

Table of Contents

1.	AMIC KNEE Overall	2
1.1	RCT	2
1.2	Meta-analysis.....	2
1.3	Systematic Review	2
1.4	Case Control.....	3
1.5	Case series.....	3
1.6	Guidelines.....	5
1.7	Case Reports & Expert Opinions.....	5
2.	AMIC Patellofemoral (Subset from AMIC Knee)	6
2.1	Case Control.....	6
2.2	Case series.....	6
2.3	Case Reports.....	6
3.	AMIC ANKLE	7
3.1	Meta-Analysis	7
3.2	Systematic Review	7
3.3	Case Control.....	7
3.4	Case Series	7
3.5	Guidelines.....	10
3.6	Case Reports & Expert Opinions.....	10
4.	AMIC HIP	11
4.1	Systematic Review	11
4.2	Case Control.....	11
4.3	Case Series	11
4.4	Guidelines.....	11
4.5	Case Reports & Expert Opinions.....	12
5.	AMIC METATARSOPHALANAGEAL.....	12
5.1	Case Control.....	12
5.2	Case Series	12
5.3	Case Report.....	12
6.	AMIC UPPER EXTREMITY.....	13
6.1	Case Series	13
6.2	Case Report.....	13
7.	Hyaline-like cartilage with Chondro-Gide (Subset).....	14

1. AMIC KNEE Overall

1.1 RCT

1. Snow M, *et al.* (2023) A Randomized Trial of Autologous Chondrocyte Implantation Versus Alternative Forms of Surgical Cartilage Management in Patients With a Failed Primary Treatment for Chondral or Osteochondral Defects in the Knee. *Am J Sports Med.*51(2):367-78. <https://www.ncbi.nlm.nih.gov/pubmed/36661257>
2. de Girolamo L, *et al.* (2019) Autologous Matrix-Induced Chondrogenesis (AMIC) and AMIC Enhanced by Autologous Concentrated Bone Marrow Aspirate (BMAC) Allow for Stable Clinical and Functional Improvements at up to 9 Years Follow-Up: Results from a Randomized Controlled Study. *J Clin Med.*8(3). <https://www.ncbi.nlm.nih.gov/pubmed/30901900>
3. Fossum V, *et al.* (2019) Collagen-Covered Autologous Chondrocyte Implantation Versus Autologous Matrix-Induced Chondrogenesis: A Randomized Trial Comparing 2 Methods for Repair of Cartilage Defects of the Knee. *Orthopaedic Journal of Sports Medicine.*7(9):2325967119868212. <https://pubmed.ncbi.nlm.nih.gov/23730377/>
4. Volz M, *et al.* (2017) A randomized controlled trial demonstrating sustained benefit of Autologous Matrix-Induced Chondrogenesis over microfracture at five years. *Int Orthop.*41(4):797-804. <https://www.ncbi.nlm.nih.gov/pubmed/28108777>
5. Anders S, *et al.* (2013) A Randomized, Controlled Trial Comparing Autologous Matrix-Induced Chondrogenesis (AMIC(R)) to Microfracture: Analysis of 1- and 2-Year Follow-Up Data of 2 Centers. *Open Orthop J.*7:133-43. <https://www.ncbi.nlm.nih.gov/pubmed/23730377>

1.2 Meta-analysis

6. Migliorini F, *et al.* (2021) Surgical management of focal chondral defects of the knee: a Bayesian network meta-analysis. *J Orthop Surg Res.*16(1):543. <https://www.ncbi.nlm.nih.gov/pubmed/34470628>
7. Migliorini F, *et al.* (2022) Autologous matrix-induced chondrogenesis is effective for focal chondral defects of the knee. *Sci Rep.*12(1):9328. <https://www.ncbi.nlm.nih.gov/pubmed/35661147>
8. Steinwachs MR, *et al.* (2019) Systematic Review and Meta-Analysis of the Clinical Evidence on the Use of Autologous Matrix-Induced Chondrogenesis in the Knee. *Cartilage.*1947603519870846. <https://www.ncbi.nlm.nih.gov/pubmed/31508990>

1.3 Systematic Review

9. Migliorini F, *et al.* (2022) Matrix-induced autologous chondrocyte implantation (mACI) versus autologous matrix-induced chondrogenesis (AMIC) for chondral defects of the knee: a systematic review. *British Medical Bulletin.*ldac004. <https://doi.org/10.1093/bmb/ldac004>
10. Karpinski K, *et al.* (2021) Matrix-induced chondrogenesis is a valid and safe cartilage repair option for small- to medium-sized cartilage defects of the knee: a systematic review. *Knee Surg Sports Traumatol Arthrosc.* <https://www.ncbi.nlm.nih.gov/pubmed/33743030>
11. da Cunha CB, *et al.* (2020) Enhanced microfracture using acellular scaffolds improves results after treatment of symptomatic focal grade III/IV knee cartilage lesions but current clinical evidence does not allow unequivocal recommendation. *Knee Surg Sports Traumatol Arthrosc.* <https://www.ncbi.nlm.nih.gov/pubmed/31894366>
12. Kim J, *et al.* (2020) Clinical and Radiological Outcomes After Autologous Matrix-Induced Chondrogenesis Versus Microfracture of the Knee: A Systematic Review and Meta-

- analysis With a Minimum 2-Year Follow-up. *Orthopaedic Journal of Sports Medicine*.8(11):2325967120959280. <https://pubmed.ncbi.nlm.nih.gov/33209942/>
13. Gao L, et al. (2019) Autologous matrix-induced chondrogenesis: a systematic review of the clinical evidence. *The American journal of sports medicine*.47(1):222-31. <https://pubmed.ncbi.nlm.nih.gov/29161138/>
 14. Shaikh N, et al. (2017) Systematic review on the use of autologous matrix-induced chondrogenesis for the repair of articular cartilage defects in patients. *World J Orthop*.8(7):588-601. <https://www.ncbi.nlm.nih.gov/pubmed/28808630>
 15. Wylie JD, et al. (2016) Failures and Reoperations after Matrix-Assisted Cartilage Repair of the Knee: A Systematic Review. *Arthroscopy - Journal of Arthroscopic and Related Surgery*.32(2):386-92. <https://www.ncbi.nlm.nih.gov/pubmed/26422710>
 16. Bark S, et al. (2014) Enhanced microfracture techniques in cartilage knee surgery: Fact or fiction? *World J Orthop*.5(4):444-9. <https://www.ncbi.nlm.nih.gov/pubmed/25232520>
 17. Lee YHD, et al. (2014) Autologous Matrix-Induced Chondrogenesis in the Knee: A Review. *Cartilage*.5(3):145-53. <https://www.ncbi.nlm.nih.gov/pubmed/26069694>

1.4 Case Control

18. Migliorini F, *et al.*, (2021) Management of Patellar Chondral Defects with Autologous Matrix Induced Chondrogenesis (AMIC) Compared to Microfractures: A Four Years Follow-Up Clinical Trial. *Life (Basel)*. 11(2). <https://pubmed.ncbi.nlm.nih.gov/33668454/>
19. Migliorini F, *et al.*, (2021) Autologous Matrix-Induced Chondrogenesis (AMIC) and Microfractures for Focal Chondral Defects of the Knee: A Medium-Term Comparative Study. *Life (Basel)*. 11(3). <https://pubmed.ncbi.nlm.nih.gov/33669015/>
20. Schagemann J, *et al.* (2018) Mid-term outcome of arthroscopic AMIC for the treatment of articular cartilage defects in the knee joint is equivalent to mini-open procedures. *Arch Orthop Trauma Surg*. 138(6):819-25. <https://www.ncbi.nlm.nih.gov/pubmed/29356942>

1.5 Case series

21. Bakowski P, et al. (2022) Autologous Matrix-Induced Chondrogenesis (AMIC) for Focal Chondral Lesions of the Knee: A 2-Year Follow-Up of Clinical, Proprioceptive, and Isokinetic Evaluation. *J Funct Biomater*.13(4). <https://www.ncbi.nlm.nih.gov/pubmed/36547537>
22. Gille J, et al. (2022) Dynamic Postural Stability after Cartilage Repair in the Knee. *The Open Orthopaedics Journal* <https://openorthopaedicsjournal.com/VOLUME/16/ELOCATOR/e187432502206300/>
23. Gille J, et al. (2021) Autologous Matrix-Induced Chondrogenesis for Treatment of Focal Cartilage Defects in the Knee: A Follow-up Study. *Orthopaedic Journal of Sports Medicine*.9(2):2325967120981872. <https://doi.org/10.1177/2325967120981872>
24. Waltenspül M, et al. (2021) Autologous Matrix-Induced Chondrogenesis (AMIC) for Isolated Retropatellar Cartilage Lesions: Outcome after a Follow-Up of Minimum 2 Years. *CARTILAGE*:19476035211021908. <https://pubmed.ncbi.nlm.nih.gov/34116609/>
25. Kaiser N, et al. (2020) Stable clinical long term results after AMIC in the aligned knee. *Arch Orthop Trauma Surg*. <https://www.ncbi.nlm.nih.gov/pubmed/32794150>
26. Miyahira MKC, et al. (2020) Larger Chondral Lesions Treated with Collagen Membrane - Matrix-Induced Autologous Chondrogenesis - Show Larger Increase in Clinical Scores. *Rev Bras Ortop*. 56(3):333-9 <https://www.ncbi.nlm.nih.gov/pubmed/34239198>

27. Otašević T, et al. (2020) [Two-Year Results of Modified AMIC Technique for Treatment of Cartilage Defects of the Knee]. Acta chirurgiae orthopaedicae et traumatologiae Cechoslovaca.87(3):167-74. <https://pubmed.ncbi.nlm.nih.gov/32773017/>
28. Tradati D, et al. (2020) AMIC-Autologous Matrix-Induced Chondrogenesis Technique in Patellar Cartilage Defects Treatment: A Retrospective Study with a Mid-Term Follow-Up. J Clin Med.9(4). <https://www.ncbi.nlm.nih.gov/pubmed/32326092>
29. Gudas R, et al. (2019) Clinical outcome after treatment of single and multiple cartilage defects by autologous matrix-induced chondrogenesis. J Orthop Surg (Hong Kong).27(2):2309499019851011. <https://www.ncbi.nlm.nih.gov/pubmed/31146653>
30. Hede K, et al. (2019) Combined Bone Marrow Aspirate and Platelet-Rich Plasma for Cartilage Repair: Two-Year Clinical Results. Cartilage:1947603519876329. <https://www.ncbi.nlm.nih.gov/pubmed/31538811>
31. Massen FK, et al. (2019) One-Step Autologous Minced Cartilage Procedure for the Treatment of Knee Joint Chondral and Osteochondral Lesions: A Series of 27 Patients With 2-Year Follow-up. Orthopaedic Journal of Sports Medicine.7(6). <https://www.ncbi.nlm.nih.gov/pubmed/31223628>
32. Astur DC, et al. (2018) Surgical treatment of chondral knee defects using a collagen membrane - autologous matrix-induced chondrogenesis. Rev Bras Ortop.53(6):733-9. <https://www.ncbi.nlm.nih.gov/pubmed/30377608>
33. Bertho P, et al. (2018) Treatment of large deep osteochondritis lesions of the knee by autologous matrix-induced chondrogenesis (AMIC): Preliminary results in 13 patients. Orthop Traumatol Surg Res.104(5):695-700. <https://www.ncbi.nlm.nih.gov/pubmed/29935334>
34. Hoburg A, et al. (2018) Treatment of osteochondral defects with a combination of bone grafting and AMIC technique. Archives of Orthopaedic and Trauma Surgery.138(8):1117-26. <http://dx.doi.org/10.1007/s00402-018-2944-7>
35. Lahner M, et al. (2018) Cartilage Surgery in Overweight Patients: Clinical and MRI Results after the Autologous Matrix-Induced Chondrogenesis Procedure. Biomed Res Int.2018:6363245. <https://www.ncbi.nlm.nih.gov/pubmed/29854770>
36. Schiavone Panni A, et al. (2018) Good clinical results with autologous matrix-induced chondrogenesis (AMIC) technique in large knee chondral defects. Knee Surg Sports Traumatol Arthrosc.26(4):1130-6. <https://www.ncbi.nlm.nih.gov/pubmed/28324152>
37. Sadlik B, et al. (2017) All-Arthroscopic Autologous Matrix-Induced Chondrogenesis-Aided Repair of a Patellar Cartilage Defect Using Dry Arthroscopy and a Retraction System. J Knee Surg.30(9):925-9. <https://www.ncbi.nlm.nih.gov/pubmed/28282672>
38. Dhollander A, et al. (2014) Treatment of patellofemoral cartilage defects in the knee by autologous matrix-induced chondrogenesis (AMIC). Acta Orthop Belg.80(2):251-9. <https://www.ncbi.nlm.nih.gov/pubmed/25090800>
39. Gobbi A, et al. (2014) One-step surgery with multipotent stem cells for the treatment of large full-thickness chondral defects of the knee. Am J Sports Med.42(3):648-57. <https://www.ncbi.nlm.nih.gov/pubmed/24458240>
40. Gille J, et al. (2013) Outcome of Autologous Matrix Induced Chondrogenesis (AMIC) in cartilage knee surgery: Data of the AMIC Registry. Archives of Orthopaedic and Trauma Surgery.133(1):87-93. <https://pubmed.ncbi.nlm.nih.gov/23070222/>
41. Skowronski J, et al. (2013) Large cartilage lesions of the knee treated with bone marrow concentrate and collagen membrane--results. Ortop Traumatol Rehabil.15(1):69-76. <https://www.ncbi.nlm.nih.gov/pubmed/23510816>
42. Kusano T, et al. (2012) Treatment of isolated chondral and osteochondral defects in the knee by autologous matrix-induced chondrogenesis (AMIC). Knee Surg Sports Traumatol Arthrosc.20(10):2109-15. <https://www.ncbi.nlm.nih.gov/pubmed/22198419>

43. Dhollander AA, et al. (2011) Autologous matrix-induced chondrogenesis combined with platelet-rich plasma gel: technical description and a five pilot patients report. *Knee Surg Sports Traumatol Arthrosc.*19(4):536-42. <https://www.ncbi.nlm.nih.gov/pubmed/21153540>
44. Gobbi A, et al. (2011) One-Step Cartilage Repair with Bone Marrow Aspirate Concentrated Cells and Collagen Matrix in Full-Thickness Knee Cartilage Lesions: Results at 2-Year Follow-up. *Cartilage.*2(3):286-99. <https://www.ncbi.nlm.nih.gov/pubmed/26069587>
45. Schiavone Panni A, et al. (2011) The management of knee cartilage defects with modified amic technique: preliminary results. *Int J Immunopathol Pharmacol.*24(1 Suppl 2):149-52. <https://www.ncbi.nlm.nih.gov/pubmed/21669155>
46. Gille J, et al. (2010) Mid-term results of Autologous Matrix-Induced Chondrogenesis for treatment of focal cartilage defects in the knee. *Knee Surg Sports Traumatol Arthrosc.*18(11):1456-64. <https://www.ncbi.nlm.nih.gov/pubmed/20127072>
47. Pascarella A, et al. (2010) Treatment of articular cartilage lesions of the knee joint using a modified AMIC technique. *Knee Surg Sports Traumatol Arthrosc.*18(4):509-13. <https://www.ncbi.nlm.nih.gov/pubmed/20012016>

1.6 Guidelines

48. Niemeyer P, et al. (2023) Empfehlungen der AG Klinische Geweberegeneration zur Behandlung von Knorpelschäden am Kniegelenk. *Z Orthop Unfall.* 161(1):57-64. <https://pubmed.ncbi.nlm.nih.gov/35189656/>
49. Niemeyer P, et al. (2018) Stellenwert der matrixaugmentierten Knochenmarkstimulation in der Behandlung von Knorpelschäden des Kniegelenks: Konsensusempfehlungen der AG Klinische Geweberegeneration der DGOU. *Z Orthop Unfall.* 2018 Oct;156(5):513-532. <https://pubmed.ncbi.nlm.nih.gov/29913540/>

1.7 Case Reports & Expert Opinions

50. Felder JJ, et al. (2015) Advances and Current Concepts of Cartilage Repair in the Patellofemoral Joint. *Operative Techniques in Sports Medicine.*23(2):143-9. <https://www.sciencedirect.com/science/article/pii/S106018721500026X>
51. Sadlik B, et al. (2014) Dry arthroscopy with a retraction system for matrix-aided cartilage repair of patellar lesions. *Arthroscopy Techniques.*3(1):e141-e4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3986628/pdf/main.pdf>
52. de Girolamo L, et al. (2012) Modified autologous matrix-induced chondrogenesis (AMIC) for the treatment of a large osteochondral defect in a varus knee: a case report. *Knee Surg Sports Traumatol Arthrosc.*20(11):2287-90. <https://pubmed.ncbi.nlm.nih.gov/22842652/>
53. Piontek T, et al. (2012) All-arthroscopic AMIC procedure for repair of cartilage defects of the knee. *Knee Surg Sports Traumatol Arthrosc.*20(5):922-5. <https://www.ncbi.nlm.nih.gov/pubmed/21910000>
54. Schuttler S, et al. (2012) Periosteal Transplantation Combined with the Autologous Matrix-Induced Chondrogenesis (AMIC) Technique in Isolated Patellofemoral Osteoarthritis: A Case Report. *Cartilage.*3(2):194-8. <https://pubmed.ncbi.nlm.nih.gov/26069633/>
55. Benthien JP, et al. (2011) The treatment of chondral and osteochondral defects of the knee with autologous matrix-induced chondrogenesis (AMIC): method description and recent developments. *Knee Surg Sports Traumatol Arthrosc.*19(8):1316-9. <https://www.ncbi.nlm.nih.gov/pubmed/21234543>
56. Benthien JP, et al. (2010) Autologous matrix-induced chondrogenesis (AMIC). A one-step procedure for retropatellar articular resurfacing. *Acta Orthop Belg.*76(2):260-3. <https://www.ncbi.nlm.nih.gov/pubmed/20503954>

2. AMIC Patellofemoral (Subset from AMIC Knee)

2.1 Case Control

- (18.) Migliorini F, *et al.*, (2021) Management of Patellar Chondral Defects with Autologous Matrix Induced Chondrogenesis (AMIC) Compared to Microfractures: A Four Years Follow-Up Clinical Trial. *Life (Basel)*. 11(2):141.
<https://pubmed.ncbi.nlm.nih.gov/33668454/>

2.2 Case series

- (24.) Waltenspül M, *et al.* (2021) Autologous Matrix-Induced Chondrogenesis (AMIC) for Isolated Retropatellar Cartilage Lesions: Outcome after a Follow-Up of Minimum 2 Years. *CARTILAGE*:. Dec;13(1_suppl):1280S-1290S. <https://pubmed.ncbi.nlm.nih.gov/34116609/>
- (28.) Tradati D, *et al.* (2020) AMIC-Autologous Matrix-Induced Chondrogenesis Technique in Patellar Cartilage Defects Treatment: A Retrospective Study with a Mid-Term Follow-Up. *J Clin Med*.9(4). <https://www.ncbi.nlm.nih.gov/pubmed/32326092>
- (37.) Sadlik B, *et al.* (2017) All-Arthroscopic Autologous Matrix-Induced Chondrogenesis-Aided Repair of a Patellar Cartilage Defect Using Dry Arthroscopy and a Retraction System. *J Knee Surg*.30(9):925-9. <https://www.ncbi.nlm.nih.gov/pubmed/28282672>

2.3 Case Reports

- (51.) Sadlik B, *et al.* (2014) Dry arthroscopy with a retraction system for matrix-aided cartilage repair of patellar lesions. *Arthroscopy Techniques*.3(1):e141-e4.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3986628/pdf/main.pdf>
- (54.) Schuttler S, *et al.* (2012) Periosteal Transplantation Combined with the Autologous Matrix-Induced Chondrogenesis (AMIC) Technique in Isolated Patellofemoral Osteoarthritis: A Case Report. *Cartilage*.3(2):194-8. <https://pubmed.ncbi.nlm.nih.gov/26069633/>
- (56.) Benthien JP, *et al.* (2010) Autologous matrix-induced chondrogenesis (AMIC). A one-step procedure for retropatellar articular resurfacing. *Acta Orthop Belg*.76(2):260-3.
<https://www.ncbi.nlm.nih.gov/pubmed/20503954>

3. AMIC ANKLE

3.1 Meta-Analysis

57. Migliorini F, et al. (2022) Surgical Management of Focal Chondral Defects of the Talus: A Bayesian Network Meta-analysis. *Am J Sports Med.*50(10):2853-9. <https://www.ncbi.nlm.nih.gov/pubmed/34543085>
58. Walther M, et al., (2020) Is there clinical evidence to support autologous matrix-induced chondrogenesis (AMIC) for chondral defects in the talus? A systematic review and meta-analysis. *Foot and Ankle Surgery.* 2020. <https://pubmed.ncbi.nlm.nih.gov/32811744/>

3.2 Systematic Review

59. Migliorini F, et al. (2022) Autologous Matrix-Induced Chondrogenesis (AMIC) for Osteochondral Defects of the Talus: A Systematic Review. *Life.*12(11):1738. <https://www.mdpi.com/2075-1729/12/11/1738>
60. Migliorini, F., et al., (2021). "Matrix-induced autologous chondrocyte implantation versus autologous matrix-induced chondrogenesis for chondral defects of the talus: a systematic review." *Br Med Bull.* <https://www.ncbi.nlm.nih.gov/pubmed/33940611>
61. Jantzen C, et al., (2022). AMIC Procedure for Treatment of Osteochondral Lesions of Talus-A Systematic Review of the Current Literature. *J Foot Ankle Surg.* 2021. <https://www.ncbi.nlm.nih.gov/pubmed/35012836>

3.3 Case Control

62. Migliorini, F., et al., (2021). "Autologous Matrix Induced Chondrogenesis (AMIC) Compared to Microfractures for Chondral Defects of the Talar Shoulder: A Five-Year Follow-Up Prospective Cohort Study." *Life* 11(3): 244. <https://www.mdpi.com/2075-1729/11/3/244>
63. Ackermann, J., et al., (2021). "Autologous Matrix-Induced Chondrogenesis With Lateral Ligament Stabilization for Osteochondral Lesions of the Talus in Patients With Ankle Instability." *Orthopaedic Journal of Sports Medicine* 9(5): 23259671211007439. <https://doi.org/10.1177/23259671211007439>
64. Becher, C., et al., (2019). "Arthroscopic microfracture vs. arthroscopic autologous matrix-induced chondrogenesis for the treatment of articular cartilage defects of the talus." *Knee Surg Sports Traumatol Arthrosc* 27(9): 2731-2736. <https://www.ncbi.nlm.nih.gov/pubmed/30392029>
65. Richter, M., et al., (2019). "Comparison Matrix-Associated Stem Cell Transplantation (MAST) with Autologous Matrix Induced Chondrogenesis plus Peripheral Blood Concentrate (AMIC + PBC) in Chondral Lesions at the Ankle—A clinical matched-patient analysis." *Foot and Ankle Surgery* S1268-7731(19)30141-9. <https://www.ncbi.nlm.nih.gov/pubmed/31548148>

3.4 Case Series

66. Gottschalk O, et al. (2022) Evaluation of the new defined EFAS score (European foot and ankle society score) in relation to already established functional scores (FFI, MOXFQ) after cartilage reconstructive therapy (AMIC®) for osteochondral lesion of the talus. *Foot and Ankle Surgery.* <https://pubmed.ncbi.nlm.nih.gov/35144852/>
67. Gottschalk O, et al. (2022) Correlation between EFAS- and MOCART score and clinical outcome after AMIC((R))-procedure for osteochondral lesion of the talus. *Arch Orthop Trauma Surg.* <https://www.ncbi.nlm.nih.gov/pubmed/35597883>
68. Migliorini F, et al. (2022) Autologous matrix induced chondrogenesis (AMIC) as revision procedure for failed AMIC in recurrent symptomatic osteochondral defects of the talus. *Sci Rep.*12(1):16244. <https://www.ncbi.nlm.nih.gov/pubmed/36171261>

69. Richter M, *et al.* (2022) Autologous matrix induced chondrogenesis plus peripheral blood concentrate (AMIC+PBC) in chondral lesions at the ankle as part of a complex surgical approach - 5-year follow-up. *Foot Ankle Surg.*28(8):1321-6.
<https://www.ncbi.nlm.nih.gov/pubmed/35803836>
70. Casari FA, *et al.* (2021) The Role of Magnetic Resonance Imaging in Autologous Matrix-Induced Chondrogenesis for Osteochondral Lesions of the Talus: Analyzing MOCART 1 and 2.0. *Cartilage.*13(1_suppl):639s-45s. <https://pubmed.ncbi.nlm.nih.gov/32741215/>
71. Götze C, *et al.* (2021) AMIC for traumatic focal osteochondral defect of the talar shoulder: a 5 years follow-up prospective cohort study. *BMC Musculoskelet Disord.*22(1):638.
<https://pubmed.ncbi.nlm.nih.gov/34303367/>
72. Viehofer AF, *et al.* (2021) Smoking Is Associated with Anterior Ankle Impingement After Isolated Autologous Matrix-Induced Chondrogenesis for Osteochondral Lesions of the Talus. *Cartilage.*13(suppl_1):1366S – 72S.
<https://www.ncbi.nlm.nih.gov/pubmed/32940049>
73. Ahrend M-D, *et al.* (2020) Preexisting and treated concomitant ankle instability does not compromise patient-reported outcomes of solitary osteochondral lesions of the talus treated with matrix-induced bone marrow stimulation in the first postoperative year: data from the German Cartilage Registry (KnorpelRegister DGOU). *Knee Surgery, Sports Traumatology, Arthroscopy.* <https://pubmed.ncbi.nlm.nih.gov/32737525/>
74. Ayyaswamy B, *et al.* (2020) Early to medium term outcomes of osteochondral lesions of the talus treated by autologous matrix induced chondrogenesis (AMIC). *Foot Ankle Surg.* <https://www.ncbi.nlm.nih.gov/pubmed/32414700>
75. Gottschalk O, *et al.* (2020) Influence of the Medial Malleolus Osteotomy on the Clinical Outcome of M-BMS + I/III Collagen Scaffold in Medial Talar Osteochondral Lesion (German Cartilage Register/Knorpelregister DGOU). *Cartilage.*1947603520961169.
<https://www.ncbi.nlm.nih.gov/pubmed/33030049>
76. Götze C, *et al.* (2020) AMIC for Focal Osteochondral Defect of the Talar Shoulder. . *Life.*10:328. <https://pubmed.ncbi.nlm.nih.gov/33291383/>
77. Korner D, *et al.* (2020) Concomitant ankle instability has a negative impact on the quality of life in patients with osteochondral lesions of the talus: data from the German Cartilage Registry (KnorpelRegister DGOU). *Knee Surg Sports Traumatol Arthrosc.*28(10):3339-46.
<https://www.ncbi.nlm.nih.gov/pubmed/32240347>
78. D'Ambrosi R, *et al.* (2019) Return to Sport After Arthroscopic Autologous Matrix-Induced Chondrogenesis for Patients With Osteochondral Lesion of the Talus. *Clin J Sport Med.*29(6):470-5. <https://www.ncbi.nlm.nih.gov/pubmed/31688177>
79. Galla M, *et al.* (2019) Open reconstruction with autologous spongiosa grafts and matrix-induced chondrogenesis for osteochondral lesions of the talus can be performed without medial malleolar osteotomy. *Knee Surg Sports Traumatol Arthrosc.*27(9):2789-95.
<https://www.ncbi.nlm.nih.gov/pubmed/30019075>
80. Murphy EP, *et al.* (2019) Matrix-associated stem cell transplantation is successful in treating talar osteochondral lesions. *Knee Surg Sports Traumatol Arthrosc.*27(9):2737-43.
<https://www.ncbi.nlm.nih.gov/pubmed/30888452>
81. Richter M, *et al.* (2019) Matrix-associated stem cell transplantation (MAST) in chondral lesions at the ankle as part of a complex surgical approach- 5-year-follow-up in 100 patients. *Foot and Ankle Surgery.*25(3):264-71.
<https://www.ncbi.nlm.nih.gov/pubmed/29409182>
82. Sadlik B, *et al.* (2019) Surgical repair of osteochondral lesions of the talus using biologic inlay osteochondral reconstruction: Clinical outcomes after treatment using a medial malleolar osteotomy approach compared to an arthroscopically-assisted approach. *Foot and Ankle Surgery.*25(4):449-56. <https://www.ncbi.nlm.nih.gov/pubmed/30321967>

83. Weigelt L, *et al.* (2019) Autologous Matrix-Induced Chondrogenesis for Osteochondral Lesions of the Talus: A Clinical and Radiological 2- to 8-Year Follow-up Study. *Am J Sports Med.*47(7):1679-86. <https://www.ncbi.nlm.nih.gov/pubmed/31084491>
84. Baumfeld T, *et al.* (2018) All-arthroscopic AMIC((R)) (AT-AMIC) for the treatment of talar osteochondral defects: A short follow-up case series. *Foot (Edinb).*37:23-7. <https://www.ncbi.nlm.nih.gov/pubmed/30321855>
85. D'Ambrosi R, *et al.* (2018) The role of bone marrow edema on osteochondral lesions of the talus. *Foot Ankle Surg.*24(3):229-35. <https://www.ncbi.nlm.nih.gov/pubmed/29409254>
86. Usuelli FG, *et al.* (2018) All-arthroscopic AMIC((R)) (AT-AMIC((R))) technique with autologous bone graft for talar osteochondral defects: clinical and radiological results. *Knee Surg Sports Traumatol Arthrosc.*26(3):875-81. <https://www.ncbi.nlm.nih.gov/pubmed/27620469>
87. D'Ambrosi R, *et al.* (2017) Osteochondral Lesions of the Talus and Autologous Matrix-Induced Chondrogenesis: Is Age a Negative Predictor Outcome? *Arthroscopy.*33(2):428-35. <https://www.ncbi.nlm.nih.gov/pubmed/27956234>
88. D'Ambrosi R, *et al.* (2017) Combining Microfractures, Autologous Bone Graft, and Autologous Matrix-Induced Chondrogenesis for the Treatment of Juvenile Osteochondral Talar Lesions. *Foot Ankle Int.*38(5):485-95. <https://www.ncbi.nlm.nih.gov/pubmed/28076977>
89. Gottschalk O, *et al.* (2017) Functional Medium-Term Results After Autologous Matrix-Induced Chondrogenesis for Osteochondral Lesions of the Talus: A 5-Year Prospective Cohort Study. *J Foot Ankle Surg.*56(5):930-6. <https://www.ncbi.nlm.nih.gov/pubmed/28647522>
90. Usuelli FG, *et al.* (2017) The Impact of Weight on Arthroscopic Osteochondral Talar Reconstruction. *Foot Ankle Int.*38(6):612-20. <https://pubmed.ncbi.nlm.nih.gov/28379733/>
91. Kubosch EJ, *et al.* (2016) Clinical outcome and T2 assessment following autologous matrix-induced chondrogenesis in osteochondral lesions of the talus. *Int Orthop.*40(1):65-71. <https://www.ncbi.nlm.nih.gov/pubmed/26346373>
92. Wiewiorski M, *et al.* (2016) Sports Activity After Reconstruction of Osteochondral Lesions of the Talus With Autologous Spongiosa Grafts and Autologous Matrix-Induced Chondrogenesis. *Am J Sports Med.*44(10):2651-8. <https://www.ncbi.nlm.nih.gov/pubmed/27587743>
93. Valderrabano V, *et al.* (2014) Osteochondral lesions of the ankle joint in professional soccer players: treatment with autologous matrix-induced chondrogenesis. *Foot Ankle Spec.*7(6):522-8. <https://www.ncbi.nlm.nih.gov/pubmed/25037954>
94. Richter M, *et al.* (2013) Matrix-associated stem cell transplantation (MAST) in chondral defects of foot and ankle is effective. *Foot and Ankle Surgery.*19(2):84-90. <https://www.ncbi.nlm.nih.gov/pubmed/23548448>
95. Valderrabano V, *et al.* (2013) Reconstruction of osteochondral lesions of the talus with autologous spongiosa grafts and autologous matrix-induced chondrogenesis. *Am J Sports Med.*41(3):519-27. <https://www.ncbi.nlm.nih.gov/pubmed/23393079>
96. Wiewiorski M, *et al.* (2013) Delayed gadolinium-enhanced MRI of cartilage of the ankle joint: results after autologous matrix-induced chondrogenesis (AMIC)-aided reconstruction of osteochondral lesions of the talus. *Clinical radiology.*68(10):1031-8. <https://pubmed.ncbi.nlm.nih.gov/23809267/>

3.5 Guidelines

97. Aurich, M., *et al.*, (2017). "[Treatment of Osteochondral Lesions in the Ankle: A Guideline from the Group "Clinical Tissue Regeneration" of the German Society of Orthopaedics and Traumatology (DGOU)]." *Z Orthop Unfall* **155**(1): 92-99.
<https://www.ncbi.nlm.nih.gov/pubmed/27769090>

3.6 Case Reports & Expert Opinions

98. Kim BS, *et al.*, (2020) Operative Treatment for Osteochondral Lesions of the Talus: Bone Marrow Aspirate Concentrate and Matrix-induced Chondrogenesis. *J Korean Foot Ankle Soc.* 2020;24(2):61-8. <https://www.koreamed.org/SearchBasic.php?RID=2502911>
99. Hotfiel T, *et al.*, (2015) [Osteochondritis Dissecans of the Talus with Hindfoot Malalignment--Autologous Matrix-Induced Chondrogenesis with Lateral Calcaneal Distraction Osteotomy in an Internationally Successful Young Female Ski Racer]. *Sportverletz Sportschaden.* 2015;29(2):118-21.
<https://pubmed.ncbi.nlm.nih.gov/25211309/>
100. Piontek T, *et al.*, (2015) Arthroscopic Treatment of Chondral and Osteochondral Defects in the Ankle Using the Autologous Matrix-Induced Chondrogenesis Technique. *Arthrosc Tech.* 2015;4(5):e463-9. <https://www.ncbi.nlm.nih.gov/pubmed/26697305>
101. Usuelli FG, *et al.*, (2015) All-Arthroscopic Autologous Matrix-Induced Chondrogenesis for the Treatment of Osteochondral Lesions of the Talus. *Arthroscopy Techniques.* 2015;4(3):e255-e9. <https://www.ncbi.nlm.nih.gov/pubmed/26258040>
102. Syed F, *et al.*, (2014) Management of recurrent multiple osteochondral lesions of the talus (OCLT) in a young active patient. *J Clin Orthop Trauma.* 2014;5(2):99-102.
<https://www.ncbi.nlm.nih.gov/pubmed/25983479>
103. Walther M, *et al.*, (2013) Scaffold based reconstruction of focal full thickness talar cartilage defects. *Clinical Research on Foot & Ankle.* 2013;1(2):1-5.
<https://www.omicsonline.org/open-access/scaffold-based-reconstruction-of-focal-full-thickness-talar-cartilage-defects-2329-910X.1000115.pdf>
104. Wiewiorski M, *et al.*, (2013) Autologous matrix-induced chondrogenesis in osteochondral lesions of the talus. *Foot Ankle Clin.* 2013;18(1):151-8.
<https://www.ncbi.nlm.nih.gov/pubmed/23465954>
105. Miska M, *et al.*, (2012) Reconstruction of a large osteochondral lesion of the distal tibia with an iliac crest graft and autologous matrix-induced chondrogenesis (AMIC): a case report. *J Foot Ankle Surg.* 2012;51(5):680-3.
<https://www.ncbi.nlm.nih.gov/pubmed/22770901>
106. Wiewiorski M, *et al.*, (2012) Revision of failed osteochondral autologous transplantation procedure for chronic talus osteochondral lesion with iliac crest graft and autologous matrix-induced chondrogenesis: a case report. *Foot Ankle Spec.* 2012;5(2):115-20.
<https://www.ncbi.nlm.nih.gov/pubmed/22293389>
107. Wiewiorski M, *et al.*, (2011) Autologous matrix-induced chondrogenesis aided reconstruction of a large focal osteochondral lesion of the talus. *Arch Orthop Trauma Surg.* 2011;131(3):293-6. <https://www.ncbi.nlm.nih.gov/pubmed/20091174>

4. AMIC HIP

4.1 Systematic Review

108. Hotham, W. E., *et al.*, (2018). "A systematic review of surgical methods to restore articular cartilage in the hip." *Bone Joint Res* 7(5): 336-342.
<https://www.ncbi.nlm.nih.gov/pubmed/29922453>

4.2 Case Control

109. Sobti, A., *et al.*, (2020). "Autologous matrix-induced chondrogenesis and bone marrow aspirate concentrate compared with microfracture for arthroscopic treatment of femoroacetabular impingement and chondral lesions of the hip: bridging the osteoarthritis gap and facilitating enhanced recovery " *J Hip Preserv Surg*: 1-8.
<https://pubmed.ncbi.nlm.nih.gov/33948205/>
110. de Girolamo, L., *et al.*, (2018). "Acetabular Chondral Lesions Associated With Femoroacetabular Impingement Treated by Autologous Matrix-Induced Chondrogenesis or Microfracture: A Comparative Study at 8-Year Follow-Up." *c* 34(11): 3012-3023.
<https://www.ncbi.nlm.nih.gov/pubmed/30266548>
111. Goeminne, S., *et al.*, (2016). "Arthroscopic Treatment of Acetabular Cartilage Lesions in Cam-Type Hip Impingement with Membrane Induced Chondrogenesis versus Microfracturing." *Journal of Sports Science* 4: 9-17.
<http://www.davidpublisher.org/index.php/Home/Article/index?id=24729.html>
112. Fontana, A., *et al.*, (2015). "Sustained five-year benefit of autologous matrix-induced chondrogenesis for femoral acetabular impingement-induced chondral lesions compared with microfracture treatment." *Bone Joint J* 97-B(5): 628-635.
<https://www.ncbi.nlm.nih.gov/pubmed/25922456>
113. Mancini, D., *et al.*, (2014). "Five-year results of arthroscopic techniques for the treatment of acetabular chondral lesions in femoroacetabular impingement." *Int Orthop* 38(10): 2057-2064. <https://www.ncbi.nlm.nih.gov/pubmed/24951948>

4.3 Case Series

114. Steppacher, S. D., *et al.*, (2020). "Surgical hip dislocation with femoral osteotomy and bone grafting prevents head collapse in hips with advanced necrosis." *Hip Int* 30(4): 398-406. <https://pubmed.ncbi.nlm.nih.gov/31204506/>
115. Thorey, F., *et al.*, (2020). "Sustained benefit of autologous matrix-induced chondrogenesis for hip cartilage repair in a recreational athletic population." *Knee Surg Sports Traumatol Arthrosc* 28(7): 2309-2315. <https://www.ncbi.nlm.nih.gov/pubmed/31781800>
116. Leibold, C. S., *et al.*, (2019). "Femoral osteotomies for the treatment of avascular necrosis of the femoral head." *Oper Orthop Traumatol*.
<https://www.ncbi.nlm.nih.gov/pubmed/31784775>
117. Fontana A. (2016) Autologous Membrane Induced Chondrogenesis (AMIC) for the treatment of acetabular chondral defect. *Muscles, ligaments and tendons journal*.6(3):367-71. <https://pubmed.ncbi.nlm.nih.gov/28066742/>
118. Leunig, M., *et al.*, (2012). "Surgical technique: Second-generation bone marrow stimulation via surgical dislocation to treat hip cartilage lesions." *Clin Orthop Relat Res* 470(12): 3421-3431. <https://www.ncbi.nlm.nih.gov/pubmed/22773396>

4.4 Guidelines

119. Jannelli E, *et al.*, (2020) Il ruolo dell'artroscopia d'anca nel trattamento delle lesioni condrali acetabolari: stato dell'arte tra passato e futuro. *Giornale Italiano di Ortopedia e Traumatologia*. 2020;46:32-9. <https://www.doi.org/10.32050/0390-0134-197>

120. Fickert S, et al., (2017) [Biologic Reconstruction of Full Sized Cartilage Defects of the Hip: A Guideline from the DGOU Group "Clinical Tissue Regeneration" and the Hip Committee of the AGA]. *Z Orthop Unfall*. 2017;155(6):670-82. <https://www.ncbi.nlm.nih.gov/pubmed/28915523>
121. Jannelli E, et al., (2017) Arthroscopic treatment of chondral defects in the hip: AMIC, MACI, microfragmented adipose tissue transplantation (MATT) and other options. *SICOT J*. 2017;3:43. <https://www.ncbi.nlm.nih.gov/pubmed/28589877>

4.5 Case Reports & Expert Opinions

122. Fontana, A. (2012). "A Novel Technique for Treating Cartilage Defects in the Hip: A Fully Arthroscopic Approach to Using Autologous Matrix-Induced Chondrogenesis." *Arthroscopy Techniques* 1(1): e63-e68. <https://pubmed.ncbi.nlm.nih.gov/23766978/>

5. AMIC METATARSOPHALANAGEAL

5.1 Case Control

123. Richter, M., *et al.*, (2020). "Matrix-associated stem cell transplantation (MAST) versus autologous matrix induced chondrogenesis plus peripheral blood concentrate (AMIC+PBC) in chondral defects of the first metatarsophalangeal joint – A clinical cohort analysis." *Fuß & Sprunggelenk* 18(3): 217-226. <http://www.sciencedirect.com/science/article/pii/S1619998720300763>

5.2 Case Series

124. Rajeev A, et al. (2022) Freiberg's disease of lesser metatarsals treated with bone grafting and autologous matrix induced chondrogenesis (AMIC) membrane - A series of 10 cases. *Foot Ankle Surg*. <https://www.ncbi.nlm.nih.gov/pubmed/36572615>
125. Richter M, et al., (2022) Autologous matrix induced chondrogenesis plus peripheral blood concentrate (AMIC+PBC) in chondral defects of the first metatarsophalangeal joint - 5-year follow-up. *Foot and Ankle Surgery*. <https://pubmed.ncbi.nlm.nih.gov/35850950/>
126. Nurmukhametov MR, et al., (2021) The Use of Autologous Matrix-Induced Chondrogenesis as a Surgical Treatment for Patients with the First Metatarsophalangeal Joint Osteoarthritis: Immediate and Medium-Term Results. *Cartilage*. 2021:1354S-65S. <https://www.ncbi.nlm.nih.gov/pubmed/32917097>
127. Nurmukhametov M, et al., (2020) Use Of First Metatarsophalangeal Joint Chondroplasty With The Autologous Matrix-Induced Chondrogenesis Technique For The Treatment Of Patients With Hallux Rigidus: Immediate Results. *Rheumatology Science and Practice*. 2020;58(1):97-101. <https://rsp.ejpub.ru/rsp/article/view/2849/1935>
128. Richter M, et al., (2019) Mid-term (4–7 years) results of matrix-associated stem cell transplantation (MAST) in chondral defects of the first metatarsophalangeal joint. *Fuß & Sprunggelenk*. 2019;17(1):11-20. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8696342/>
129. Richter M, et al., (2017) Matrix-associated stem cell transplantation (MAST) in chondral defects of the 1st metatarsophalangeal joint is safe and effective-2-year-follow-up in 20 patients. *Foot and Ankle Surgery*. 2017;23(3):195-200. <https://www.ncbi.nlm.nih.gov/pubmed/28865590>

5.3 Case Report

130. Kriegelstein S, et al. (2012) Autologous matrix-induced chondrogenesis at the first metatarsophalangeal joint. *Fuss und Sprunggelenk*.10(3):191-5. <http://dx.doi.org/10.1016/j.fuspru.2012.06.009>

6. AMIC UPPER EXTREMITY

6.1 Case Series

131. Cuéllar, A., *et al.*, (2016). "The Use of All-Arthroscopic Autologous Matrix-Induced Chondrogenesis for the Management of Humeral and Glenoid Chondral Defects in the Shoulder." *Arthroscopy Techniques* **5**(2): e223-e227.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4912974/pdf/main.pdf>

6.2 Case Report

132. De Vega PLO, *et al.*, (2021) AMIC Technique for the Treatment of Chondral Injuries of the Hand and Wrist. *Revista Iberoamericana de Cirugia de la Mano*. 2021;49(2):E165-E75.
<https://www.thieme-connect.com/products/ejournals/html/10.1055/s-0041-1739163>
133. Buchmann, S., *et al.*, (2012). "Early clinical and structural results after autologous chondrocyte transplantation at the glenohumeral joint." *J Shoulder Elbow Surg* **21**(9): 1213-1221. <https://www.ncbi.nlm.nih.gov/pubmed/22047789>

7. Hyaline-like cartilage with Chondro-Gide (Subset)

- (98.) Kim BS, *et al.*, (2020). Operative Treatment for Osteochondral Lesions of the Talus: Bone Marrow Aspirate Concentrate and Matrix-induced Chondrogenesis. *J Korean Foot Ankle Soc.*: 24(2):61-8. <https://doi.org/10.14193/jkfas.2020.24.2.61>
134. Zhang C, *et al.*, (2016). One-Step Cartilage Repair Technique as a Next Generation of Cell Therapy for Cartilage Defects: Biological Characteristics, Preclinical Application, Surgical Techniques, and Clinical Developments. *Arthroscopy*: 32(7):1444-50. <https://www.ncbi.nlm.nih.gov/pubmed/27129375>
- (39.) Gobbi A, *et al.*, (2014). One-step surgery with multipotent stem cells for the treatment of large full-thickness chondral defects of the knee. *Am J Sports Med*: 42(3):648-57. <https://www.ncbi.nlm.nih.gov/pubmed/24458240>
- (96.) Wiewiorski M, *et al.*, (2013). Delayed gadolinium-enhanced MRI of cartilage of the ankle joint: results after autologous matrix-induced chondrogenesis (AMIC)-aided reconstruction of osteochondral lesions of the talus. *Clinical radiology*: 68(10):1031-8. <https://pubmed.ncbi.nlm.nih.gov/23809267/>
- (44.) Gobbi A, *et al.*, (2011). One-Step Cartilage Repair with Bone Marrow Aspirate Concentrated Cells and Collagen Matrix in Full-Thickness Knee Cartilage Lesions: Results at 2-Year Follow-up. *Cartilage*.2(3):286-99. <https://www.ncbi.nlm.nih.gov/pubmed/26069587>