

CORRESPONDENCE

Response to Green et al.

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We would like to thank Green et al. [1] for contributing to the discussion regarding the validity of microfracture as a part of hip arthroscopy. Green et al. cited our previous publication, stating that patients with chondral defects do well without microfracture, concluding that the addition of microfracture is not justified based on the available data. We feel that their conclusion is, in part, due to a misunderstanding of our study [2]. In the following paragraphs, we hope to clarify our work which was cited by Green et al. Furthermore, while we acknowledge the suggestion that long-term safety data will be beneficial, we offer a brief review of some of the existing data supporting microfracture.

In our study titled “Microfracture in the hip: a matched-control study with average 2-year follow-up” [2], we were able to show the following: arthroscopic microfracture in patients with full-thickness chondral defects (Outerbridge IV) of the hip during treatment of labral tears results in favorable outcomes that are similar to the results of arthroscopic treatment of labral tears in patients without full thickness chondral damage; and patients with microfracture had statistically significant improvements between pre and post-operative patient-reported outcome (PRO) scores at all-time points (Table I).

Green et al. suggests that our comparison between a group of patients with Outerbridge IV who underwent microfracture to a group of patients with Outerbridge III or less who did not undergo microfracture introduces bias. They state that patients with and without microfracture had equivalent outcomes. This may mislead the reader into thinking that the patients were similar between these two groups and that performing a microfracture made no difference. To clarify our study’s methodology, these were not two similar groups treated with two different procedures. Rather, they comprised a study group with full thickness chondral damage and a control group without such chondral damage. All patients in the study group were treated with microfracture. The control group was used as a benchmark. The null hypothesis was that the study group would have inferior outcomes due to the presence of full thickness chondral defects. Using microfracture to treat these difficult problems, we

were able to disprove the null hypothesis. This finding supports the use of microfracture in patients with full-thickness cartilage defects (Outerbridge IV).

Other studies have also been supportive of microfracture. A systematic review done by MacDonald et al. showed that 11 out of 12 studies reported positive outcomes after hip arthroscopy with microfracture [3]. Domb et al. demonstrated that both worker’s compensation and non-worker’s compensation patients had statistically significant clinical improvement in patient-reported outcomes after receiving microfracture during arthroscopic hip surgery at minimum two-year follow-up. Lodhia et al. also reported significant improvement in patient reported outcomes at three-year follow-up for patients with full-thickness chondral defects who underwent microfracture (Outerbridge IV) [4]. Byrd et al. found that those with microfracture (58 patients) demonstrated an average 20-point improvement (preoperative score, 65; postoperative score, 85). Microfracture was indicated for Grade IV articular lesions with an intact subchondral plate and healthy surrounding articular edges [5]. McDonald et al. showed that a high percentage of professional athletes who underwent hip arthroscopy with microfracture were able to return to the same high level of competition after surgery [6].

As an aside, it should be noted that recently there has been a transition from the awl microfracture technique to a drilling technique. A study by Chen et al. using rabbit knees showed that the awl technique produces fractured and compacted bone around the holes, essentially sealing them off from viable bone marrow and potentially impeding repair. In contrast, drilling cleanly removed bone from the holes to provide access channels for marrow stroma. Second, drilling resulted in less osteocyte death, which may be because drilling causes less shearing and crushing of adjacent bone than the awl technique [7]. Additionally, the use of a flexible drill improves trajectory, depth and position of microfracture perforation. Overall, drilling may do a better job avoiding damage to the subchondral plate, while yielding the same benefits.

TABLE I. Mean preoperative and 2-year postoperative patient-reported outcome scores for microfracture and control groups [2]

Outcomes	Status	Microfracture			Control		
		Mean	SD	P values	Mean	SD	P values
mHHS	Preop	60.66	17.43	<0.001	59.71	14.48	<0.001
	2-years postop	77.91	17.82		81.34	17.70	
HOS-ADL	Preop	61.97	19.43	<0.001	59.77	19.06	<0.001
	2-years postop	77.57	21.48		81.55	21.22	
HOS-SSS	Preop	39.86	24.06	<0.001	37.49	23.97	<0.001
	2-years postop	63.40	28.47		68.08	29.65	
NAHS	Preop	55.85	19.42	<0.001	54.86	17.71	<0.001
	2-years postop	74.90	20.29		79.26	19.07	
VAS	Preop	5.84	2.19	<0.001	6.00	2.01	<0.001
	2-years postop	3.63	2.50		2.82	2.35	

In conclusion, we hope to have clarified the methodology of our matched controlled study on microfracture. Furthermore, a brief review of the literature yields more than 12 studies showing that hips with full-thickness chondral defects have significant improvement in outcomes after microfracture. The evidence above supports the use of microfracture, ideally using a drilling technique, for full thickness chondral defects encountered during hip arthroscopy in 2016. In the future, we as a field should continue to work toward higher levels of evidence for existing practices, and toward defining innovative new techniques for the treatment of cartilage defects in the hip.

CONFLICT OF INTEREST STATEMENT

None declared.

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