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Short Communication

Basis for the Use of AMIC Technique - Microfractures Associated with Collagen Membrane

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Treatment of chondral injuries is difficult due to this tissue characteristics. Its healing potential is limited because of the presence of a complex matrix, small number of cells and the absence of vessels, nerves and lymphatic. Thus, a chondral injury tends not to heal and evolve to osteoarthritis with time.

When conservative treatment is unsuccessful, the surgical options available depends on the patient's age, presence of associated injuries, axis deviation, weight (assessed by Body Mass Index - BMI) and mainly the size of the injury.

Injuries below 2 cm2 tend to be treated with microfractures [1-3]. Injuries larger than 2 cm2 are more difficult to decide. Microfractures in these injuries tends to have a temporary effect, with results deterioration after two years of surgery [3,4]. Osteochondral autologous transplantation (OATs) could be used, but with the limitation of size and aggression of the donor area [3]. Other options would be fresh osteochondral allograft transplantation, autologous chondrocyte implantation (ACI) or autologous matrix-assisted chondrogenesis (AMIC) [3].

Fresh osteochondral allograft transplantation would be more suitable for very large injuries (larger than 10 cm2), but it is difficult to obtain in some regions [3]. Autologous chondrocyte transplantation is widely used in the United States, however it has a high cost and requires two surgeries: one for the cartilage collect for chondrocyte culture and another for cells implanting, usually using a scaffold [1].

The AMIC technique is an evolution of microfractures, with lower cost than ACI. It is a single-time procedure that is easy to perform, without the need for a donor area aggression. It consists of debridement of the injury, which must be limited by regular chondral tissue walls. Then microfractures are performed. After that, the collagen membrane is placed perfectly over the injury, sutured and glued (with fibrin glue) or simply glued. This last step allows the bleeding clot from microfractures to remain stable. The technique could be performed in an open way or by arthroscopy with the same results [8]. The functional result is good and long-lasting, with articles showing this effect up to 7 years of follow-up [1-8].

The use of a scaffold (collagen membrane) together with microfractures, can provide mechanical stability for the repair tissue, serve for stem cells migration and stimulate their differentiation into chondrocytes [2].

The AMIC technique would be better for patients with grades III or IV chondral injuries (from International Cartilage Repair Society classification), larger than 2 cm2, without inflammatory disease, with BMI below 35 and without osteoarthritis [1-8].

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