

Evaluation of the Results of Dega Acetabuloplasty in Management of DDH in Walking Children under 4 Years

EYAD A.A. ELGEBALY, M.Sc.; HASSAN M. EL BARBARY, M.D.;
ABO BAKR ZAIN MOHAMMED, M.D. and ISLAM M. ELDESOUKY, M.Sc.

The Department of Orthopaedic Surgery, Faculty of Medicine, Cairo University

Abstract

Background: Developmental dysplasia of the hip (DDH) in walking-age children presents unique surgical challenges. One-stage open reduction combined with Dega pelvic osteotomy, with or without femoral shortening and varusderotation osteotomy, has been proposed to restore hip stability and acetabular coverage.

Aim of Study: The aim of this study is to evaluate the results of Degaacetabuloplasty in treatment of DDH in walking children under 4 years of age.

Patients and Methods: A prospective case series was conducted on 24 patients (30 hips) between March 2012 and March 2015. All patients underwent open reduction and Dega pelvic osteotomy, with femoral shortening and/or varusderotation osteotomy performed as indicated. Preoperative and postoperative evaluations included acetabular index (AI), center-edge angle (CEA), modified McKay clinical criteria, and Severin radiological classification. The mean follow-up period was 24 months (range, 18–36).

Results: At final follow-up, 28 hips (93.33%) achieved satisfactory clinical outcomes (excellent or good) and 28 hips (93.33%) achieved satisfactory radiological outcomes (Severin grades I–II). The mean AI improved from $47.28^{\circ} \pm 3.36^{\circ}$ preoperatively to $16.07^{\circ} \pm 2.42^{\circ}$ postoperatively ($p < 0.001$). The mean postoperative CEA was $32.97^{\circ} \pm 5.88^{\circ}$, with higher CEA values significantly associated with better clinical results ($p = 0.002$). Younger age at surgery correlated with superior clinical outcomes ($p = 0.013$). No redislocations occurred. Complications included two superficial wound infections, one transient femoral nerve palsy, and radiographic avascular necrosis in a small proportion of hips.

Conclusions: One-stage open reduction with Dega pelvic osteotomy, supplemented by femoral shortening and varusderotation osteotomy when required, yields excellent short-term stability and acetabular remodeling in walking-age children with DDH, especially when performed before the age of two years.

Key Words: Developmental dysplasia of the hip (DDH) – Degaacetabuloplasty – Walking children.

Introduction

DEVELOPMENTAL dysplasia of the hip (DDH) represents a spectrum of anatomical abnormalities affecting the formation of the acetabulum and femoral head, ranging from mild acetabular dysplasia to frank dislocation. It is one of the most common orthopedic conditions in pediatric populations, with an estimated incidence of 1–2 per 1,000 live births. While early detection and non-operative interventions such as Pavlik harness application or closed reduction can achieve excellent results, late-presenting DDH particularly in walking children remains a significant clinical challenge [1].

In walking children under 4 years of age, the hip joint has already undergone significant adaptive changes due to abnormal biomechanics. The femoral head may be displaced, and the acetabulum often shows shallow architecture and deficient anterolateral coverage. At this stage, non-operative treatment is typically ineffective, and surgical correction becomes the mainstay of management. The surgical goal is not only to achieve concentric reduction of the femoral head but also to remodel the acetabulum to provide stable coverage that promotes long-term joint congruency and function [2].

Correspondence to: Dr. Eyad A.A. Elgebaly, The Department of Orthopaedic Surgery, Faculty of Medicine, Cairo University

Degaacetabuloplasty, first described by WiktorDega in 1969, is a pericapsular osteotomy designed to reshape and reorient the acetabulum without entering the triradiate cartilage. It allows selective reorientation, providing improved antero-lateral coverage while preserving growth potential. The technique is especially suitable for children with open triradiate cartilage, as it promotes acetabular remodeling over time. Its partial, incomplete osteotomy design maintains pelvic stability and reduces the risk of disturbing pelvic growth, making it a favored option in young walking children with DDH [3].

The evaluation of Degaacetabuloplasty outcomes in this specific age group is essential for several reasons. First, walking children present unique surgical challenges soft tissue contractures are more severe, and acetabular deficiency is more pronounced than in infants. Second, the window for optimal remodeling narrows as the child grows older; thus, understanding age-specific results can guide surgical decision-making. Finally, a systematic analysis of functional and radiographic outcomes provides valuable insight into long-term prognosis, including the likelihood of achieving a pain-free, stable hip in adulthood [4].

Previous studies have reported favorable results with Degaacetabuloplasty in younger children, with improved acetabular index and hip stability, but variations in technique, patient age, and preoperative hip morphology have led to heterogeneous outcomes [4].

Patients and Methods

Study design:

This prospective case series was conducted between March 2012 and March 2015. The study aimed to evaluate the outcomes of one-stage open reduction combined with Dega pelvic osteotomy, with or without femoral shortening and varus-derotation osteotomy, in walking-age children diagnosed with developmental dysplasia of the hip (DDH).

Participants:

A total of twenty-four consecutive patients, involving thirty hips, met the eligibility criteria and were included in the study. Nineteen patients (79.17%) were female and five (20.83%) were male. The mean age at surgery was 1.99 years, ranging from 1.5 to 3.7 years. Thirteen patients (54.17%) were younger than two years, seven patients (29.17%) were between two and 2.5 years,

and four patients (16.67%) were older than 2.5 years. Laterality analysis showed that eighteen patients (75%) had unilateral involvement twelve on the left side and six on the right while six patients (25%) had bilateral involvement.

Inclusion and exclusion criteria:

Inclusion criteria were walking children younger than four years with radiographically confirmed DDH and no previous operative intervention. Exclusion criteria included children younger than walking age or older than four years, any prior surgical treatment for DDH, and dislocations of teratologic, post-septic, or neuromuscular origin.

Preoperative evaluation:

All patients underwent detailed history taking and thorough physical examination. Historical data obtained from the parents included perinatal and obstetric history, family history of DDH, previous conservative management, and onset of gait abnormalities. Abnormal gait was present in all cases, with two patients (7%) reporting a family history of DDH in siblings. Ninety percent of patients had normal obstetric histories; three patients had been delivered in breech presentation, one of which occurred in a twin pregnancy. Clinical examination assessed gait pattern, Trendelenburg sign, skin fold symmetry, hip abduction range, limb length discrepancy, Galeazzi sign, and flexion deformities. In unilateral dislocations, hip abduction was limited to 15–20 degrees and limb shortening ranged from 1 to 2.5cm. Bilateral cases frequently showed waddling gait, wide perineum, lumbar hyperlordosis, and symmetrical limitation of hip abduction.

Radiographic evaluation included standardized anteroposterior pelvic radiographs to measure acetabular index (AI) and center-edge angle (CEA), and to classify dislocation severity according to the Tönnis system. The AI ranged from 34° to 51° with a mean $\pm$ standard deviation of $47.28^\circ \pm 3.36^\circ$, and all hips demonstrated negative CEA values preoperatively. Based on the Tönnis classification, twenty-four hips (80%) were grade 4, four hips (13.33%) were grade 3, and two hips (6.67%) were grade 2.

Surgical technique:

All operations were performed under general anesthesia on a radiolucent table with the patient in the supine position and the affected hemipelvis slightly elevated on a padded roll. The surgical field, including the entire lower limb and affected half of the pelvis, was prepared and draped in a sterile fashion. An adductor tenotomy was per-

formed as the first step to improve exposure and hip abduction. Surgical exposure was achieved through an anterolateral “Bikini” incision, carefully protecting the lateral femoral cutaneous nerve. The iliac apophysis was split longitudinally, and the abductor muscles were reflected laterally to expose the outer and inner iliac surfaces. A T-shaped capsulotomy was then performed, preserving a 4–6 mm medial rim for later repair. Hypertrophied ligamentum teres and intra-acetabular fibro-fatty tissue were excised to facilitate concentric reduction of the femoral head.

Hip stability was assessed intraoperatively in various positions. Dega pelvic osteotomy was performed when stability was achieved only in flexion and abduction. Femoral varusderotation osteotomy was added when stability required internal rotation and abduction, and femoral shortening osteotomy was undertaken if the femoral head reduced under tension in neutral position. The Dega osteotomy was executed under fluoroscopic control, preserving a posterior hinge, and the osteotomy gap was filled with appropriately sized iliac crest or femoral shortening grafts. Capsulorrhaphy was carried out in an overlapping fashion to reduce capsular redundancy before layered wound closure.

Postoperative management and follow-up:

All patients were immobilized in a hip spica cast for 8–12 weeks, maintaining 20° abduction, 20° flexion, and neutral rotation. After cast removal, a structured rehabilitation program was initiated, including active mobilization, hydrotherapy, and gradual weight-bearing. Radiographic evaluations were performed immediately postoperatively, at the time of cast removal, and at three and six months, with annual follow-up thereafter. Clinical outcomes were assessed according to the modified McKay criteria, while radiographic results were graded using the Severin classification. The follow-up period ranged from 18 to 36 months, with a mean duration of 24 months.

Statistical analysis:

Data were analyzed using the Statistical Package for the Social Sciences (SPSS, version XX, IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean $\pm$ standard deviation (SD) and compared using the student's *t*-test. Categorical variables were presented as frequencies and percentages, and analyzed using the Chi-square or Fisher's exact test when appropriate. A *p*-value <0.05 was considered statistically significant.

Results

Clinical results:

At the final follow-up (18–36 months), clinical evaluation using the modified McKay criteria demonstrated excellent results in 10 hips (33.3%), good in 18 hips (60%), and fair in only 2 hips (6.7%), with no poor outcomes encountered. Therefore, the overall satisfactory rate (excellent + good) reached 93.3%, while unsatisfactory outcomes accounted for only 6.7%.

Radiological results:

Radiological evaluation according to Severin's classification revealed that 24 hips (80%) were graded as I, 4 hips (13.3%) as II, and 2 hips (6.7%) as III. None of the hips were classified as IV. Therefore, the overall radiological satisfactory rate was 93.3%.

Acetabular Index (AI):

The mean preoperative AI was 47.3° (range 34–51°), which improved significantly postoperatively to 16.1° (range 12–21°) ($p<0.001$). This reflects marked acetabular remodeling. Preoperative AI did not significantly affect the final clinical outcome ($p=0.472$). However, hips that achieved lower final AI values had significantly better clinical outcomes ($p=0.005$).

Center-Edge (CE) Angle:

Preoperatively, the CE angle was negative in all hips. At the final follow-up, the CE angle improved remarkably, ranging from 16–45° (mean 33°). This indicates restoration of acetabular coverage. Higher CE angles were significantly associated with superior clinical outcomes ($p=0.002$).

Age at surgery and clinical outcome:

Age at surgery showed a significant effect ($p=0.013$). Patients younger than 2 years achieved the highest proportion of excellent results (47%). Both hips with fair results were in this group. Patients between 2–2.5 years achieved only good results, while older patients still showed satisfactory but fewer excellent outcomes.

Sex and clinical outcome:

Sex was not significantly associated with outcome ($p=0.056$). Both males and females achieved comparable satisfactory results.

Side of involvement and clinical outcome:

Laterality of involvement (right vs left hip) did not show any significant association with clinical results ($p=0.135$).

Radiological relations:

Preoperative AI did not significantly influence final radiological outcomes ($p=0.590$). Lower final AI values were associated with better Severin grades ($p=0.04$). Similarly, higher CE angles at follow-up correlated with more favorable radiological outcomes ($p=0.003$).

Correlation between clinical and radiological results:

There was a strong correlation between clinical and radiological results ($p=0.001$). All hips with Severin Grade I achieved satisfactory clinical results, all hips with Severin Grade II were clinically good, and the two hips with Grade III showed only fair clinical results.

Table (1): Clinical Results According to Modified McKay Criteria.

Clinical results McKay		
Grading of the results	No. of hips	%
Fair	2	6.67
Good	18	60.00
Excellent	10	33.33
Total	30	100.00

Table (2): Radiological Results According to Severin's Classification.

Radiological Severin's Class		
	No.	%
Grade I	24	80.00
Grade II	4	13.33
Grade III	2	6.67
Total	30	100.00

Table (3): Preoperative (AI) and final clinical outcome.

Clinical results McKay	Pre-A Index		ANOVA	
	Range	Mean $\pm$ SD	F	P-value
Fair	45.000-45.000	45.000 $\pm$ 0.000	0.773	0.472
Good	42.000-51.000	47.824 $\pm$ 2.298		
Excellent	34.000-51.000	46.800 $\pm$ 4.872		

Table (4): Relationship between acetabular index final and final clinical outcome.

Clinical results McKay	Post-A Index		ANOVA	
	Range	Mean $\pm$ SD	F	P-value
Fair	17.000-19.000	18.000 $\pm$ 1.414	6.376	0.005*
Good	12.000-21.000	16.889 $\pm$ 2.374		
Excellent	12.000-16.000	14.200 $\pm$ 1.398		

Table (5): Relation between the center edge angle preoperatively and at the end of follow-up.

CE ang.	Range	Mean $\pm$ SD
Pre	Negative	
Post-	16.000-45.000	32.967 $\pm$ 5.881

Table (6): CE Angle final and final clinical outcome.

Clinical results McKay	Post-A Index		ANOVA	
	Range	Mean $\pm$ SD	F	P-value
Fair	16.000-33.000	24.500 $\pm$ 12.021	8.292	0.002*
Good	24.000-39.000	31.444 $\pm$ 4.668		
Excellent	33.000-45.000	37.400 $\pm$ 3.438		

Table (7): Relationship between age at time of surgery and final clinical outcomes.

Clinical results McKay	Age group								Chi-Square	
	<2		2-2.5		>2.5		Total		X ²	p-value
	N	%	N	%	N	%	N	%		
Fair	2	6.67	0	0.00	0	0.00	2	6.67	12.606	0.013*
Good	7	23.33	9	30.00	2	6.67	18	60.00		
Excellent	8	26.67	0	0.00	2	6.67	10	33.33		
Total	17	56.67	9	30.00	4	13.33	30	100.00		

Table (8): Relationship between sex and clinical results.

Sex	Clinical results McKay								Chi-Square	
	Fair		Good		Excellent		Total		X ²	p-value
	N	%	N	%	N	%	N	%		
Male	0	0.00	5	16.67	0	0.00	5	16.67	5.763	0.056
Female	2	6.67	13	43.33	10	33.33	25	83.33		
Total	2	6.67	18	60.00	10	33.33	30	100.00		

Table (9): Relationship between side of involvement and clinical results.

Laterality	Clinical results McKay								Chi-Square	
	Fair		Good		Excellent		Total		X ²	p-value
	N	%	N	%	N	%	N	%		
RT	0	0.00	6	20.00	6	20.00	12	40.00	4.006	0.135
LT	2	6.67	12	40.00	4	13.33	18	60.00		
Total	2	6.67	18	60.00	10	33.33	30	100.00		

Table (10): Relationship between preoperative AI and radiological results.

Radiological Severin's Class	Pre-A Index		ANOVA	
	Range	Mean $\pm$ SD	F	p-value
Grade I	34.000-51.000	47.348 $\pm$ 3.676	0.539	0.590
Grade II	46.000-49.000	48.000 $\pm$ 1.414		
Grade III	45.000-45.000	45.000 $\pm$ 0.000		

Table (11): Relationship between final AI and radiological results.

Radiological Severin's Class	Final-A Index		ANOVA	
	Range	Mean $\pm$ SD	F	p-value
Grade I	12.000-21.000	14.625 $\pm$ 2.374	2.767	0.04
Grade II	15.000-20.000	17.750 $\pm$ 2.217		
Grade III	17.000-19.000	18.000 $\pm$ 1.414		

Table (12): Relationship between final CE angle and radiological results.

Radiological Severin's Class	Post-CE ang.		ANOVA	
	Range	Mean $\pm$ SD	F	p-value
Grade I	24.000-45.000	33.875 $\pm$ 5.127	2.938	0.003*
Grade II	26.000-38.000	31.750 $\pm$ 5.315		
Grade III	16.000-33.000	24.500 $\pm$ 12.021		

Table (13): Correlation between clinical and radiological results.

Clinical results McKay	Radiological Severin's Class								Chi-Square	
	Grade I		Grade II		Grade III		Total		X ²	p-value
	N	%	N	%	N	%	N	%		
Fair	0	0.00	0	0.00	2	6.67	2	6.67	18.593	0.001*
Good	14	46.67	4	13.33	0	0.00	18	60.00		
Excellent	10	33.33	0	0.00	0	0.00	10	33.33		
Total	24	80.00	4	13.33	2	6.67	30	100.00		



(A)



(B)



(C)



(D)

Fig. (1): Radiographs of a 1-year-9-month-old child with left DDH. (A) Preoperative image shows acetabular dysplasia with high dislocation. (B) Early postoperative radiograph demonstrates successful concentric reduction after adductor tenotomy, open reduction, and Dega osteotomy. (C & D) Follow-up radiographs at 6 and 12 months reveal maintained reduction with improved acetabular index and hip stability.

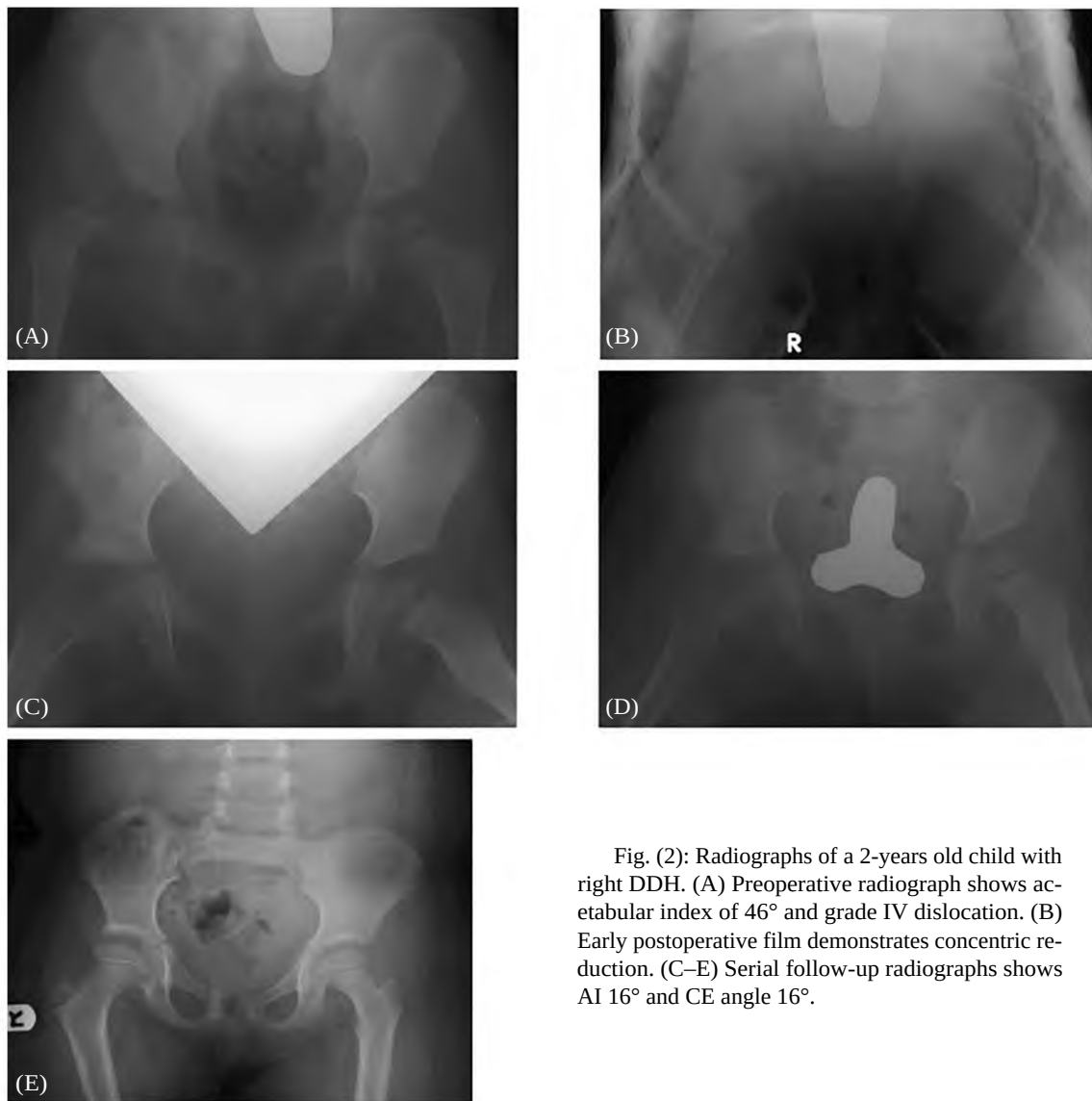


Fig. (2): Radiographs of a 2-years old child with right DDH. (A) Preoperative radiograph shows acetabular index of 46° and grade IV dislocation. (B) Early postoperative film demonstrates concentric reduction. (C–E) Serial follow-up radiographs shows AI 16° and CE angle 16° .

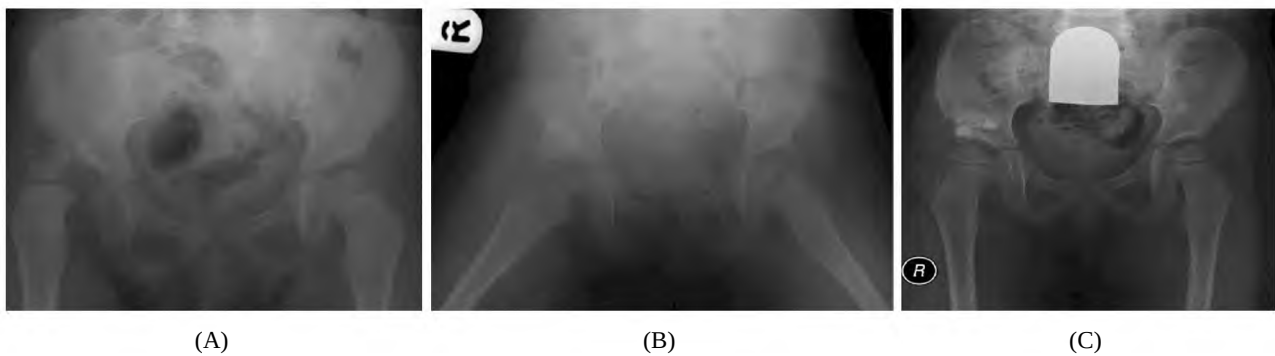


Fig. (3): Radiographs of a 1-year-10-months old child with right DDH. (A) Preoperative image showing severe acetabular dysplasia. (B) Immediate postoperative radiograph after Dega osteotomy demonstrating concentric reduction. (C) Follow-up X-ray with Severin's grade I radiographic result.

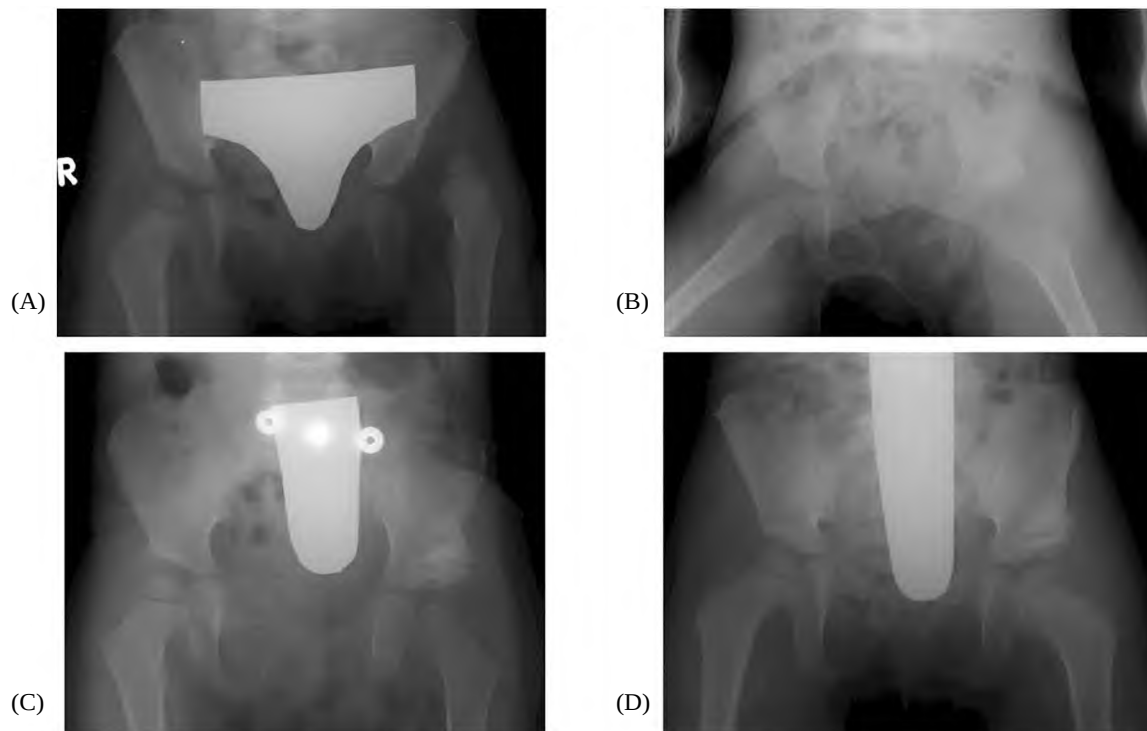


Fig. (4): Radiographs of a 2.5-years old child with left DDH. (A) Preoperative film with high dislocation. (B) Early postoperative image showing successful reduction. (C & D) Follow-up X-rays at 6 and 12 months shows maintained central reduction and AI 14° and CE angle 40°.

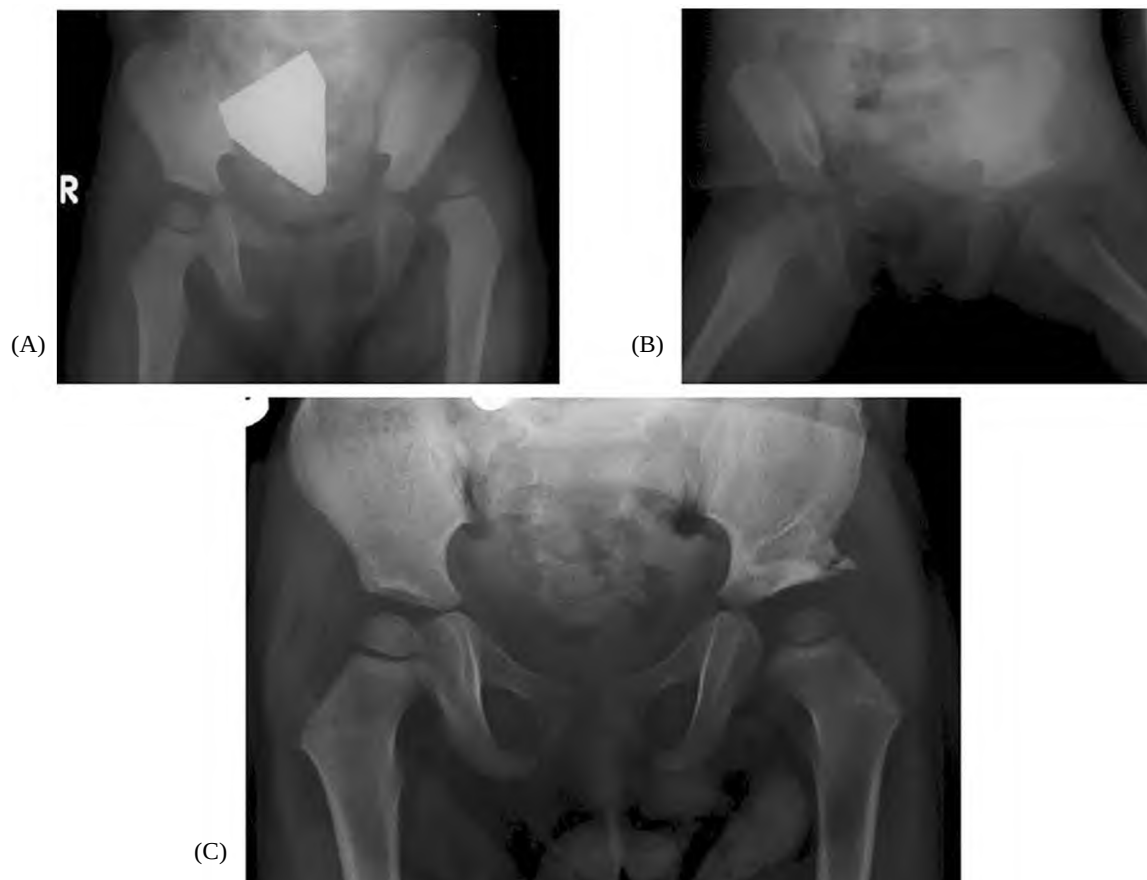


Fig. (5): Radiographs of a 1-year-9-months old child with left DDH. (A) Preoperative film showing AI 45°. (B) Early postoperative radiograph confirming concentric reduction. (C) Follow-up X-ray shows AI 12° and CE angle 12°.

Discussion

It has been estimated that degenerative joint disease of the hip is secondary to subluxation or dysplasia of the acetabulum in 20–50% of affected hips, and that approximately half of patients with osteoarthritis associated with acetabular dysplasia undergo their first reconstructive hip procedure before the age of 60 years, compared with less than 5% after the age of 70 years [5]. The younger the patient at the time of diagnosis and management, the better the anticipated clinical outcome. The age group in the present study walking-age children younger than four years was chosen because of the recognized importance of early reduction for the development of a normal hip joint and the high remodeling potential of the acetabulum in early childhood [4].

Regarding the final clinical outcomes, the current study revealed that at the 18–36 months follow-up, one-third of the hips demonstrated excellent results, and nearly two-thirds showed good results according to the modified McKay criteria, with only a small fraction classified as fair and no poor outcomes recorded. Consequently, the overall satisfactory rate reached more than nine-tenths of the cases, while the unsatisfactory rate was minimal.

These findings are in agreement with Merckaert et al. [6], who reported that more than nine-tenths of their cases achieved satisfactory results, with the majority graded as good or excellent. Conversely, Lucchesi et al. [7], observed a lower satisfactory rate of about three-fourths, which they attributed to older age at the time of surgery and delayed diagnosis.

Concerning the radiological outcomes, the current study showed that according to Severin's classification, four-fifths of the hips were graded as class I, while a small proportion were class II, and only a few cases were class III. No hips were graded as class IV. This resulted in an overall radiological satisfactory rate of more than nine-tenths, reflecting a strong correlation with the high clinical success rate observed in the study. These results are consistent with Gigi et al. [8], who reported that more than nine-tenths of hips were graded as Severin class I or II at final follow-up.

Regarding the acetabular index (AI), the current study demonstrated that the mean preoperative AI of slightly less than 50° showed a significant postoperative improvement to slightly above 15°, indicating marked acetabular remodeling after Degaacetabuloplasty. The statistical analysis con-

firmed that this improvement was highly significant ($p < 0.001$), emphasizing the procedure's effectiveness in restoring normal acetabular morphology. Preoperative AI did not significantly influence the final clinical outcome, suggesting that the surgery can yield favorable results even in patients with markedly elevated preoperative AI values.

However, hips that achieved lower final AI values demonstrated significantly better clinical outcomes ($p = 0.005$), highlighting the importance of postoperative acetabular correction in functional recovery. It may be due to the fact that achieving optimal acetabular coverage facilitates better hip stability, improved biomechanics, and reduced risk of residual dysplasia, thus enhancing the overall functional prognosis.

These findings are in agreement with Lucchesi et al. [7], who reported a similar significant improvement in mean AI postoperatively, with final AI strongly correlating with better McKay clinical scores. Conversely, Axt and Wadley [9], observed that although AI improved significantly after surgery, preoperative AI was a predictor of outcome in their series, which may be attributed to differences in surgical timing and patient age compared to the present study.

Regarding the center-edge (CE) angle, the present study revealed that all hips had a negative CE angle preoperatively, reflecting severe deficiency in acetabular coverage. At the final follow-up, there was a remarkable improvement, with CE angles ranging from slightly above 15° to mid-40s, and a mean value of approximately 33°, indicating effective restoration of acetabular coverage after Degaacetabuloplasty.

These findings are consistent with Lyu et al. [10], who reported a significant postoperative increase in mean CE angle, with values above 25° correlating strongly with excellent and good McKay clinical grades.

Regarding the radiological relations, the current study demonstrated that the preoperative acetabular index (AI) did not have a statistically significant influence on the final radiological outcomes ($p = 0.590$), suggesting that the initial severity of acetabular dysplasia alone may not be a strong determinant of long-term radiological success after Degaacetabuloplasty. However, hips that achieved lower final AI values postoperatively were significantly associated with better Severin grades ($p = 0.04$), indicating that improved acetabular slope correction contributes to enhanced joint congruency. It may be due to the fact that a lower postoper-

ative AI reflects a more horizontal acetabular roof, which provides superior femoral head coverage and reduces the risk of residual dysplasia.

These results are in agreement with Wen et al. [11], who reported that hips with postoperative AI $<20^\circ$ and CE angle $>25^\circ$ achieved the highest rates of Severin grade I classification. Conversely, Danişman et al. [4], observed that while CE angle improvement was consistently linked to favorable outcomes, AI reduction alone did not always guarantee optimal radiographic classification, suggesting that combined parameters should be considered when evaluating surgical success.

Regarding the correlation between clinical and radiological results, the present study revealed a strong and statistically significant association ($p=0.001$) between the two outcome measures. All hips classified as Severin Grade I achieved satisfactory clinical results, all hips with Severin Grade II were clinically graded as good, and the two hips with Grade III demonstrated only fair clinical outcomes. It may be due to the fact that optimal radiological restoration of acetabular morphology directly improves joint biomechanics, femoral head containment, and range of motion, which collectively translate into superior functional outcomes. This finding is consistent with Beck et al. [12], who reported that the majority of hips with Severin Grade I had excellent or good clinical scores according to the McKay criteria.

Conclusion:

One-stage open reduction combined with Dega pelvic osteotomy provides reliable clinical and radiological correction of DDH in walking-age children. The study results demonstrate that this approach achieves high rates of stable reduction and favorable acetabular remodeling, with minimal complications, when performed by meticulous technique. Age at surgery remains a key determinant of outcome, with earlier intervention associated with superior results. Given the absence of redislocation and the strong correlation between final radiographic parameters and clinical success, this method can be recommended as a primary surgical option in appropriately selected patients. Long-term follow-up into skeletal maturity is warranted to confirm the durability of these outcomes.

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تقييم نتائج إعادة بناء الجوف الحقي بطريقة ديجا في علاج عسر تصنع مفصل الورك التطوري في الاطفال بعد المشى ودون الرابعة

خلل النمو التطوري لمفصل الفخذ (DDH) عند الأطفال في سن المشي يمثل تحديات جراحية خاصة. وقد طُرحت فكرة إجراء رد مفتوح في عملية واحدة مصحوباً بقطع حوضي من نوع ديغا، مع أو بدون تقصير عظمي للفخذ أو قطع عظم الفخذ الدوراني، بهدف استعادة ثبات المفصل وتحسين تغطية الحق. أُجريت دراسة مستقبلية على ٢٤ مريضاً (٣٠ مفصل فخذ) خلال الفترة من مارس ٢٠١٢ حتى مارس ٢٠١٥. خضع جميع المرضى لعملية رد مفتوح مع قطع حوضي من نوع ديغا، وأُضيف تقصير الفخذ و/أو القطع الدوراني حسب الحاجة. تم تقييم المرضى قبل وبعد الجراحة باستخدام مؤشر الحق (AI)، وزاوية مركز-الحافة (CEA)، ومعايير ماكاي المعدلة للتقييم السريري، وتصنيف سيفرين الشعاعي. كان متوسط فترة المتابعة ٢٤ شهراً (المدى ١٨-٣٦ شهراً). أظهرت النتائج النهائية أن ٢٨ مفصلاً (٩٣.٣٪) حققت نتائج سريرية مرضية (ممتازة أو جيدة)، و٢٨ مفصلاً (٩٣.٣٪) حققت نتائج شعاعية مرضية (الدرجتان I-II وفق تصنيف سيفرين). تحسن متوسط مؤشر الحق من ٤٧.٢٨ ± ٣.٣٦ قبل الجراحة إلى ١٦.٠٧ ± ٢.٤٢ بعد الجراحة ($p < ٠.٠٠١$). بلغ متوسط زاوية مركز-الحافة بعد الجراحة ٣٢.٩٧ ± ٥.٨٨ ، مع وجود علاقة ذات دلالة إحصائية بين القيم الأعلى للزاوية والنتائج السريرية الأفضل ($p = ٠.٠٠٢$). كما ارتبط العمر الأصغر عند إجراء الجراحة بنتائج سريرية أفضل ($p = ٠.٠١٣$). لم تسجل أي حالات إعادة خلع، وكانت المضاعفات محدودة وشملت حالتين التهاب سطحي للجرح، وحالة شلل عابر للعصب الفخذي، وبعض علامات النخر العظمي في نسبة صغيرة من المفاصل. نستنتج أن الرد المفتوح في عملية واحدة مع قطع حوضي من نوع ديغا، مدعوماً عند الحاجة بتقصير الفخذ والقطع الدوراني، يحقق استقراراً ممتازاً وإعادة تشكيل فعالة للحق في الأمد القصير لدى الأطفال في سن المشي المصابين بـ DDH، خاصة إذا أُجري قبل عمر السنتين.