

Chondral Flaps in Patients with Femoral Acetabular Impingement Cam Type are not Suitable for Reattachment and Preservation

Francisco Rodriguez Fontan,
Jorge Chahla, MD, PhD, UNITED STATES
Abigail Richards, Undergraduate, UNITED STATES
Michelle Sauque, Research assistant, UNITED STATES
Karin Payne, PhD, UNITED STATES
Cecilia Pascual-Garrido, MD, UNITED STATES

Department of Orthopedics, University of Colorado Denver
Aurora, Colorado, UNITED STATES

Summary:

According to our results the chondral flap remains viable, but with poor quality tissue. The proposed chondral flap reattachment is not a suitable option. Further studies are required to judge the clinical benefit of chondral flap repair.

Abstract:

Francisco Rodriguez Fontan, MD1; Jorge Chahla, MD2; Abigail Richards1; Michelle Sauque3; Karin Payne PhD3; Cecilia Pascual-Garrido, MD1

1 Sports Medicine, Hip Preservation, 3 Regenerative Orthopedics Laboratory, Orthopedics Department, University of Colorado Denver, Aurora, CO;

2 Steadman Philippon Research Institute, Vail, CO

INTRODUCTION: Chondrolabral damage is commonly observed in patients with FAI (femoroacetabular impingement) Cam type. Acetabular chondral flaps are normally treated with flap removal and subsequent microfracture. Evaluation of the viability and tissue quality of the chondral flap may raise the need to develop a chondral flap reattachment preservation technique.

PURPOSE: To evaluate the viability and tissue quality of chondral flaps obtained from patients undergoing hip arthroscopy secondary to FAI Cam type.

MATERIALS AND METHODS: The study included nine male patients with an average age of 36.3 years old (range 30 - 55). All patients were consented and IRB was approved for the proposed study. All patients underwent hip arthroscopy for FAI cam type impingement and chondral flap removal. All flaps were classified according to Beck's classification. The resected flap was sent to the lab and evaluated immediately after collection. A control sample was obtained from the cartilage next to the fovea and evaluated concurrently with the study sample. The viability of the samples was evaluated using live-dead staining with Calcein AM and Ethidium homodimer-1. Images were composed using Nikon software. Percent of living cells was evaluated using the Image J software. The number of live cells was then divided by the total number of cells and multiplied by 100% as previously described. Histological analysis was performed using Safranin-O and Fast green staining, along with Hematoxylin and Eosin solution staining. Evaluation of the staining was performed using the OARSI grading system. Compositions of the tissue samples were evaluated using EVOS microscope program.

RESULTS: All chondral flaps appeared macroscopically normal. However, the average cellular viability of the chondral flap specimens was reduced (52.1% \pm 25.85 SD). In addition, the chondral flap tissue showed microscopic degeneration and loss of ECM. Control samples had 35.6% (\pm 30.28 SD) viability and minimal signs of degeneration

ISAKOS

**International Society of Arthroscopy, Knee Surgery and
Orthopaedic Sports Medicine**

11th Biennial ISAKOS Congress • June 4-8, 2017 • Shanghai, China

Paper #218

as well ($p > .05$). Overall, both study and control samples did show some degenerative changes, with an OARSI grading of 3.8 (± 1.30 SD) for the study sample and 3.5 (± 1.38 SD) for the control sample ($p > .05$).

DISCUSSION: This study shows that acetabular chondral flaps encountered during hip arthroscopy for FAI remain viable. However, there is degeneration of the chondral flap with suboptimal tissue quality. Thus, we do not encourage reattachment of the chondral flap. Unexpectedly, control sample appeared to have degeneration as well. This could be secondary to either the posterior hip impingement that is also generated in patients with FAI Cam lesion or a possible "unhealthy or pre- osteoarthritis" joint phase that patients with FAI Cam lesions may have.

CONCLUSION: According to our results the chondral flap remains viable, but with poor quality tissue. The proposed chondral flap reattachment is not a suitable option. Further studies are required to judge the clinical benefit of chondral flap repair.