the snare. There are twenty-five cases or more on record of tumors of this sort and size which have been removed by pharyngotomy or by the mouth. The nature of the growth in my case was like that of an accessory thyroid. I had great difficulty in adjusting the snare, because the tumor had a very broad base, but finally removed it by means of an unusually large strong snare. Most of these tumors can be removed in this way, thus avoiding the difficulties and dangers of an external operation, as well as avoiding a tracheotomy and leaving a bad scar in the neck. I do not know whether it would have been possible to have operated on Dr. Bryant's case with a snare, but it should be done whenever possible. I was interested very much in the case, and the explanation of the method of operation. I wish to make a plea for the avoidance of pharyngotomy when possible.

DR. FRANK J. LUTZ, St. Louis—Besides the anatomic difficulties encountered in doing a subhyoid pharyngotomy the question of anesthesia is one of great importance. Some years ago I called attention to this and stated that the operation could readily be done under local anesthesia. The vital indications in my case were dyspnea and dysphagia. The patient was an old man who was dying for want of nutrition. The tumor was so large that I was afraid to use general anesthesia. Under local infiltration I was enabled to do the dissection without any mishap. I applied a 4 per cent. solution of cocain on the mucous membrane covering the growth and on the pharyngeal surface and under its influence the tumor was very readily enucleated. By the use of local anesthesia you secure the intelligent co-operation of your patient, which is very important. The literature of subhyoidean pharyngotomy is much greater than the author has stated.

DR. GEORGE GOODHUE, Dayton, Ohio—Some six weeks ago I was called to see a man who had performed pharyngotomy upon himself by the anterior route. He hugged the inferior maxillary so closely that he had left below the cut not only the trachea and larynx but the epiglottis. There was tremendous gaping. He had not cut any vessels, except those which had ceased to bleed, but they commenced again on manipulation and had to be ligated. The parts were sewed with catgut, layer by layer, using an interrupted suture. This case demonstrates a large field for operative procedure and leads us to wonder if after all the anterior route would not be preferable to the lateral.

DR. R. F. WEIR, New York—As to the practical treatment afterward in closing up esophageal wounds, I think Dr. Dawbarn is correct in his theory about this. It is a part of the body which can not be kept still. Mucus and saliva will accumulate and must be swallowed. You may close the leakage, but it will probably leak. Hence, in addition to the closure of the pharyngeal or esophageal wound, one should pack thence outward to the skin with something like iodoform gauze in order to prevent leakage. It is sometimes of advantage to use for this a sticky gauze and for this Whitehead's solution is of service. This consists of iodoform dissolved in ether mixed up with the compound tincture of benzoin, which gives to gauze dipped into it the desired adhesiveness.

DR. BRYANT, in closing—At the outset permit me to thank you for the courteous attention exhibited in connection with the consideration of this unusual case. As to the selection of the route of entrance to the pharynx, I had thought that I stated this part of the question as clearly as possible. Whether to seek the removal through an incision made in front or at the side was not clear to me at first, but later, when finding that the growth encroached more on the right than on the left side of the pharynx, it was appreciated that I might be able to define its limits, determine its attachments, and, perhaps remove it through a lateral opening better than from any other aspect of the neck; also, it occurred to me that I might be able to remove it from beneath its mucous membrane covering without impairing the structural integrity of the latter, which could not of course be accomplished by any other line of access. Only a sufficiently large incision was made into the larynx at the upper part of the common incision to enable me to investigate with the index finger the extent of the growth and its probable attachments, which facts were practically ascertained by this means. Extension downwards of this incision exposed to approach the tumor, which was enucleated with the finger, leaving its mucous covering intact. The opening into the pharynx was then closed with two rows of sutures in the manner already stated. The sac was rinsed out with peroxid of hydrogen, found by this means to be intact, was then dressed, and the upper portion of the wound finally closed as already described. From this time the real point of interest seems to me to be whether or not the sac would slough, in part or wholly, or contract into place, leaving only a protuberance which would slowly disappear. It did not occur to me, except in a passing manner, that injury to the carotid vessels might happen, especially since the incision was far removed from them. Only superficial vessels and nerves were involved in the first incision; the profounder ones already enumerated were avoided in the succeeding deeper ones. So far as the sewing is concerned I remember long ago performing an esophagotomy for removal of a campaign button and contrary to the advice of an older surgeon than myself, sewed up with a single row of catgut the opening through the mucous membrane and its immediate superimposed tissue the entire length, leaving unclosed though lightly packed with gauze, the larger part of the superficial wound. In this instance only partial union of the deep tissue ensued, the remainder healing slowly by granulation. However, something was gained by this step in sewing without attending danger, and therefore deep sewing should be considered a proper measure of practice. The drawing upward of the greater cornu of the hyoid bone with a tenaculum or traction loop, serves not only to increase the space beneath it for operative purposes, but also averts the movements of the parts—thereby affording increased opportunity and much comfort in making incisions here for various purposes, and especially in ligating the lingual artery.

I respectfully submit that it does not lie in the power of any man to so apply a hot or cold snare to a growth of this peculiar attachment as to enable him to remove it as promptly and effectively without subsequent annoyance as was done in this case.

THE SYMPTOMATOLOGY OF CALCULOUS RENAL AND URETERAL DISEASE.*

CHARLES LESTER LEONARD, A.M., M.D.

PHILADELPHIA.

The symptoms in calculous nephritis and ureteritis are seldom commensurate with the gravity of the case, or the size of the calculus. Small calculi are the most dangerous as they threaten the functional life of the kidney, before giving rise to symptoms that suggest their presence. A calculus resting in the calyx or pelvis of the kidney is simply a foreign body. So long as it remains aseptic it can only produce mechanical irritation or obstruction. Such a quiescent aseptic calculus can increase to large proportions before it is suspected.

A number of large calculi that have been found produced only a dull ache in the lumbar region, a slight amount of albumin, and in some a microscopic trace of pus. In some of these cases the condition had lasted for years and had been frequently diagnosed as chronic Bright's disease. The semi-quiescent calculi produce more marked symptoms. They are often adherent to the pelvic mucosa and cause hemorrhages after violent movements. If the blood is sufficient to form clots, they may produce obstructive symptoms and colic. In freely movable calculi the symptoms and size bear a closer relationship. The larger the calculus the less severe

* Read at the Fifty-third Annual Meeting of the American Medical Association, in the Section on Surgery and Anatomy, and approved for publication by the Executive Committee: Drs. H. O. Walker, A. J. Ochsner and DeForest Willard.

the symptoms. Obstruction is less liable and they are difficult to detect. Very small calculi, if smooth, may pass almost unnoted. If rough they may produce considerable pain as well as slight hemorrhage.

When the calculi are somewhat larger and enter the ureter they are the most dangerous. They become impacted in the ureter, obstructing or occluding it, and produce a temporary or complete hydronephrosis that may result in unilateral anuria and the functional death of one kidney. When they progress down the ureter, their progression is marked by an intermittent hydronephrosis with a constant dull pain in the lumbar region, accentuated by acute exacerbations or colic attacks, as the calculus is pushed down the ureter. These calculi produce a symptom complex that closely simulates a movable kidney, a twisted ureter or a valvular formation. These various conditions have been frequently found in cases suspected of calculus where a negative diagnosis had been rendered excluding calculi. The time required for these ureteral calculi to pass has varied from a few hours or days, to months.

Such calculi may, however, become impacted in the ureter and give rise to the very grave condition of unilateral anuria. It is impossible to determine the presence of the calculus or of such a condition from the symptoms or urinalysis. After the occlusion, the urine is derived only from the normal kidney. The subsidence of the symptoms is identical, whether the ureter remains occluded and the kidney ceases to act, or the calculus passes unnoted or the urine finds its way past the calculus. The results are entirely different in their gravity. If the calculus is permitted to remain, the kidney will atrophy and any serious involvement of the other kidney will thereafter result in death.

The greatest danger, therefore, lies in permitting such a calculus to remain *undetected* and not removed by surgical intervention, if it is producing complete obstruction. The only way to determine the presence of the calculus is by operation, or by the Roentgen examination. The only way to determine the absence of unilateral anuria is to show that there is present a bilateral urinary flow, either by the cystoscope, the ureteral catheter or the segregator. The simplest and the gravest conditions may be present where there are aseptic calculi that fail to produce sufficient symptoms to determine their presence. The importance of a method that absolutely determines their presence or absence, as soon as suspected, is therefore evident.

When infection is present with the calculus, the symptoms approximate more nearly those classically described as renal colic. Yet any one, or more than one, of these symptoms may be wanting and yet a calculus be present. Thus the symptom complex may approximate or be identical with that of other intranephritic or extranephritic conditions. In fact, this similarity in symptomatology may make a differential diagnosis impossible except by the Roentgen method. The impacted calculus in the right ureter, producing a pyonephrosis, may closely resemble an appendicitis. The distended ureter, if the calculus is impacted just above the iliac vessels, may be mistaken for the swollen appendix. The exquisitely tender ureter over the calculus is close to the position of the inflamed appendix. The increased proportion of ureteral calculi, over sixty per cent., makes it highly probable that this error in diagnosis has been made. With complete impaction there would be no morphologic elements in the urine to aid, while all the systemic symptoms could be produced by the pyonephrosis, even the rigidity of the abdominal wall might be included, caused by a peri-ureteritis and peritonitis.

Recent investigations by Thomas R. Brown show that calculi in infected alkaline urines are probably secondary to the infection and result from the action of bacteria that decompose the urea, forming the phosphates and carbonates of calcium and magnesium of which the calculi are composed. This is undoubtedly true in some cases, but all calculi have their origin in the pelvis or calyces of the kidney, and many large calculi are found in perfectly sterile urines. Infection must in many cases be secondary to calculus formation, though it probably occurs more often in acid than in alkaline urines.

Where a calculous pyelitis is secondary to a cystitis the diagnosis would be very difficult. The cystitis might subside and a chronic pyelitis remain, without sufficient symptoms to make its calculous nature suspected. The persistence of a chronic pyelitis or cystitis should excite the suspicion of calculus and its presence should be eliminated or determined by the Roentgen examination. Two cases that approximate each other very closely in symptomatology will serve to illustrate how difficult the diagnosis sometimes is without the use of the Roentgen rays.

CASE 1.—The first case (No. 32), A. B. D., 33 years old, was referred by Dr. Holman of Pittsburg. He had suffered from nervous prostration for five years. For the last eighteen months he had had acute pain in the left lumbar region. There had been pus in varying quantity in the urine. Sometimes the urine was perfectly normal. There had been no true colic. The urine contained pus, some red blood corpuscles, a slight amount of albumin, no casts and a few oxylate of lime crystals. Inoculations for tubercle gave negative results. There had never been any symptoms of cystitis. The Roentgen examination excluded calculus and the patient was referred for further examination and diagnosis. A sacculated atonic bladder was found containing sixteen ounces of residual urine loaded with pus. The atonic bladder and the lancinating lumbar pains suggested a spinal lesion with prodromal pains. The patient was put on urotropin to clear up the pus and referred to a neurologist. He subsequently developed a paraplegia from which he has partially recovered. This case simulated closely a calculous nephritis but proved to be neuropathic.

CASE 2.—The second case (No. 231), A. G. C., 38 years old, was referred by Dr. R. W. Stewart of Pittsburg. Before coming under his care he had been treated by various physicians, including a neurologist of very high standing, for nervous prostration. His symptoms were lumbar pain, never intense in character, with no colic. A small amount of albumin, a trace of pus and large quantities of uric acid in the urine. The Roentgen examination showed a large calculus that formed a cast of the pelvis and calyces of the kidney. It had to be broken in order to remove it during the operation by Dr. Stewart. The patient has since made a complete recovery.

Of these two cases the first presents the more typical symptom complex of a large renal calculus, while the second had been treated as a spinal lesion of specific character.

Small movable calculi in the infected kidney have symptoms that resemble more closely the typical classical grouping of nephritic colic. The following case illustrates the symptomatology in cases where a small calculus is passing down through the ureter in an acute attack.

CASE 3.—G. V. (No. 226), 38 years old, was referred by Dr. A. H. Goodwin. He had two attacks before the one in which he was examined. They had occurred three and eighteen months previously. The present attack had lasted six days before he was seen and examined by the Roentgen rays at his home. There had been malaise, sleeplessness, dry lips and skin, pulse 100-105 and anorexia. There was constant pain in

the lumbar region and radiating from it, with exacerbations. There was no tympany, no muscular rigidity, no frequent urination. One ounce and a half of urine passed three and one-half hours after the onset of the attack showed acid reaction, yellow color, cloudy, albumin in small amount, a trace of pus, blood in pale discs, 2 hyalin casts in 5 slides, cylindroids plentiful. The urinalyses remained practically the same with a decrease in the blood and pus. The amount passed in the day was 777 c.c. with 16.9 grains of urea. For the first five days morphia had to be given for the pain. The Roentgen examination showed a small calculus in the juxta-vesical portion of the ureter. The calculus was passed five days after its detection. It was a small flattened oval, slightly roughened, of ash-brown color. It weighed 0.096 gm. A chemical analysis showed that it was composed of earthy phosphates and uric acid.

This case illustrates the value of this method of diagnosis and shows that small calculi composed of uric acid and phosphates can be detected with such accuracy as to justify the employment of an expectant line of treatment.

The character of the pain in renal and ureteral involvement in calculous conditions or in any obstructive lesion of the ureter is quite characteristic though not always to be depended on. The dull ache in the lumbar region is produced by a quiescent or semi-quiescent stone. The intense pain or colic, localized in the lumbar or renal region, and radiating from that point down into the testicle, is produced by a large movable calculus that blocks the ureter or a smaller calculus that has just entered it. The calculus that has entered and is passing down the ureter causes by obstructing the flow of urine the distension of the pelvis of the kidney and the ureter. The spasmodic contractions, that result in the pushing onward of the calculus, give rise to exacerbations of pain that are characterized by a tendency to nausea and vomiting when the upper portion of the ureter is involved.

The absorption of toxins from the pent-up pyonephrosis is generally expressed in gastric irritation. In one case (No. 121) of complete occlusion of the ureter, the absence of urinary disturbance and the presence of gastric irritation, led to the demonstration of the patient in a clinic as a case of nervous dyspepsia. Nausea and vomiting are not as constant symptoms when the calculus has passed the iliac vessels and lies in the pelvic portion of the ureter. In its upper portion it is often possible to palpate the distended ureter and elicit exquisite tenderness, "like a toothache," by pressure on the calculus. The pyonephrotic kidney can sometimes be palpated, its intermittent hydronephrotic or pyonephrotic state making the diagnosis of a movable or floating kidney very possible.

The ureteral calculus situated in the pelvic portion of the ureter may present a symptomatology identical with that of calculi higher up. It may present the symptoms of renal calculus only. The pain may be referred to the kidney alone, with no symptom to locate the calculus in the ureter. Or, the symptoms of cystitis or vesical calculus may be presented, with pain referred to the glans penis. The latter symptom is particularly common when the calculus lies in the juxta-vesical portion of the ureter, or when it projects into the bladder. It is not, however, a constant symptom and may be entirely wanting. Here it may also be possible to palpate the calculus by rectal or vaginal examination.

As recently pointed out by Dr. H. H. Young, the examination with the cystoscope and ureteral catheter is particularly serviceable. The ureteral papilla often shows decided changes on the affected side, or a calculus may be seen distending or projecting from the ureteral orifice. The collection of the individual urines and comparative analyses is of great service, as the functional efficiency of each kidney may be determined. The value of careful urinalyses, especially of the individual urines, should not be underestimated. Implicit confidence should not, however, be placed in the findings. The urinalyses from a number of conditions may often present identical characteristics. Bacteriologic analyses often prove of great value, but more often fail in detecting the micro-organism that is responsible for the pathologic condition. The most constant element present in the urinalyses from cases of calculous nephritis or ureteritis has been albumin. This element is so common in all renal inflammations that its presence is hardly more than suggestive. The amount of urea excreted, especially if the comparison is made between the individual urines, is very valuable in establishing the functional efficiency of the individual kidneys. The relative amount of sugar eliminated from the individual kidneys after the hypodermic injection of phlorizin is another new and valuable laboratory test.

The separate urines give an additional value to microscopic examinations, but the traumatism produced in obtaining them makes it impossible to depend on them in estimating the amount of blood. It can only be accurately estimated in the fresh specimen secured without instrumentation. It is found so often in other conditions that its value as a sign of the presence of a calculus has been overestimated.

Pus is an element that can only have diagnostic value when its source is accurately determined by the catheterization of the ureters. It is, however, still a mooted question whether catheterization is justifiable in the presence of infection, especially in the male.

The difficulties in the way of making a differential diagnosis from the symptoms and urinalyses are, therefore, very great, especially when we take into consideration the fact that one or more of these symptoms may be wanting. They are equally great in intranephritic and extranephritic conditions that simulate each other very closely in symptomatology. It is, however, particularly difficult to determine the presence of the smaller calculi, which, as has been shown, are the source of the gravest danger. But all calculi should be detected and removed in their earliest stages, as soon as a suspicion points to their presence. The symptomatology of these earliest stages is too uncertain to base operative procedures upon. Delay is dangerous, while the presence and size of the calculus is still undetermined. Delay is the best treatment, when the exact determination of the size and position of the calculi shows that its passage can be safely awaited by nature's methods. Such exact knowledge removes an element of imminent danger from the patient, and often results in the complete avoidance of all operation.

These deductions are based on the study of 254 cases suspected of calculous conditions that have been referred for the Roentgen diagnosis. In the 73 positive diagnoses calculi were found in the ureter 47 times; 50 cases were in males, 18 in the kidney, 32 in the ureter; 23 cases were in females, 8 in the kidney, 15 in the ureter. In 11 cases bilateral calculi have been found, sometimes both renal and ureteral. Multiple ureteral calculi have been found in 6 cases.

The value and accuracy of the Roentgen method and its superiority to all other methods in determining the presence or absence of calculi in the urinary tract has

been demonstrated beyond a doubt. The variations in symptoms and the frequency with which they are deficient in the early stages render it essential to the safety of patients suspected of renal or ureteral lithiasis that they should be submitted to a Roentgen examination and the presence or absence of all calculi determined.

Such an accurate and absolute diagnosis can not be made until the diagnostician has developed a careful technic. Clinical experience is essential in reading the negatives as well as in making them, and must count in estimating the value of the diagnosis rendered.

112 South Twentieth Street.

INFRAPUBIC SECTION FOR PROSTATECTOMY.*

E. WYLLYS ANDREWS, M.D.
Professor of Surgery Northwestern University Medical School; Surgeon to Mercy Hospital and Michael Reese Hospital.
CHICAGO.

The operation here described is based on principles somewhat at variance with those now current, and I beg your indulgence if I speak dogmatically while trying to make its features plain. I have to offer as an excuse the good results I have attained and the rather chaotic condition of the whole subject in the literature.

STRUCTURES CONTRIBUTORY TO THE OBSTRUCTION.

We are not accustomed to consider the male pelvic outlet as of surgical importance, but we must now revise our ideas of pathogenesis and treatment of prostatic obstruction if my theories are true, and concede that the bones and ligaments also of the pelvis have much to do with compressing the urethra in prostatics. I contend that unless there is crowding together of the walls of the prostate by outside pressure, enlargement alone will not cause stoppage. That this crowding does take place I will endeavor to show. Were the prostate free to expand, I believe that enlargement of the organ would seldom cause dysuria, as the vesical sphincter is not a part of it. At any rate, many very large prostates have come under my notice, in which there was no retention and no cystitis. A much smaller one, bound tightly against the pubis and subject to lateral pressure, will often give complete obstruction. Of course, the presence or absence of inflammation often determines the question of obstruction in different cases or at different times in the same case. It is not fair, however, to give this too great weight, because there are undoubtedly large numbers of cases constantly obstructed by mechanical causes, only the inflammatory part of the trouble being unimportant. The thesis I wish to defend is this: The prostate, when enlarged by myomata or other cause, like a myomatous uterus, lacks room in the bony pelvis and crowds all the other organs and itself until it obstructs its own lumen.

The prostate sits in a rigid triangle, having one side of ligament and two of bone. It is exceedingly firmly fixed in this narrow box by the short, hard band called the triangular ligament and the two prostate-pubic ligaments. These effectually prevent any backward motion into the looser and wider space behind, except in so far as the ligamentous fibers can stretch. The triangular ligament (lig. transversum pelvis) also forms a perfectly rigid floor on which the organ is firmly seated and through which the urethra perforates, thus establishing, immovably, the position of neck of the bladder, prostate and bulb.

A consideration of these anatomic and pathologic points led me to devise the operation I now advocate. This is a partial prostatectomy, the posterior part of the gland being left in place. It is, however, more than this, as it involves cutting loose the gland from its pubic and lateral ligaments, and partial destruction of the pelvic floor or urogenital diaphragm, with dislocation backward of the whole mass. This means such a radical departure from the old technic that a few words of explanation seem necessary.

DISCUSSION OF THE COMMON ROUTES OF OPERATION.

Of the two routes commonly chosen, suprapubic and perineal, each present various phases that are instructive. After a fair experience with each, I became convinced that certain types of enlargement are better suited to suprapubic prostatectomy, and certain others to the perineal, although I admit that the pre-operative selection is not easy.

An advantage of suprapubic section is remoteness from complex structures about the vesical neck, such as the numerous nerves, vessels and muscles located there,

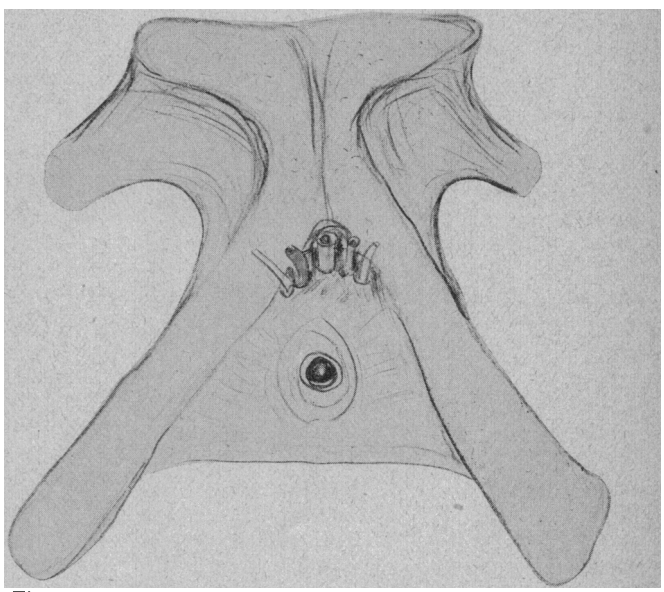

Fig. 1.—Infrapubic section, dorsal vein, arteries and nerves.

deep fascia, pelvic floor, posterior urethra and seminal vesicles and ducts. Incising the fundus of the bladder in Retzius' space is a much less damaging cut. The suprapubic opening also gives more visible field, enables us to detect and remove stones easily, and gives easier route for pedunculated internal lobes. My observation is that emphasizing certain features of the technic makes suprapubic prostatectomy a rather rapid and easy operation. The features are:

1. Use of a larger Barnes' bag than usual, lifting the prostate into a visible position and holding it against the pubic arch.

2. High Trendelenburg position, which seems to cause the prostate to move toward the front still more.

3. Careful incision of the capsule through the bladder wall, turning it off the gland in a flap each side.

4. Bimanual enucleation. The gloved hand or two fingers in the rectum constantly working against the one in the bladder so that the prostate and its myomatous masses are shelled out between them. If items 3 or 4 are neglected, the operation is long and bloody, especially if instruments are used instead of fingers to enucleate.

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