

# Editorial Commentary: When Performing Cartilage Restoration, Please Don't Put Down the Osteotomy Saw!



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**Abstract:** Cartilage restoration procedures appear to be increasing in popularity and are being performed more frequently for older patients according to a recent analysis of database data. Chondroplasty and microfracture are most commonly performed; however, chondrocyte transfer procedures, including osteochondral autologous transplantation and autologous chondrocyte implantation, are being performed more commonly. Relatively few corrective osteotomies are being performed in conjunction with these procedures; this is concerning because surgeons are either not looking for malalignment or not correcting it. Please, when performing joint preservation surgery, don't put down the saw!

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Joint preservation surgery, including cartilage restoration procedures, is increasing in popularity. Procedures including osteochondral allograft, autograft, and autologous chondrocyte implantation were found to increase more than 200% in a study titled “Management of Chondral Lesions of the Knee: Analysis of Trends and Short-Term Complications Using the National Surgical Quality Improvement Program Database” by Gowd, Cvetanovich, Liu, Christian, Cabarcas, Redondo, Verma, Yanke, and Cole.<sup>1</sup> The mean age of patients is also increasing—perhaps 50 is the new 40 after all. Chondroplasty and microfracture remain the workhorse procedures. If you evaluate only prospective randomized controlled trials, osteochondral autologous transplantation (OAT) has consistently been shown to preserve activity levels longer than microfracture surgery.<sup>2</sup> Microfracture and chondroplasty make up the majority of all “cartilage” procedures and are performed 20 times more commonly than restorative procedures. Over the past decade in the National Surgical Quality Improvement Program database, the workhorse procedures are not gaining steam. Instead, surgeons are

more commonly turning to advanced cartilage restoration procedures (OAT autograft or allograft and autologous chondrocyte implantation).

Large database studies are important ways to look at trends in practice or other quality metrics such as readmission after surgery.<sup>3</sup> With early (30-day) complications so low after cartilage procedures of the knee, the National Surgical Quality Improvement Program database does a poor job of comparing outcomes of these different procedures. The real questions are: How well do these procedures work? How often are they revised? What about progression to osteoarthritis? Does 1 type of repair or restorative technique allow for expedited or more reliable return to sport? All of these are shortcomings of “big data.”

So what are big data good for in this context? Trends in practice. The article by Gowd et al.<sup>1</sup> suggests that there is rapid adaption of cartilage restoration procedures ranging from increases in surgical volume between 200% and 600%. Big data also allow us to evaluate the proper treatment of concomitant pathology. Whenever I have a young, active patient with an isolated cartilage defect, the next step is to look at limb alignment using standing long-leg films (for femorotibial defects) or axial alignment for patellofemoral isolated cartilage lesions. Some degree of malalignment is detectable in at least 1 in 4 patients; literature on restorative procedures suggests that malalignment (either coronal or rotational) is present in nearly half (47%) of patients

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undergoing surgery for isolated cartilage defects.<sup>4</sup> What do big data say on the topic?

According to the National Surgical Quality Improvement Program, realignment procedures are rarely performed in the setting of an isolated cartilage defect. They are more likely to be performed in conjunction with restorative procedures such as autologous chondrocyte implantation (22%) or OAT (0.7% to 9%); however, these numbers do not approach malalignment rates consistent with those cited in the literature. This is another shortcoming of big data because the same patient could have undergone staged surgery (osteotomy first, followed by a restorative cartilage procedure), but this is difficult to evaluate, given restrictions on the dataset.

Although we appear to be pursuing more advanced cartilage restoration techniques, we cannot forget the basic principles inherent to the data that support these procedures: optimizing the biomechanical environment for joint preservation surgery. Patients for whom reparative or restorative cartilage surgeries have failed often have significant limb malalignment.<sup>5</sup> Addressing ligamentous deficiencies or pathologic malalignment is a foundation of cartilage restoration surgery. When

performing cartilage restoration, please, don't put down the saw!

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