



## ORIGINAL ARTICLE

# Factors associated with the failure of arthroscopic surgery treatment in patients with femoroacetabular impingement: A cohort study<sup>☆</sup>



D. Martínez<sup>a,\*</sup>, J. Gómez-Hoyos<sup>b,c,f</sup>, W. Márquez<sup>d,f</sup>, J. Gallo<sup>e,f</sup>

<sup>a</sup> Facultad de Medicina, Universidad de Antioquia, Medellín, Colombia

<sup>b</sup> Hip Preservation Center, Baylor University Medical Center, Dallas, TX, United States

<sup>c</sup> Sección de Ortopedia, Universidad de Antioquia, Colombia

<sup>d</sup> Unidad de Ortopedia, Clínica Las Américas, Medellín, Colombia

<sup>e</sup> Posgrado de Medicina Deportiva, Universidad de Antioquia, Medellín, Colombia

<sup>f</sup> Grupo de investigación GRINMADE, Universidad de Antioquia, Medellín, Colombia

Received 13 May 2014; accepted 4 September 2014

### KEYWORDS

Femoroacetabular impingement;  
Hip arthroscopy;  
Risk factors;  
Therapeutic failure;  
Osteoarthritis

### Abstract

**Objective:** The aim of this study was to evaluate the association of the anatomical and functional characteristics with therapeutic failure in patients with femoroacetabular impingement, who underwent hip arthroscopy.

**Materials and methods:** A cohort study was performed on 179 patients with femoroacetabular impingement who underwent hip arthroscopy between 2004 and 2012. The demographic, anatomical, functional, and clinical information were recorded. A logistic regression model and ANCOVA were used in order to compare the described characteristics with the treatment outcomes of the hip arthroscopy.

**Results:** The median time of follow-up for symptoms was 13 months (8–30), and the mean time of follow-up after surgery was  $23.83 \pm 9.8$  months. At the end of the follow-up 3.91% of the patients were considered as a therapeutic failure. The WOMAC score in pain and functional branches, as well as the total WOMAC score, showed significant differences ( $p < 0.05$ ). The mean WOMAC score was higher (0–100 with 0 being a perfect score) in the group of patients who failed after surgery as compared with the group who meet the requirements for a successful treatment, 65.9 vs 48.8, respectively (mean difference 17.0; 95% CI; 1.3–32.6;  $p = 0.033$ ).

<sup>☆</sup> Please cite this article as: Martínez D, Gómez-Hoyos J, Márquez W, Gallo J. Factores asociados al fracaso terapéutico de la cirugía artroscópica en pacientes con choque femoroacetabular: un estudio de cohorte. Rev Esp Cir Ortop Traumatol. 2015;59:112–121.

\* Corresponding author.

E-mail address: [damian.martinez.soto@hotmail.com](mailto:damian.martinez.soto@hotmail.com) (D. Martínez).

**Conclusion:** The poor functional state prior to arthroscopic treatment of femoroacetabular impingement, mainly due to preoperative pain, assessed using the WOMAC scale, is associated with a higher therapeutic failure rate.

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## PALABRAS CLAVE

Choque femoroacetabular; Artroscopia de cadera; Factores de riesgo; Fracaso del tratamiento; Osteoartritis

## Factores asociados al fracaso terapéutico de la cirugía artroscópica en pacientes con choque femoroacetabular: un estudio de cohorte

### Resumen

**Objetivo:** Evaluar la asociación entre las características anatómicas y funcionales y el fracaso terapéutico de la cirugía artroscópica en pacientes con choque femoroacetabular (CFA).

**Materiales y métodos:** Se realizó un estudio de cohorte que incluyó a 179 pacientes adultos con diagnóstico de CFA sometidos a artroscopia de cadera entre 2004 y 2012. Se obtuvo información demográfica, clínica, anatómica y funcional para determinar si ocurrió fracaso del tratamiento. Se utilizó un modelo de regresión logística y un análisis de covarianza para comparar las características anatómicas y funcionales con el resultado del tratamiento artroscópico.

**Resultados:** La mediana del tiempo de evolución de los síntomas fue de 13 meses (8-30) y el tiempo de evolución posquirúrgico fue en promedio de  $23,83 \pm 9,8$  meses. El 3,91% presentaron fracaso del tratamiento. La puntuación en la escala de WOMAC en el dominio de dolor y capacidad funcional, así como su puntuación global, mostraron diferencias significativas ( $p < 0,05$ ). La media de la puntuación de WOMAC total también fue mayor (0 a 100, siendo 0 una puntuación perfecta) en el grupo de fracaso en comparación con el grupo de éxito del tratamiento, 65,9 vs. 48,8, respectivamente (diferencia de 17,0; IC del 95%, 1,3-32,6;  $p = 0,033$ ).

**Conclusión:** El pobre estado funcional previo al tratamiento artroscópico del CFA principalmente en la esfera de dolor preoperatorio, evaluado mediante la escala WOMAC, se asocia a mayor índice de fracaso terapéutico.

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## Introduction

In some cases, pain in non-arthritic hips is associated to anatomical alterations of the acetabulum (pincer type deformity), the femoral neck (cam type deformity) or both (mixed deformity), which added to cyclical mechanical loads or lesions caused during physical activity derive in damage to the labrum or cartilage.<sup>1-3</sup> This condition, known as femoroacetabular impingement (FAA), is probably the main cause of osteoarthritis (OA) in non-dysplastic hips.<sup>4-6</sup> The association between labral lesions and a history of FAA in 90% of cases has led to early interventions in order to avoid the progression of degenerative changes.<sup>7,8</sup>

The etiology of the typical anatomical deformities of FAA is still controversial.<sup>9</sup> The theories put forward include evolutionary changes,<sup>10</sup> predisposing diseases, like proximal femoral epiphysiolysis,<sup>11,12</sup> and genetic factors,<sup>13</sup> among others.

Despite the presence of anatomical deformities typical of FAA, some epidemiological studies have determined that the onset is not associated to symptoms in nearly 4.3% of males and 3.6% of females.<sup>14</sup> The absence of studies which clearly associate OA with asymptomatic FAA is the reason why the current trend is to intervene patients only when they present pain, related or not to physical activity.<sup>9</sup> In 2013, Agricola et al. found an association between OA and an alpha angle over 60°, with a greater association as the measurement

increased, and finding the greatest association among patients with 83°. <sup>15</sup> Nevertheless, all the patients in that study were symptomatic, so the scenario of patients with anatomical configurations compatible with FAA but without symptoms and developing OA remains unexplored.

Conservative treatment is currently accepted as the initial intervention for all patients. However, its effectiveness in terms of functional improvement or modification of the natural history of the degenerative changes has not been proven so far. Therefore, surgical treatment in patients with symptoms acquires great relevance in order to alleviate pain, improve functional condition, shorten the return to physical activity and prevent degenerative changes on the labrum and cartilage.<sup>9</sup>

The correction of the alterations described can be carried out through open, arthroscopic or mini-anterior arthroscopy-assisted surgery. Open surgery involves a controlled dislocation of the hip, which makes the procedure technically demanding and, due to factors inherent to the technique, may entail complications such as nonunion of the trochanteric osteotomy, osteonecrosis of the femoral head, heterotopic ossification and persistent weakness of the abductor musculature.<sup>16,17</sup>

Arthroscopic and assisted mini-anterior treatments avoid the need to dislocate the hip, but they also require maneuvers, like prolonged traction and liquid infusion, that can cause transient neuropraxias and extravasation of fluid to

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