

# CaReS-1S®

The matrix makes the difference



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## CaReS-1S® - the new generation in the therapy of Cartilage Defects

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- **Matrix – Technology**

99,8 % pure, native collagen is gelatinized to a formable, 3-dim. matrix with high biocompatibility

- **Hydrogel as a „cell catcher“**

osmotic properties stimulate the ingrowth of cells into the implant

- **Migration of autologous cells**

migrated autologous cells from the surrounding tissue proliferate and populate the entire implant

- **Complete conversion into collagen type II**

together with migrated chondrocytes the cells express collagen type II in the extracellular matrix

### Cartilage regeneration system for the formation of hyaline-like cartilage

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Scaffold showing a strong staining reaction for cartilage type I collagen(a) and showing no reaction for collagen type II(b) \*



Regenerated cartilage showing no reaction for typ I collagen(a) and a strong staining reaction for cartilage type II collagen(b)\*

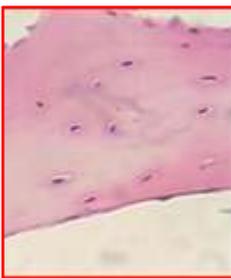
\* Schüettler et al.: Repair of a chondral defect using a cell free scaffold in a young patient – a case report of successful scaffold transformation and colonisation. BMC Surgery 2013 13:11.

# CaReS-1S® - path to lasting cure by cartilage defects

- forms hyaline-like cartilage, no fibrocartilage
- marginal adaptation (bonding) by formable hydrogel
- complete conversion of collagen type I in collagen type II
- single-stage surgery
- no microfracture necessary
- suitable for defect sizes up to 8 cm<sup>2</sup>
- „ready to use“
- storage at room temperature

Native cartilage consists of collagen type II, chondrocytes and proteoglycan. Impelmenting **CaReS-1S®**, the challenging regeneration of damaged cartilage can be achieved.

**CaReS-1S® supports the body by a hydrogel embedded in a multidirectional collagen matrix in the accretion of autologous chondrocytes.**



Cartilage under microscope



Histological view of hyaline cartilage (hemotoxylin & eosin) under polarized light

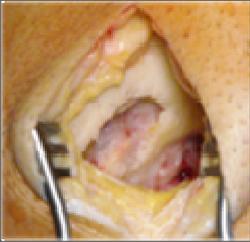
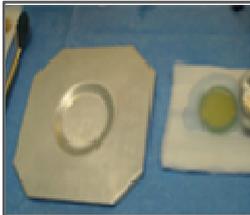
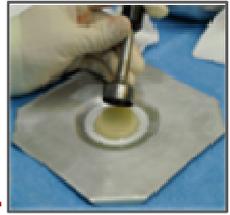
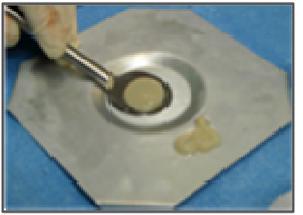
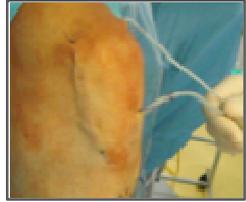


Hyaline cartilage with chondrocytes, organelles, lacunae and matrix

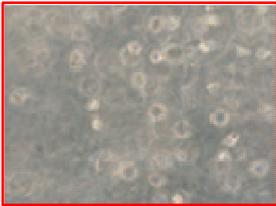
**“Cell-free collagen type I matrices appear to be a safe and suitable treatment option even for large cartilage defects of the knee.” \***

\*Roessler et al. International Orthopaedics (SICOT) DOI 10.1007/s00264-015-2695-9

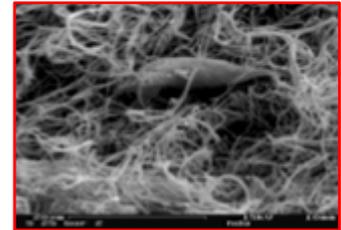
## Surgical Technique – Knee (short)

1.  MRI, side shot; defect area
2.  Access on the location of cartilage damage
3.  Debridement of the defect zone
4.  Filling of the bone defect; e.g. with NanoBone
5.  Adjustment of CaReS-1S®
6.  Opening of the sterile packaging and transfer to a sterile pad
7.  Cutting of the CaReS-1S® implant
8.  Transfer of the CaReS-1S® to the defect zone
9.  \*Application of fibrin glue for the fixation of CaReS-1S®
10.  Placing of the prepared CaReS-1S® implant
11.  Careful modeling of the CaReS-1S® implant
12.  Capsule suture and wound closure
13.  Do not use suction drainage

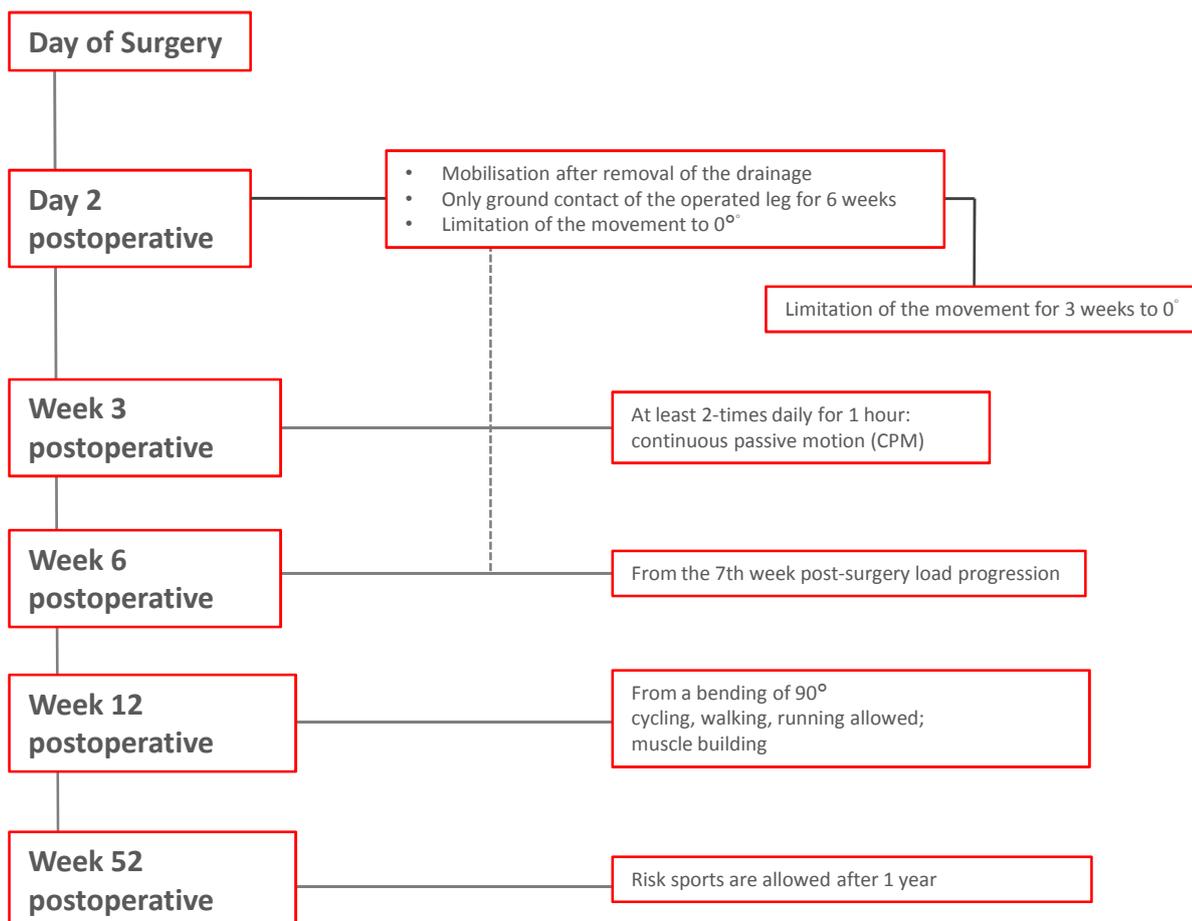
Modeling: A safe and easy insertion of the **CaReS-1S®** implant, to the level of the surrounding cartilage, achieves the best possible result.



- ✓ Homogeneous cell distribution
- ✓ Visco-elastic properties comparable to those of hyaline cartilage



## Rehabilitation (Femur condyles/Talus role)



# Indications of CaReS-1S®

## Indications

- Focal, full-layer cartilage defects with cartilage shoulder
- ICRS classification 3 and 4
- Defects without and with involvement of the subchondral bone (for osteochondral lesions the bone has to be reconstructed, e.g. with NanoBone®)
- Defect size up to 8 cm<sup>2</sup>
- Age: 18 – 60 years, depending on the biological age of the joint
- BMI < 35
- Osteochondritis dissecans



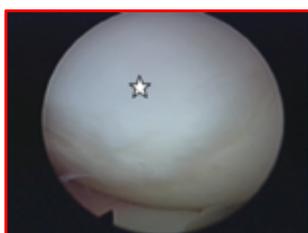
## Requirements

- Resection of the meniscus: a maximum of 1/3 may be resected
- Stable joint (no untreated ligament injuries; a cruciate ligament plastic can be done together with the CaReS®-1S implantation in one surgery)
- Leg deformity < 5°



## Contra Indicationen

- Generalized osteoarthritis
- Inflammatory diseases (rheumatism, articular gout,...)
- Chronic infection diseases


**Intraoperative view of the CaReS-1S® implant**
**! 3.5 years AFTER implantation (star)**

Schüettler et al. BMC Surgery 2013, 13:11

<http://www.biomedcentral.com/1471-2482/13/11>

Defect size	Advantages of CaReS®-1S	Previous treatments	Disadvantage of previous treatments
regardless of the defect size	Stable implant; complete filling of the defect and formation of hyaline-like cartilage; long lasting effect	Chondroprotectives, e.g. hyaluronic acid injections	Rapid degradation of hyaluronic acid; only short-term relief of symptoms; cartilage damage remains
0cm <sup>2</sup> – 2cm <sup>2</sup>	No formation of scar-like cartilage but regeneration of the tissue; no damage to the healthy bone; formation of hyaline-like cartilage; long lasting effect	Microfracture	Formation of scar-like cartilage inferior quality; only suitable for small defects
1.5cm <sup>2</sup> – 3cm <sup>2</sup>	No damage to healthy cartilage and bone necessary; complete filling of the defect; Preparation of the congruence of the cartilage surface	Osteochondral Transplantation (OCT), mosaicplasty; osteochondral autologous graft system (OATS)	Damage of the bone and cartilage at the donor site; no complete filling of the defect possible; restoration of the cartilage surface difficult
3cm <sup>2</sup> – 12cm <sup>2</sup>	Only one operation; costs are covered by health insurance; formation of hyaline-like cartilage; long lasting effect	ACI/MACI, (matrix-coupled) autologous chondrocyte implantation	Two operations; very expensive and complex method; high administrative expenses (registration required); pharmaceutical
0cm <sup>2</sup> – 8cm <sup>2</sup>	All the advantages described above	This size range is not covered by a single, previous described method	

## Excerpt from the bibliography

Titel	Autor
A comparative study of 3 different cartilage repair techniques	Schneider et al., Knee Surg Sports Traumatol Arthrosc DOI 10.1007/s00167-011-1460-x
Cell-free repair of small cartilage defects in the Goettinger minipig: which defect size is possible?	Gavenis et al., Knee Surg Sports Traumatol Arthrosc DOI 10.1007/s00167-011-1847-8
A Cell-Free Collagen Type I Device for the Treatment of Focal Cartilage Defects	<i>Gavenis et al., Artif Organs, Vol. 34, No. 1, 2010</i>
Cell-free collagen type I matrix for repair of cartilage defects—clinical and magnetic resonance imaging results	Efe et al., Knee Surg Sports Traumatol Arthrosc DOI 10.1007/s00167-011-1777-5
Repair of a chondral defect using a cell free scaffold in a young patient - a case report of successful scaffold transformation and colonisation	Schüettler et al. BMC Surgery 2013, 13:11 <a href="http://www.biomedcentral.com/1471-2482/13/11">http://www.biomedcentral.com/1471-2482/13/11</a>
Use of cell-free collagen type I matrix implants for the treatment of small cartilage defects in the knee: clinical and magnetic resonance imaging evaluation	Schüttler et al., Knee Surg Sports Traumatol Arthrosc DOI 10.1007/s00167-013-2747-x
Short-term follow up after implantation of a cell-free collagen type I matrix for the treatment of large cartilage defects of the knee	Roessler et al., International Orthopaedics (SICOT) DOI 10.1007/s00264-015-2695-9

## Manufacturer



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## Product list CaReS-1S®

product number	Description
C-1S 114	CaReS-1S® 11 x 4 mm
C-1S 116	CaReS-1S® 11 x 6 mm
C-1S 224	CaReS-1S® 22 x 4 mm
C-1S 226	CaReS-1S® 22 x 6 mm
C-1S 344	CaReS-1S® 34 x 4 mm
C-1S 346	CaReS-1S® 34 x 6 mm

