Articular cartilage defects in weight-bearing joints, due to trauma or other conditions, often fail to heal on their own and may be associated with pain, loss of function, disability, and long-term complications such as osteoarthritis. Chondral lesions may naturally occur in osteochondritis dissecans (OCD). Improved diagnostic procedures like magnetic resonance imaging (MRI) and arthroscopy have demonstrated that chondral lesions are quite frequent, even in persons without symptoms: at least 5% of cases of traumatic haemarthrosis [1] are associated with chondral defects, confirmed in 63% of arthroscopies [2]. Some traditional surgical procedures, such as endoarticular washing, shaving and debridement, provide relief from pain, locking and swelling, while there are others, such as Pridie's subchondral perforation and Steadman's microfracture, which can generate cartilage but only of the fibrous type, having biomechanical properties that are inferior to the original hyaline cartilage. Even restoration with osteochondral grafts has its limitations, which often depend on the size and depth of the defects, the dead space between circular grafts and integration of the donor and recipient hyaline cartilage [3].
With the development of autologous chondrocyte implantation (ACI), research by Smith [4], Aston and Bentley [5] and Brittberg et al. [6] has led to a new biotechnological treatment of cartilage defects. The clinical outcome, the histological evidence and, more recently, the results of randomised controlled studies have demonstrated better recovery of the cartilage defects in patients treated with ACI-based techniques, rather than by mosaicplasty [7] and microfracture [8]. Over the last few years, great strides have been made in research on ACI applications and ACI-based surgery, and now a second generation of autologous chondrocyte implantation called MACI (matrix-induced autologous chondrocyte implantation; Verigen) has become available. This technique is based upon the growth of chondrocytes directly on a collagen I-III matrix, and the cells can perfectly differentiate in the matrix three-dimensional environment [7, 9]. At a second surgical procedure, the chondrocyte-loaded matrix’s fixed to the defect with fibrin glue, so much so that it is no longer necessary to saturate the periosteal flap to the cartilage, as was the case in the original technique. With the MACI procedure, we have treated patients suffering from chondral lesions, which were sometimes associated with other pathological conditions of the joint. We followed their clinical course by using a standard evaluation protocol. This report summarizes the preliminary results obtained from the treatment of 36 knees that had a follow-up of at least of 6 months.

Materials and methods

In accordance with International Cartilage Repair Society (ICRS) guidelines, 56 consecutive patients with chondral knee defects were selected from September 2000 and, after informed consent was obtained, we treated the cartilage defects with MACI. Nineteen of 56 patients had less than 6 months of follow-up and their data are not reported here. Two patients did not adhere to the scheduled visits and so were considered as drop-outs. Thirty-five of 56 patients (23 male, 12 female) adhered to the scheduled visits and consequently were included in this analysis: all the data reported here refer to these 35 patients, aged 33.1±7.9 years (range, 18–51 years). One of them who had bilateral osteochondritis dissecans had both his knees treated. The mean follow-up of these patients was 22 months (range, 6–39 months). Patients were treated according to the ethical standards outlined in the Helsinki Declaration.

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