

FEMALE PREPUBIC ANATOMY AND ITS IMPLICATIONS TO PREPUBIC MID-URETHRAL SLING PLACEMENT

Hypothesis / aims of study

Retropubic and Transobturator routes of mid-urethral sling placement may result in inadvertent visceral, nerve, and major vascular injury during blind passage of trocars and introducer needles through body spaces. In an attempt to minimize these potential risks a prepubic approach to sling placement has been described and is currently in clinical trials. The purpose of our investigation is to study needle passage during prepubic mid-urethral sling placement, in a cadaver model, and to define the relationship of the tape to adjacent structures.

Study design, materials and methods

4 female cadavers (2 fresh and 2 embalmed) underwent prepubic mid-urethral sling placement using a modified tension-free vaginal tape (TVT) introducer needle. A 2-centimeter (cm) vaginal incision was made at the level of the mid-urethra followed by dissection superior-laterally similar to that performed for other mid-urethral sling procedures. The introducer needle was placed into the incision and directed first laterally then superiorly exiting the skin at the level of the pubic tubercle anterior to the pubic symphysis. Following sling placement complete dissection of the tissue bounded by the ischio-pubic ramus cephalad, mons-pubis ventrally, inguinal-gluteal folds laterally and anterior vaginal wall dorsally was performed and documented.

Results

Beneath the skin and fatty tissue, the prepubic space is occupied by the vestibular bulbs, the bulbospongiosus and ischiocavernosus muscles, as well as the body and crus of the clitoris. The glans and body of the clitoris lie in the midline at the pubic symphysis with the crus of the clitoris extending 4-6 cm down the ischi-pubic rami on either side. Branches of the pudendal nerve innervating the clitoris run inside the medial edge of the ischio-pubic rami ventrally and unite in the midline at the glans (Figure 1). Other than muscle fibers and fat, only the crus of the clitoris lies in the path of a needle passing over the pubic ramus, and seems to be well protected behind this bony shelf (Figure 2). The trunk of the clitoral nerve lies posterior to the descending pubic rami as well and emerges from behind the bone in a small area less than 2 cm inferior to the pubic symphysis bilaterally. This represents the only area of potential injury to the nerve.

Interpretation of results

Careful anatomic dissection following prepubic mid-urethral sling placement has allowed us to define clearly the important structures that reside in the prepubic space, namely the crus of the clitoris and the clitoral nerve, and reliably avoid injury during mesh placement.

Concluding message

The anatomy of the female prepubic space, within the boundaries defined by prepubic sling passage, contains few structures of clinical concern. Knowledge of the clitoral anatomy as well as its nerve supply is critical to avoiding injury during prepubic needle passage. To date we have not observed any instance of injury to either the crus of the clitoris or the clitoral nerve in cadaver or human studies. Further large scale studies are needed to document the efficacy and safety of the prepubic mid-urethral sling.

References

1. Eur J Obstet Gynecol (2003) 107; 205-207.
2. BJU Int (2006) 98 supp 1; 32-40.

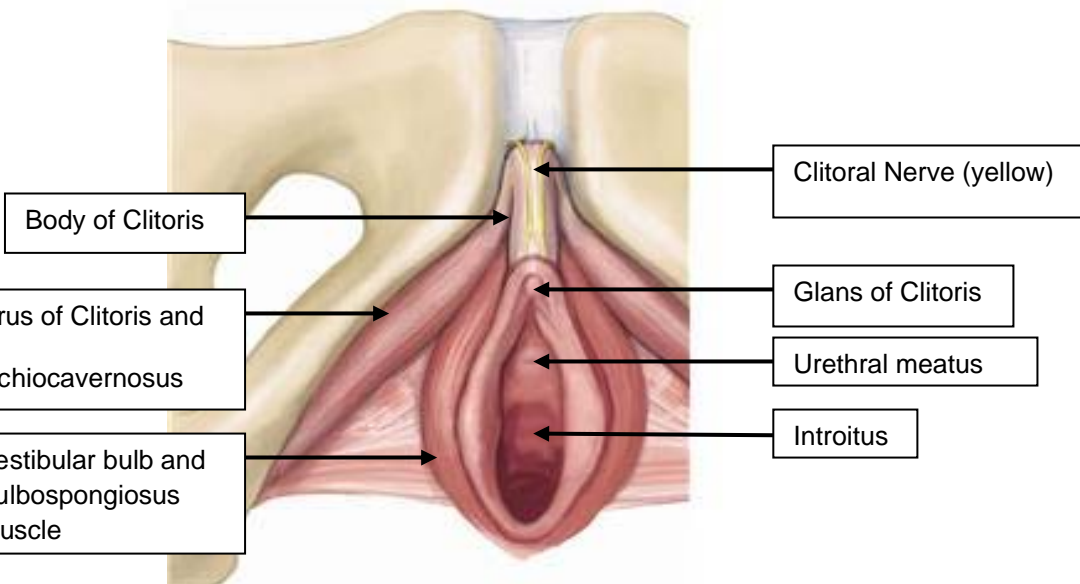


Figure 1: Female Prepubic Anatomy



Figure 2: Path of prepubic sling needle passage

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HUMAN SUBJECTS: This study did not need ethical approval because No ethics committee approval was needed as cadaveric subjects were used who had donated their bodies to be used for scientific endeavors. but followed the Declaration of Helsinki Informed consent was not obtained from the patients.