RADIOGRAPHIC MEASURES

Overall Procedure

Pre-operative radiographic factors were obtained by plain radiography using both a lateral view, such as cross-table lateral, Dunn 45° or frog lateral, and an anterior-posterior pelvic view, as this represents the minimum radiological procedure for assessment of hip-related pain.[1,2] It has recently been recommended that Dunn 45° view is the best choice for initial radiographic assessment of femoral head-neck junction morphology,[2] and while this is standard procedure in Denmark, we cannot guarantee that this has been applied on all patients included in the present study.

Femoral head-neck morphology - Alpha Angle

The Alpha Angle, a measure of cam morphology, was obtained using a lateral radiographic view.[2] The Alpha Angle represents the angle between: 1) the line from the center of the femoral head parallel to the axis of the femoral neck, and 2) the line from the center of the femoral head to the point where the femoral head-neck junction extends beyond the margin of the circle along the periphery of the femoral head.[3]

Acetabular morphology

The Lateral Center Edge Angle (LCEA), Ischial Spine Sign, and Acetabular Index Angle, measures used to quantify over- or under-coverage of the femoral head and acetabular retroversion (i.e. pincer morphology or dysplasia), was obtained using an anterior-posterior pelvic view.[2]

Lateral Center Edge Angle

The LCEA was measured as the angle between 1) the vertical line through the femoral head perpendicular to the line between the centers of the two femoral heads (or a similar horizontal line)
and 2) the line between the center of the femoral head and the lateral end of the sourcil (i.e. weight-bearing area of the acetabulum).[2,3]

**Ischial Spine Sign**

The Ischial Spine Sign was considered positive if the projected shape of the of the Ischial Spine is visible medially to the pelvic brim.[2]

**Acetabular Index Angle**

The Acetabular Index Angle was measures as the angle between a horizontal line and a line through the most medial point of the sclerotic zone of the acetabulum and the sourcil.[4,5]

**Joint Space Width**

The Joint Space Width, an indirect measure of cartilage injury [6] and osteoarthritis.[2] was assessed using an anterior-posterior pelvic view as the distance between the femoral head and the lateral sourcil at the acetabulum.[2,3]

**CARTILAGE GRADING**

Cartilage status was graded during surgery by the operating surgeon.

**Acetabular cartilage**

Acetabular cartilage injury was graded using the modified Becks cartilage classification as: normal cartilage (grade 0), fibrillation (grade 1), wave sign (grade 2), cleavage tear between acetabular bone and cartilage (grade 3), or exposed bone (grade 4). In addition, cartilage injury size was graded as: no lesion (grade 0), <1 cm² (grade 1), 1-2 cm² (grade 2), or >2 cm², while the acetabular labral was graded as injured or uninjured.
**Femoral head cartilage**

Femoral head cartilage injury was graded using the International Cartilage Repair Society (ICRS) classification as: normal cartilage (grade 0), nearly normal (grade 1), abnormal (grade 2), partial loss of cartilage (grade 3), or exposed bone (grade 4). In addition, cartilage injury size was graded as: no lesion (grade 0), <1 cm\(^2\) (grade 1), 1-2 cm\(^2\) (grade 2), or >2 cm\(^2\).

**REFERENCES**


