

Common Pediatric Problems: Hypospadias, Enuresis, and Circumcision

JOHN H. TEXTER, JR., M.D.

Associate Professor, Division of Urology, Department of Surgery, Medical College of Virginia, Health Sciences Division of Virginia Commonwealth University, Richmond, Virginia

Three topics of common pediatric interest from the urologist's viewpoint are congenital hypospadias, persistent enuresis, and complications of elective circumcision. None of these are usually life-threatening in severity, yet each problem can be of profound psychological importance and play an extremely important role in the child's subsequent development.

The least common of the three is a malformation or incomplete formation of the male urethra and the associated deformity of the foreskin and penile shaft known as hypospadias. This condition results from incomplete closure of the urethra in utero. Since the urethra normally begins closing from the proximal end of the penile shaft and progresses distally to the glans, it is possible for the hypospadiac meatus to be positioned at any location from the perineum to the coronal sulcus. The timing of the arrest of the urethral closure will determine the location of the meatus and the length of the deficient distal urethra. Since the portion of the urethra which is not closed is represented by fibrous tissue or what was destined to be normal corpus spongiosum, this material is non-elastic and is represented by a fibrous band or tract. When erection occurs, this tissue pulls down on the penile shaft and produces the curvature of the penis or ventral chordee seen in classical hypospadias. The urethral closure is also responsible for the formation

of the normal prepuce. When hypospadias occurs, the foreskin is incomplete ventrally, producing the typical "dorsal hood" of preputial tissue seen in this condition.

Over the years, numerous types of surgery have been recommended to correct this malady. Often these procedures were only partially successful, and individual surgeons developed their own modifications of previously described techniques. A very effective method was used about 200 BC by the Greeks, Heliodorus and Antius. They simply guillotined the distal end of the penis at the level of the meatus. In this maneuver, all three deformities were corrected; the curvature was gone, the dorsal hood excised, and the meatus was now at the end of the penis. The stump end of the penis was then cauterized with a red-hot iron which provided hemostasis and produced a swollen, knotty stub at the end of the penis which occasionally resembled a glans penis. There were also very few readmissions or requests for repeat surgery.

Surgical techniques improved over the centuries. In 1842, one of the first successful, planned hypospadias repairs was performed by Dr. John Peter Mettauer in the western part of Virginia. With present-day techniques it is possible to completely repair even the most severe degree of hypospadias and, when healing is complete, to have a relatively normal-appearing penis capable of normal micturition and sexual function.

While the multitude of surgical repairs will not be individually discussed, most severe degrees of hypospadias require corrective surgery performed in stages. This often results in a child returning to the

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Correspondence and reprint requests to Dr. John H. Texter, Division of Urology, Box 176, Medical College of Virginia, Richmond, VA 23298.

operating room at regular intervals over a period of several years. This is undesirable from a financial as well as a psychological standpoint. Fortunately, in the mid-1950s, single-stage repairs became possible; this not only decreased the psychological stresses on the patient and family, but also produced excellent cosmetic results. The tube graft repair for hypospadias was popularized by Drs. Devine and Horton in Norfolk, Virginia. While the original technique has been altered somewhat, the basic procedure is sound and continues to produce excellent results in the hands of many surgeons throughout the world. In the late 1960s, the single-stage "flap" procedure was devised by Dr. Norman Hodgson which added another useful tool to the urologist's armamentarium.

These new methods have changed our concept of what is considered a satisfactory repair. In 1950, Dr. Campbell's textbook, *Urology*, stated that if the hypospadias were mild and the meatus were located in the distal part of the penile shaft, no attempt should be made to correct the condition. If the patient had "free urination and adequate insemination," any further surgical repair was "meddlesome"; however, today there is concern about the cosmetic appearance as well as the functional capabilities of the penis. If the chordee is mild and the meatus located distally, it may still be desirable to correct these conditions and position a new meatus on the tip of the glans penis. This is now possible, using one of the new single-stage procedures; however, since both types of repair require the use of excess skin which ideally can be taken from the foreskin or dorsal hood, it is extremely important not to circumsize the child. If there is any question about the possibility of subsequent surgical correction at the time of birth, circumcision should be postponed.

Enuresis

The second pediatric problem the urologist is often asked to evaluate is far more common than hypospadias. This is the problem of the persistent bed-wetter. This problem is not unique to our country, but occurs throughout the world. It is interesting, however, to note that the frequency differs greatly from one country to another. For example, in the United States there is an incidence of enuresis at age 5 of about 15% to 20%, whereas in Brazil the incidence in this age group is close to 2%. This suggests that social and environmental factors contribute to enuresis. With increasing age, enuresis generally becomes less common so that in our country by age 10, only

5% of the children are enuretic and by age 15, only 1%. The reported incidence of 2% enuresis in military recruits must be viewed carefully as the individual may be influenced by the fact that bed-wetting is one of the criteria for military rejection. On the basis of these statistics, it is valid for the family physician to recommend to the family that treatment for enuresis is not always necessary and if given enough time the bladder will "mature and the child will outgrow his or her bed-wetting."

Until the age of 3 years, enuresis or daytime wetting is physiological and probably the result of incomplete myelination of the innervation. The age of 3 years is purely an arbitrary cutoff point, but most authorities agree that beyond this point, enuresis should be considered to be either functional or organic. The majority of these enuretic children will demonstrate a functionally decreased bladder capacity; however, under general anesthesia the bladder volumes are within normal limits. In general, if the wetting occurs only at night and there are no other urologic symptoms, little is to be gained by doing an extensive urologic evaluation. This impression is borne out by the study of Dr. Tony Middleton of Salt Lake City who studied the results of 216 enuretic children who were completely evaluated and had only enuresis. He concluded that the likelihood of identifying any major urologic abnormality was nil, although, if there were other symptoms or findings such as urinary tract infection, diurnal enuresis, or difficulty with urination, base line urologic evaluation was helpful. According to this study, approximately 10% of the children required some type of surgical repair.

It is interesting to note that many of these functional enuretic children came from a family in which other members were enuretic. If both the mother and father had enuresis, there was an 80% chance that one of their children would be enuretic. Also, if the mother or father developed their control at age 10, then it was quite likely that their child would stop wetting the bed at about the same age. Also, an identical twin would be more likely to have enuresis than a dizygotic twin.

There is a vast spectrum of recommendations concerning the treatment for essential enuresis; however, most measures fall into one of three main categories.

1. *Bladder training maneuvers and fluid restriction:* Effort is directed to keep records of voiding times and the volumes passed with each voiding. The

patient is aroused during the middle of the night and required to empty his bladder in order to keep the bladder as empty as possible. Also, the youngster is not allowed to drink any additional liquids, following a set time of day such as after the evening meal or before bedtime.

2. *Drug therapy:* Antispasmodics such as belladonna or propantheline bromide (Pro-Banthine) are effectively used to increase functional bladder capacity. Other agents such as the tricyclic antidepressives are prescribed for their altered sleep patterns and their direct action upon bladder musculature. In the group of antidepressive agents, the most popular one at the present time is imipramine (Tofranil).

3. *Waking devices:* The sleeping youngster is aroused from deep sleep by activation of some electrical device when urine leakage occurs. The urine causes electrical contact to occur and completes a circuit which in turn sets an alarm, electrical stimuli, or flashing lights. The waking devices are said to be very popular in England and are reported to be quite effective in terminating enuresis. In the United States and Canada more emphasis has been placed upon the bladder training program and drug therapy. Both techniques are reported to be effective in 65% to 80% of enuretic patients.

Circumcision

Today, circumcision is the second most frequently performed operation on the male. While it is often performed for religious purposes and less often for strict urologic indications, the largest number of circumcisions are done for hygiene or simply as a routine procedure. Dr. Julien Ansell at the University

of Washington in Seattle evaluated all the circumcisions performed in the University Hospital during a 10-year period of time. It is of note that of 5,882 male births, 5,521 or 94% were circumcised before they left the hospital. Of the remaining 361 male infants who were not circumcised, 22 were denied the operation because of some degree of hypospadias. This correlates well with the reported incidence of hypospadias of about 1 per 267 male births.

About half the circumcisions were done with the Gomco® clamp and the remaining half performed by the Plastibell® apparatus. The overall complication rate from routine elective circumcision was slightly in excess of 1%. This was most often due to hemorrhage occurring equally often with the Gomco® clamp and the Plastibell®. Most bleeding problems were easily managed by application of an adrenaline (1-1,000) soaked sponge applied to the area of bleeding (25 out of 59 patients were successfully handled by this measure). The others required placement of a suture or ligature to provide hemostasis. Infections were uncommon, occurring in less than 0.4% of patients and were generally managed with local measures such as cleaning and soaks. Only four patients, all of whom had Plastibell® circumcisions, required systemic antibiotics. Nine patients had wound-healing problems such as dehiscence and denudation of the penile shaft skin. Eight of these patients had Gomco® clamps used for the circumcision. In general, it was concluded that circumcisions can be performed routinely with a low complication rate and those complications that do occur are relatively easy to manage. The type of clamp used for the operation does not appear to make a significant difference.