

Diagnosis and Treatment of Labrum Tears by Hip Arthroscopy

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Abstract

Objective: This study aimed to evaluate the functional outcomes of arthroscopic debridement of labral tears retrospectively.

Methods: Between April 2001 and September 2006, 17 patients who underwent arthroscopic debridement were analyzed. Functional outcomes of the patients were assessed using modified Harris hip score (MHHS). Mann-Whitney U and Wilcoxon tests were used to evaluate the data. $P < 0.05$ was considered statistically significant.

Results: In total, 70.5% of the patients had developmental dysplasia of hip (DDH) at the time. Cartilage damage was detected in 88% of the patients, and both acetabular and femoral compartments were involved in 35% of them. Postoperative MHHS increased in all patients after hip arthroscopy. However, in patients with DDH, MHHS was significantly lower than that in non-DDH patients ($p < 0.05$). Labral tears often found to be associated with developmental dysplasia of the hip (DDH).

Conclusion: Patients with DDH and chondral damage in both compartments may benefit less than the patients with unicompartamental chondral damage from arthroscopic debridement.

Keywords: Labrum, arthroscopic debridement, developmental dysplasia of hip

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INTRODUCTION

The labrum is a fibrocartilage structure comprising collagen fibrils that adhere circumferentially to the acetabular side. Labrum contributes to balance load distribution, proprioceptive-noiseptif feedback, joint alignment and joint stability (1). Labrum also expands acetabular volume at an average rate of 33% and joint surface area at a rate of 22% (2). Labrum tears may occur due to trauma, acetabular dysplasia, hip degenerative arthritis, femoroacetabular impingement syndrome, and ligamentous laxity (1). In patients with hip pain, the incidence of labrum rupture varies between 22% and 55% (3). Disturbing inguinal pain, stumbling, and movement limitation are the main complaints (3). Hip arthroscopy is an endoscopic method used in the diagnosis and treatment of many problems associated with the hip joint and in its surrounding, particularly labrum tears. Labrum tears can be treated arthroscopically with surgical methods such as debridement, repair, and labrum reconstruction. Arthroscopic debridement of the labrum is used particularly in the treatment of less vascularized peripheral tears (4). In more than half of the patients who undergo arthroscopic debridement, cartilage damage is detected in the femoral head and/or acetabulum during the operation (5). The aim of this study was to retrospectively evaluate patients who were found to have tears while performing hip arthroscopy due to the suspicion of labrum lesions, in terms of the accompanying pathologies and functional aspects.

METHODS

After The Institutional Review Board and inform consent were obtained, patients who underwent hip arthroscopy due to hip pain in our clinic between April 2001 and September 2006 were screened from hospital records. Our study was conducted in accordance with the ethical

Table 1. Evaluation of age, central edge angle and follow-up periods

	Average	Standard deviation	Median	Minimum	Maximum
Age (years)	35.58	9.43	35	22	53
CEA (degrees)	16.05	10.22	15	-14	28
FP (months)	30	12.1	30	9	66

CEA: central edge angle; FP: follow-up period

Table 2. Evaluation of the increase in Modified Harris Hip Score in the presence of developmental dysplasia of the hip and chondral lesions

	MHHS		p
CL	Single compartment n=11 (Mean±SD)	Two compartments n=6 (Mean±SD)	0.009
	16.27±19.88	10±8.57	
DDH	existing (n=12)	Not existing (n=5)	0.478
	7.66±11.67	29.4±18.07	

MHHS: modified harris hip score; CL: chondral lesion; DDH: developmental dysplasia of the hip

principles of the 1964 Helsinki Declaration. Patients with tumors in the hip joint or surrounding area, those with rheumatologic or neurological joint involvement and polytrauma, and those whose regular records could not be obtained were excluded from the study. All the patients included in the study signed "Informed Consent Forms." In addition to the demographic data, such as age, gender, side, and onset time of the complaints, the patients were evaluated clinically and radiologically. All the patients were evaluated radiologically in both hips, anteroposteriorly and laterally, and with contrast hip MRI. The central edge angle was measured on the anteroposterior x ray of the hip to assess the presence of DDH. The central edge angle over 20 degrees was considered to be normal dysplasia, between 15 and 20 degrees to be mild dysplasia, between 10 and 15 degrees to be moderate dysplasia, and less than 10 degrees to be advanced dysplasia. The diagnosis of labrum rupture was made by two independent musculoskeletal radiologists. All the patients were prepared in the lateral decubitus position with fluoroscopic guidance under general anesthesia. The foot was placed in the distractor and adapted to the traction apparatus. The hip was taken to 20 degrees of abduction and 10 degrees of flexion (6). After entering the joint, it was observed that the vacuum phenomenon disappeared by administering physiological saline solution. The rupture was detected through anterolateral and posterolateral portals, and debridement and washing were performed. Hip joint function was evaluated using modified Harris hip score (MHHS). In this scoring system, scores between 90 and 100 were defined as excellent, those between 80 and 89 as good, those between 70 and 79 as moderate, and those below 70 points as poor. During hip arthroscopy, the Bauer and Jackson classification was used to evaluate cartilage injuries.

Statistical Analysis

Statistical Package for the Social Sciences, version 16.0 (SPSS Inc, Chicago, IL, USA) was used for statistical analysis of the

data. Normal distribution of the data was evaluated using Kolmogorov-Smirnov test. Independent sample t test was used for parametric values. Non-parametric data were evaluated using Mann-Whitney U and Wilcoxon tests. $p < 0.05$ was considered statistically significant.

RESULTS

A total of 17 patients who underwent hip arthroscopy in our clinic and in whom labrum rupture was detected between April 2001 and September 2006 were included in the study. Of the patients, 88% (n=15) were female and 12% were male; the right side was affected in 70.5% of them and the left side in 29.5%. The mean age was 35.58 ± 9.43 (median, 35) years, and the mean follow-up period was 30 ± 12.1 (median, 30) months (Table 1). Of the patients with labrum tears, 70.5% had DDH. Femoroacetabular impingement in one patient (6%) and ligamentum teres lesion in one patient (6%) were the other accompanying lesions. The mean central edge angle was 16 ± 10.22 degrees (median, 15). Chondral lesions were detected in the acetabulum in three patients (18%), in the femoral head in six (35%), and in both the femoral head and acetabulum in six (35%). The gain in MHHS was higher in the group with no chondral damage or with damage in a single compartment than in the group wherein damage was found in both compartments. However, this difference was not statistically significant (16.27 ± 19.88 , 10 ± 8.57 , $p = 0.478$). Preoperative and postoperative MHHS were significantly increased in all patients ($p = 0.002$). In patients without acetabular dysplasia, the increase in postoperative MHHS was significantly higher than that in the group with dysplasia (29.4 ± 18.07 , 7.66 ± 11.67 , $p = 0.009$; Table 2). Total hip replacement was performed in two (12%) patients with acetabular dysplasia after a mean of 4 months due to worsening clinical condition. The chondral lesion in the femoral head and acetabulum in both of these patients was remarkable.

DISCUSSION

The most important result obtained from this study is that the most important etiology in patients with labrum tear is DDH and that the patients with DDH gain lower benefit from arthroscopic labral debridement than those without DDH. Noguchi et al. (7) performed hip arthroscopy in 120 patients who had DDH and who were scheduled for osteotomy; stated that cartilage and labrum degeneration usually occur as a stage of early osteoarthritis. Mc Carty et al. (8) found labrum tear at a rate of 90% in patients with DDH and mechanical symptoms. Jayasekara et al. (9) found labrum rupture in all patients with DDH and reported an equal increase in MHHS in the group with and without DDH. Although this is uncertain,

the difference in our study may be due to the severity of concomitant chondral and other pathologies or different surgical techniques performed. In a prospective study, Streich et al. classified patients who underwent hip arthroscopy due to labrum tear into two groups according to whether or not chondral injury existed. They noted that ongoing articular cartilage injury had a negative impact on the results of clinical functions and arthroscopic debridement (10). Byrd et al. (11) performed hip arthroscopy in two groups with and without cartilage lesions and found that the group with cartilage lesions did not benefit from arthroscopic labrum debridement as much as the other group. Farjo et al. (12) classified patients with labral injury according to the presence of preoperative osteoarthritis and reported a good-excellent function in 10 of 14 patients without osteoarthritis; three of the 14 patients in the osteoarthritis group showed good-excellent results. In addition, it was reported that lower incidence of total hip arthroplasty in the group with isolated labral tear than those with labral tear plus osteoarthritis. In our study, we found a cartilage lesion in most of the patients with labrum rupture. We found that the patients with no chondral lesions or with chondral lesions only in one compartment had significantly more benefit from arthroscopic debridement in reference to the preoperative values than those in whom both compartments were affected. Total hip arthroplasty was performed in two patients with damage in both compartments due to clinical deterioration after 4 months on average. When these results were evaluated, it was observed that labrum rupture may be a pre-arthrosic process and arthroscopic debridement may not be sufficient in patients with severe chondral damage. Labral tears should be primarily treated with anti-inflammatory drugs, activity regulation, and conservative modalities involving physical therapy. Surgical treatment is recommended if pain persists despite 4 weeks of conservative treatment (13). Surgical interventions include safe hip dislocation and open repair, arthroscopic labral repair or debridement, and a combination of these. Due to their minimally invasive nature and lower complication rates, arthroscopic methods are becoming increasingly popular (13). Debates continue on whether debridement or repair should be applied (13-15). Although arthroscopic repair is recommended in intrasubstance degeneration, calcification, ossification, and complex and peripheral tears, only arthroscopic debridement can be performed in some of the cases (15). It has been reported that hip diseases concomitant with labrum tear are more effective on pain and functional outcomes (15). In the present study, arthroscopic debridement was performed in all patients. The fact that accompanying chondral and pre-arthrosic pathologies were effective on the functional outcomes was considered to be consistent with the literature. Being a single-center, retrospective study and having been conducted with a small number of patients are considered to be the weaknesses of the study.

CONCLUSION

The disease that was most commonly associated with labrum rupture was DDH. Although all patients benefited from arthroscopic debridement, the presence of DDH and chondral damage in both compartments may have had a negative effect on functional outcomes.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

Informed Consent: Written informed consent was obtained from the patients who participated in this study.

Peer-review: Externally peer-reviewed.

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