Gynecologic Urology and Urodynamics

Theory and Practice

edited by
Donald R. Ostergard, M.D.

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Dedication

I gratefully dedicate this book to my loving wife, Charlene, for putting up with my many hours of editing and for her help and suggestions in the writing of this text.

Preface

The multiplicity of different procedures, operations, concepts and evaluations relating to female urinary incontinence bespeaks the complexity of this problem. In spite of the "80%" surgical cure rate reported by various writers, all too often the gynecologist must care for the patient who is still incontinent after more than one operative procedure. There is genuine uneasiness by all who are confronted by the patient's question: "Will *this* operation cure my incontinence?"

The custom of performing a vaginal reparative operation on the basis of history alone continues to be the norm. When the vaginal operation fails, a retropubic procedure follows. The physician refers those patients who are still incontinent after the second operation with an air of resignation that little hope is in prospect.

From time to time questions arise about the scope of responsibility of the obstetrician-gynecologist regarding urinary tract symptoms in the female and the nature of the preoperative evaluation. All too often failures of operative treatment are due to the lack of proper assessment of the lower urinary tract before surgery.

The goal of this text is to promote a more active role of the obstetrician-gynecologist in the evaluation of the lower urinary tract regardless of how obvious the patient's symptoms of stress incontinence may seem. Office procedures are now available to adequately screen the lower urinary tract. More sophisticated techniques are now available to accurately diagnose alterations of vesicourethral physiology. The physician rapidly learns the skills necessary to perform or interpret the results of these evaluations.

The medical literature of the past few years contains information concerning the neurophysiology, maturation of micturition, new techniques for evaluation of the lower urinary tract and the fascinating new field of urodynamics. Unfortunately, most of this material is in publications which the practicing obstetrician-gynecologist does not regularly re-

view. This text collates the relevant medical literature in a readily comprehensive format. The contributors to this text are experts in such diverse areas of medicine as neurology, urology, gynecology and psychiatry. The foundation of their collective clinical experience with a sound basis in the medical literature leads to the formulation of a logical, orderly, practical evaluation of the patient's lower urinary tract. The thoroughness of this evaluation ensures the likeliness of clinical success. The clinical evaluation and triage plans provide a clinical diagnosis and treatment programs which are unique for each individual patient.

This text brings together the known facets of lower urinary tract physiology and pathophysiology which are needed for an in-depth understanding of the basis of urinary complaints of the individual patient. The "anatomy of failure" in the past has largely been a failure to apply the correct treatment to the specific urinary malfunction and to a preoccupation with incontinence as the only symptom of the female urinary tract. The availability of modern urodynamic evaluation equipment now allows us to alter this myopic view of the lower urinary tract. A comprehensive urodynamic evaluation of the patient in a step-by-step fashion allows the establishment of a specific diagnosis. The physician then treats specific problems either medically or surgically. Surgical procedures are applied only when indicated for that patient with true anatomical stress incontinence. The education of the physician in the establishment of specific therapies based upon appropriate diagnosis is the goal of this text.

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Introduction and Historical Perspectives:

THE TIME HAS COME

Philip J. DiSaia, M.D.

"There is no more distressing lesion than urinary incontinence—a constant dribbling of the repulsive urine soaking the clothes which cling wet and cold to the thighs, making the patient offensive to herself and her family and ostracizing her from society."

Howard A. Kelly, M.D., 1928

It is somewhat paradoxical that the field of gynecological urology which gave birth to the greater discipline of gynecology has been so long in becoming a science of its own. In his book *Genitourinary Problems in Women*, Robertson discusses the ancient writing of the Kahun papyrus written approximately 2000 years B.C., devoted to diseases of women and including a discussion of diseases of the urinary bladder. Indeed, the Ebers papyrus in 1550 B.C. classified diseases by systems and organs. Robertson states that in Section 6, of this latter papyrus, there was a description for the cure of a woman who suffers from a disease of her urine, as well as her womb. Henhenit was one of six women attached to the court of Menuhotep II, of the 11th dynasty, who reigned in Egypt about 2050 B.C. Her mummified body was found in 1955; radiographs of this mummy revealed that she had an extensive urinary fistula.

It was one of our own, Marion Simms, who is credited with the birth of modern gynecology through his pioneer work in the treatment of obstetrical urinary fistulas. Robertson writes that Marion Simms chose to study medicine, much to his father's disgust, as the elder had only contempt for the medical profession. Simm's father felt that there was no science in medicine and there was no longer honor to be achieved by going from house to house with a box of pills in one hand and a squirt in the other. However, Marion

Simms did enter the field of medicine and started his practice in Lancaster, South Carolina. His first two patients were infants who died from cholera. He was so disturbed that he moved to Mount Meigs, Alabama, where he earned the reputation of a great surgeon and he married his childhood sweetheart, Eliza Theresa Jones, in December, 1836. His practice had flourished at that point and his income was a wholesome $3000 per year.

Robertson tells us of the birth of gynecology with a specific case. Evidently, Simms' settled life was changed by an event which eventually led to his great medical achievement. A Mrs. Merril was thrown from a horse and this resulted in an impacted retroverted uterus. She was brought to Simms after many other physicians had failed to help her. Although Simms did not like to examine women, he did recall the advice of one of his professors from medical school. He placed her in a knee-chest position and reluctantly applied pressure to the vagina. The impacted uterus suddenly yielded and Mrs. Merril had immediate relief. His success with this particular patient led him to consider examining several slave women with vesicovaginal fistulas, utilizing the same rather advantageous knee-chest position. He found that this position allowed careful examination of the vagina which had hitherto been very difficult. When examining patients with a fistula he was able to clearly see the opening, and he began thinking of methods for repair. As is well known, his first attempts at fistula repair utilized silk sutures, but these attempts failed. His first success was with a slave girl named Anarcha, where the fistula repair was accomplished with silver wire sutures. Her fistula had first occurred at the age of 17 following childbirth and she seemed doomed forever to be a disgusting object to herself as well as to everyone who came near her. It was this that led to the motivation which allowed her to submit to so many surgeries. Simms had convinced his jeweler to make the wire out of unalloyed silver drawn out as thin as a horse hair. It was in May of 1849 when he prepared Anarcha for her 13th operation. He brought the edges of the fistula close together with four of his five flexible new silver wires, passing them through little strips of lead to keep them from cutting into the tissue and fastening them tightly by using, once again, his perforated lead shot. Then he introduced the essential catheter into the bladder and readied himself for the tedious week of waiting. On a score or more of earlier occasions, he had been sure that when the week was over, he would witness a successful cure; this time he was filled with anxieties. It seemed to him that he had played his last trump; if he had failed to win now, the game was really lost; even with his fanatical devotion he could not keep on forever. At the week's end, almost four years to the day from the time when he had first seen those gaping,

mocking holes which were Anarcha's souvenirs of childbirth labor, he had Anarcha placed again on the operating table. With pounding heart and fearful mind, he introduced the speculum. There lay the suture apparatus just as he had fixed it, quite undisturbed by swelling and inflammation. There was no longer any fistula. Its edges had joined close in a perfect union. Anarcha's recovery with the silver sutures in place was uncomplicated and she remained dry for the rest of her life. This was a great relief for this particular patient because her fistula not only opened into the bladder but into the rectum as well.

In 1852, Simms reported the cure of 252 fistulas out of 320 attempts. It was apparently the use of silver wire sutures that turned repeated failures into predictable successes. Shortly thereafter, Simms left Alabama for New York where he became one of the founders of the Women's Hospital in that city. He toured Europe and operated successfully on patients throughout the continent.

His success did not end with his accomplishments in fistula surgery. The Internal Medical Congress in London in 1881 was perhaps the most satisfactory medical meeting in the life of Marion Simms. Simms' thesis and his valedictory address was "Progress in Peritoneal Surgery." Dr. Simms prefaced his remarks by saying, "that he was prompted to discuss the subject as a result of what he had seen and heard in the surgical and obstetric sections at the International Medical Congress." His object was to lay before the Academy a synopsis of the progress of peritoneal surgery in his own pioneer practice. In his address, the physically afflicted 68-year-old pioneer surgeon was ardent in his plea for surgeons to adopt the new methods—aseptic technique in particular—in dealing with any wound that invaded the peritoneal cavity. He pleaded for the adoption of Lister's principle for preventing infection in all wounds, particularly with the abdomen. "Ovariotomy is the parent of peritoneal surgery," said Simms, and he gave credit to Ephraim McDowell and Washington Atlee, whom he called the "great ovariodomists."

Marion Simms died quietly in 1883 while working on his autobiography entitled "The Story of My Life," a book that was to be released by his son, Harry Marion Simms, a year after his father's death.

The spirit of Marion Simms was to be assumed by Howard A. Kelly who was appointed the first professor of gynecology at the Johns Hopkins Medical School. Like Simms, Kelly believed that gynecology and urology were so closely related that they could not be separated. It is interesting that this conference and the new society of gynecologic

urology, which embryonically lingers in the wings of this conference, is the fulfillment of the beliefs of Marion Simms and Howard Kelly.

In 1893, Kelly invented the cystoscope. According to Robertson, he utilized the so-called air cystoscope with the patient in knee-chest position. Robertson relates that the cystoscope originally was a hollow tube with a handle and a glass partition which prevented water from running out of the bladder. The bladder had been distended with the installation of water prior to the insertion of the cystoscope and light was reflected from a head mirror. One day, an assistant to Dr. Kelly dropped the scope and the glass shattered. Kelly had noticed that the vagina ballooned with air when the patient was in the knee-chest position. He concluded that the bladder might be distended with air in a similar manner. He inserted the broken cystoscope and when he removed the obturator, the bladder ballooned with air and he was able to satisfactorily inspect the bladder mucosa. Kelly's interest in urologic problems of the female intensified, and in 1949, he and Burnham co-authored a text entitled *Diseases of the Kidney, Ureters and Bladder.*

Kelly wrote, "The commonest form of incontinence is the result of childbirth, entailing an injury to the neck of the bladder; it is occasionally seen in elderly nullipara and is most common after the age of forty. It is usually progressive, beginning with an occasional dribble, later becoming more frequent and occurring on slight provocation. In its incipiency, a strain, cough, sneeze or stepping up to get on a tram car starts a little spurt of urine which, in the course of time, initiates the act which empties the bladder. The list of operations devised to overcome the incontinence is legion; most unsuccessful, but occasionally, temporarily at least, affording some control. The best plan, often successful, is to set free the thickened musculature (sphincter) at the neck of the bladder (Bell's muscle) and to suture it so as to overlap its ends, forming a good internal sphincter." This was to be the forerunner of the Kelly plication as a component of the anterior colporrhaphy. The individuals at the Johns Hopkins Medical School that followed Kelly were similarly interested in female urology. Guy Hunner described the Hunner's ulcer, which today is called intestinal cystitis. Houston Everett succeeded Hunner; his important contribution was the relationship of the urinary tract to cervical cancer. His concepts are fundamental in modern concepts of gynecological oncology. He is the author of *Gynecologic and Obstetrical Urology* and co-author of *Female Urology.*

In 1914, Latzko described a new operation for closure of the posthysterectomy vesicovaginal fistula. His simple

method consisted of an upper vaginectomy and was easily applicable to a large number of patients in the United States who have a small fistula posthysterectomy. Many modifications of this technique have been proposed during the last several decades, but the fundamental methodology remains unchanged.

As stated above, a surgical approach to stress incontinence was begun by Howard A. Kelly who reported on 20 cases of incontinence treated by plication of the vesical neck with success in sixteen cases. In 1949, Marshall, Marchetti and Krantz reported a new operation in which they had treated 50 patients with stress incontinence; 25 of these patients had previous unsuccessful surgical procedures for incontinence. Their overall success rate was 82%. This retropubic suspension of the bladder neck has been modified by many individuals over the last three decades. The procedure described by Burch in 1968 has received great popularity. This procedure accomplishes the retropubic suspension by suturing the periurethral tissue to Cooper's ligament.

Most recently, the evaluation of bladder dynamics has been more carefully and scientifically approached. This began with the report by Robertson of the use of the culdoscope which had been modified to accommodate the physician in his inspection of the bladder and urethra. The standard culdoscope, used for many years in gynecology, could not be used to visualize the vesical neck or the urethra because of the right angle of the lens and the heat from the bulb. Robertson modified the Kelly air cystoscope to overcome these obstacles. The new urethroscope had optical glass fibers enclosed between double walls of a stainless steel barrel. An electric source in the handle transmitted cold light around the circumference at the distal end. This allowed magnification at the proximal end. An air vent allowed a closed system by placing a fingertip over the vent. The development of fiberoptic telescopes revolutionized endoscopy and has made many changes in the practice of gynecology. Robertson developed a new female urethroscope with a direct view telescope which looks into an open barrel tube. The fiberoptic cord and the gas tubing are attached to the head. Carbon dioxide is used for distention of the urethra and bladder. This flexible system allows both thorough inspection of the urinary tract mucosa and the beginnings of analysis of bladder and urethral function. Recently, utilizing this instrument and modifications thereof, a more sophisticated system for dynamic assessment of bladder and urethral function has been pioneered with a more thorough understanding of the entire process of micturition.

It would appear that the discipline which gave birth to the

larger specialty of gynecology has finally come of age. Many of us have been frustrated by the paucity of concrete knowledge in the area of stress incontinence and related problems. The number of surgical procedures which have been devised over the last century to accommodate and improve these afflicted patients is legion. Undoubtedly, the fundamental problem was a serious lack of understanding of the etiology. Developments in the last few years would suggest that our understanding of the mechanisms involved in the proper function of the healthy and diseased bladder and urethra are at hand, and appropriate procedures are forthcoming to improve the well being of this large group of afflicted patients.

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Contents