

Osteochondral grafting for failed knee osteochondritis dissecans repairs



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ABSTRACT

Background: Revision of failed surgical treatments of osteochondritis dissecans (OCD) lesions remains a challenge without an obvious solution. The aim of this study was to evaluate seven consecutive patients undergoing osteochondral grafting of a failed OCD repair.

Methods: The mean time from surgery to the latest evaluation was 7.0 years. IKDC, WOMAC, Tegner, and MRI studies were collected both preoperatively and during follow-up. Evaluation of the graft was assessed using the magnetic resonance observation of cartilage repair tissue (MOCART) grading system.

Results: Over the course of the study period, five patients required additional surgery with a study median of one additional surgery (range, zero to 3). At most recent follow-up, there was significant improvement from preoperative values in median IKDC ($p = 0.004$), WOMAC ($p = 0.030$), and Tegner ($p = 0.012$). Complete cartilage fill and adjacent tissue integration of the paste graft were observed by MRI evaluation in five of the seven (71.4%) patients. Definitive correlation between clinical outcomes and MRI scores was not observed.

Conclusions: This study shows promising results of osteochondral grafting as a viable option for the revision of failed OCD lesion repairs; however, more patients are needed to fully support its efficacy in these challenging failed revision cases.

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1. Introduction

Osteochondritis dissecans (OCD) of the knee is a debilitating disorder primarily affecting adolescents and young adults at a rate between 15 and 30 per 100,000 [1,2]. OCD is characterized by the separation of an osteochondral fragment from its surrounding bone and cartilage tissues. Fixation of the dislocated fragment is often seen as an ideal surgical solution, with the potential to recreate the natural joint surface and biomechanical properties. However, human histological studies have shown fibrous repair tissue in the subchondral cleft [3–7]. Furthermore, substantial damage to articular cartilage can occur through the use of surgical instrumentation and fixation devices. For OCD lesions that have failed to respond to previous surgical interventions, the goal should be to: i) re-establish the compromised subchondral bone; ii) restore marrow access in an injured or ischemic area; and iii) restore a protective cartilaginous cover with good integration at the border zone. Studies of the osteochondral grafting technique in rabbits have demonstrated the technique's ability to create a synergistic interaction between pluripotential cells, cartilage matrix, and viable chondrocytes [8] yielding well-integrated cartilage tissue with near-complete rebuilding of the subchondral bone [9]. Previous clinical studies by Stone et al. have shown the efficacy of articular cartilage paste

grafting to accomplish these goals in Outerbridge Grades III and IV articular cartilage lesions of varying sizes and aetiologies [10,11]. To our knowledge, there has been no report specifically on the treatment of failed surgical repairs of OCD lesions using this osteochondral grafting technique. This report documents the first group of patients treated in order to expose surgeons to a new treatment option for these difficult conditions. The purpose of this study was to evaluate the effect of osteochondral grafting on previously failed surgical repair of OCD lesions with a hypothesis of resultant satisfactory healing and clinical outcomes.

2. Patients and methods

A total of seven patients, six males and one female, diagnosed with failed OCD repairs of the knee were treated by the senior author using the osteochondral graft technique between December 1997 and September 2006. Prior to surgery, patients were consented to a follow-up protocol approved by an independent Institutional Review Board. Study evaluations included the International Knee Documentation Committee Subjective Knee Evaluation Form (IKDC) [12], Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) [13], and Tegner activity index [14]. The primary study inclusion criteria included: previous diagnosis of a femoral condyle OCD lesion confirmed by independent musculoskeletal radiologist and previous failed surgical treatment of the OCD lesion. Failure was clinically defined as: clinical presentation of palpable pain and moderate to

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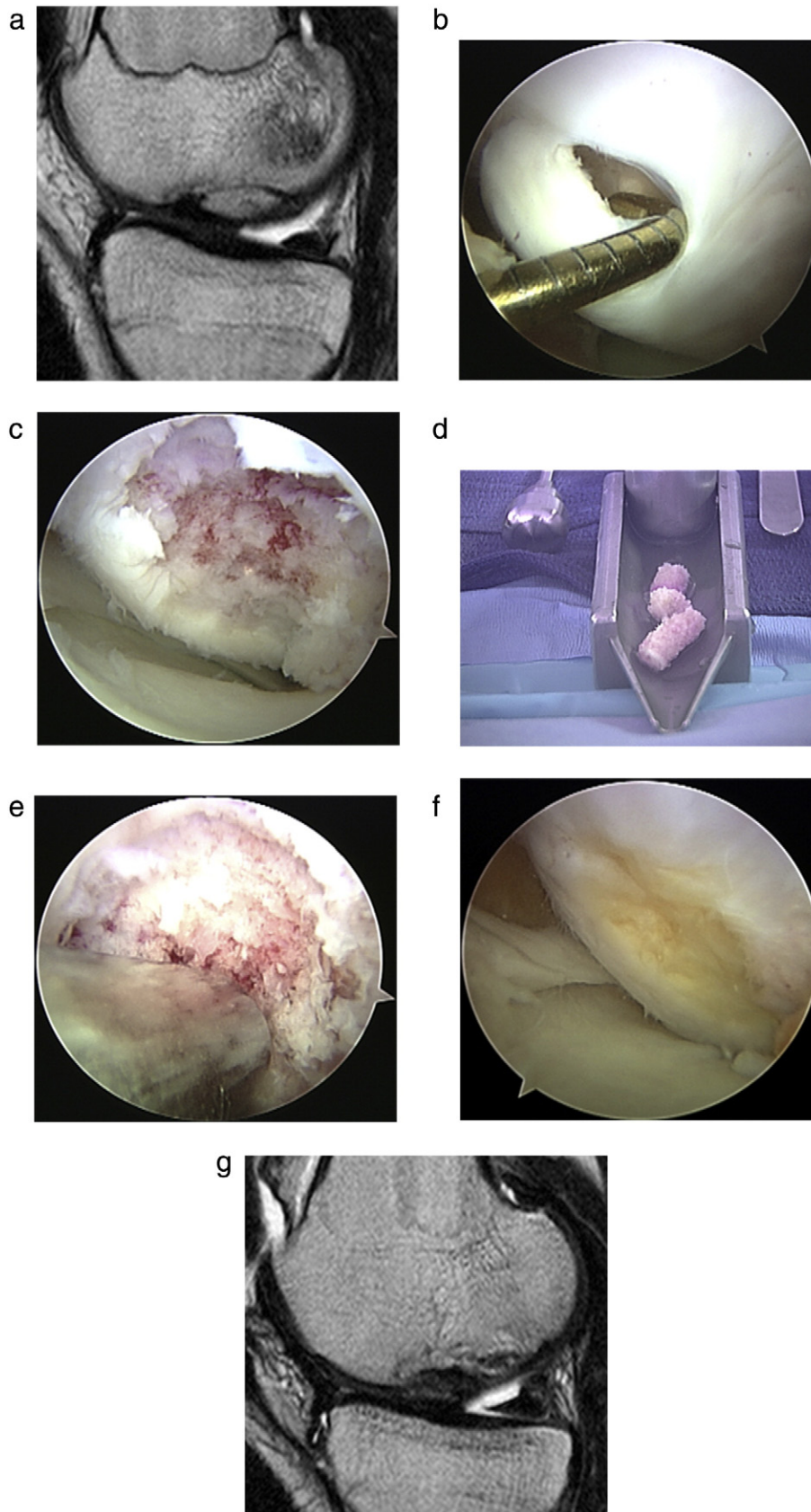


Fig. 1. a: Patient 7 was a 16-year-old student at the time of initial osteochondral grafting who had failed to respond to a fixation of an unstable OCD lesion on the MFC. Preoperative sagittal MRI image showing an unstable fragment. b: Arthroscopic image of the unstable fibrous fragment. c: Debridement of defect. d: Harvested osteochondral plugs in graft impactor. e: Paste graft impacted into morselized defect. f: Defect healing 1 year post-operatively. g: 4 year postoperative sagittal MRI image showing defect healing.

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