Tomographic Study of the Arthroscopic Approaches to the Hip Joint

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Purpose: The anatomic depth of the hip joint has long been one of the limiting factors in the development of arthroscopy of this particular joint. A major factor would seem to be variation in body size. The main purpose of this study was to quantify the distance between the joint and the skin in usual arthroscopic approaches. Type of Study: In vivo radiologic study using computed tomography.

Methods: We studied the distance from the center of the acetabulum to the skin. The lines that we studied correspond to the paratrochanteric, the anterolateral, and anterior arthroscopic entry points. Results: Although notable differences exist from one individual to another, the average values of the aforementioned are 12.4 cm, 11.2 cm, and 9.8 cm, respectively. The distances of these portals are greater in women than in men (P < .05), and there is no statistically significant relationship to age.

Conclusions: The results of the present work suggest that surgical tools needed for arthroscopy of the hip should be more than 16 cm long to guarantee performing hip arthroscopy comfortably in more than 95% of the population. Key Words: Arthroscopy—Hip—Surgical instrumentation—Portals—CT scan.

 Researchers began to perform arthroscopy of the hip joint in the 1930s.1,2 However, it has evolved less than arthroscopy in other joints, such as the shoulder or the knee.3,4 The technical requirements of arthroscopic surgery of the hip and the anatomy of this particular joint have caused this slower development.

Several techniques have been suggested to improve access to the joint and working inside it. Eriksson et al.5 first established the force necessary to distract the joint in anesthetized patients, thus allowing adequate visualization of the articular surfaces. Conversely, approaches to the

TOMOGRAPHIC STUDY OF HIP ARTHROSCOPY

FIGURE 1. Measurement 1 is a horizontal line parallel to the floor plane (paratrochanteric approach). Line 90° is perpendicular to the horizontal line through the femoral vessels. Measurement 2 is a line 50° above the horizontal line through the femoral vessels.
are considered standard (anterior, anterolateral, and paratrochanteric).

**METHODS**

A prospective study was performed on a population of 100 volunteers who were chosen at random. The criteria for inclusion in the study included the subject having undergone a CT scan of the abdominal and pelvic zones. We excluded subjects who had undergone a previous treatment of the hip joints or the bones. We did this to avoid possible radiologic facts or distortions of the anatomy of that zone. Patients signed a release permitting the procedure to be performed. Subjects included comprised of 50 men and 50 women with an average age of 55 (range, 22 to 87 years).

**Radiologic Technique**

A tomographic study was performed with the volunteer in the supine position. From a preliminary "scout view," a cut level plane situated 5 mm superior to the tip of the greater trochanter was selected. To locate the selected approaches, 2 lines were drawn over the previously obtained images. The first line was parallel to the plane of the floor (0°) and is extended from the center of the acetabulum to the skin of the trochanter region. This line, or measure 1, corresponds to the trajectory of the paratrochanteric approach. The second line, perpendicular (90°) to the previous one, led to the groin skin and passes through the femoral vessels. Between both, we determine a quadrant of a circumference. Next, 2 new lines were drawn at 50° and 70° angles with respect to measure 1, called measures 2 and 3, respectively. They represent the anterolateral (50°) and anterior (70°) arthroscopic portals (Figs 1 and 2).

Once these reference lines were drawn for each of the patients in the study, a measure was taken of the distance from the skin to the acetabulum center with 3 lines at different angles: one parallel to the floor, a second line 70° from the horizontal (corresponding to the anterolateral arthroscopic approach), and a third line 30° from the center of the acetabulum to the anterior arthroscopic approach.

**RESULTS**

The average distance for the paratrochanteric approach was 12.41 cm from the joint. The distance from the anterolateral and the anterior portals were 11.26 cm and 9.80 cm, respectively (Table 1). According to Pearson’s correlation coefficient, there was a degree of correlation among the 3 measurements (Table 2). No significant differences between age groups were seen in any of the measurements related to the 3 approaches (Table 3).

DISCUSSION

Women showed higher values than men in the measurements of the 3 arthroscopic approaches, although there was a high statistical significance was set at $P \leq .05$.

![Image](image-url)
the scanner. To minimize errors in the measurements, only 1 person was assigned to that task.

Triangulation is an important part of any arthroscopic procedure. The particular anatomic features of the hip joint and surrounding tissues make the portals more important than in other joints. Based on clinical experience, Keene and Villar reported that it is not possible to observe the entire hip joint.

### Related to Sex

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<td>1st</td>
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