Operative Steps: 
The Dysplastic Hip

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Summary

In this chapter we will review the indications and problems of hip replacement in the presence of developmental dysplasia of the hip (DDH). The principles of total hip replacement for DDH are similar to those for routine total hip replacement; reconstruction of a near normal soft-tissue envelopes carried out to relieve pain. We are attempting to recreate normal joint biomechanics by restoring the centre of rotation, placing the trochanter lateral to the hip joint, thus improving the lever arm of the abductors, which will reduce the joint reaction force and Trendelenburg dip. We require small implant components and will attempt to insert the largest offset available. We should be able to perform acetabular augmentation and femoral osteotomy to restore the soft-tissue balance around the hip. We should be familiar with anterior and posterior approaches to the hip joint and comfortable with mobilising major neurovascular structures that may be encased in dense fibrosis due to previous surgery in childhood. We will present a system of assessment and reconstruction for the acetabulum and femur we have followed for 10 years (the results of which are recorded in later chapters ◀ chapters 8.7, 9.3), which can be used to resolve the many and varied problems.

Indications for Arthroplasty

Pain

For most patients with osteoarthritis secondary to developmental dysplasia of the hip, replacement is carried out for the same indications as for routine hip replacement, pain. However, often the pain radiates further down to the front of the knee and can be associated with a reasonable range of motion, particularly when the hip was completely dislocated.

Disability

In most cases, surgery is undertaken for pain. However, disability, reduced walking distance, difficulty dressing and mounting stairs can be a major feature in younger patients. Because developmental dysplasia predominantly affects young females, there can be other functional difficulties resulting from reduced abduction leading to problems with personal hygiene and sexual intercourse, particularly when the condition is bilateral.

Where there is significant leg length discrepancy or deformity (Fig. 2.37), long-leg arthritis can develop in the contralateral knee. In these circumstances, it is often wise to perform total hip replacement on the abnormal hip before undertaking total knee replacement in the more normal, longer leg because the knee replacement would work at a mechanical disadvantage; this would lead to premature failure of the knee replacement.

Occasionally patients with longstanding fixed adduction deformity of the hip will present with valgus OA of the ipsilateral knee. Knee replacement in these patients will accentuate their scissoring gate and lead to premature failure of the TKR if the adduction deformity of the hip is not addressed first.

Where leg-length discrepancy is longstanding and the patient has developed a compensatory scoliosis, it is important to ensure that the scoliosis is correctable (by examining the back sitting) before attempting to fully correct any leg-length discrepancy.

Gait

Many patients with osteoarthritis secondary to DDH, or DDH itself, present with a waddling gait (abductor lurch). Developmental dysplasia can be regarded as a field change around the hip that includes the soft tissues as well as the bony anatomy. By reconstructing near normal hip biomechanics with hip replacement, the waddling gait
will improve. However, even with perfect reconstruction of the hip, many patients will continue to waddle post surgery. All patients should be warned of the possibility of the abnormal gait continuing.

**Leg Length**

Most patients with unilateral DDH will have significant leg-length discrepancy and may feel this to be a cosmetic problem. When assessing leg length it is important to ensure that the leg-length discrepancy is entirely due to the dislocated hip or abnormal posture. Occasionally, particularly when previous surgery has been carried out, a limb will overgrow below a dysplastic hip such that if the normal hip anatomy is restored, the leg with be overlengthened. This can be disabling for the patient.

**Back Pain**

Many older patients will have walked for many years with a significant leg-length discrepancy developing secondary osteoarthritis in the lumbar spine. During clinical examination it is important to assess this by examining the sitting posture to ensure that the spinal deformity will be correct. While correction of leg-length discrepancy may improve long-term back problems in the dysplastic patient, this cannot be guaranteed. Over-correction of the leg length stressing the spinal deformity may lead to or increase back pain.

**Conservative Treatments**

Prior to considering surgery all conservative treatments, shoe-raises, simple analgesia, injection of steroids and – if insufficient – operative treatment including arthroscopic debridement of labral tears and realignment osteotomies, pelvic or femoral osteotomy (or both) should be considered. However, if these have been tried or are thought not suitable, then total hip replacement may be the only solution. These predominantly young patients present considerable technical problems. However, a successful, total joint replacement will relieve their pain and increase their mobility.

**Grading and Planning**

A variety of grading systems can be used to try to define the extent of surgery necessary (and the possible problems and outcomes). Unfortunately, most documented grading systems are used to describe the combined acetabular and femoral deformities, e.g. Eftekhar’s elongated, intermediate, high, false, or no contact descriptions [3] and Crowe’s grading system [2] based on migration of the femoral head in proportion to the height of the pelvis. Crowe’s system is particularly difficult to apply routinely when limited views of the pelvis are taken. Perhaps clinically most useful is the grading system of Hartofilakidis [4] (Figs. 2.38 to 2.40) describing the hips as

- **dysplastic**: those with an acetabular segmental defect that is contained with a large medial osteophyte as a consistent feature (Fig. 2.38);
- **low**: those with an overlapping false acetabulum resulting in reduced depth (Fig. 2.39a);
- **high**: a false shallow acetabulum, that is rim deficient and anteverted (Fig. 2.39b).

However, all three systems ignore femoral geometry and problems related to the reconstruction of leg length. They also fail to take into account the increased difficulty of surgery when previous femoral or pelvic osteotomies have been carried out.

To be useful, a grading system should predict surgical difficulties and long-term outcome. Hence, we use the following system to plan surgery.