**What is this research about?**

Cartilage is the flexible connective tissue that separates bones in joints, providing a nearly frictionless surface. Accidents and aging can damage the stability of the knee, which results in increased friction and further breakdown of the cartilage. Defects in the cartilage surface can be difficult to treat since cartilage has a poor capacity for self-repair and regeneration. In a treatment method called microfracture surgery, an orthopedic surgeon drills small holes into the bone marrow beneath the cartilage, which encourages stem cells to fill the gap in cartilage. Stem cells have the ability to become any cell in the body, including chondroblasts (cartilage cells). Microfracture surgery is easy to perform, inexpensive, and eliminates the need for a second surgery. Unfortunately, with microfracture the original smooth, articular cartilage is replaced by denser and tougher fibrocartilage scar tissue. Since the number of stem cells in bone marrow decreases with age, microfracture surgery may also be less effective in older adults. Little research has been done to compare how microfracture is performed by different surgeons.

**What did the researchers do?**

The researchers reviewed studies on microfracture knee surgery before 2011 to identify all factors that were associated with better surgery results. Patient factors included age, body-mass index, location of injury, and pre-surgery physical activity level. Surgery factors included the surgical tools used, post-surgery exercise limitations, and whether or not the calcified (hardened) cartilage was removed. On the basis of these factors, a survey was created and sent by email to all members of the Canadian Orthopedic Association (COA), which asked how they decided which patients should have microfracture surgery, and how they performed this surgery.

**What you need to know:**

Canadian orthopedic surgeons varied greatly in terms of how patients were selected for microfracture surgery of the knee, which surgical techniques were used, and what post-surgery programs were prescribed. Sport medicine surgeons were more likely than non-sports medicine surgeons to use practices supported by current evidence.
What did the researchers find?
Of 299 completed surveys, 131 surgeons reported regularly performing microfracture of the knee. 41% of surgeons had no upper age limit, while 34% only performed surgery on patients less than 50 years of age. 88% of surgeons had no upper body-mass index limit. Although the technique is known to improve results of the surgery, 31% of surgeons did not remove the calcified cartilage before creating holes in the bone. After surgery, only 11% used a continuous passive motion (CPM) physical therapy machine, and 39% did not limit weight-bearing activities such as standing and walking. Sports medicine surgeons were more likely to follow recommended surgical practices.

How can you use this research?
Orthopedic surgeons can use this research to better their understanding of the factors relating to patient selection, surgical technique, and post-surgery care that influence the success of microfracture surgery. Standardization is needed.

Medical scientists can further this research by identifying which patients are best suited for microfracture surgery, as well as which surgical techniques and post-surgery care programs lead to the best results. This information can be used to make best-practice recommendations to surgeons.

Keywords:
Knee, cartilage, microfracture surgery, chondral defect, chondral injury, orthopedics

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