilage defects.

chondrotissue®
• the cartilage implant

Product Indications:
• chondrotissue® is recommended for use following bone-marrow stimulating techniques such as microfracturing and Pridie drilling.
• chondrotissue® is approved for cartilage repair in cases of traumatic and degenerative changes of the synovial joints.

Product Features:
• provides optimal defect covering
• leads to biological defect filling
• induces cartilaginous repair tissue formation
• is approved for use following microfracturing and Pridie drilling
• is used in cases of degenerative and traumatic changes to the synovial joints
• reduces pain and symptoms associated with articular defects
• increases patients’ mobility and quality of life
Hyaluronic acid

- is a natural polymer with important functions in the articular cartilage
- provides an important stimulus for chondrogenic differentiation with the formation of hyaline cartilage matrix
- contributes to the viscoelasticity of the cartilage and protects against friction and impact loading

Resorbable polymer-based textile scaffold

- guarantees initial mechanical stability
- provides opportunity for stable fixation
- allows optimal, three-dimensional cell distribution
- offers an environment for mesenchymal cells

Product combinations

- clinically approved in combination with platelet-rich plasma (PRP), human autologous serum and physiological saline for infusion
- human serum stimulates the migration of mesenchymal cells
Preclinical Outcomes

Preclinical studies show that chondrotissue® promotes the formation of cartilaginous repair tissue following microfracturing\textsuperscript{6,9}

Microfracturing in the sheep model without defect cover: biopsy after 6 months

Inferior tissue formation

Microfracturing in the sheep model with chondrotissue®: biopsy after 6 months

Hyaline-like tissue

Microfracturing in the sheep model without defect cover: Biopsy after 6 months

Collagen type II staining
- Inferior tissue formation

Microfracturing in the sheep model with chondrotissue®: Biopsy after 6 months

Collagen type II staining
- Hyaline-like tissue
Clinical Outcomes: MRI Evaluation

Patient 1: male, 43 years, 0.7cm² cartilage defect of the lateral talus

Patient 2: female, 54 years, 3cm² degenerative defect of the medial femoral condyle

Patient 3: male, 35 years, 4cm² traumatic defect of the lateral femoral condyle

Clinical data following treatment with chondrotissue show excellent cartilage repair, high volume defect filling, and smooth peripheral integration of the repair tissue to the adjacent tissue.
Clinical Outcomes: Histological Evaluation

Histological evaluation shows hyaline-like cartilage tissue, round chondrocytic cells, proteoglycan-rich matrix, and collagen type II formation. The repair tissue is firmly integrated into the subchondral bone and shows a homogenous hyaline-like structure following treatment with chondrotissue®ab.

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a Patrascu J.M., MD, Orthopedics and Trauma Clinic II, Victor Babeş University of Medicine and Pharmacy, Timișoara, Romania13

b Behrendt S., MD, Evangelic Hospital, Lütgendortmund, Germany (publication in preparation)
Surgery

1 Taking autologous blood samples shortly before arthroscopy
In order to restore the elastic properties of chondrotissue®, it is recommended to mix chondrotissue® with autologous human serum before implantation. For this purpose, approximately 9 ml blood should be drawn from the patient before arthroscopy. The blood should then be centrifuged for 10 minutes or left to stand at room temperature for about 30 minutes until the blood clot has settled. chondrotissue® can also be immersed in human autologous platelet-rich plasma (PRP).

Important: please use serum monovettes, not EDTA monovettes. If no or too little human serum or PRP is available, physiological saline for infusion can be used or supplemented to reconstitute the elasticity of chondrotissue®.

2 Bone-marrow stimulation
Following debridement, the defect should be measured and the subchondral bone perforated with an awl, with spacing of around 3 - 5 mm, during arthroscopy.
3 Preparation of chondrotissue®
Cover chondrotissue® with the patient’s own serum, or alternatively with platelet-rich plasma, (2 - 3 ml of fluid are sufficient) and leave to stand for approximately two minutes. This can be done directly in the sterile container supplied. The moistened chondrotissue® can then be cut exactly to size to fit the defect.

4 Fixing chondrotissue®
chondrotissue® can be fixed in the defect using common orthopaedic fixation methods e.g.:

- bioresorbable pins
- transosseous ancher knot fixation
- cartilage suture
- fibrin glue: Please apply the glue to the edges of the chondrotissue® - previously placed in the defect - and distribute it evenly

Please read the package leaflet for more information concerning the product and its use.
Rehabilitation

The information given below is intended only as a recommendation and depends on the size and the site of the defect, the patient’s age and the general demands of daily living.

Femoral and tibial defects

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2 - 6</th>
<th>After 6 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Loading / Mobilisation</strong></td>
<td>Foot sole contact with walking support / Braces</td>
<td>Foot sole contact with walking support / Femorale condyle – CPM* with restriction Week 2 - 3: 0/0/60° Week 4 - 6: 0/0/90°</td>
</tr>
<tr>
<td><strong>Walking, sport</strong></td>
<td>Mobilisation</td>
<td>Aqua gymnastics, swimming</td>
</tr>
</tbody>
</table>

Patellar and trochlear defects

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Week 2 - 7</th>
<th>After 7 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mobilisation</strong></td>
<td>Braces</td>
<td>CPM* with restriction : Week 2 - 3: 0/0/30° Week 4 - 5: 0/0/60° Week 6 - 7: 0/0/90°</td>
</tr>
<tr>
<td>0 - 14 days</td>
<td>Weeks 3-4</td>
<td>After 4 weeks</td>
</tr>
<tr>
<td><strong>Loading</strong></td>
<td>Foot sole contact with walking support</td>
<td>50% body weight with walking support ; Climbing stairs only with healthy leg</td>
</tr>
</tbody>
</table>

* CPM : continuous passive motion


Further publications about scaffold-based cartilage regeneration:


