Journal of
Alcoholism & Drug Dependence

Ito, J Alcohol Drug Depend 2016, 4:2
DOI: 10.4172/2329-6488.1000235

Rapid Communication Open Access

Intermediate to Long-Term Results of Periacetabular Osteotomy in Patients Younger and Older Than 40 Years of Age

Hiroshi Ito*

Department of Orthopaedic Surgery, Asahikawa Medical University, Asahikawa, Japan

***Corresponding author:** Hiroshi Ito, Department of Orthopaedic Surgery, Asahikawa Medical University, Midorigaoka Higashi 2-1-1-1, Asahikawa, 078-8510, Japan, Tel: +81-166-68-2511; Fax: +81-166-68-2519; E-mail: itohiro@asahikawa-med.ac.jp

Received date: January 28, 2016; **Accepted date:** April 11, 2016; **Published date:** April 15, 2016

Rapid Communication

In 1939, Wiberg described the development of osteoarthritic changes of the hip joint in young adults who had a dysplastic hip with <20° of the center-edge (CE) angle on antero-posterior radiographs [1]. Murphy et al. [2] reported that no patient in whom the hip functioned well until the age of 65 years had had <16° of the CE angle. The function of the hip in patients with developmental dysplasia has been reported to be well for many years; however, it tended to deteriorate after those periods of time [3]. Increased joint contact pressures which were estimated from radiographs at the time of maturity of patients with developmental dysplasia have been reported to correlate with unsatisfactory clinical and radiographic outcome [4,5].

Up to the present, no drug or physical therapy has the evidence to delay the development of osteoarthritis of the hip. On the contrary, surgical corrections including periacetabular osteotomy (PAO) which reduce articular cartilage contact stress can delay the appearance or reduces the severity of osteoarthritis [6,7]. Various osteotomies to reposition the acetabulum have been described [8-10]. Satisfactory intermediate to long-term clinical results have been reported in association with these osteotomies [11-15]. Several studies have identified older age as a predictor of failure [11,13,15]. However, good clinical results have been reported following periacetabular osteotomies in older patients [16-18].

The results of those previous studies are conflicting, and the use of periacetabular osteotomy to treat middle-aged patients remains controversial. We found no previous studies comparing younger and older patients with more than ten years of follow-up. We hypothesized that a periacetabular osteotomy would yield similar results for young and old patients with short to intermediate-term follow-up, with the results in older patients deteriorating thereafter. When planning hip surgery for patients with developmental dysplasia, accurate assessment of the degree of subluxation, dislocation or acetabular dysplasia is essential. We have performed periacetabular osteotomy through an Ollier lateral-U trans trochanteric approach since 1990 with consistent surgical indications and techniques [19]. We compared the results in patients forty-years of age or older with those in patients less than forty years of age, with particular attention to differences between these two groups in terms of hip pain, hip function, and progression of osteoarthritis on radiographs.

Between February 1990 and December 2004, 166 periacetabular osteotomies were performed in 146 patients. We evaluated 158 hips in 139 patients who had a mean age of 32 years at the time of surgery. The mean duration of follow-up was 11 years (range, 5 to 20 years). We compared 36 patients (41 hips) who were 40 years of age or older with 103 patients (117 hips) who were younger than 40 years of age at the time of surgery. The average Harris hip score increased from 70 points preoperatively to 90 points postoperatively. The mean Harris hip scores at the time of the five-year follow-up were similar in the older and younger groups (p=0.57), although the latest follow-up scores were significantly higher in the younger group than in the older group (91 compared with 88 points; p=0.02). The average modified Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) function score (With 0 representing the worst score and 100 representing the best score) was higher for the younger group than for the older group (92 compared with 90 points; p=0.03).

Kaplan-Meier analysis with progression of the Tönnis grade of osteoarthritis as the end point showed a 10 year survival rate of 90.8% (95% confidence interval, 88.3% to 93.3%) and a 15 year survival rate of 83.0% (95% confidence interval, 78.5% to 87.5%); the 10-year survival rates in the younger and older groups were 94.4% and 81.3%, respectively, and the 15 year survival rates were 86.9% and 71.2%, respectively (p=0.025). The gradual decrease in the hip score in the older group seemed to be related to two major factors: a decrease in physical function due to aging itself and susceptibility to progression of osteoarthritis in the older group. Because the aging process is slow, a gradual decrease in the hip scores in the older group seems reasonable.

A higher rate of osteoarthritis progression in the older group seems to be more closely related to aging issues rather than to the periacetabular osteotomy. Periacetabular osteotomy yielded similar results for the two groups at the time of the five-year follow-up, although the results for the older group deteriorated thereafter. Decrease in physical function due to aging and increased susceptibility to the progression of osteoarthritis may be responsible for the poorer results over time in the older group (Table 1).

Parameters	Older Group (40 yr ≤) (N = 41)	Younger Group (40 yr >) (N = 117)	P Value
Age (range) (yr)	47.2 (40–56)	27.1 (12–39)	<0.01 †
Sex (M: F) (no. of hips)	7:34	17:100	0.80
Side (Left: Right) (No. of hips)	22:19	64:53	0.91
Duration of follow-up (range) (yr)	10.8 (5–18.5)	11.0 (5–20)	0.63
Harris hip score*			
Overall			
Preop.	68.9 ± 7.3	70.1 ± 9.1	0.61
5-year follow-up	91.4 ± 8.4	92.0 ± 8.2	0.57
Last follow-up	88.0 ± 11.7	91.4 ± 9.6	0.02 †
Pain score at last follow-up	39.4 ± 5.8	40.5 ± 5.6	0.11
Function score at last follow-up	41.7 ± 5.6	43.5 ± 4.3	0.02 †
WOMAC at last follow-up*			
Pain	89.1 ± 11.3	92.3 ± 9.9	0.06
Function	89.7 ± 10.8	92.2 ± 10.8	0.03 †
Progression of OA grade (no. of hips)	8 (20%)	9 (8%)	0.04 †
* Values are given as the mean and the standard deviation. † Significant.			

Table 1: Comparison of data in the older and younger groups.

References

1. Wiberg G (1939) Studies on dysplastic acetabula and congenital subluxation of the hip joint: with special reference to the complication of osteoarthritis. Acta Chir Scand 83 Suppl 58: 1-135.
2. Murphy SB, Ganz R, Müller ME (1995) The prognosis in untreated dysplasia of the hip: a study of radiographic factors that predict the outcome. J Bone Joint Surg Am 77: 985-989.
3. Malvitz TA, Weinstein SL (1994) Closed reduction for congenital dysplasia of the hip: functional and radiographic results after an average of thirty years. J Bone Joint Surg Am 76: 1777-1792.
4. Hadley NA, Brown TD, Weinstein SL (1990) The effects of contact pressure elevations and aseptic necrosis on the long-term outcome of congenital hip dislocation. J Orthop Res 8: 504-513.
5. Maxian TA, Brown TD, Weinstein SL (1995) Chronic stress tolerance levels for human articular cartilage: two nonuniform contact models applied to long-term follow-up of CDH. J Biomech 28: 159-166.
6. Mills MB, Murphy SB, Poss R (1995) Osteotomies about the hip for the prevention and treatment of osteoarthrosis. J Bone Joint Surg Am 77: 626-647.
7. Poss R (1984) The role of osteotomy in the treatment of osteoarthritis of the hip. J Bone Joint Surg Am 66: 144-151.
8. Eppright RH (1975) Dial osteotomy of the acetabulum in the treatment of dysplasia of the hip. J Bone Joint Surg Am 57: 1172.
9. Ganz R, Klaue K, Vinh TS, Mast JW (1988) A new periacetabular osteotomy for the treatment of hip dysplasias: technique and preliminary results. Clin Orthop Relat Res 232: 26-36.
10. Ninomiya S, Tagawa H (1984) Rotational acetabular osteotomy for the dysplastic hip. J Bone Joint Surg Am 66: 430-436.
11. Matheney T, Kim YJ, Zurakowski D, Matero C, Millis M (2009) Intermediate to long-term results following the Bernese periacetabular osteotomy and predictors of clinical outcome. J Bone Joint Surg Am 91: 2113-2123.
12. Schramm M, Hohmann D, Radespiel-Troger M, Pitto RP (2003) Treatment of the dysplastic acetabulum with Wagner spherical osteotomy: a study of patients followed for a minimum of twenty years. J Bone Joint Surg Am 85: 808-814.
13. Steppacher SD, Tannast M, Ganz R, Siebenrock KA (2008) Mean 20-year followup of Bernese periacetabular osteotomy. Clin Orthop Relat Res 466: 1633-1644.
14. Van Hellemondt GG, Sonneveld H, Schreuder MH, Kooijman MA, de Kleuver M (2005) Triple osteotomy of the pelvis for acetabular dysplasia: results at a mean follow-up of 15 years. J Bone Joint Surg Br 87: 911-915.
15. Yasunaga Y, Ochi M, Shimogaki K, Yamamoto S, Iwamori H (2004) Rotational acetabular osteotomy for hip dysplasia: 61 hips followed for 8-15 years. Acta Orthop Scand 75: 10-15.
16. Millis MB, Kain M, Sierra R, Trousdale R, Taunton MJ, et al. (2009) Periacetabular osteotomy for acetabular dysplasia in patients older than 40 years: a preliminary study. Clin Orthop Relat Res 467: 2228-2234.
17. Teratani T, Naito M, Kiyama T, Maeyama A (2010) Periacetabular osteotomy in patients fifty years of age or older. J Bone Joint Surg Am 92: 31-41.
18. Yamaguchi J, Hasegawa Y, Kanoh T, Seki T, Kawabe K (2009) Similar survival of eccentric rotational acetabular osteotomy in patients younger and older than 50 years. Clin Orthop Relat Res 467: 2630-2637.
19. Ito H, Matsuno T, Minami A (2007) Rotational acetabular osteotomy through an Ollier lateral U approach. Clin Orthop Relat Res 459: 200-206.