Rebound® Cartilage

Supports successful rehabilitation following surgical repair of a contained cartilage lesion

Rehabilitation following cartilage repair is a key component to ensure good clinical outcomes. Although evidence for the available treatment options is growing, clear guidance for rehabilitation is diverging and managing patient expectations is clinically challenging.[1,2,3,4] Therefore Össur conducted an expert consensus meeting to discuss the key components of rehabilitation following surgical repair of a contained, full thickness cartilage lesion with global key opinion leaders. In preparation of a 1.5 day face to face meeting, current rehab protocols of the experts were gathered via a standardized questionnaire. Based on these findings, the experts discussed the different protocols and reached a consensus on the rehabilitation following marrow stimulation, surface restoration and surface reconstruction of an 1.5cm² contained full thickness (Outerbridge 4°) cartilage lesion of the medial condyle of a 28-year-old male (normal BMI, athletic type, non-smoker, normal sports activities) who injured his knee while playing soccer on weekends with friends. The recommendations address key components of rehabilitation such as weight-bearing, range of motion (ROM), bracing and physical therapy.

REBOUND CARTILAGE BRACE - RECOMMENDED BY GLOBAL EXPERTS

As bracing, either for immobilization, ROM restriction or unloading of the repaired femoro-tibial compartment is often indicated - Össur has developed innovative functional knee braces to support rehabilitation of patients with knee injuries - beside the immobilizing and ROM restriction braces (Formfit Knee Immobilizer® and the intuitive Rebound Post-Op Knee brace) the Rebound Cartilage brace can play an important role within rehabilitation of knee cartilage injuries due to its dynamic and adjustable unloading.

Key opinion leader panel: Nathan Urquhart (CA), Adam Anz, Matthew Provencher, Paul Murphy, Deryk Jones, James Kercher, Ajay Lall, Matthew Pifer, Jonathan Grantham (USA), Kirti Moholkar (UK), Stephan Vogt, Frank Wiedersheim (GER)

REHABILITATION FOLLOWING MARROW STIMULATION OF A CONTAINED CARTILAGE LESION

Contained cartilage lesion - Marrow Stimulation

	PHASE I WEEK 1-2	PHASE II WEEK 3-6	PHASE III WEEK 7-12	PHASE IV > WEEK 13
Weight-bearing	NWB, TTWB, 20lbs (static) load TT – no shear force	PWB (based on size, discretion)	WBAT	FWB
Bracing	If brace (immobilizer), locked when amb – otherwise no brace	None – potential Unloader® (swelling pain)	Unloading brace	Unloader – pain free Wean off brace based on pain
ROM	0-90 as pain allows	Free	Free	Free
Physical Therapy	Gentle passive as pain allows, active assist. Cryotherapy	Active assist – active quad sets/hamstrings isometrics BFR	Progressive resist. Strengthening phase BFR	16 weeks low impact, Non-impact cardio (12 – 24 weeks) Running (24 weeks) **Note Phase 5** Regain muscle volume for RTP sport specific training -6 months
Other	Cryotherapy, crutches, HA, Consider DVT prophylaxis	Stationary cycle Aquatics, HA, Consider DVT prophylaxis	Aquatics, Alter G, Consider DVT prophylaxis	Alter G

NWB. Non-weight bearing; TTWB. Toe touch weight bearing; PWB. Partial weight bearing; WBAT. Weight bearing as tolerated; FWB Full weight bearing. RTP. Return to play; BFR. Blood flow restriction therapy; HA. Hyaluronic acid; TT. Toe touch; DVT. Deep vain tromboses; Alter G. Anti Gravity treadmill

The Data:

1. Ebert et al. (2017) Two-Year Outcomes of a Randomized Trial Investigating a 6-Week Return to Full Weightbearing After Matrix-Induced Autologous Chondrocyte Implantation.HYPERLINK \l "Am J Sports Med. 2017 Mar;45(4):838-848. **2.** Marder RA, Hopkins GJ, Timmerman LA. Arthroscopic microfracture of chondral defects of the knee: a comparison of two postoperative treatments. Arthroscopy. 2005;21:152–158. **3.** Steadman JR, Rodkey WG, Briggs KK. Microfracture to treat full-thickness chondral defects: surgical technique, rehabilitation, and outcomes. J Knee Surg. 2002;15: 170–176. **4.** Wondrasch et al. (2015) Am J Sports Med. 2015 Jan;43(1):146-53. Effect of accelerated weightbearing after matrix-associated autologous chondrocyte implantation on the femoral condyle: a prospective, randomized controlled study presenting MRI-based and clinical outcomes after 5 years

Expert Consensus - Contained Cartilage Lesion

REHABILITATION FOLLOWING SURFACE RESTORATION (MACI, PARTICULATED, MINCED) OF A CONTAINED CARTILAGE LESION

	PHASE I WEEK 1-2	PHASE II WEEK 3-6	PHASE III WEEK 7-12	PHASE IV > WEEK 13
Weight-bearing	NWB, TTWB, 20lbs (static) load TT – no shear force	PWB (based on size, discretion)	WBAT	FWB
Bracing	Immobilizer, Unloader	Unloader	Unloader	Unloader
ROM	0-20, 0-30	Increase to 90	progressive ROM	
Physical Therapy	Gentle passive as pain allows, active assist. Cryotherapy	Active assist – active quad sets/hamstrings isometrics BFR	Progressive resist. Strengthening phase BFR	16 weeks low impact, Non-impact cardio (12 – 24 weeks) Running (24 weeks) **Note Phase 5** Regain muscle volume for RTP sport specific training -6 months
Other	Cryotherapy, crutches, HA	Stationary cycle Aquatics, HA	Aquatics, Alter G	Alter G

NWB. Non-weight bearing; TTWB. Toe touch weight bearing; PWB. Partial weight bearing; WBAT. Weight bearing as tolerated; FWB Full weight bearing. RTP. Return to play; BFR. Blood flow restriction therapy; HA. Hyaluronic acid; TT. Toe touch; ROM. Range of motion; Alter G. Anti Gravity treadmill

REHABILITATION FOLLOWING SURFACE RECONSTRUCTION (OSTEOCHONDRAL AUTO-/ ALLOGRAFT) OF A CONTAINED CARTILAGE LESION

	PHASE I WEEK 1-2	PHASE II WEEK 3-6	PHASE III WEEK 7-12	PHASE IV > WEEK 13
Weight-bearing	WBAT	Week 3 FWB	FWB	FWB
Bracing	None or Immobilizer	Unloader		
ROM	0-90	Free ROM	Free	Free
Physical Therapy	Active assist – active quad sets/Hams isometrics BFR	Progressive resist. Strengthening phase BFR		**Note Phase 5** Regain muscle volume for RTP sport specific training -5 months
Other	Cryotherapy, crutches, HA	Stationary cycle Aquatics, HA	Aquatics, Alter G	Alter G
		Consider HA, BMAC		

WBAT. Weight bearing as tolerated; FWB Full weight bearing. RTP. Return to play; BFR. Blood flow restriction therapy; HA. Hyaluronic acid; ROM. Range of motion; Alter G. Anti Gravity treadmill; BMAC. Bone Marrow Aspirate Stem Cell Concentrate

Formfit® Knee immobilizer

Rebound® Post-Op Knee

Rebound® Cartilage