Lee GW, Son JH, et al. Is platelet-rich plasma able to enhance the results of arthroscopic microfracture in early osteoarthritis and cartilage lesion over 40 years of age? Eur J Orthop Surg Traumatol. 2013 Jul;23(5):581-7.

Design: Randomized clinical trial

Study question: In patients between the ages of 40 and 50 who are undergoing microfracture for chondral defects of the knee, does the addition of platelet-rich plasma (PRP) at the time of the procedure improve clinical results or improve the quality of the cartilage in the knee at followup?

Population/sample size/setting:

- 49 patients (29 men, 20 women, mean age 46) undergoing microfracture for early knee osteoarthritis at a university-affiliated hospital in Busan, Korea
- Eligibility criteria were age between 40 and 50, with degenerative changes (Kellgren-Lawrence grades I, II, or III) and cartilage defects of less than 4 cm^2 of grade III or IV according to the Outerbridge classification , and willing to be followed up for 2 years
- Exclusion criteria were concurrent ligamentous injury such as ACL or PCL, meniscus degeneration and/or tear, traumatic meniscal injury, severe obesity, current infection, advanced OA, (Kellgren-Lawrence grade IV), immunosuppression, or autoimmune disease

Interventions:

- All patients had arthroscopic microfracture which removed unstable cartilage using a shaver and a hand-held angled curette
- Full weight-bearing was introduced at about 7 or 8 weeks following 6 weeks of no weight-bearing, and return to regular activities was generally achieved 6 to 8 months postoperatively
- Randomization was to either PRP (n=24) or no PRP (n=25)
    - All patients had venipuncture with 54 ml of venous blood withdrawn before surgery; the PRP group blood was spun to 6 ml PRP using bags containing sodium citrate but no other activators before injection

Outcomes:

- VAS and International Knee Documentation Committee (IKDC) were recorded at 1 month, 6 months, 1 year, and 2 years after microfracture
    - In the PRP group, the mean preoperative VAS was 8.1, with mean VAS of 3.2 and 2.3 at 1 and 2 years postoperatively
    - In the control group, the mean preoperative VAS was 8.5, with means of 3.6 and 3.4 at 1 and 2 years postoperatively

    - In the PRP group, the mean preoperative IKDC was 49.5, with means of and 76.3 and 87.7 at 1 and 2 years postoperatively
    - In the control group, the mean preoperative IKDC was 46.7, with means of and 71.5 and 73.2 at 1 and 2 years postoperatively
- At final followup, 18 PRP patients reported complete pain relief; 5 were unchanged, and 1 was worse
    - In the control group at final followup, 15 had complete pain relief, 5 were unchanged, and 5 were worse
- Sports activity levels prior to surgery and at 2 years were recorded
    - This ability improved in 84.2% of PRP patients and in 68.5% of control patients
- Repeat arthroscopy was done by an independent examiner in 10 randomly selected patients in each group between 4 and 6 months postoperatively, usually at about 5 months
    - In the PRP patients, the cartilage defects were covered with near-similar tissue to the surrounding normal cartilage on macroscopic inspection, was at about 80% level of normal residual cartilage, and was firm or hard when palpated by a probe
    - In the control patients, the cartilage defects were covered with less firm tissue compared to the surrounding normal cartilage on macroscopic inspection, was at about 50% level of normal residual cartilage, and was fragile when palpated by a probe

Authors' conclusions:

- The effectiveness of microfracture is generally not satisfactory in patients over 40
- The addition of intra-articular PRP at the time of microfracture improves the quality and growth level of the cartilage in the defective areas of the knee compared to when no PRP is administered
- One limitation of the study is that a microscopic study of the postoperative cartilage was not done at the time of the second arthroscopy
- If PRP is shown to be effective in this setting, the use of microfracture could be extended to patients as old as 50

Comments:

- Although improvements within groups were reported with unpaired t-tests for scores before and after the procedure, there were no independent sample t-tests to compare groups directly
- There appears to be a misprint either in the text or in Figure 2, where the level of cartilage in the control knees is reported; in the text, the cartilage is at 50% of the normal residual level, and in Figure 2 it is at 30%

    - The corresponding author (Kim) has been sent an e-mail requesting clarification of this question, since the journal does not appear to have published any corrections at this time point
    - The same author has also been asked for the results of independent sample t-tests and for variability in the 80% and 50% levels of the cartilage on the second arthroscopy
- It does appear that the patients were adequately blinded, and the second arthroscopy by an "independent" examiner is likely to have been blinded
    - The hardness or fragility of the cartilage at followup would be vulnerable to bias and its variability in the examined patients would be useful to know
- At this time, the study must be rated as inadequate as evidence, but this could change if the author is able to provide clarification regarding the missing information
    - The corresponding author has indicated that no statistical comparison of groups has been done and that the variation in cartilage thickness has not been measured
    - The correct figure for the thickness of the cartilage in the control group was 30% level of normal residual cartilage; the author is contacting the journal to correct the record

Assessment: Inadequate for evidence of the effectiveness of PRP in the setting of microfracture in patients with knee OA over the age of 40 pending the receipt of information from the corresponding author