Editorial Commentary: Hip Chondral Defect Treatment Requires Cells, Signal, and Scaffold: The Chef Is In the Kitchen

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Abstract: Hip cartilage defects are most common in the anterosuperior acetabulum and central femoral head, and, while chondrolabral delamination can be treated satisfactorily with repair, articular defects are variably treated, with overall heterogenous outcomes. Hip chondral lesions have consistently predicted arthroplasty following arthroscopy. Microfracture in isolation has waned in attractiveness and use in both the hip and knee, given similar results to debridement alone and the addition of intraoperative time and potential postoperative complications such as subchondral fracture and intralesional osteophyte formation. We recommend debridement for small-to-moderate (<6 cm^2) full-thickness chondral defects. However, the poor prognosis for grade III to IV defects highlights the need for novel treatment options. One such approach is "biologically enhanced" microfracture in conjunction with (autologous) platelet-rich plasma, micronized allograft extracellular cartilage matrix, and fibrin glue. This certainly satisfies our biologic mantra of "cells, signal, and scaffold," providing the influx of marrow-based stromal cells, platelet-rich plasma, and matrix-associated growth factors, and fibrin-sealed defect fill.

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Hip arthroscopy is rapidly advancing and increasingly commonly performed.[1,2] A growing body of mid- and long-term evidence supports that our ability to arthroscopically address labral tears and femoroacetabular impingement is both efficacious and durable.[3-5] However, to date, the treatment of hip chondral defects remains a topic of controversy, with less-predictable results. Hip cartilage defects are most common in the anterosuperior acetabulum and central femoral head, and, while chondrolabral delamination can be treated satisfactorily with repair, articular defects are treated variably, with overall heterogenous outcomes.[6-8] The clinical relevance of the treatment of these defects is highlighted by the fact that acetabular and femoral chondral lesions have consistently predicted arthroplasty following arthroscopy at multiple high-volume centers.[9-11] Certainly, there is room for improvement.

In terms of treatment algorithm, we generally recommend consideration of isolated debridement (abrasionplasty) for small- to moderate-sized (<6 cm^2) full-thickness chondral defects visualized at the time of hip arthroscopy, given controlled but retrospective data that suggest that debridement performs as well as microfracture, with similar clinical outcomes and reoperation/arthroplasty rates.[12] These findings also are supported by prospective data in the knee demonstrating no clear benefit of microfracture over debridement.[13] However, given the relatively grim prognostic value of grade III to IV defects visualized at the time of hip arthroscopy, new treatment modalities, including "biologically enhanced" microfracture, are of substantial research and clinical interest.

We commend Luo, Beck, Trammell, Kuolopoulos, Edge, Marquez-Lara, Al-Khafaji, Schallmo, and Stubbs

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The authors report the following potential conflicts of interest or sources of funding: J.C. reports paid consultant for Arthrex, CONMED, Linvatec, Ossur, and Smith & Nephew; and board member/committee appointments for the American Orthopaedic Society for Sports Medicine, Arthroscopy Association of North America, and International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine. Full ICMJE author disclosure forms are available for this article online, as supplementary material.

0749-8063/22754/$36.00

https://doi.org/10.1016/j.arthro.2022.06.007

on their article "Hip Arthroscopic Microfracture Augmented With Platelet-Rich Plasma-Infused Micronized Cartilage Allograft Significantly Improves Functional Outcomes."[14] The authors have provided the description of a new item in the biologic toolbox of the hip arthroscopist, consisting of microfracture in conjunction with (autologous) platelet-rich plasma, micronized allograft extracellular cartilage matrix, and fibrin glue. This certainly satisfies our biologic mantra of "cells, signal, and scaffold," providing the influx of marrow-based stromal cells, platelet-rich plasma and matrix-associated growth factors, and fibrin-sealed defect fill. Their paper suggests both safety and efficacy of this therapeutic option extending beyond 1-year minimum follow-up. An important item to note is the absence of a control group. In the future, we would be highly interested to see the value add provided by the presented biologic milieu as compared with traditional isolated debridement/microfracture approaches. Nevertheless, their findings highlight the evolving arthroscopic management and repair strategies of hip chondral defects.

While our ability to diagnose and treat labral tears has substantially expanded over the past 10 to 15 years, there remains a relative paucity of options, particularly those supported by high-level studies, when it comes to the treatment of focal hip chondral pathology. In the future, we envision arthroscopic treatment options that can predictably and durably reconstitute hyaline-like cartilage of the femoral head and acetabulum. Doubtless, this will be made possible by advances in biological therapeutic agents (cells, signal, scaffold) as well as associated instrumentation. We are glad to see that the "chefs are in the kitchen" and doing so with prospective focus on safety and efficacy. We look forward to seeing this and future solutions du jour presented, ideally, in a comparative manner, as we together build and develop the next generation of hip preservation and restoration therapeutics.

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