



Intramedullary fixation in Intertrochanteric femoral fracture

An Essay

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Introduction

Intertrochanteric fractures account for nearly 50% of all fractures of the proximal femur. Patient age of incidence is 66 to 76 years. The ratio of women to men ranges from 2:1 to 8:1, likely because of postmenopausal metabolic changes in bone.^[1]

Trochanteric fractures occur mostly in elderly patients, and the outcome may be extremely poor if there is prolonged bed rest. Stable fixation that allows early mobilization is the treatment of choice.^[1]

The best operative treatment for trochanteric fracture remains controversial. Fixation Implants include the dynamic hip screw which gain widespread acceptance during last decade but complication is frequent specially in unstable pertrochanteric fracture some of this complication include application of a DHS requires a relatively larger exposure, more tissue handling , all of which increase the morbidity, the probability of infection and significant blood loss, the possibility of varus collapse and the inability of the implant to survive until fracture union .^[2]

Next era was intramedullary implant for the treatment of unstable intertrochanteric fractures. Intramedullary implants withstand higher static and several-fold higher cyclical loading than DHS-types of implants.

Given all these limitations of the DHS fixation, various hip nailing systems are attractive alternatives to the DHS plus TSP. Nailing has shorter lever arm with reduction in bending stress and lower implant failure rate and makes no dissection at the fracture site. The nail occupies the medullary canal, preventing excessive sliding and medialization of the shaft even in A3 fractures. It also covers all the other fracture patterns like reverse obliquity and intertrochanteric fracture with subtrochanteric extension effectively.^[3,4]

However, the nailing system usually costs double the price of DHS; is associated with iatrogenic abductor injury, though the real clinical value of these suggestions is still unknown and is complicated with femoral shaft fractures that decreased significantly with better design of the nails.^[5,6]

Introduction

This technique is more difficult than DHS. Finally, although the nailing seems to produce fracture healing in a more anatomical position than DHS fixation, this anatomical healing does not seem to guarantee better functional results in A1 and A2 fractures.^[7]

Many types of intramedullary nails was introduced with different specifications we will discuss 6 types of nails in this study.

Aim of the work

Study the benefits of cephalomedullary fixation in treatment of intertrochanteric femoral fractures and its advantages in comparison with dynamic hip screw.

Anatomy

The femur is the most proximal bone of the lower limb. It is the strongest bone in the body it consists of head, neck, trochanters, shaft and distal end, The head of the femur articulates with the acetabulum. (Fig. 1,2)

The head & neck:

The head which is globular and forms rather more than a hemisphere, is directed upward, medial ward, and a little forward, the greater part of its convexity being above and in front. Its surface is smooth, coated with cartilage in the fresh state, except over an ovoid depression, the fovea centralis, which is situated a little below and behind the center of the head, and gives attachment to the ligamentum teres.[8]

The neck is a flattened pyramidal process of bone the femoral neck is about 5 cm long, connecting the head with the shaft, and forming with the latter a wide angle opening medial ward. The angle is widest in infancy, and becomes lessened during growth, so that at puberty it forms a gentle curve from the axis of the body of the bone. In the adult, the neck forms an angle of about 125° with the body, facilitates movement of the hip joint, the neck is also laterally rotated with respect to the shaft (angle of anteversion) about 10° - 15° . [8]

The Trochanters:

The trochanters are prominent processes which afford leverage to the muscles that rotate the thigh on its axis, they are two in number, the greater and the lesser.

The greater trochanter:

It is a large, irregular, quadrilateral eminence, situated at the junction of the neck with the shaft. It is directed a little lateral ward and backward, It has two surfaces and four borders:

The lateral surface:

Quadrilateral in form, is broad, rough, convex, and marked by a diagonal impression, which extends from the postero-superior to the antero-inferior angle, and serves for the insertion of the tendon of the Glutæus medius.

The medial surface:

Of much less extent than the lateral, presents at its base a deep depression, the **trochanteric fossa** (digital fossa), for the insertion of the tendon of the Obturator externus, and above and in front of this an impression for the insertion of the Obturator internus and Gemelli.

The superior border:

Is free; it is thick and irregular, and marked near the center by an impression for the insertion of the Piriformis.

The inferior border:

Corresponds to the line of junction of the base of the trochanter with the lateral surface of the body; it is marked by a rough, prominent, slightly curved ridge, which gives origin to the upper part of the Vastus lateralis.

The anterior border:

Is prominent and somewhat irregular; it affords insertion at its lateral part to the Glutæus minimus.

The posterior border:

Is very prominent and appears as a free, rounded edge, which bounds the back part of the trochanteric fossa.[8]

The lesser trochanter:

Is a conical eminence, which varies in size in different subjects; it projects from the lower and back part of the base of the neck. From its apex three well-marked borders extend; two of these are above a medial continuous with the lower border of the neck, a lateral with the intertrochanteric crest; the inferior border is continuous with the middle division of the linea aspera. The summit of the trochanter is rough, and gives insertion to the tendon of the Psoas major. [8]

Intertrochanteric line:

It is a prominent ridge at the junction of the anterior surface of the neck and shaft, descending medially from a tubercle,

Superomedial on the anterior aspect of the greater trochanter to the lower border of the neck, distally it is continuous with the spiral line. The proximal end gives attachment to the most proximal fibers of vastus lateralis and the vastus medialis distally, and it forms the lateral attachment of the capsule of the hip joint, its upper part receives the attachment of the upper band of the iliofemoral ligament, the lower part receives the lower band of the same ligament.[8]