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The President, DR. ROBERT G. LECONTE, in the Chair

THE TECHNIC OF MEDIAN PERINEAL
PROSTATECTOMY.

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EVER since 1887, when the late Mr. McGill, of Leeds, demonstrated the possibility of enucleating the enlarged prostate from its fibrous sheath through a suprapubic cystotomy, the thought and ingenuity of many surgeons have been directed to perfect this procedure, either by modifications and improvements upon McGill's method, or by surgically approaching the prostate by incisions through the perineum.

At the present time there are three well-recognized operative procedures for the removal of the obstruction caused by the enlarged prostate. These are, first, by suprapubic cystotomy and intracapsular enucleation; second, by median perineal urethrectomy and intracapsular enucleation; third, by a perineal incision, which exposes the posterior surface of the prostate and transcapsular enucleation. Each of these methods has its advocates. All of these methods have been modified and improved from time to time.

The controversies concerning operations upon the prostate which have arisen during recent years have been marked often with an undue personal animus which is to be regretted. These controversies have usually been upon minor points of technic and upon questions of priority, and too often the essential question, namely, the anatomical and surgical basis of the operations, has been overlooked or ignored. All of

these operations are frequently performed successfully, but it would be an error to claim that any one of them is a perfect operation which can be performed by every surgeon with uniform success. The last word upon the technic of prostatectomy certainly has not been spoken, nor will it be until there is a more wide-spread and a better practical knowledge of the various pathological and anatomical changes which occur as the result of prostatic enlargement. There are, however, certain anatomical facts which can be clearly demonstrated, and these form the basis of any operation which has for its object the enucleation of the portions of the enlarged prostate which cause obstruction to urination, whether the operation be performed through a suprapubic cystotomy or by either of the perineal procedures.

In the present paper I shall call attention to what I regard as the most important of these anatomical facts, and I shall endeavor to point out their practical significance to the surgeon who performs this operation.

I. WHAT PORTIONS OF THE PROSTATE CAUSE OBSTRUCTION TO URINATION.

It may be positively stated that the portions of the prostate which cause obstruction to urination by their enlargement, whether this obstruction be mechanical or physiological, are those portions which lie upon the sides of the urethra and anterior to the seminal ducts. These are (1) the lateral lobes, and (2) the middle isthmus or middle lobe (when this latter exists). The portion of the prostate which lies behind the urethra and posterior to the seminal ducts does not cause obstruction. This portion I shall call (although perhaps not properly) the posterior isthmus of the lateral lobes.

The Line of Cleavage.—These two portions of the prostate, namely, the lateral lobes and the posterior isthmus of the lateral lobes, are separated from each other by a distinct line of cleavage. This line of cleavage is formed by a series of fibrous bands which radiate outward from a central nucleus,

behind the urethra, and these bands pass outward and forward to join the sheath of the prostate. The shape and direction of this line of cleavage give to the posterior isthmus of the lateral lobes a more or less crescentic shape, with the concavity directed forward. This posterior isthmus of the lateral lobes must become enlarged, but it never causes obstruction to urination. It is not necessary to remove it by prostatectomy, and it cannot be enucleated from the prostatic sheath. It is therefore an error, and not in accord with the facts of anatomy, to say that the entire prostate is removed by any of these prostatectomy operations.

The lateral lobes of the prostate which lie on either side of the urethra, and which, by their enlargement, cause obstruction to urination, are anterior to this line of cleavage. These lobes can be easily enucleated from the sheath of the prostate if the line of cleavage be followed. These lateral lobes in the prostate are loosely attached to the sheath of the prostate. The line of cleavage has a constant anatomical position; the relation of the line of cleavage to the urethra is always the same. This can be shown by a transverse section made through the enlarged prostate at right angles to the urethra. The line of cleavage always begins *posteriorly*, on the level with the floor of the urethra, and extends outward and forward so as to partially surround each of the lateral lobes. If, therefore, the urethral mucous membrane be torn through by the finger at the level of the floor of the prostatic urethra, the line of cleavage will be opened and the lateral lobes can be easily separated from the sheath of the prostate.

II. THE RELATION OF THE BASE OF THE PROSTATE TO THE BLADDER.

Normally, the muscular fibres of the bladder are attached to the upper part or base of the lateral lobes of the prostate. The base of these lobes is not enveloped by the fibrous sheath of the prostate. It is covered by the mucous coat of the bladder. This coat is rather loosely attached and may be easily pushed off from the base of the prostate by digital dissection.

The Anatomical Middle Lobe.—The lateral lobes of the prostate are joined together by a wedge-shaped band of prostatic tissue, which varies in quantity in different individuals, and which runs behind the urethra and in front of the seminal ducts. This is known as the anatomical middle isthmus or middle lobe. When this band becomes enlarged, it arrests the finger during the enucleation of the lateral lobes from within the sheath. This middle isthmus, however, can be broken through at its junction with either lateral lobe by the finger. When the prostate is separated from its sheath by following the line of cleavage and the middle isthmus is broken at its junction with either lateral lobe, the latter is suspended within the sheath of the prostate only by the attachment of the mucous membrane of the urethra. This mucous membrane is easily torn through by the finger, and the enucleated lateral lobe then lies free within the prostatic sheath and may be extracted through the external wound by forceps. The enucleation of the lateral lobes is comparatively easy if the facts just mentioned are known and their practical value appreciated.

The enucleation of the middle lobe or middle isthmus, when this is enlarged and causes obstruction, is a little more difficult. The presence of a so-called middle lobe is not a constant factor in prostatic enlargement, and when there is present a so-called middle lobe enlargement, the condition is not always the same either morphologically or anatomically. I think it necessary, therefore, to call attention to certain anatomical facts, the importance of which does not seem to be appreciated by some writers upon this subject.

Some years ago I called attention to the fact that the so-called middle lobe enlargement which projects in some cases intravesically between the two lateral lobes is not always anatomically the same; it may be due either, first, to enlargement of accessory glands, which are situated in some cases just beneath the mucous membrane on the posterior side of the internal urethral orifice; or second, it may be due to enlargement of these glands, plus an enlargement of the

anatomical median isthmus; or third, it may be due to enlargement of the anatomical median isthmus alone. The importance of the enlargement of these accessory glands in this situation is that they push upward the muscular fibres beneath the trigone and thus interfere with the opening of the urethra at the time of urination. The real anatomical isthmus, when this is enlarged alone, can be removed or enucleated with the lateral lobe, which is last removed, by passing the finger beneath it and by stripping it off from its connection with the mucous membrane of the bladder. The enlargement of the accessory glands alone cannot be enucleated without tearing the mucous membrane on the posterior lip of the vesical outlet.

Since 1895, in nearly all cases, I have been doing a median perineal operation, which I shall now describe.

Preparation of the Patient for Operation.—As a rule, no special preparation is necessary. I think it is inadvisable to change in any important particular the habits of an old man, and therefore, unless there is some evidence of kidney insufficiency, I operate without any previous preparation, except that it is customary to give the day before operation a dose of castor-oil, and to follow this with a simple enema. It is best when possible to operate early in the morning, so as to insure for the patient a good night following the day of operation. The operative field of the perineum is prepared by shaving the surface and by washing with green soap and water. No antiseptic is used. The perineum is then covered with dry gauze and a towel. In anæsthetizing, nitrous oxide gas, followed by ether, is employed. The patient is put in a position of lateral lithotomy, the buttocks overhanging the edge of the table. It is not desirable to make this position extreme by over-flexion of the thighs upon the abdomen. The operating table should be high, so that the perineum will be on a level with the chin of the operator as he sits at the foot of the table. A lithotomy staff with a deep median groove is passed into the bladder. This is then given to an assistant who stands on the patient's left and who holds the staff steadily on the

median line. The perineum is divided in the middle line by an incision of about two inches in length, which terminates behind at a point about three-quarters of an inch in front of the anterior margin of the anus. The skin, the superficial fascia, and Colles's fascia are divided. Buck's fascia covering the accelerator urinæ muscle is not divided. The membranous urethra is divided by thrusting a sharp-pointed straight bistoury into the groove of the staff just behind the bulb of the urethra, and cutting forward the floor of the urethra and the lower border of the triangular ligament; a grooved director is then passed in until its point enters the groove of the staff. It is then gently pushed forward through the prostatic urethra and into the bladder, and the staff is withdrawn. The groove of the director is turned backward, and along this the bistoury is guided with the cutting edge directed backward, and the membranous urethra thoroughly divided up to the apex of the prostate. It is of the utmost importance that this division of the floor of the membranous urethra should be thoroughly done, and for this purpose a very sharp knife should be used so as not to lacerate the compressor urethræ muscle. The operator, holding the director in his left hand, introduces the forefinger of his right hand into the wound, and, keeping close to the groove of the director, pushes the finger forward until its tip has passed into the prostatic urethra. The director is then withdrawn, and the finger is advanced with a slight rotary motion through the prostatic urethra, thus dilating this portion of the canal. There is usually very little bleeding up to this point. In cases in which the prostate is not greatly enlarged, the finger can be passed through the prostatic urethra so that its tip will enter the bladder. In cases of marked lateral enlargement, it is sometimes impossible to force the finger entirely through the prostatic urethra.

The second step in the operation, namely, enucleation of the lateral lobes, is now begun. In order to proceed in a systematic manner, I always remove the obstruction from the side which is the larger, but when the two lateral lobes are

of about equal size, I remove the right side first. The forefinger of the right hand is turned with the nail towards the floor of the urethra. The mucous membrane on the side of the urethra is torn through with the tip of the finger at a level with the urethra floor, and the line of cleavage is entered. As soon as the mucous membrane is torn, the finger, following the line of cleavage between the enlarged lateral lobe and the portion of the prostate lying behind it and the sheath, separates the one from the other by a sweeping movement outwards and forward. At the same time the tip of the finger is pushed upward toward the bladder wall. The pulp of the finger should be turned towards the prostatic capsule, and the nail should be kept closely to the outer side of the lateral lobe which is being enucleated. The finger should not pass beyond the middle line either in front of or behind the urethra, for it is perfectly easy to separate one lateral lobe from the other. When the side and posterior surface of one lobe have been freed from within the sheath, the base of the lobe which is attached to the bladder wall can be separated from the latter by hooking the finger above its upper margin, and by a sawing motion this can be easily peeled from the bladder wall without injury to the mucous membrane of the latter. When this has been done, the junction of the lateral lobe with the middle isthmus is torn through by the finger. The mucous membrane along the upper surface of the lobe is now torn through, and the enucleated mass can be picked out from within the capsule by a small pair of lithotomy forceps. These should be tightly closed in delivering the enucleated mass, so as not to unduly stretch the opening which has been made in the floor of the membranous urethra.

The same procedure is now followed on the opposite side, and in a case in which there is only lateral lobe enlargement, this completes the enucleation. In cases in which there is very marked enlargement of the lateral lobes, so that the tip of the finger cannot be passed through the prostatic urethra and into the vesical orifice, the enucleation may be begun in the

manner above described, and the lateral lobe separated from the prostatic sheath; but it may be necessary, in order to separate the lobe from its attachment to the bladder, to seize the lobe with forceps and draw it towards the perineum and over towards the opposite side. The forceps are held with one hand, and a gentle traction is made; the forefinger of the other hand is passed between the mass to be removed and the capsule of the prostate, and is hooked over the upper margin of the lateral lobe, which is then to be stripped off from the mucous membrane of the bladder.

When the lateral lobes have been removed and the line of cleavage closely followed, little injury will have been done to the prostatic plexus of veins which run through the sheath of the prostate, and therefore the bleeding will be inconsiderable. After the right lobe has been removed, it will be found that in separating the left lobe the working space within the capsule is increased and the enucleation of the second lobe is much easier. In cases in which there is obstruction on the floor of the urethra at the vesical orifice (so-called middle lobe enlargement), this is to be removed after the lateral lobes have been enucleated. In most cases the middle lobe can be enucleated with one of the lateral lobes, preferably that which is taken out last. This is done by simply separating it with the finger from beneath the lower lip of the urethral orifice. When this cannot be done, the middle lobe can be seized just beneath the mucous membrane of the bladder by forceps passed along the finger and separated from it.

The middle lobe, when enlarged, is sometimes quite difficult to remove because of its firm attachment to the bladder. If, however, the forefinger of the right hand be passed up into the space which was occupied by the left lobe, there is not much difficulty in pushing the middle lobe over to the right side and separating it from the bladder and the urethral mucous membrane. To facilitate this it may be caught with forceps and pulled down toward the perineum. In some cases the middle lobe consists simply of a soft tab of raised mucous

membrane with the enlarged accessory glands. These cannot be enucleated without tearing the mucous membrane, and in such a case I usually catch the tab with forceps, draw it down towards the perineum and cut it off cleanly with scissors in the same way in which the uvula is shortened. I have done this a number of times; the part cut off consists only of dilated glands and mucous membrane, and the cutting does not destroy the muscular fibres of the bladder.

At the completion of the operation of enucleation, the vesical outlet is felt as a soft ring which fits loosely the end of the forefinger. The floor of the bladder is level with the urethra. The mucous membrane about the vesical orifice is intact on all sides, and in case of enlargement limited to the lateral lobes, the mucous membrane upon the floor of the urethra, including the verumontanum, may be and usually is preserved. The cavities from which the lateral lobes have been removed are quite smooth. The position and shape of the prostatic urethra are preserved in a very remarkable degree by the contraction of the prostatic sheath and by the action of the levator ani muscles.

Changes in method are required in certain cases. When the prostatic lateral tumors are very large and consist of irregularly shaped masses each of which seems to be surrounded by its own capsule, it may be advisable to remove the lateral tumors from each side in two or three parts and not *en masse*, so as not to over-stretch the urethra or lacerate the compressor urethræ muscle. The line of cleavage between the tumors can be felt and they can be separated from each other and from the mucous membrane or bladder wall, and removed separately.

When it is necessary to do this some part of the lateral lobe may be overlooked and not removed. This is especially likely to occur about the vesical orifice. It should therefore be a rule that the operation is not considered complete until the mucous surface of the latter is felt to be smooth and even, the tissues pliable, and the orifice dilatible and its floor level with that of the bladder.

In cases of long-standing prostatic disease in which the fibrous changes are marked in both the prostate and bladder wall, the enucleation of the obstructive masses is more difficult because of the firm attachment of these to the capsule and bladder wall by strong bands of fibrous tissue, which are difficult to break with the finger, and it is sometimes necessary to catch the obstructing mass with forceps and to divide the bands with scissors passed into the wound under the guidance of the finger.

The Control of Hemorrhage.—The operation of enucleation of the obstructing portions of the prostate being completed, the control of hemorrhage demands attention. I have found that when the neck of the bladder is drawn down toward the perineum after removal of the obstruction, the veins of the prostatic plexus are compressed and the hemorrhage ceases immediately. I therefore have adopted the following method to accomplish this: The tip of the forefinger of the left hand is introduced through the wound into the bladder, and is hooked over the lower lip of the vesical orifice. Along this finger is passed a pair of flat volsellum forceps, and with these the lower lip of the vesical orifice is grasped; the forefinger is withdrawn and slight traction made upon the forceps. The hemorrhage at once stops.

Bladder Drainage.—A metal tube is then introduced into the bladder and the bladder irrigated with hot water to remove all clots. The metal tube is removed and a large rubber catheter, No. 32 F, is passed into the bladder in front of the forceps. This should be accurately placed so that the eye of the catheter is just within the urethral orifice. Adequate drainage of the bladder depends upon the proper adjustment of this tube.

Wound Dressing.—An assistant holds this tube in place, while the surgeon packs with gauze the cavities left by enucleation of the lateral lobes. This packing should be made of iodoform gauze one inch wide. This is passed by long forceps alongside of the tube, and during its introduction gentle traction is made upon the forceps which hold the vesical outlet.

The ends of the gauze packing hang out of the wound. After the packing is in place the drainage tube is tested, and is then secured by pinning it to the skin with a safety pin. The dressing is then applied. This consists of a pad of gauze which is slipped between the skin and the safety pin,—two or three pads of folded gauze on either side of the tube and two pads of cotton and gauze. These are to be held in place by a special 3-tailed T bandage. During the dressing the surgeon makes gentle traction upon the forceps to prevent the bladder from slipping upwards and causing bleeding. The tube is then tested again and the patient put to bed. The forceps holding the bladder are then removed, and a simple siphon tube is attached to the bladder tube by a glass connection. The siphonage tube should be passed under the patient's knee and the free end dropped into a large bottle placed at the bedside, containing six or eight ounces of a 1:5000 bichloride solution. The siphon is secured by a pin to the draw sheet of the edge of the bed. When siphonage has been established the glass tube will be full of fluid, but if the drainage stops the tube will be empty. The tube may be full and yet drainage may be defective if a clot of blood plugs up the eye; when this occurs there will be leakage along the tube and soiling of the perineal dressing, and there will be associated with this pain at the end of the penis and a painful desire to pass water. The efficiency of the drainage and the comfort of the patient after operation depend upon the care with which the drainage tube is placed and secured. If the siphonage tube is too long it causes pain by sucking the bladder wall into the eye of the tube. When the drainage tube is properly adjusted and secured and the dressing evenly and artfully applied, the patient has no pain and rarely needs an anodyne. With this mode of dressing and drainage the patient may lie upon his back or upon his side (the side opposite to that on which the siphonage bottle and tube are placed), but the position of these may be changed from time to time to suit the wishes of the patient and to permit of his freer movements.

The Post-operative Management.—The management of

cases after prostatectomy is of as much importance to secure a successful result as the operation. A skilfully performed operation may fail by unskilful nursing or failure to attend to the necessary details, but I now expect to have prostatectomy operations follow much the same course as simple perineal sections.

General Treatment.—For the first two or three days I give a light diet of eggs, cereals, milk, broth, tea, toast, and as much water as the patient can be made to take. If the drainage is perfect there will be little leakage about the tube, but if the prostate removed has been large there may be some leakage along its sides by the capillary action of the gauze strips, which will necessitate the changing of the outside dressing. If there is no pain and no clogging of the tube by retained clots the tube should be gently washed out once or twice to keep it clear and to remove pus in cases of cystitis. In some cases a pillow placed under the patient's knees will give relief to the backache due to the dorsal position. If the drainage is perfect and the patient comfortable, this is the plan to follow for 24 hours. A cathartic is given at the end of 24 hours. I then make the first change of dressing. The tube is removed and the gauze packing is taken out of the wound and the urethra flushed out with saline solution. After removing the gauze there is sometimes free oozing of blood, but this stops in a few minutes. A little iodoform gauze or gauze soaked in a 2 per cent. protargol solution is placed between the edges of the wound so as to separate them. I then apply over the perineum a cotton gauze dressing in the form of pads secured by the 3-tailed T bandage. These are changed every two to three hours.

After removing the tube there is usually almost complete urinary incontinence for two or three days. This is because the patient cannot control his over-stretched and atonic sphincter. But control is soon gained and he then passes voluntarily at first through the wound. The discharge of urine through the urethra usually begins about a week after operation. The dressing of the perineum should be changed

as often as necessary to keep it dry, and the wound should be washed by a flow of water injected into it from a syringe to wash away any urine; the skin about the anus and wound should be powdered with talcum. The wound is subsequently inspected twice a day and is made to heal from the bottom. The edges of the wound should be wiped with cotton every day to prevent the growth of epithelium into it.

It is not my custom to pass any sound through the urethra for several weeks after operation. The bladder for the first three days is washed out by passing a catheter through the perineal wound. After this time, if it is necessary to wash out the bladder on account of a cystitis, a catheter a coudé can be easily passed through the urethra.

The Control of Urination and the Return of Vesical Power.—It is not to be expected that the patient's control over urination should be immediately and perfectly re-established, when we consider that the operation has disturbed the relation of the sphincters and caused them to become atonic by stretching, but it is surprising how quickly this control returns, although sometimes after the operation the calls to urinate, if not heeded, will be followed by involuntary escape of urine. But as soon as the wound has healed and the tissues which have been cut and disturbed have consolidated, the power of retaining and expelling urine voluntarily is perfect. In most cases now this can be expected in six or eight weeks, but in many this result is obtained much earlier.

The return of vesical function, no matter how atonic may have been the bladder, is to be confidently expected, provided there remain no obstruction to urination and there be no incurable cystitis. As a rule the bladder is free of cystitis by the time the perineal wound is healed. Its expulsive power gradually improves, and there is only to be noted that the capacity may be lessened, owing to the weakening of the muscle at the vesical outlet which permits a little urine to escape into the urethra before the former capacity of the bladder is exceeded. On this account we find that the intervals of urination after operation may be four instead of six

or eight hours, and the patient may have to get up once or twice even during the night. This condition improves with time, but should be understood. The cystitis in any case will get well under washing and local injection, if the bladder is not sacculated and if there is no obstruction to urination.

ADVANTAGES OF THIS OPERATION.

1. It is a clearly defined surgical procedure which has a rational anatomical basis.
2. It can be very rapidly performed by a practised hand, the operation lasting rarely more than five minutes and the patient being not more than 15 or 20 minutes upon the operating table.
3. The hemorrhage can be quickly and effectually stopped.
4. The drainage of the bladder is simple, and need not be maintained after the first 24 hours.
5. The patients are spared the discomforts of continuous drainage and irrigation.
6. The comfort of the patient is much greater than after any other form of prostatectomy.
7. The functional results are very satisfactory.

THE TECHNIC OF SUPRAPUBIC PROSTATECTOMY.

DR. JOHN B. DEEVER, with reference to the technic of suprapubic prostatectomy, said that:

The technic of suprapubic prostatectomy commences in reality with the selection of the patient for operation. A patient, irrespective of age, good general health, good kidneys (in that they functionate normally, that is to say, excrete the normal amount of urine from the stand-point of the patient's age), with a large soft prostate, one that upon palpation with the finger in the rectum gives a sensation as if it were movable in its capsule, is a suitable case for operation.

He laid great stress upon the condition of the kidneys in the selection of his patients, and then preparation for operation. The patient must pass the normal amount of urine for a man at his time of life, considering that he must have more or less contraction of the kidneys, therefore the amount of urine must be larger than he had passed earlier in life. The speaker also

laid stress upon the percentage of urea. He cared little if there is albumin, so long as it is not much, or if there are casts. He also considered carefully the condition of the bladder, its capacity, its tonicity, the amount of residual urine, the degree of cystitis if any, and the presence or not of a stone.

A cystoscopic examination should be made in certain cases, which will determine the condition of the bladder, the vesical aspect of the prostate, ureteral orifices, etc.

A bad cystitis should receive serious attention and is best handled by a retention catheter and bladder washings with boric acid, permanganate of potash, argyrol, etc. Culture of the urine to determine the micro-organism is essentially important. A few cases will not tolerate a permanent catheter, but will not be made worse by passing a catheter twice daily when the bladder can be irrigated. This will enable the operator to determine the class of cases in which he can close the bladder wound and that of the abdominal wall up to the drainage tube and thus prevent infection of the wound, which so often is a disagreeable factor; in this wise convalescence is hastened. A severe cystitis at the time of operation favors epididymitis; so does passing of sounds too soon after operation.

In the presence of high arterial tension as shown by the pulse, which is also often irregular, and the blood-pressure instrument, a course of nitroglycerine, the drinking freely of water, and in some cases proctoclysis are necessary to bring the case to a successful termination after operation.

The surgeon's anxiety and greatest responsibility only commence, as in many surgical operations, after the operation. Proper nursing at the hands of a gentle, kind, diplomatic, and experienced female nurse is important.

The operative technic involves the following elements:

Anæsthetic.—Ether is the only anæsthetic used in the speaker's clinic and he has no reason to think of using any other. Ether has always been perfectly satisfactory if properly given.

The anæsthetic may be given with the patient in the Trendelenburg position. The patient having been anæsthetized, an English catheter is passed into the bladder, followed by the introduction of two ounces of boracic or normal salt solution, catheter clamped with hæmostat.

Incision. Opening of bladder. Retractors. Inspection of bladder. Piece of gauze in the fundus of the bladder. Circular incision round internal meatus over prostate. Enucleation. Hemorrhage. Drainage.

Massage to coapt walls of bed of prostate. Small piece of gauze in perineal space to be removed in two days. Gauze in bed of prostate to control bleeding. Sterile rabbit serum if coagulation time is very slow. Can save prostatic urethra frequently.

Before recovery from anæsthetic, hypodermoclysis followed by proctoclysis.

After-treatment.—Avoid passing instruments through the urethra for three weeks, then simply to see if channel is unobstructed.

Stricture: Irregular margin of roof of bed of the prostate may be the cause of subsequent trouble. Two cases in speaker's experience requiring correction. Suspensory to be worn during convalescence.

After drainage tube is removed, wash out through suprapubic opening until it becomes too small to pass it, then introduction of simply the end of the nozzle of the tube into the external meatus and wash out bladder. This is sometimes required while the suprapubic wound is still large enough to wash out the bladder through this avenue, as when there are pus or shreds in the urine this affords means of thorough cleansing of the base of the bladder. The latter can be done through a soft catheter passed through the urethra into the bladder, but should not be used if avoidable, for fear of disturbing the healing process going on in the prostatic bed. Dr. Deaver said he had seen prevesical abscess, for which it may be necessary to incise the perineum.

DR. EDWARD MARTIN said that Dr. Alexander's work has received such universal acceptance that a discussion of his findings amounts to little more than a congratulatory appreciation. He had completely summarized the principle of enucleation of the prostate in the sentence "find the line of cleavage." That done, the operation is simple. He, however, had to confess a lack of confidence in surely striking that line when guided only by the sense of touch—he preferred to look in by a wider opening than is afforded by the median perineal route. Shock is, how-

ever, proportionate rather to the roughness and long continuance of manipulation than to the size of the wound. In men over fifty also comes the possibility of sexual incapacity being dependent on perineal trauma. The perineal route is more frequently followed by this disability than is the suprapubic. He had seen the same result follow the perineal operation for stone, and, in fact, almost any perineal operation, and believed that this impotence is in no wise due to damage to ducts, but is the result of extensive perineal trauma.

With regard to Dr. Deaver's remarks, it is perfectly true that the Trendelenburg position with proper illumination brings the operative field within the range of vision. He had devised a little light for these operations that goes into the bladder with a lateral retractor, so that until free bleeding occurs the base of the bladder and the urethra and urethral orifices are plainly seen. It is stated that Freyer always enters through the anterior commissure, he believing the line of cleavage to be most marked at this point.

DR. THOMAS R. NEILSON said that he was a firm believer in the selection of cases for operation. Some bad results can be prevented by being cautious as to those who are subjected to operation. The condition of the kidney, as well as of the bladder, should as nearly as possible be known, and any needed preliminary treatment given. After operation it is wise to pass sounds. This applies to either form of prostatectomy. It can do no harm, and may do much good.

Drainage of the prevesical space is a detail in the completion of the suprapubic operation which should not be omitted. In every suprapubic operation a small gauze drain should be placed there to prevent infection which might otherwise occur.

DR. HARRY DEAVER said that he had had some difficulty in controlling hemorrhage in these perineal operations, and he thought in suprapubic operations the hemorrhage to be more easily controlled. Cases may go on nicely for four or five days, then may be purged very freely and after that hemorrhage may occur. The bowels should be kept as quiet as possible until the vessels are entirely healed.

DR. SAMUEL ALEXANDER (in closing) said, with regard to the line of cleavage, that this point applies just as much in the suprapubic operation as in the perineal. This line of cleavage

is clearer at the upper commissure than anywhere else, and any surgeon who studies the part of the prostate left as well as the part removed, will have no difficulty in reaching the same conclusion.

He did not claim any priority for any operative procedure, but simply emphasized the anatomical principles which underlie prostatectomy, whether this be done through the suprapubic or through the median perineal route. He agreed with Dr. Deaver that it is a matter of very little moment whether a part of the prostate is left behind or it is all taken out.

With regard to Dr. Deaver's remark that he had made no mention of bacteriology, he supposed was meant whether there exists a septic condition in the bladder or in the kidneys. He made no special preparation of his patient because the operation, as it is done, gives the very best treatment for septic conditions of the bladder that can be secured. If the bladder is opened and drained just as an abscess is opened, the best possible chance is given to recover itself; it does not matter whether the infection is streptococcic, staphylococcic, or gonorrhœal. The lowest possible level of access to the bladder is secured through the technic employed by him. The bladder is drained and then nature takes care of it.

Is it necessary to look into a bladder in order to see a prostatectomy? Many surgeons operate for appendicitis through a very small opening, separating adhesions with great skill, delivering the appendix, and then tying off, and have their patients recover. By practice and study of the prostate any one may become so proficient that he does not do a "blind" operation. He will be able to feel the line of cleavage just as he feels where the adhesions go in a laparotomy, can recognize the condition of the prostate just as that of the appendix, gall-bladder, or any other organ, and it is purely a matter of whether a man will take the pains to train himself as to which operation he will do. Of course, if one does not study the large number of museum specimens which are going to waste, if one will not take the trouble to dissect them intelligently, one will continue to do the open operation, but if one does study them one will learn so much more in regard to the prostate that the line of cleavage will become as simple as the Golden Rule.

In determining where to begin enucleation, cut the lateral

lobe with scissors and feel down for the line of cleavage. The statement that the base of the prostatic tumors is covered by mucous membrane is not in accordance with anatomical facts, as can be shown by any longitudinal section of a prostate.

The advantage of the perineal operation is simply in the general surgical principle that in removing a growth from any place it should be gotten out by the shortest possible route, with the least damage to tissue and least danger of hemorrhage, and in this case the median perineal is the route to follow. The only reason it is not universally adopted is because men have not taken the pains to study the pathological anatomy of the parts.

In regard to the bad results, Dr. Alexander did not feel any fear in reference to stricture as he did the operation. It is not his custom to pass any sound through the urethra until several weeks afterward. He then passed a sound in order to see that the urethra is all right. In this operation the mucous membrane is entirely preserved around and outside the urethral orifice. It is not necessary to preserve the urethra, but to prevent stricture it is necessary to preserve a perfect smooth mucous membrane about the urethra, and that is always the case in a properly performed perineal urethrotomy.

STATED MEETING, HELD DECEMBER 5, 1910

The President, DR. ROBERT G. LE CONTE, in the Chair.

VOLKMANN'S ISCHÆMIC PARALYSIS.

DR. JOHN H. JOPSON presented a boy of eight years, who was brought to him about three weeks after sustaining a fracture of both bones of the forearm, which had been treated by the use of anteroposterior splints. When the splints were removed, about ten days after the accident, pressure sloughs were found on both the flexor and extensor surfaces of the forearm. Contracture of the fingers and hand quickly followed. The contracture was typical of Volkmann's ischæmic paralysis, viz., a fixation of the part due to shortening of the flexor tendons of the fingers. There were unhealed ulcers on the flexor and extensor surfaces. Two months later the boy was admitted to the Presbyterian Hospital.

On examination of the arm, the ulcerations were found to be healed. That on the flexor surface was adherent to the subcutaneous tissues. The hand was held in a position of flexion and pronation, the fingers extended and abducted (Fig. 1). The hand could be moved about 30°. When the fullest extension possible was obtained, the fingers were flexed; when the hand was flexed, they were extended. There was anæsthesia over the distribution of the ulnar nerve in the hand.

Massage and passive motion were used for the next two months without much improvement.

Operation five months after original injury. An incision was made at the site of the scar on the flexor surface of the forearm, four inches long. The tissues beneath were adherent and were separated. The muscles were yellow in color and in a state of degeneration, brittle, and fibroid. Both the median and ulnar nerves were imbedded in fibrous tissue, and adherent, thinned out, and atrophied as if by pressure, for a considerable distance in the lower third of the forearm, but above this point abruptly becoming of normal appearance.

Muscles and nerves were dissected apart, and myotomy and lengthening of the flexor sublimis digitorum and palmaris longus