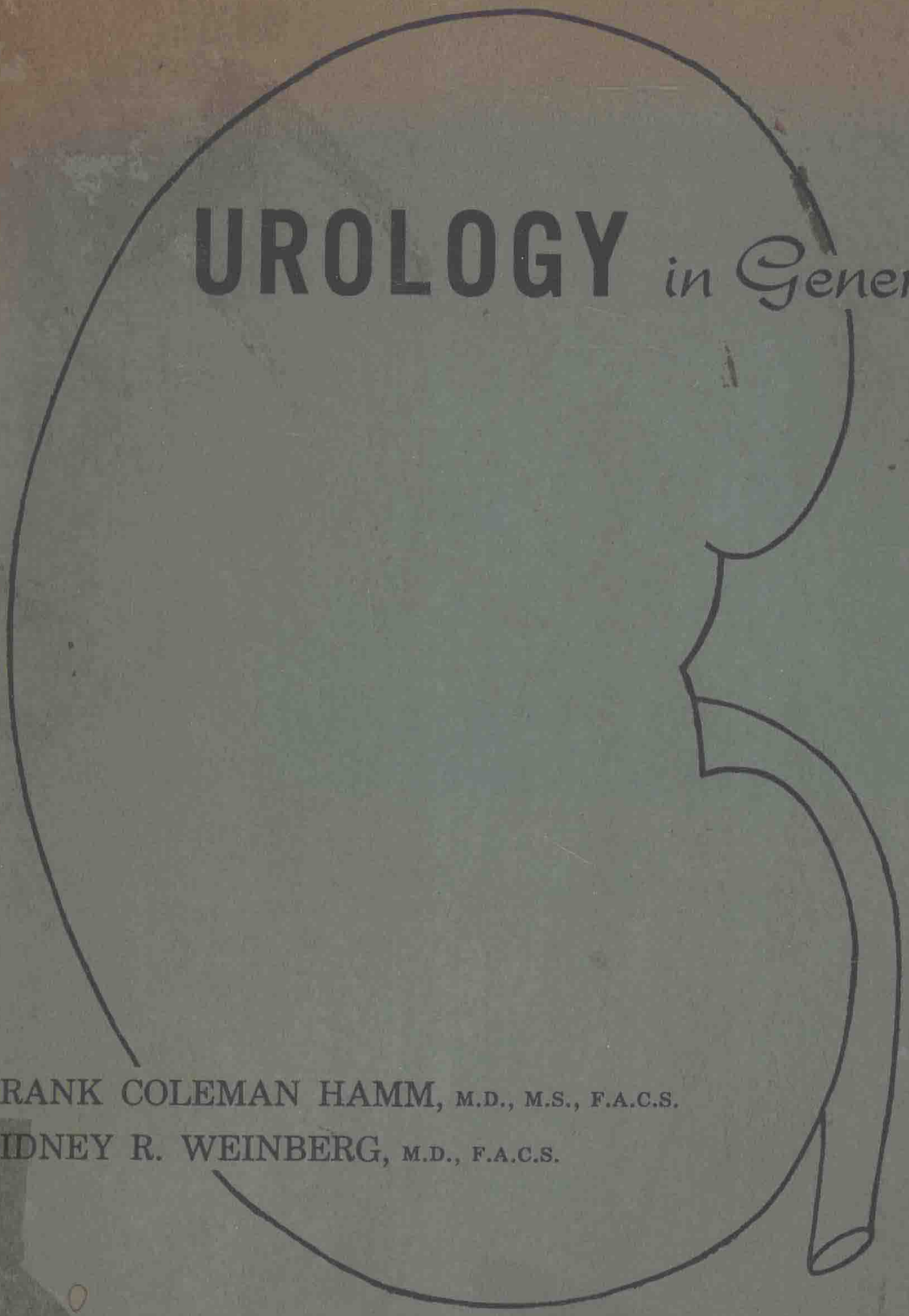
UROLOGY *in General Practice*



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Illustrated by
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Distributed by

J. B. LIPPINCOTT COMPANY

Philadelphia Montreal

Printed in the United States of America

ACKNOWLEDGMENTS

The authors wish to express their sincere gratitude to all who have helped in the preparation of this book.

Approval and aid were given by Dr. Clarence Dennis, Professor and Chairman of the Department of Surgery.

Essential contributions to the chapter on "Urinary Tract Infections" were made by Dr. Robert Austrian, Professor, Department of Medicine. The sections dealing with the endocrine functions of the testes and adrenals were prepared under the supervision of Dr. David Kydd, Associate Professor, Department of Medicine. Dr. Leonard Brandt, Associate Professor, Department of Medicine, made invaluable contributions to the chapter on renal physiology. We are fortunate to have had the assistance of these well-known authorities.

The material on congenital anomalies of the urogenital system was collected by Dr. Paul Finkelstein, Instructor, Department of Surgery (Urology).

Dr. Thomas J. Sinatra, Instructor, Department of Surgery (Urology), collaborated in the preparation of the bibliographies and assisted in obtaining roentgenograms and photographs of clinical material.

Miss Elizabeth B. Cuzzort, medical illustrator for the Medical College, deserves praise for her outstanding work in planning the entire format of the book and all of its illustrations.

Mr. Milton Miller, Business Officer, has aided in every possible way.

Alvina R. Lewis, Associate Editor, New York State Journal of Medicine, proofread and edited copy.

Goldie W. Weinberg prepared the index, an arduous task.

The photographs of the urologic instruments, roentgenograms, and patients were done by Mr. Philip Fleury, Mr. Stephen Montes, Mr. Jack Illari, and Mr. William DeVeer, Jr.

It is with great satisfaction that we take this opportunity to thank these individuals for the extra burdens and inconveniences that the preparation of this publication entailed.

PREFACE

After using this book for a year in our classes at the University of the State of New York, we have been encouraged by the response of students and other teachers to make it available for wider distribution.

Our aim is to introduce the medical student and the resident physician to the field of Urology and to provide a ready reference for those in other branches of medicine and surgery. We have tried to consider the problems encountered in this field against the larger spectrum of general medicine. Many of these disorders are included in the group of typical degenerative diseases. Population studies plainly indicate that the older age group is increasing and this trend will continue for many years. The physician in general practice will have more demands upon his knowledge and skill in the diagnosis and treatment of degenerative diseases - a great medical frontier.

Urology is at once perhaps the oldest and yet one of the newest divisions of Surgery. "Cutting for the stone" is an operation which is recorded again and again in ancient writings.

A good working knowledge of urologic principles is essential for those doing general medicine. Abdominal surgery, gynecology and obstetrics as the differential diagnosis of abdominal conditions are closely interrelated. The pediatrician is also acutely aware of the prevalence of congenital anomalies of the genito-urinary system.

The principles involved are fundamentally no different from those practiced in other divisions of surgery, yet Urology differs in two important respects. First is the use of the cystoscope, a remarkable instrument that facilitates accurate diagnosis and allows specialized operative procedures. Secondly, and of equal importance, is the development of techniques that allow the kidneys to function while surgery of the urinary tract is being performed.

The principles of management elaborated here are those generally accepted and little controversial material has been included. For those readers who wish to pursue an interesting point further, bibliographies have been supplied at the end of each chapter.

FRANK C. HAMM

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CHAPTER I

DEFINITION OF UROLOGIC TERMS

Each specialty has its own terms, descriptive words or phrases that convey a specific meaning. The following are those commonly used.

URINARY FREQUENCY - emptying one's bladder more than four or five times a day. Excessive urination during the day hours is called diurnal frequency. In the female the bladder is somewhat larger than that of the male, so that the normal female usually urinates only three to five times a day. The rate of voiding and the volume of urine may vary considerably; many factors influence it, such as the temperature, the amount of perspiration, and the fluid intake. Nervous apprehension may increase the irritability of the bladder. Frequency due to increased fluids, diuretics, or nervousness is not always abnormal.

NOCTURNAL URINATION OR NOCTURIA - being awakened from sleep to urinate; once a night is considered physiologic. When fluids are drunk in the late evening, nocturia of more than one time may be normal. Before considering frequency abnormal, the examiner must ascertain the patient's fluid intake during the preceding evening hours.

POLYURIA - an increase in the total volume of urine passed. This term refers to an increased urinary output, such as that seen in diabetes of either variety or a polyuric response to a diuretic.

DYSURIA - difficulty in voiding, also used to mean painful, urgent urination.

OLIGURIA - a diminution in the quantity of urine excreted. The average amount of urine passed during a twenty-four-hour period is about 1,500 cc. If a patient has a urine output of less than 1,000 cc. of urine a day while on a normal diet with a normal fluid intake, some degree of oliguria is present.

UREMIA - a clinical state characterized by severe toxicity. Coma, lethargy, air hunger, hiccups, convulsions, inability to retain fluids or solid food are manifestations; associated with this syndrome there is nitrogen retention, anemia, acidosis, and electrolyte imbalance. Nitrogen retention alone may not cause toxic symptoms. (see Chapter on Abnormal Physiology)

CHYLURIA - the presence of lymph and emulsified fat in the urine resulting from an obstruction to the lymph flow producing an abnormal communication between the lymphatics and the tubules of the kidney, and so diverting the lymph flow into the urine.

ANURIA - a total suppression of urinary excretion. It must be differentiated from urinary retention. In the latter; urine is formed in the kidneys but, because of mechanical obstruction, cannot be passed to the exterior. In true anuria it has never been formed.

POLLAKIURIA - a diminished volume of urine at each urination, often associated with increased frequency.

ENURESIS - literally "to pass water." It is an involuntary escape of urine, a physiologic state in infants until three years of age. When it persists beyond that age, an abnormal condition may be assumed.

NOCTURNAL ENURESIS - bed wetting occurring at night during sleep.

DIURNAL ENURESIS - occurring during the day. It is not a permanent incontinence since voluntary control can be regained. A normal urinary sphincter is present.

INCONTINENCE OF URINE - the inability of a patient to prevent urine from escaping through the external urinary meatus, even though the bladder may be empty. Paradoxical incontinence or overflow incontinence is a condition where urine escapes from a bladder which is filled to capacity and overflows.

REFLEX INCONTINENCE - occurs when a bladder which is only partially filled empties as result of spasm. This is a concomitant of neurogenic disease of the bladder.

URGENCY - an intense desire to void. It may be so severe that the urine cannot be retained voluntarily, and a portion is lost before a urinal can be used. This is not a true incontinence since the sphincter is unimpaired.

STRANGUARY - a term applied to unusually severe and painful urgency and frequency.

HEMATURIA - blood in the urine. It may be so intense that the urine is grossly discolored. Blood is never a normal constituent of the urine, and its presence is an invariable indication for cystoscopic investigation.

GROSS HEMATURIA - the presence of bright red blood with or without clots in the urine. It is important to determine whether the blood appeared at the onset of urination. This suggests a lesion at the vesical neck or prostatic urethra. Blood appearing at the end of urination suggests the presence of a lesion inside the bladder, as an ulcerative cystitis. Blood mixed with urine throughout micturition suggests renal origin. Associated pain is important; painless bleeding occurs more frequently with bladder tumor. The presence of blood in the urine may indicate serious disease, such as neoplasm; infection, either pyogenic or tuberculous; calculus; trauma, or prostatic hyperplasia. Bleeding can also accompany nonsurgical conditions such as glomerulonephritis or a hemorrhagic diathesis.

MICROSCOPIC HEMATURIA - a normal-colored or cloudy urine in which red blood cells are found during microscopic examination.

HEMOGLOBINURIA - can be diagnosed when the urine is grossly red but contains no red blood cells. It occurs during severe malarial fever; in certain individuals after prolonged exertion (march hemoglobinuria), or after exposure to cold (cold hemoglobinuria). It is most frequently seen following transfusion with mismatched blood.

PYURIA - pus in the urine; can also be subdivided as gross or microscopic. With gross pyuria the urine is cloudy and is often foul-smelling. When contaminated with coliform bacilli, it has a fecal odor. True microscopic pyuria in the female can be identified only when the vulva has been prepared for examination or when a catheterized specimen is obtained. Vaginal epithelial cells contaminate a voided urine. In the male a sterile specimen is obtained as follows: The glans penis is washed with green soap. After the first 30 cc. of urine is passed and discarded, a specimen is collected in a sterile container. This is called a midstream specimen. It can be used for culture studies.

ALTERATIONS OF THE URINARY STREAM - Thinning of the stream results from a reduced caliber of the urethra. In an advanced state the patient complains of passing only drops at a time. Intermittent, abrupt stopping of the stream while voiding may result

from a bladder calculus or because of a pedunculated tumor near the bladder orifice. In these instances the obstruction acts as a ball valve. Intermittency of the stream may also result from fatigue of the detrusor muscle because of an obstructing lesion. The muscle tires before the contents of the bladder are expelled; after a few moments rest, voiding can be resumed.

RETENTION OF URINE - an involuntary holding back of urine which should be expelled. When urine is retained in the bladder, its volume limits bladder capacity and may induce urinary frequency. When fluid is present in the bladder, the bladder detrusor muscle has tonus. This excessive muscular activity leads first to hypertrophy and later to fatigue and fibrosis of the bladder. Sustained tonus is a primary requisite for ureterovesical reflux.

RESIDUAL URINE - that remaining in the bladder after micturition. It is determined by catheterizing a patient after voiding. Normally a minimal amount of residual urine is found in the bladder. For an adult 30 to 50 cc. are normal. In children under ten years more than 10 cc. is probably abnormal. Care should be exercised in estimating residual urine. Some patients are unable to void on demand. It is better to arrange for catheterization after a natural voiding. A single test may not be reliable; several tests are usually required.

PNEUMATURIA - the presence of gas in the urine. This condition is often associated with a communication between the intestinal tract and the urinary tract. In other instances, such as diabetes, gas is formed in the urine by fermentation of sugar.

Disorders of Seminal Ejaculation

HEMOSPERMIA - blood in the seminal ejaculate. It may be gross or microscopic and is always abnormal. It is seldom if ever caused by neoplasm.

OLIGOSPERMIA - a diminished number of spermatozoa in the ejaculate.

ASPERMIA - a complete absence of sperm in the seminal ejaculate.

CHAPTER II

HISTORY-TAKING AND PHYSICAL EXAMINATION

History-taking and examination of a patient with urogenital disorders must be carried out with discretion. In order to lessen psychologic barriers, complete privacy should be maintained and a candid doctor-patient relationship established. This is achieved after a physician gives his patient undivided attention and patiently leads him into a discussion of the specific urinary or genital symptoms. An open and frank attitude on the part of the physician will frequently encourage a patient to talk freely. Any degree of levity on the part of the examining physician will endanger this relationship.

History-Taking

OCCUPATION - Industrial chemicals produce toxic effects on specific organs of the urogenital system. Toluene and benzene fumes are toxic to the seminiferous tubules and affect spermatogenesis adversely. In greater concentrations both of these chemicals have a nephrotoxic effect. Carbon tetrachloride vapors have caused acute renal failure with anuria. As another example, workers in the aniline dye industries absorb a carcinogen that induces bladder tumors.

The seminiferous tubules are sensitive to radiation, with the widespread use of radioisotopes and other agents which emit gamma rays, this hazard will become more prevalent.

GENERAL SYSTEMIC COMPLAINTS - Disease of the urogenital system often causes generalized somatic alterations. For example, sudden weight loss occurs with chronic renal failure and in patients with prostatic carcinoma. A sudden weight gain in an adult female often indicates the onset of an alteration of metabolism, such as that seen in the adrenocortical syndrome (Figure 1). The presence of generalized symptoms, such as cough, headache, or night sweats, should lead one to suspect the presence of a persistent infection or the possibility of malignant metastases to the lung. Chills and high fever immediately suggest the possibility of an infection arising from the urinary tract. The kidneys are prone to infection during a transient septicemia. The invading organism can usually be recovered from the bloodstream if a culture is obtained at the height of the fever.

FAMILY AND PAST MEDICAL HISTORY - A familial tendency is observed in cystine calculous disease, as well as in some congenital anomalies such as polycystic renal disease or hypospadias (Figure 2). Prostatic hyperplasia also tends to follow a familial pattern.

In the female it is important to obtain complete obstetric and gynecologic record. Obstetric or sexual trauma may initiate chronic inflammatory disease of the urethra or bladder. Vesicovaginal fistula can be traced directly to obstetric trauma. A vaginal discharge or pelvic inflammatory disease may be present with chronic urinary complaints or may initiate urologic disturbances.

PRESENT COMPLAINTS - The characteristics of the act of urination are recorded in detail. The examiner should always ask specific questions. Casual inquiries, such as "Do you

Fig. 1. Preoperative appearance of patient with Cushing's syndrome.
(A) Hirsutism. (B) "Buffalo hump."

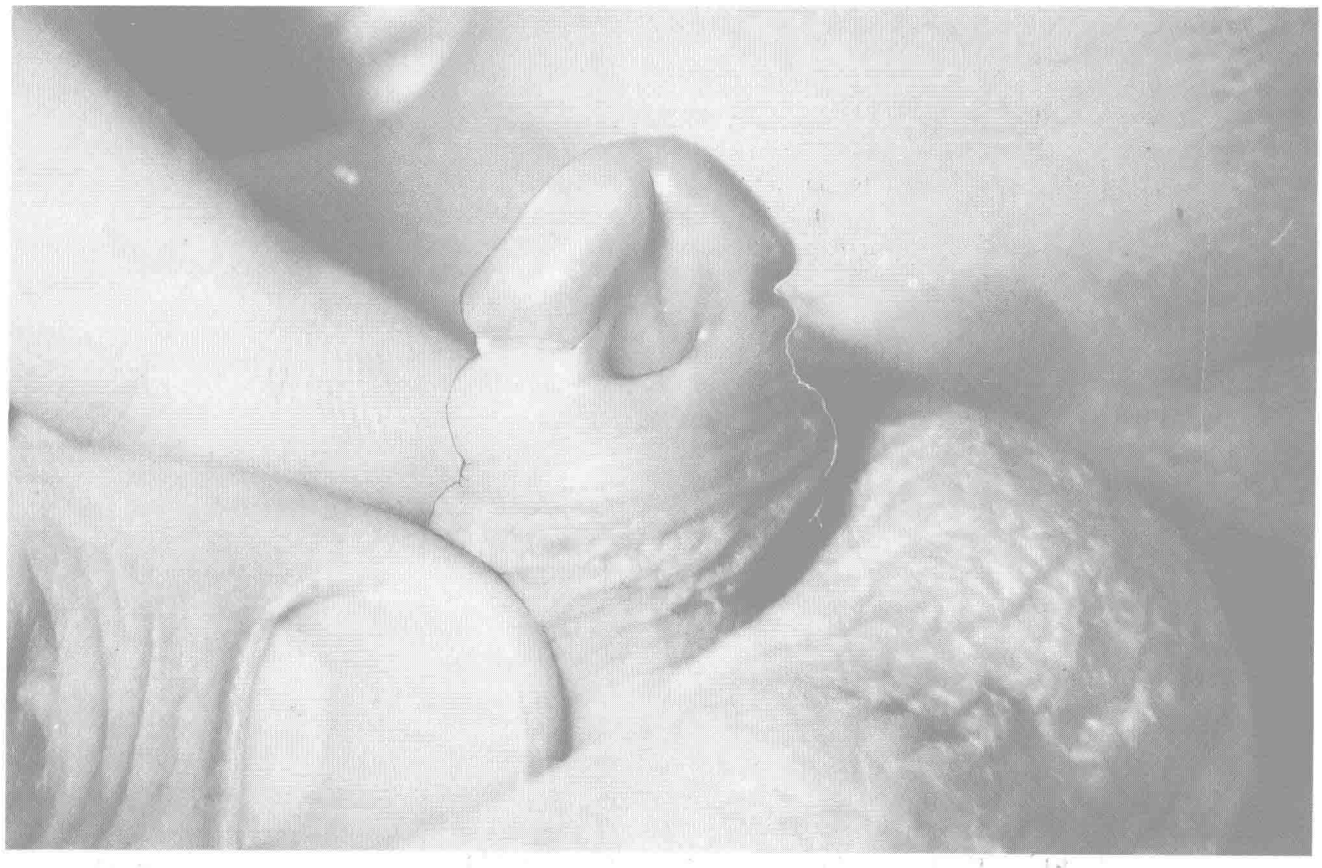


Fig. 2. Glandular hypospadias.

urinate normally?," are usually answered "yes." The type of pain is very important and requires specific questions on the part of the examiner. A definite history of a renal colic indicates a lesion of the upper urinary tract requiring identification.

The renal pelvis and capsule and the ureter are well innervated. The renal parenchyma has no sensory nerve fibers. Colic is a general term used to denote any spasmodic pain caused by intermittent contractions of smooth muscle. Renal colic varies in intensity, but it can represent the most severe pain that can arise from any of the abdominal viscera. In the typical instance, it is easy to recognize. The onset is sudden, without any apparent cause, and the pain may be so hard to endure that the patient will collapse. There is frequently an increase in intensity with each peristaltic wave. Colic is a result of obstruction in the ureter or renal pelvis and is usually caused by a calculus or a blood clot (Figure 3). The pain results from an increase in hydrostatic pressure, which distends the renal pelvis and proximal ureter and initiates painful afferent sensations. The distribution of the pain is typical, usually originating in the renal area, radiating anteriorly and downward toward the suprapubic area in the female or toward the testicle in the male.

Renal pain resulting from irritation of the nerve fibers in the renal capsule, while severe, is less intense and more localized to the renal area. It is constant, and typical radiation is absent. Many patients have only a vague idea where the kidneys are located. They believe that any backache results from kidney disorders. When discussing complaints referable to backache, the examiner should identify the renal area for the patient (Figure 4).

The genital area is one where psychic overlay occurs. Apprehensive patients are prone to attribute to this region symptoms which are of a purely psychosomatic nature. These symptoms may include pain in the testes, vague suprapubic pain, shooting pains in the penis, or backache (Figure 5). Frequency of urination is often an associated symptom. Only complete urologic investigation can determine the nature of these complaints.

A general screening of all other systems should be included. Cardiac conditions and carcinoma of the large bowel are frequently seen in patients with urologic symptoms.

Physical Examination

As in other branches of medicine, the general appearance of a patient often furnishes clues to an accurate diagnosis. Endocrine disorders, such as Cushing's syndrome precocious puberty, pseudohermaphroditism, and eunuchoidism are apparent on inspection. Marked anemia, sudden weight loss, and general debility are also important signs that must be investigated.

ABDOMINAL EXAMINATION - Abdominal examination is an integral part of urologic examination. The kidneys are best palpated with the patient in the supine position; one hand is placed behind the kidney, and the other probes the kidney from the abdominal side (Figure 6). The patient is then allowed to assume a sitting position, and the kidneys are percussed to determine whether any tenderness can be elicited (Murphy's sign) (Figure 7). The abdomen is also palpated for abdominal masses or points of tenderness. The suprapubic area is percussed to determine the outline of the distended bladder. Palpation will determine whether there is any pain or tenderness over the bladder area. Many so-called tumors of the lower abdomen disappear following catheterization. An abnormally distended bladder can almost reach the umbilicus (Figure 8).

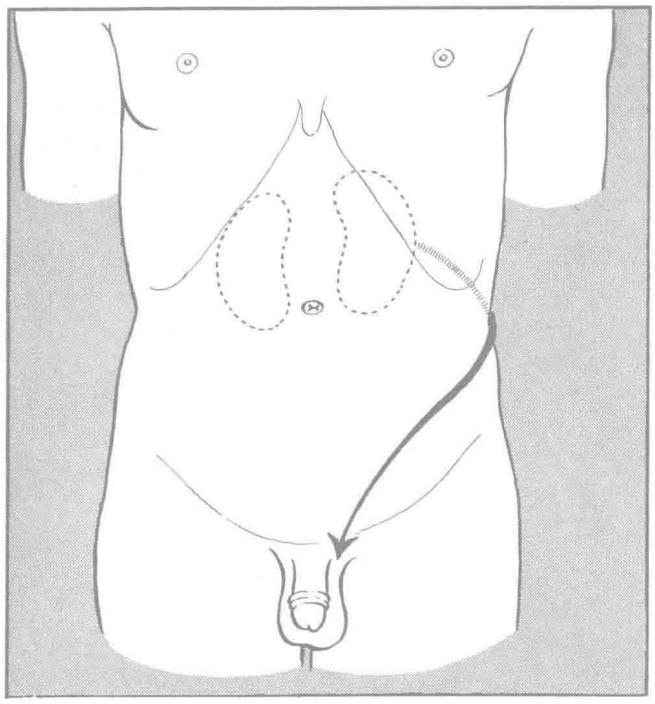


Fig. 3. Direction of referred pain of renal or ureteral colic.

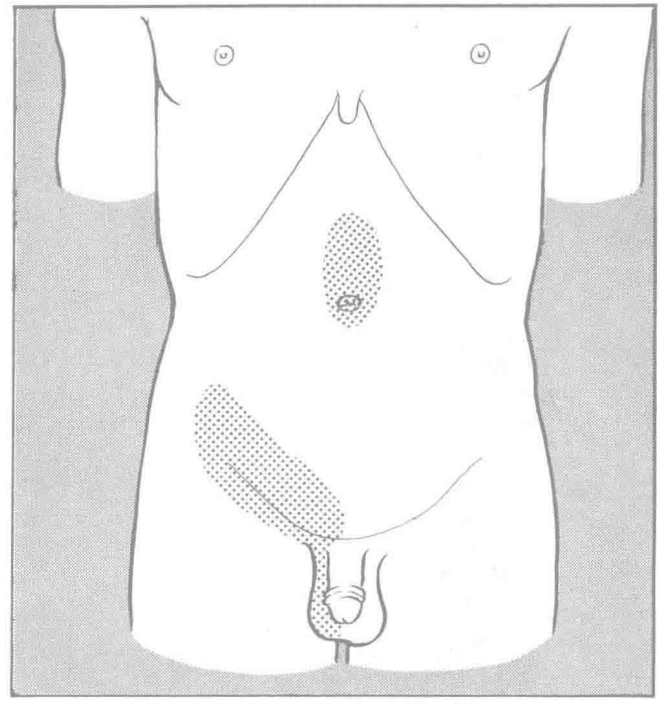


Fig. 5. Area of pain and cutaneous tenderness and hypersensitivity in patients with disease of the testes.

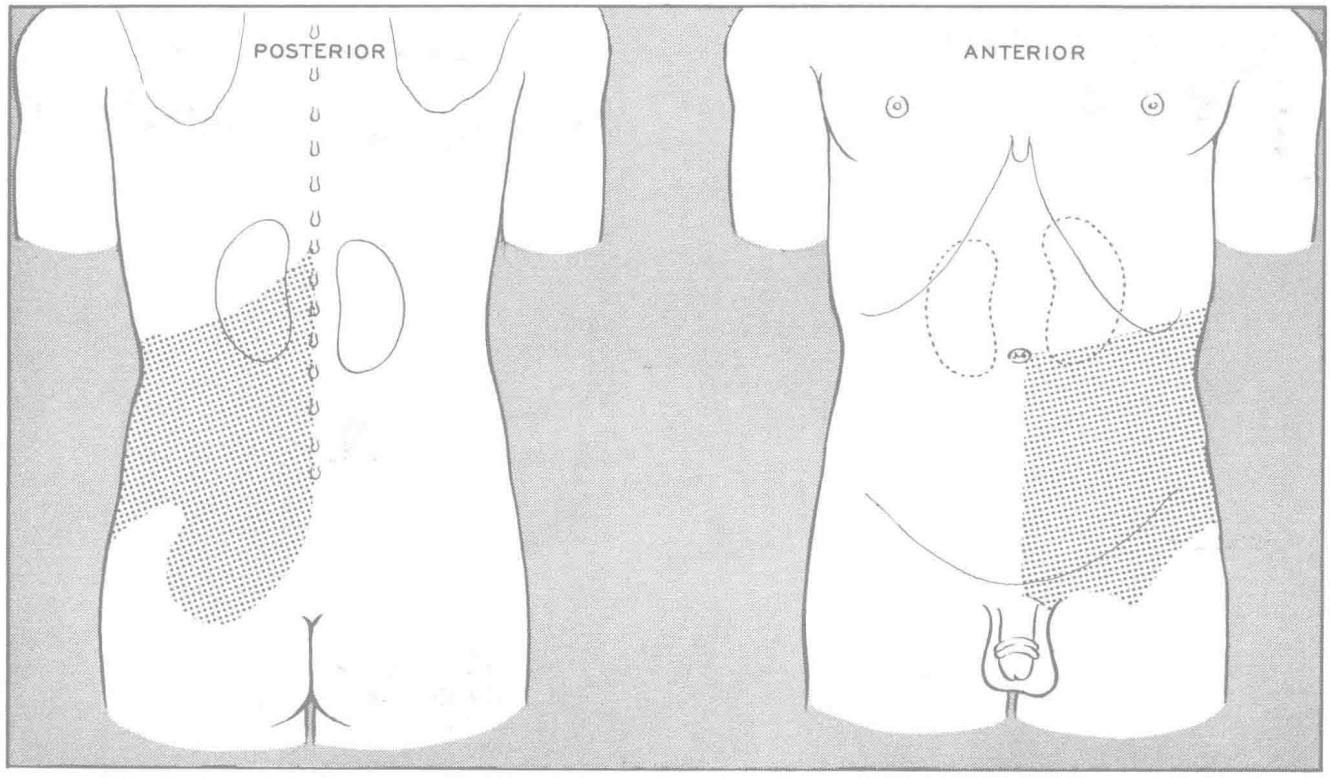


Fig. 4. Area of tenderness and cutaneous hyperaesthesia in patients with diseases of the kidneys and of the upper portion of the ureters.

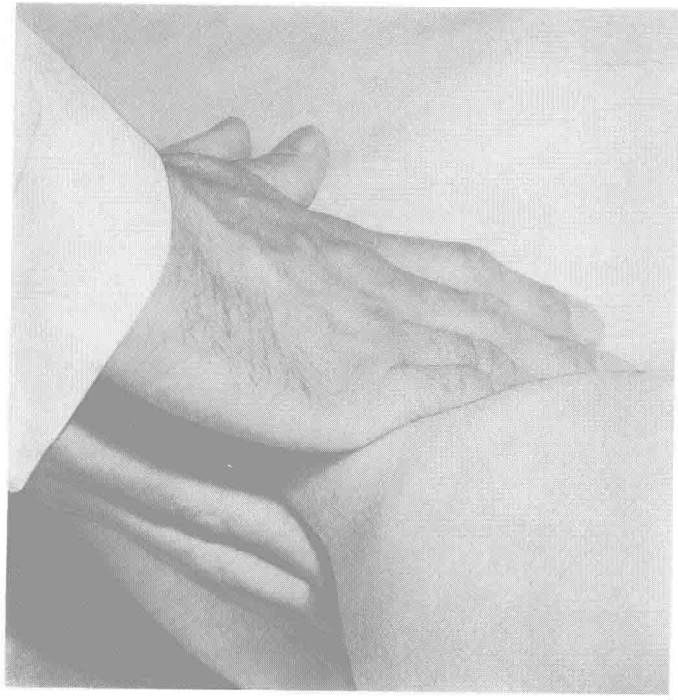


Fig. 6. Bimanual palpation of the kidney.

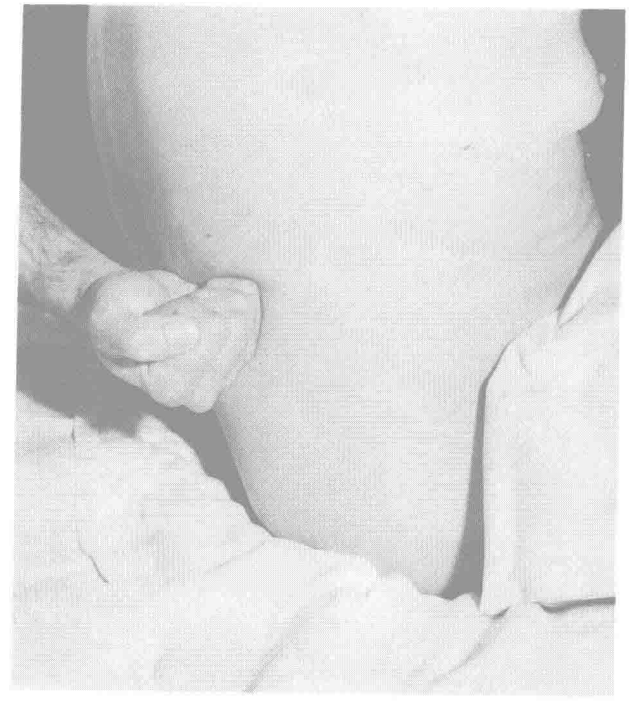


Fig. 7. Fist percussion of kidney.

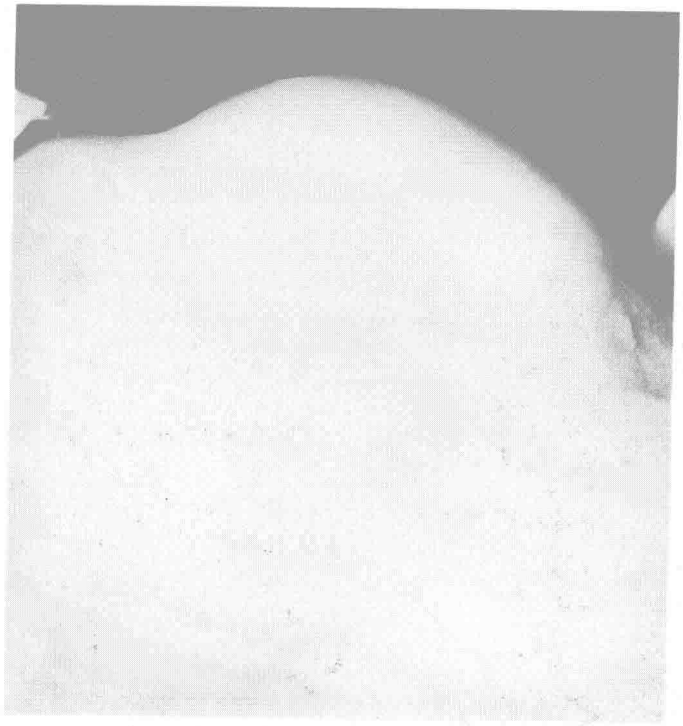


Fig. 8. Appearance of abnormally distended bladder in acute urinary retention.

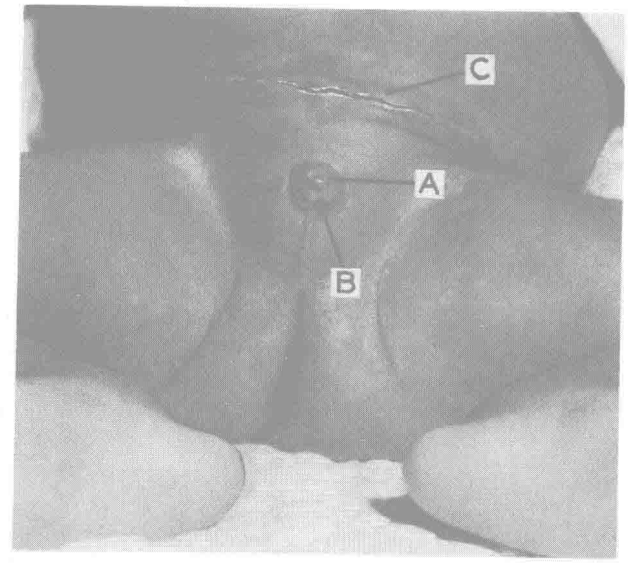


Fig. 9. Female pseudohermaphroditism. (A) Enlarged clitoris. (B) Urogenital sinus. (C) Laparotomy scar. Laparotomy done to visualize internal genitalia and to obtain biopsy from gonads.

INSPECTION OF THE EXTERNAL GENITALIA: In the newborn, immediately after birth there may be edema of the genital area, so that mistaken identify of sex may be made. This error has occurred in female babies with pseudohermaphroditism with an enlargement of the clitoris. As the urethra opens into the vagina, the labia may resemble a bifid scrotum, and the sex may be mistaken for that of a male (Figure 9). The male infant may have a hypospadias perineal with a divided scrotum and undescended testes, so that it is very possible to mistake the sex of this child for that of a female.

It is important that the first examining physician make certain of the sex of the newborn by careful inspection of the organs. If there is any doubt, adequate follow-up examinations should be made. (see Chapter 17.)

The following routine is recommended for examination of the genitalia.

In the examination of the penis, the foreskin is retracted to observe phimosis or glandular lesions. The position of the external urinary meatus is ascertained, and it is determined whether or not any degree of hypospadias, stricture, or meatitis is present. In the adult male inquiry is made about curvatures when the penis is erect, a characteristic symptom of Peyronie's disease or fibrous cavernositis. Physical examination of penis will determine whether any tumors, ulcers, or plaques are present.

The scrotum is next examined, the position of both testes ascertained, and the spermatic cord palpated. The epididymis and the vas deferens are examined for nodules or tumors. If any masses are felt or seen in the scrotum, their position, consistency, and size are ascertained. Transillumination in a darkened room is a helpful aid in differential diagnosis of a scrotal mass (Figure 10) It is well to use a small pen type flashlight placed directly under the testes. If encysted fluid is present, light will be seen shining through the scrotal sac.

In the female, vaginal examination and inspection of the external genitalia are routine. The patient is placed in lithotomy position on a urologic table. First, the external urethral meatus is inspected for caruncle, stenosis, or prolapse of the urethral mucosa. The presence of a vaginal discharge is noted, and the urethra is palpated, preferably over a catheter or sound. In this case a diverticulum in the urethra will be detected.

If an ectopic ureteral orifice is suspected as a reason for urinary incontinence, its presence may be confirmed by chromoscopy; the colored urine will be seen to come from an ectopic opening in the external genitalia. The diagnosis is confirmed by cystoscopic examination with retrograde pyelography.

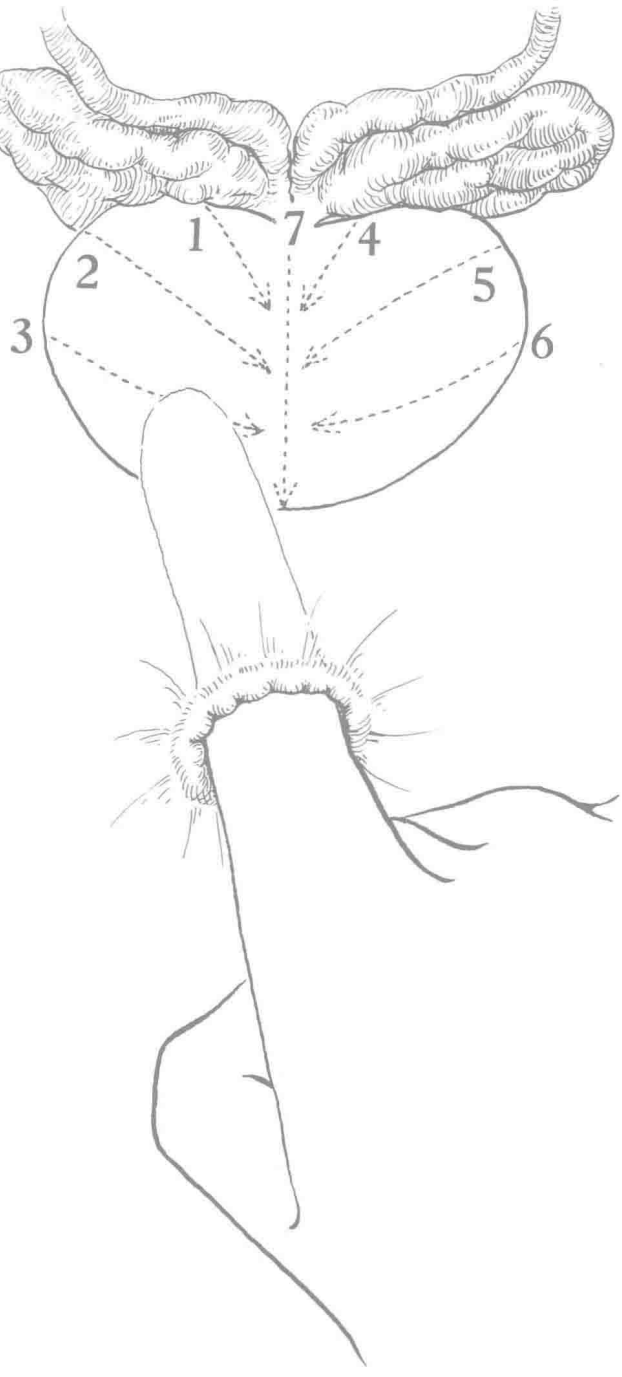
If a vesicovaginal fistula is suspected, a tampon is placed in the vagina; following instillation of methylene blue into the bladder the tampon is discolored if a fistula is present. After the external genitalia are inspected, a speculum is inserted for examination of the upper vagina and cervix. Bimanual palpation of the pelvic organs and bladder is then done.

RECTAL EXAMINATION: Rectal examination is an invariable part of the physical examination (Figure 11, 12). It should be done under uniform conditions. The patient should first void, so that a distended bladder does not interfere. A distended bladder may give an entirely false impression of the size of the prostate. In the male the rectal examination is best conducted in a knee-chest position or with the patient standing but bent forward on a bed or chair. In the female the rectum can be examined after the vaginal examination while the patient is in a supine position. Gentleness and adequate lubrica-

Fig. 10. Transillumination of the scrotum.

Fig. 11. Rectal examination in the knee-chest position.

Fig. 12. Rectal examination with patient standing and bent over.



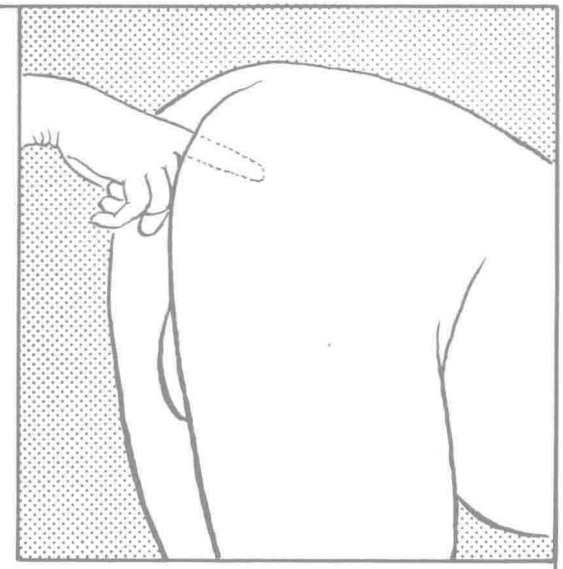


Fig. 13. Method of prostatic massage.