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# THE FEMALE URETHRAL SPHINCTER: A MORPHOLOGICAL AND TOPOGRAPHICAL STUDY

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### Abstract

#### Purpose

We reassess the anatomy and topography of the female urethral sphincter system and its innervation in regard to urethra sparing anterior exenteration and other surgical procedures.

#### Materials and Methods

Anatomical and histological studies were performed on 9 fetal specimens and 4 adult cadavers. Using graphics software the anatomical structures of the true pelvis were reconstructed based on computerized tomography cross sections and digitized histological sections. On the adult cadavers anterior exenteration was performed to study the implications of the isolated urethra and its sphincter mechanism.

## Results

Strata of connective tissue were found to divide the smooth muscles of the proximal two-thirds of the female urethra into 3 layers. Computer guided 3-dimensional reconstruction of digitized histological sections showed that thin fibers of the pelvic plexus course to this part of the urethra. The majority of these fibers may be preserved by carefully dissecting the bladder neck and the proximal portion of the urethra, leaving the lateral vaginal walls intact. The striated rhabdosphincter, which is innervated by fibers of the pudendal nerve, was in the caudal third of the urethra.

## Conclusions

A well-defined sphincteric structure or sphincter could not be anatomically recognized in the bladder neck region. The majority of rhabdosphincter fibers were found in the middle and caudal thirds of the urethra. Thus, in patients undergoing removal of the bladder neck and part of the proximal portion of the urethra continence can be maintained by the remaining urethral sphincter system, provided that innervation remains essentially intact.



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