



The Lower Urinary Tract and Male Genital System



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CHAPTER CONTENTS

THE LOWER URINARY TRACT 959

Ureters 960

Congenital Anomalies 960

Inflammation 960

Tumors and Tumor-like Lesions 960

Obstructive Lesions 960

Urinary Bladder 961

Congenital Anomalies 961

Inflammation 962

*Acute and Chronic Cystitis 962**Special Forms of Cystitis 962*

Metaplastic Lesions 963

Neoplasms 964

*Urothelial Tumors 964**Mesenchymal Tumors 968**Secondary Tumors 968*

Obstruction 969

Urethra 969

Inflammation 969

Tumors and Tumor-like Lesions 969

THE MALE GENITAL TRACT 970

Penis 970

Congenital Anomalies 970

*Hypospadias and Epispadias 970**Phimosis 970*

Inflammation 970

Tumors 970

*Benign Tumors 970**Malignant Tumors 971*

Testis and Epididymis 972

Congenital Anomalies 972

Cryptorchidism 972

Regressive Changes 973

Atrophy and Decreased Fertility 973

Inflammation 973

*Nonspecific Epididymitis and Orchitis 973**Granulomatous (Autoimmune) Orchitis 974**Specific Inflammations 974*

Vascular Disorders 974

Torsion 974

Spermatic Cord and Paratesticular Tumors 975

Testicular Tumors 975

*Germ Cell Tumors 975**Tumors of Sex Cord-Gonadal Stroma 979**Gonadoblastoma 980**Testicular Lymphoma 980*

Miscellaneous Lesions of Tunica

Vaginalis 980

Prostate 980

Inflammation 981

Benign Enlargement 982

Benign Prostatic Hyperplasia or Nodular Hyperplasia 982

Tumors 983

*Adenocarcinoma 983**Miscellaneous Tumors and Tumor-like Conditions 990***THE LOWER URINARY TRACT**

The renal pelves, ureters, bladder, and urethra (except the terminal portion) are lined by a special form of transitional epithelium called *urothelium*. Urothelium is composed of five to six layers of cells with oval nuclei, often with linear nuclear grooves, and a surface layer consisting of large, flattened “umbrella cells” with abundant cytoplasm. This epithelium rests on a well-developed basement membrane, beneath which is a lamina propria. The lamina propria in the urinary bladder contains wisps of smooth muscle that form discontinuous muscularis mucosae. It is important to differentiate the muscularis mucosae from the deeper well-defined larger muscle bundles of the detrusor muscle (muscularis propria), since bladder cancers are staged on the basis of invasion of the latter. If urine flow is obstructed

and intravesical pressures rise, the bladder musculature undergoes hypertrophy.

The ureters lie throughout their course in a retroperitoneal position. Retroperitoneal tumors or fibrosis may entrap the ureters, sometimes obstructing them. As ureters enter the pelvis, they pass anterior to either the common iliac or the external iliac artery. In the female pelvis they lie close to the uterine arteries and are therefore vulnerable to injury in operations on the female genital tract. There are three points of slight narrowing—at the ureteropelvic junction, where they enter the bladder, and where they cross the iliac vessels—all locales where renal calculi may become impacted when they pass from the kidney to the bladder. As the ureters enter the bladder they pursue an