

FEMORAL OSTEOTOMY IN PODIATRIC SURGERY

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Intoeing In Children

Deformities of the lower extremity in children whether angular or rotational and regardless of their etiology are a cause for concern in treatment. Judgement is required in knowing when the deformity will correct with growth and when it will not. Rotational abnormalities are common in children, occurring in 13.6% of "normal" children.

A significant number of intoeing children are seen annually and parents want to know what is wrong with the child's feet. There is an old adage that "if you know only one diagnosis, there is only one diagnosis you can make".

Femoral anteversion (FA) is a measure of the relationship the angle of the femoral neck and head make with the shaft, i.e. the forward facing of the femoral neck and head. This angle is great in newborns (averaging 40 degrees) and usually improves spontaneously until age 12. This angle finally approaches 15 degrees in adults. Problems occur when this normal correction fails to take place (Fig. 1). It is important for the head of the femur to be well seated in the acetabulum for the hip to function efficiently. In children with excessive femoral anteversion the entire limb will rotate inward in an attempt to contain the head of the femur within the acetabulum. This is also the position of comfort (Fig. 2).

Internal rotation of the entire lower limb causes parents and older children to be concerned about an unsightly gait and increased clumsiness. Studies do show, however, that running skills in the adolescent and adult are not adversely affected by a moderate increase in femoral anteversion. It is important to be aware that femoral anteversion is associated with various foot deformities. Treatment directed only at the feet without concern for the deforming forces at work from excessive femoral anteversion can lead to failure.

Orthopedists consider femoral anteversion in evaluating genu valgum and as a cause for external tibial torsion. Many orthopedists believe excessive femoral

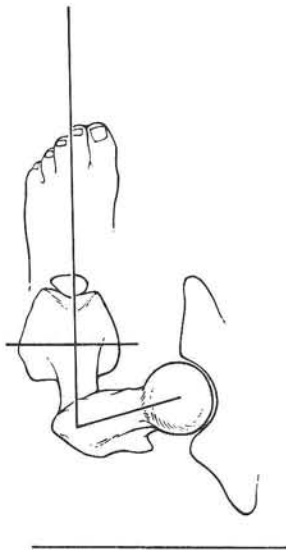
anteversion may lead to persistent acetabular maldirection which may cause degenerative arthritis of the hip in adult life.

There are several complicated methods to measure femoral anteversion. However, the most useful is a comparison of internal and external rotation of the hip taken with the patient lying prone. The ability to internally rotate 30 degrees more than to externally rotate is considered to be excessive femoral anteversion. Since the natural history is for the amount of anteversion to decrease with time it is useful to have a method of recording changes in the patient. Staheli's rapid method for rotational assessment is superb for documentation.

If a child demonstrates excessive femoral anteversion, treatment begins with passive external rotation of the leg by the parents. The child needs to be discouraged from sleeping prone with feet turned in. Sewing the heels of the child's sleepers or night clothes together may even be adequate. The child should also be discouraged from sitting in the "W" or TV watching position, and encouraged to sit in a tailor position with legs crossed in front.

If the deformity is severe and does not respond to conservative treatment, or if the patient is developing secondary changes, consideration should be given to surgical intervention. Since the cause of this deformity is an absence of external rotation at the hip, the logical treatment is to perform a lateral rotational osteotomy of the femur. Only patients with severe deformity require surgical intervention. If the hip can be rotated externally more than 15 degrees in the extended position the condition will usually not need surgery. Probably less than 1:500 children with excessive femoral anteversion will require osteotomy.

The technique of derotation osteotomy is to make a lateral approach to the area of the femur just distal to the lesser trochanter. The proximal portion of the femur should be secured by internal fixation. A transverse osteotomy should be performed, rotating the femur laterally enough to make the new amount of internal and external rotation equal. The distal portion of the osteotomy is secured with internal fixation.



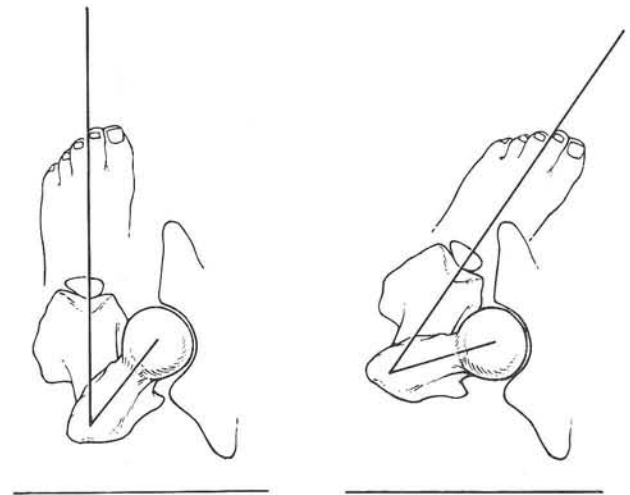
NORMAL HIP

Figure 1. Normal position of femoral head in acetabulum and normal angular relationship between femoral neck and shaft.

The patient is placed in a hip spica cast for six weeks to allow the osteotomy to heal. The results are usually excellent and the patients are happy.

Summary

Excessive femoral anteversion is a problem facing patients, parents, pediatricians, podiatrists, and orthopedists. It is important to know the natural history of this problem and recognize that untreated excessive femoral anteversion can lead to future problems for the patient, the podiatrist, and the orthopedist.



**ANTEVERTED HIP
ABNORMAL HIP
POSITION**

**ANTEVERTED HIP
INTOEING**

Figure 2. In-toeing position of the foot due to anteverted relationship of femoral neck to the shaft. Femoral head is in normal position within acetabulum.

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