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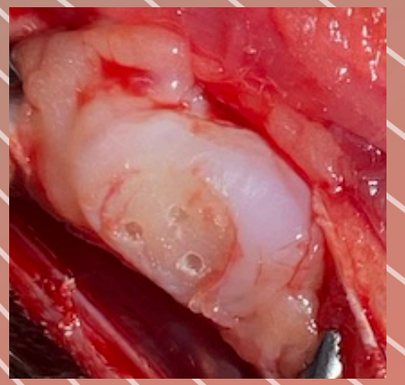

One-Step Treatment for Cartilage Lesions in the Patella: Randomized Preclinical Study in New Zealand Rabbits

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Aim

To compare five different one-step treatments for a 4 mm diameter patella full-thickness cartilage lesion in an animal model (New Zealand rabbits)

Aim

- Find a treatment that could be:

- **Low cost:** affordable in most countries
- **One-step:** one surgery, more likely to complete treatment
- **Good:** a method can produce hyaline-like cartilage
  - Better than natural history or micro/nanofractures

Methods

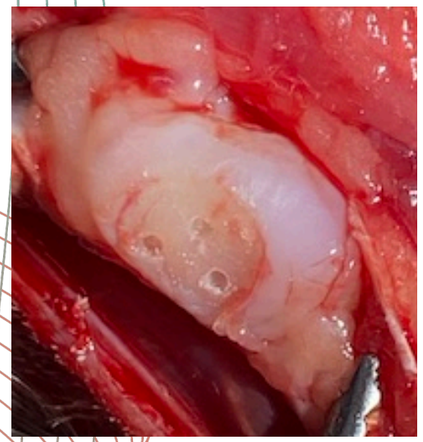
A 4-mm full-thickness cartilage lesion was created in the patella of the rabbits through an open approach (CORR, J&J)

Methods

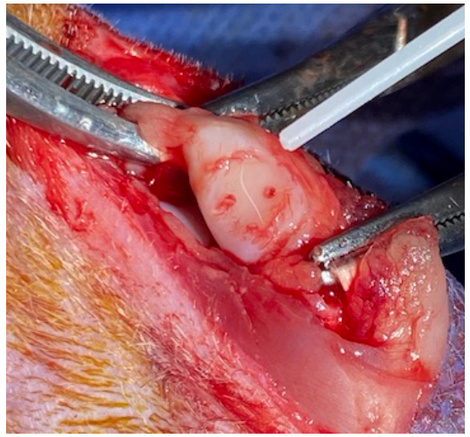
- Every knee was individually randomized
- Rabbits were fed and taken care at the university's vivarium
- After 20-weeks of follow-up the patellae were extracted and the cartilage was studied microscopically
- The outcomes studied were the percentage of filling for the cartilage defect and the 14 quality items from ICRS II histological score (International Cartilage Repair Society)
- IRB for animal studies approved the study

Methods

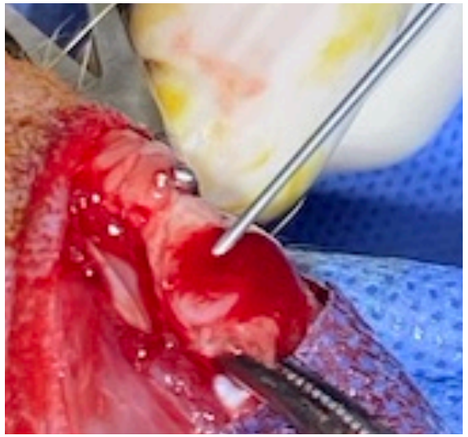
Nanofractures (1 mm)



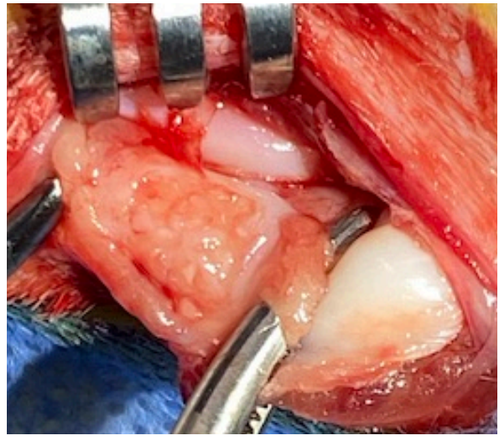
Nanofractures plus fibrin glue



Bone marrow aspirate



Minced autologous cartilage



Results

- There were no statistically significant differences when comparing the five groups **together**
- However, the worst quality in cartilage repair was observed in the control group and the nanofractures group
- Statistically significant differences were found in direct comparisons for some variables

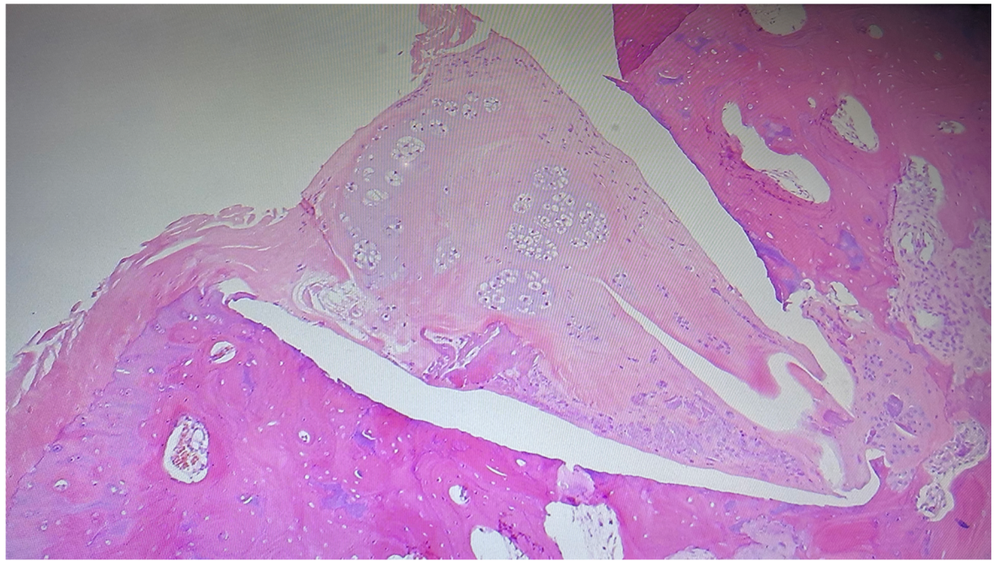
Results

Nanofractures head-to-head with other treatments

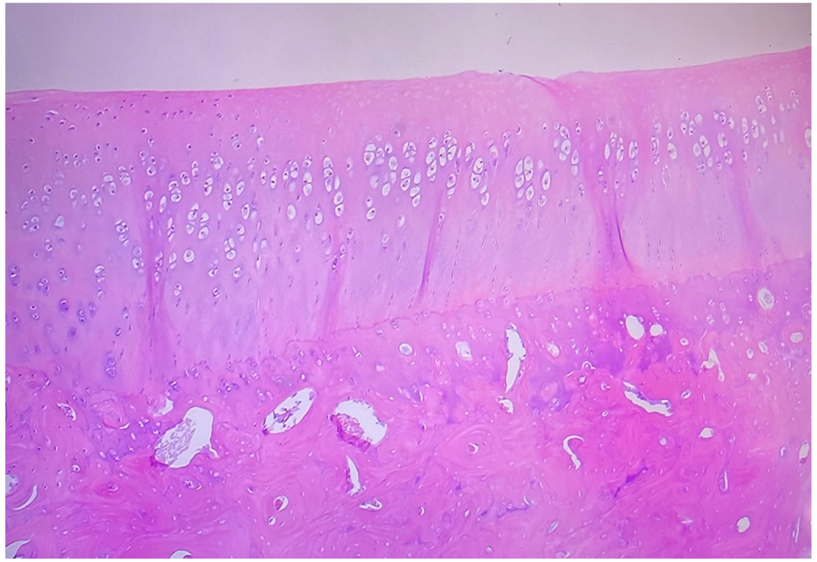
- **Nanofractures "plus"** was better in surface architecture, subchondral bone and mid/deep zone assessment
- **Bone marrow aspirate** was superior in basal integration, chondrocyte clustering and mid/deep zone assessment
- **Minced autologous cartilage** was superior in subchondral bone quality

Results

Nanofractures



Bone marrow aspirate



Conclusion

- One-step cartilage lesion treatment for the patella with nanofractures plus fibrin glue, bone marrow aspirate and autologous minced cartilage, were **superior** to traditional nanofractures
- These treatments should be studied further in pre-clinical and clinical studies as they could be low cost, effective and easy ways of treating these types of injuries in a single surgery

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