

ANATOMIC CONSIDERATIONS FOR THE TVT-OBTURATOR APPROACH FOR THE CORRECTION OF FEMALE STRESS URINARY INCONTINENCE

Objective

To describe the 3-D anatomy of the external obturator space and surgical relationships of the TVT-O procedure.

Methods

Ten fresh cadaver dissections were performed to examine the external obturator space, the surrounding regional anatomy and its relationship to the technical aspects of the TVT-O procedure, specifically the "inside-to-out" directional transobturator passage. Measurements were taken in four of the specimens to determine the spatial relationships of vital structures to the surgical events that take place during the performance of the TVT-O procedure.

Results

The obturator foramen is bounded by the superior pubic ramus, the body of the pubis, the inferior pubic ramus, the ischium (fusing with the inferior part of the bony ilium) and densely spanned by the fibrous obturator membrane. The surgical path begins with a mid-urethral vaginal incision, then courses laterally at a 45° angle toward the superior medial edge of the obturator foramen, beneath the origin of pubococcygeus and puborectalis muscles and below the arcus tendineus levator ani and arcus tendineus fascia pelvis through the anterior recess of the ischioanal fossa. Neither the instrument nor the tape enters the space of Retzius. Dissections revealed the mean distance from the vaginal incision to the obturator membrane to be 4.0 cm (range 3.5-4.5), and from vaginal incision to the obturator neurovascular bundle, 6.75 cm (range 6.5-7). The surgical tract then curves laterally along the bony inferior pubic ramus near the attachment of the obturator internus muscle, then passes through the obturator membrane. During its course through the obturator membrane the passer was observed to be a mean distance of 2 cm (range 1.5-2.5) from the obturator neurovascular bundle at its closest point and as a function of its curvature, is directed away from these structures when advanced. Once through the membrane, the tract passes through the obturator externus, superior aspect of the adductor magnus, the adductor brevis, upper edge of the gracilis muscle, fascia lata, subcutaneous tissue and skin. The exit site is 2 cm above the level of the external urethral meatus and 2cm lateral to the thigh crease. In 6 out of the 10 cadavers an anterior branch of the obturator artery was found coursing medially along the exterior edge of the obturator foramen. This artery is effectively shielded by the exterior bony rim of the obturator foramen during an "inside-to-out" passage but can potentially be disrupted in an "outside-to-in" transobturator approach. The femoral neurovascular structures are well lateral and anterior to the surgical path at a mean distance of 10.1 cm (range 8-11.5).

Conclusion

The "inside-to-out" placement of the TVT-O procedure appears to offer additional safety during transobturator passage by being directed away from the urethra and bladder and when present, unable to jeopardize the anterior branch of the obturator artery. Furthermore, the radius of the helical passer assures that as it traverses the obturator foramen it is directed away from the obturator neurovascular bundle into the surgically safe environment of the external obturator space to exit the skin lateral to the groin fold.