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Technical Note

Total arthroplasty in displaced dysplastic hips with acetabular reconstruction and femoral shortening – technical note☆,☆☆

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ARTICLE INFO

Article history:
Received 3 April 2013
Accepted 13 May 2013

Keywords:
Arthroplasty, replacement, hip
Bone diseases, developmental
Osteotomy
Transplantation, autologous

ABSTRACT

To describe a new procedure of total hip replacement in patient with severe developmental dysplasia of the left hip, using technique of acetabular reconstruction with autogenous bone grafts and subtrochanteric shortening femoral osteotomy. Total hip replacement done in January of 2003. The Eftekhar's classification was used and included type D, neglected dislocations. Bone graft incorporated in acetabular shelf and femoral osteotomy. Our contribution is the use of an Allis plate to better fix acetabular grafts, avoiding loosening, and cerclage around bone graft in femoral osteotomy site, which diminish pseudoarthrosis risk. This technique shows efficiency, allowing immediately resolution for this case with pain and range of motion of hip improvement. It also allows the acetabular dysplasia reconstruction, equalization of the limb length (without elevated risk of neurovascular lesion) and repairs the normal hip biomechanics due to the correction of the hip's center of rotation.

Artroplastia total em quadris displásicos luxados com reconstrução acetabular e encurtamento femoral

Palavras-chave:
Artroplastia de quadril
Doenças do desenvolvimento ósseo
Osteotomia
Transplante autólogo

RESUMO

Descrever contribuições à técnica da cirurgia de artroplastia total em displasias do desenvolvimento do quadril grave, por meio da reconstrução acetabular com o uso de enxerto autólogo e encurtamento femoral feito com osteotomia subtrocantérica em V invertido. Paciente submetido a artroplastia total do quadril esquerdo em janeiro de 2003. Foi usada a classificação de Eftekhar e o paciente era do tipo D, luxação inveterada. Incorporação do enxerto no teto acetabular e osteotomia femoral. Acrescentamos a fixação do enxerto da cabeça femoral no acetábulo com placa do tipo Allis, que contribui para maior resistência do sistema, e a cerclagem com fio de aço no enxerto ósseo junto à osteotomia subtrocantérica, que

☆ Please cite this article as: Silva P, de Oliveira LA, Coelho DL, do Amaral RA, Rebello PR, de Moraes FB. Artroplastia total em quadris displsícos luxados com reconstrução acetabular e encurtamento femoral. Rev Bras Ortop. 2014;49:69–73.

☆☆ Study conducted at Department of Hip Surgery, Hospital Geral de Goiânia, Clínica de Ortopedia e Traumatologia de Goiânia, GO, Brazil.

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2255-4971 http://dx.doi.org/10.1016/j.rboe.2014.01.013

diminui o risco de pseudoartrose. Essa técnica demonstrou eficácia e permitiu a resolução imediata do caso com melhoria da dor e da amplitude de movimento do quadril. Permitiu também a reconstrução do déficit ósseo acetabular, a recomposição do comprimento do membro (sem risco aumentado de lesão neurovascular) e a recuperação da biomecânica do quadril com a reparação do centro de rotação normal.

Introduction

Since the emergence of the modern techniques of prosthetic reconstruction of the hip using the principles of Charnley et al,[1] a disease continues to challenge hip orthopedic surgeons: developmental dysplasia of the hip (DDH). In DDH the anatomy is altered. The dysplastic acetabulum is vertical, shallow and with proximal migration, and has poor bone quality and superolateral coverage deficit. The proximal femur is narrow, with small femoral head; and the short neck and trochanter are located posteriorly. Changes in the soft parts also occur, with flattening of the abductor muscles, joint capsule thickening and redundant, hypertrophy of iliopsoas muscle and shortening of the sciatic nerve.[2]

Because of these changes, Charnley et al. and Feagin et al. discouraged the practice of total hip arthroplasty (THA) in patients with DDH.[3] Subsequently, other authors have published studies using bone graft, with the goal of reconstructing the acetabulum and promoting an increase in the coverage of the prosthetic component. Hasting et al. and Parker et al.,[4] in 1975, were the first to use autograft of the femoral head, with good results. Harris, in 1977, demonstrated the incorporation of cortico-cancellous grafts,[5] and Azuma et al.,[6] in 1994, reviewed the graft incorporation by radiographic studies. These studies encouraged the practice of acetabular reconstruction and adopted the incorporation of the graft into the acetabular bed with increased bone stock, which results in increased survival of the hip arthroplasty.

Apart from the difficulties imposed by acetabular dysplasia, other important obstacles are the changes of the proximal femur and the lower limb dysmetria. In these patients, the ectopy of the femoral head, more proximally located, leads to the formation of a false acetabulum and to the soft tissue changes already mentioned. In patients with bilateral involvement, the two surgeries should be made with little delay between the procedures, so there is no detrimental effect on the patient's gait rehabilitation.[2] In those people in whom the affection is unilateral, one should try to restore the limb length. The femoral shortening should be made to avoid an exaggerated limb lengthening and to protect the sciatic nerve.

The aim of this study was to describe the surgical steps of a total hip arthroplasty in patients with DDH with dislocated hip, through an acetabular reconstruction with bone grafting of the femoral head and fixation with plate for added strength, and femoral shortening with osteotomy in inverted-V, with addition of bone graft cerclage into the osteotomy, to prevent nonunion.

Technical note

Female patient, 44 years old, submitted to THA in January 2003, with clinical presentation of DDH and stubborn dislocation of left hip. The patient was operated by a group of hip surgeons in the General Hospital of Goiânia (GO). The classification of DDH of Eftekhar[7] was used: type D (stubborn dislocation), in which, besides the need for acetabular reconstruction, femoral shortening osteotomy was also made.

In the preoperative planning, we requested AP radiographs of the pelvis, including the proximal third of femur, hip profile, and orthoradiographic profile of the lower limbs. An assessment with the use of templates was performed. The goal was the normal biomechanics of the hip to be operated (Fig. 1).

The patient underwent spinal anesthesia and was positioned in lateral recumbency. The procedure started with an extensive posterolateral approach and posterior capsulectomy (via Kocher-Langenbeck). Following the osteotomy of the femoral neck, the femoral head is reserved to be used as a graft to the acetabulum. After locating the true acetabulum (to restore the biomechanics of the hip and give durability to the implant; one must be careful not to put the implant into the false acetabulum), this structure was prepared to receive the graft of femoral head fragment, and an osteotomy of the femoral neck was performed. The femoral head is kept to be used as graft of the acetabulum, which is positioned so as to increase the superolateral coverage of acetabulum, and for correction of dysplasia. To obtain a good integration, the recipient bed was scarified till bleeding and the graft is fixed with an Allis plate and screws for small fragments,

Fig. 1 – Radiography of pelvis in the anteroposterior view in the preoperative planning that highlights the developmental dysplasia of the left hip with stubborn dislocation.