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Original Article

# Clinical and radiographic medium-term evaluation on patients with developmental dysplasia of the hip, who were submitted to open reduction, capsuloplasty and Salter osteotomy☆,☆☆

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ABSTRACT

*Objective:* to evaluate the clinical and radiographic medium-term results from surgical treatment of developmental dysplasia through open reduction, Salter et al.'s osteotomy and capsuloplasty.

*Methods:* 13 patients were evaluated, 13 hips treated surgically by the proposed technique between 2004 and 2011. A clinical and radiographic evaluation was conducted by Dutoit et al. and Severin et al. criteria, respectively.

*Results:* the acetabular preoperative index for the 13 surgically treated hips ranged from 27° to 50° (average of 36), and after surgical correction to 18.5° (10–28°), so that the evaluations of preoperative and postoperative acetabular indexes showed up significant statistic reduction ($p < 0.05$). Regarding the postoperative clinical evaluation, it was found: nine excellent hips (69.2%), three good ones (23.1%), no fair hips (0%) and a poor one (7.7%). In radiographic evaluation, it was found: six excellent hips (46.1%), three good ones (23.1%), no fair hips (0%) and four poor ones (30.8%). Therefore, favorable results were obtained (92.3%), with grouped hips with excellent and good ratings as satisfactory and with fair and bad ratings as unsatisfactory. It is also important to notice that there was no significance among occurrence of complications, the patient's age, the time of surgery and the preoperative acetabular index ($p > 0.05$). As complications occurred, it was found that three subluxations and a subluxation associated with avascular necrosis of the femoral head.

*Conclusion:* open reduction, Salter et al.'s osteotomy and capsuloplasty are seen to be a viable option for the treatment of developmental dysplasia of the hip, according to clinical and radiological medium-term evaluations.



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## Avaliação clínica e radiológica em médio prazo dos pacientes portadores de displasia do desenvolvimento do quadril submetidos a redução aberta, capsuloplastia e osteotomia de Salter

*Palavras-chave:*
Luxação congênita do quadril/cirurgia
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Doenças do desenvolvimento ósseo
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RESUMO

*Objetivo:* avaliar o resultado clínico e radiológico do tratamento cirúrgico da displasia do desenvolvimento do quadril em médio prazo, por meio da redução aberta, da capsuloplastia e da osteotomia de Salter et al.

*Métodos:* foram avaliados 13 pacientes, 13 quadris, entre 2004 e 2011, tratados cirurgicamente pela técnica proposta. Uma avaliação clínica e radiológica foi feita pelos critérios de Dutoit et al. e Severin et al., respectivamente.

*Resultados:* nos 13 quadris acometidos o índice acetabular pré-operatório variou de 27° a 50° (média de 36) e, após correção cirúrgica, para 18,5° em média, com variação de 10° a 28°, de modo que as avaliações dos índices acetabulares pré e pós-operatórios apresentaram redução com significância estatística ($p < 0,05$). Quanto à avaliação clínica pós-operatória, foram encontrados: nove quadris ótimos (69,2%), três bons (23,1%), nenhum regular (0%) e um ruim (7,7%). Na avaliação radiológica, foram encontrados seis quadris ótimos (46,1%), três bons (23,1%), nenhum regular (0%) e quatro ruins (30,8%). Portanto, obtiveram-se resultados favoráveis em 92,3%, pois agrupam-se quadris com avaliação ótima e boa como satisfatórios e os com avaliação regular e ruim como insatisfatórios. Atente-se que não houve significância entre a ocorrência de complicações, a idade do paciente, o momento da cirurgia e o índice acetabular pré-operatório ($p > 0,05$). Como complicações ocorridas, têm-se três subluxações isoladas e uma subluxação associada à necrose avascular da cabeça femoral.

*Conclusão:* a redução aberta, a capsuloplastia e a osteotomia de Salter et al. são consideradas uma opção viável do ponto de vista clínico e radiológico em médio prazo para o tratamento da displasia do desenvolvimento do quadril.



## Introduction

Developmental dysplasia of the hip (DDH) involves a spectrum of developmental disorders of the hip, which present in different forms and ages, from a ligament laxity to complete dislocation of the femoral head. In such cases, the acetabulum is situated in an anterosuperior position as a result of excessive anteversion, which makes it increasingly shallow, thick and oblique. DDH is classified into two types: typical (subdivided into dislocable, subluxated and dislocated hip) and teratologic.

The etiology of DDH remains unknown, but ethnic and genetic factors are important. Genetic factors may determine the acetabular dysplasia, ligament laxity or both, as reported by Wynne-Davies.[1] In addition to the preexisting factors, mechanical factors such as intrauterine position and postnatal habits can also interfere with the process.

In several papers, the incidence of DDH ranged from 2 to 17 per 1000. In Brazil, Volpon and Carvalho Filho[2] demonstrated an incidence of 2.31 per 1000.

The treatment depends on the patient's age, degree of acetabular and proximal femur dysplasia. It is considered that, after the start of the walking, a surgical option for the treatment of DDH consists of open reduction, Salter's osteotomy, and capsuloplasty.[3] This technique promotes acetabular repositioning, aiming to increase the coverage of the femoral head, which will be surgically reduced into the acetabulum.

The aim of this study was to evaluate the clinical and radiological outcome in the medium term surgical treatment of DDH by open reduction, Salter's osteotomy, and capsuloplasty.

## Materials and methods

Thirteen patients who remained with DDH after they start walking, whether by failure of medical treatment in the first year of life or by referral of the child with a delayed diagnosis, were evaluated. All were treated surgically between 2004 and 2011, by the techniques of open reduction, capsuloplasty, and Salter's osteotomy. The study was approved by the Ethics and Research Committee of the hospital, where the work was done.

The age of patients ranged between one year and 11 months to six years. The group was composed of three males and 10 females, with six hips with involvement on the right side and seven on the left side. The average immobilization time with postoperative pelvi-pedal plaster was two months. The patients underwent surgical treatment with open reduction, capsuloplasty and Salter et al.'s osteotomy, as per surgical description,[4] and were operated by the same orthopedic surgeon (Fig. 1). However, in only one case it was necessary to make previous traction to surgery. On average, the osteosynthesis material was removed after one year of postoperative follow-up, whose clinical and radiological evaluation occurred