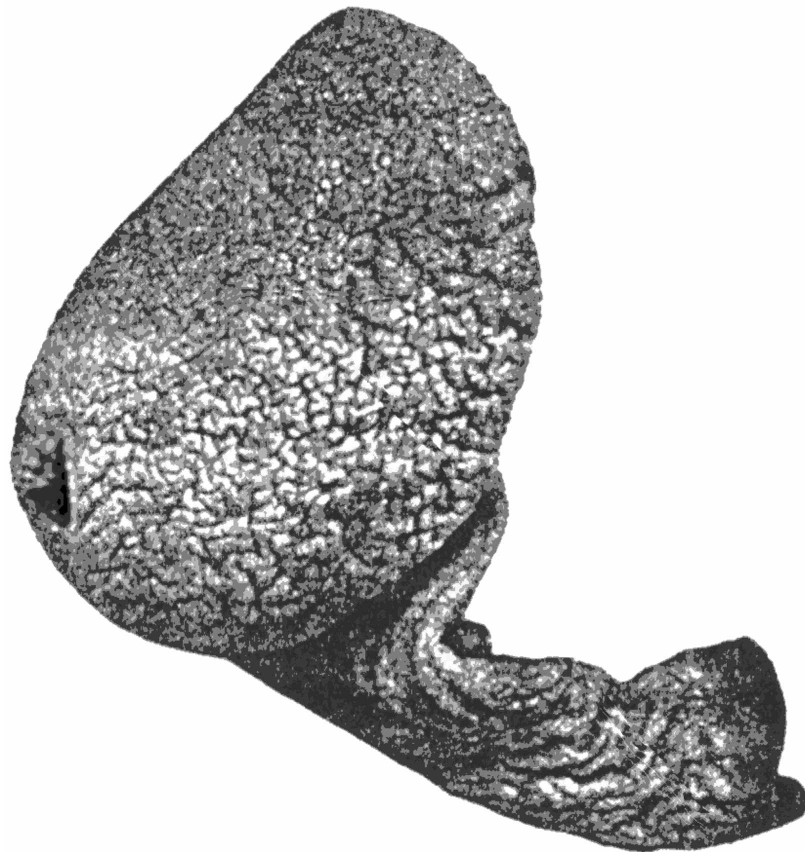
Anatomy and Surgery of the Penis
with illustrations

excerpts from

Disease and Surgery of the Genito-Urinary System, Volume I

by Francis S. Watson, M.D. assisted by John H. Cunningham, Jr., M.D.

Circumcision and Surgical Ampuation of the Penis (Partial and Full)



Above: Portion of Penis cut off by a woman for revenge.

"She cut from above downwards, as is indicated by the specimen, which is very much less than its original size, owing to the action of the alcohol in which it was mounted"

photo and quote from *Forensic Medicine; illustrated by photographs and descriptive cases*

by Harvey Littlejohn, 1924 (copyright expired)

Introduction

The following excerpts are from Volume I of a two volume set by Dr. Watson assisted Dr. Cunningham, both surgeons in the early 1900's. This volume was published in the U.S. in 1908 and the copyright expired in 1992, fifty years after Dr. Watson died in 1942, which is why I have reproduced the contents. In checking with modern surgical texts, very little has changed at least for basic surgical techniques such as circumcision and amputation. Text and diagrams are original, some diagrams have been cleaned up in PhotoShop but none have been altered. Text was scanned and converted with OCR, then proofed by eye.

DISEASES AND SURGERY

OF THE

GENITO-URINARY SYSTEM

BY

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VOLUME I

THE EXTERNAL GENITALS
THE PROSTATE AND BLADDER

WITH 339 ENGRAVINGS AND 23 COLORED PLATES

PHILADELPHIA AND NEW YORK
LEA & FEBIGER

ANATOMY OF THE PENIS

The penis is primarily the organ of copulation, secondarily it is concerned in the function of urination it is from three to four inches an length when flaccid, and from five to seven when erect The circumference of the average penis, when flaccid, is three and one-quarter inches. The size of the penis bears no relation to that of the individual, it being often noticeable that small and weakly men have large organs, while those who are strong and well-developed have small ones

Structure - The penis is composed of three cylindrical, parallel bodies, two of which lie side by side and are called the corpora cavernosa; the third is placed beneath and between these, and is termed the corpus spongiosum.

The corpora cavernosa begin in two cone-shaped bodies, which are closelv united one to each ramus of the os pubis. From these points they converge and become joined together a little anterior to the arch of the symphysis pubis. Anteriorly thev again separate slightly and terminate in two conical ends, which fit into corresponding hollows upon the under side of the glans penis. The parts of the corpora cavernosa between the point at which they separate posteriorly and their insertions upon the rami of the os pubis are called the crura of the penis.

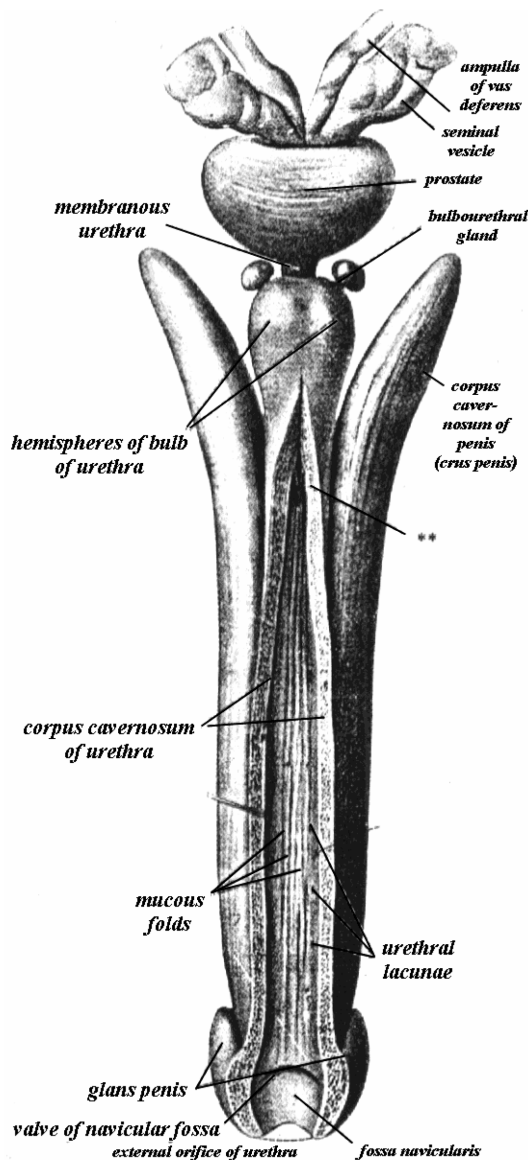

Fig. 1 The male urethra, with the corpora cavernosa of the penis, the bulbo-urethral glands, and the prostate. (Sobotta.)

The corpus spongiosum contains the urethra, which terminates in a slit-like opening upon the tip of the glans, called the meatus urinarius. The corpus spongiosum presents two expansions in its course. One is just beneath the point of separation of the two corpora cavernosa, and is called the bulb of the corpus spongiosum; the other expansion forms the head of the penis, and is termed the glans.(Fig. I.)

All three of the corpora are composed of erectile tissue, the fibrous partitions of which are derived from their connective-tissue envelopes. The corpora cavernosa are enveloped in a single fibrous covering, which, however, is extended in the form of a septum between the two, and serves to separate one from the other. This septum is least distinct anteriorly and allows intercommunication between the corpora in front. It is called the septum pectiniforme. The fibrous envelope of the corpus spongiosum is distinct from that of the corpora cavernosa. The mutual relations of these fibrous coverings are seen in Fig. 2, which represents a cross-section of the penis.

The fibrous bands of the corpora which are derived from these envelopes pass in all directions in the interior of the bodies, and make in so doing a varied series of spaces, which contain the blood vessels that supply the corpora; the fibrous trabeculae also give support to the small branches of the arteries of the corpora cavernosa, the main trunks of which pass through the middle of each of their bodies respectively and give off the minor twigs over the walls of the fibrous structure just described. The whole structure represents typical erectile tissue.

The structure of the corpus spongiosum is similar in character to that of the corpora cavernosa. The bulb, already referred to, is covered externally by the accelerator urinae muscle.

All three of the corpora are surrounded by a second fibrous covering known as Buck's fascia. This fascia blends with the suspensory ligament of the penis, which is the fibrous band that connects it to the symphysis pubis above.

Still another covering to the organ is supplied by the dartos, which is immediately beneath the skin and continuous with the dartos of

the scrotum. It is on account of the loose arrangement of the fibers of this structure that the excessive cedema of the penis which occurs under certain conditions is permitted to take place. The fibrous walls of the corpora cavernosa contain elastic fibers, which allow for the distention of the bodies. Cruveilher states that these sheaths are strong enough to sustain the weight of a cadaver.

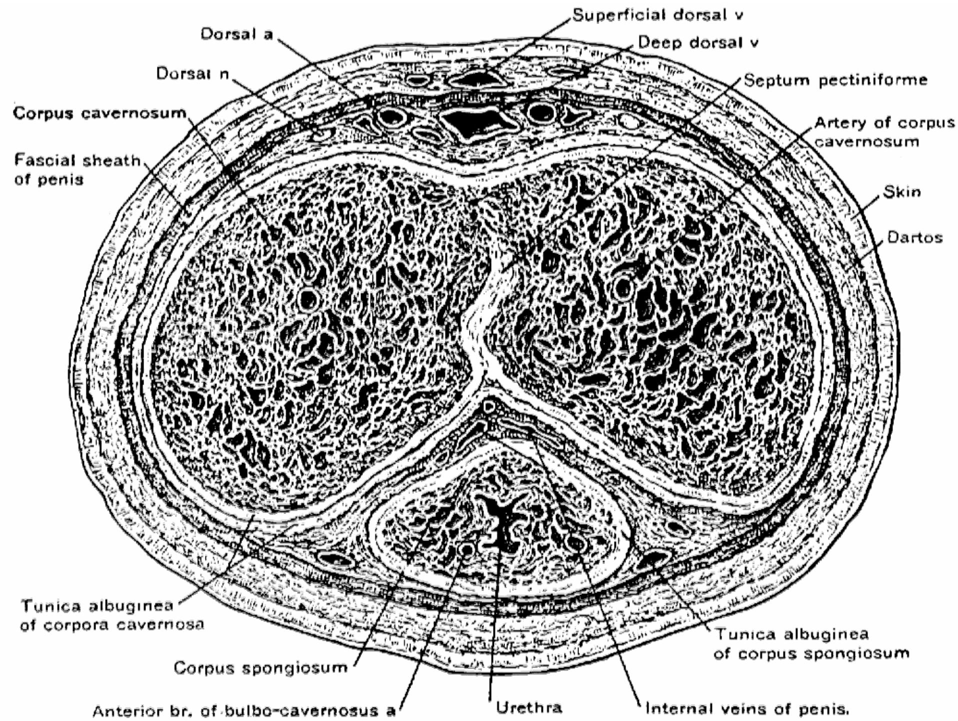

Fig. 2 Transverse section through body of penis

The prepuce is composed of a cutaneous and a mucous layer, between which there is a loose elastic connective-tissue structure devoid of adipose tissue. The mucous layer is attached just behind the corona of the glans, posteriorly; on its ventral surface it is bound to the meatus by a small triangular fold of mucous membrane, the frenum preputii (Fig. 3).

Arteries of the Penis (Plate 2).- The arteries of the penis are derived from the internal pudic, and are: (1) The artery of the bulb. (2) The artery of the corpus cavernosum. (3) The dorsal artery of the penis.

The Artery of the Bulb. - The artery of the bulb is given off from the internal pudic just after that vessel penetrates the posterior leaf of the triangular ligament. It passes forward through the compressor urethrae muscle, enters the bulb of the corpus spongiosum, and supplies the latter with blood.

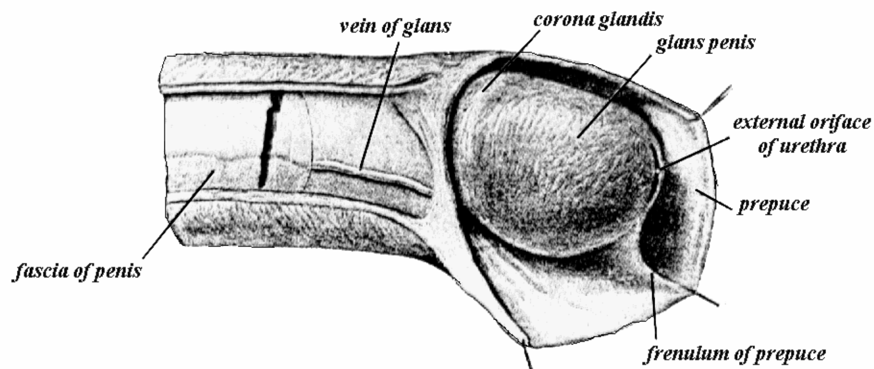

Fig. 3 The distal end of the penis with the prepuce. (Sobotta.)

It also sends small branches to Cowper's glands. It is a vessel of some size and when cut in the operation of lateral lithotomy, may give rise to troublesome hemorrhage. On this account care should be taken to avoid it.

The Artery of the Corpus Cavernosum.- On leaving the internal pudic, this vessel divides and sends a branch to each of the corpus cavernosum.

The Dorsal Artery of the Penis.- This vessel arises as a branch of the internal pudic, passes through the anterior layer of the triangular ligament, runs forward between the crura and the layers of the suspensory ligament, and is continued to the glans in the groove between the corpora upon the dorsum of the penis, in company with the dorsal vein and nerve. At the base of the glans it divides and encircles it.

Veins of the Penis .- The veins correspond with the arteries. The dorsal vein has two branches, which unite near the root ot the organ into a single trunk. From here it passes between the layers of the suspensory ligament, beneath the arch of the symphysis, betvveen the subpubic and triangular ligaments, and joins the prostatic plexus of veins.

Lymphatics.-These vessels run along the dorsum of the penis. They are in two sets, a deep and a superficial one. The former passes to the pelvic nodes, the lattcr to the inguinal ones.

Nerves.-The coverings of the penis receive their nerve supply from the genital branch of the genitocrural nerve and from the interior perineal branch of the internal pudic nerve. The erectile structures are under control of sympathetic branches from the hypogastric plexus, of spinal branches, the dorsal nerve of the penis, and ot the superficial perineal nerve.

The Urethra.-The urethra is the passage for the exit of urine from the bladder, and extends from its outlet to the tip of the glans penis. It is divided for descriptive purposes into the prostatic, the membranous, and the spongy or pendulous portions.

The prostate urethra is one and one-quarter inches in length, the membranous three-quarters of an inch, and the spongy urethra from five to six inches. The prostatic urethra is that part of the canal which is surrounded by the prostate gland; the membranous portion is that which extends from the apex of the prostate to the slight enlargement of the urethra which occurs in that part of it corresponding to and enclosed in the bulb of the corpus spongiosum. The spongy urethra extends from the end of the membranous part to the termination of the canal at the tip of the glans.

The largest part of the urethra is the prostatic' portion, the narrowest is its membranous part. There are two points in the course of the canal at which it expands into a larger size than those which are immediately adjacent to them. These are the bulbous portion and the fossa navicularis. The size of the meatus is, with but few exceptions, less than that of the urethra; the average size of the former being 24 mm. and of the latter 32 mm. of the French scale. The membranous urethra is included between the anterior and the posterior layers of the triangular ligament. It is surrounded by the compressor urethrae muscle. The former Of these facts is of importance with reference to the direction taken by an extravasation of urine which originates in a rent in this part of the canal, and which is determined by the triangular ligament. The anterior leaf of this membrane limits the passage of the fluid forward, and the posterior leaf arrests its backward progress, so that its first appearance is in the perineum.

The compressor urethrae muscle is important in two respects: the first being that it is the most efficient of the two sphincters which control the exit of the urine from the bladder, and the second because it closes the membranous part of the urethra and retains inflammatory exudations which originate in that part of the canal which lies behind it, so that their free escape is thereby prevented and insufficient drainage results.

How far the action of the compressor urethrae muscle may prevent the backward extension of infections of the anterior urethra it is difficult to say, but it is quite probable that such an influence is exercised by it.

The interior of the urethra is lined with mucous membrane, upon the surface of which are numerous small openings, which represent the mouths of the ducts of Littre's and Cowper's glands, of the ejaculatory ducts, of the utricle, and of the lacuna magna, the last named of which is a wide orifice upon the roof of the fossa navicularis.

The orifices of the ducts of Cowper's glands are placed one on either side of the floor of the bulbous urethra, about one inch in front of the anterior leaf of the triangular ligament (see Fig. I **).

TECHNIQUE OF OPERATIONS ON THE PENIS

OPERATIONS FOR PHIMOSIS

Desiderata.- The three following points are the essential ones to be observed in all operations for phimosis: (1) To remove the constricted prepuce. (2) To leave the preputial orifice thus made sufficiently large to allow it to be easily retracted over the glans. (3) To avoid injury to the frenum.

Anatomical Data. - There are two things especially to be remembered in connection with the operations for phimosis: (1) That the prepuce is made up of an outer layer of integument and an inner one of mucous membrane. They are separated by a loose network of connective tissue, which allows the outer one to move freely upon the inner. A clamp placed upon the prepuce, as it is in certain of the operations for phimosis, holds the outer, but not the inner, layer of the prepuce in its blades; consquently, the incision which removes the part of the foreskin lying above the forceps does not pass through the inner layer of the prepuce. The latter, therefore, requires a second incision in order to divide it and to expose the glans. (2) the skin of the prepuce and of the penis is very loosely attached to the underlying structure, and can be drawn forward with great ease toward the preputial orifice. The inner layer of the prepuce, on the contrary, is firmly attached just behind the corona glandis. If care is not taken to catch the foreskin (when drawing it forward in order to apply the clamp, or preparatory to incising it when doing the operation for phimosis) just at the point of junction of the skin with the inner or mucous membrane layer of the preputial orifice, and to avoid pulling down the skin too far, the latter will roll inward beneath the mucous membrane, and a disproportionately large amount of the integumentary layer as compared with the inner layer will be divided, with the result that the skin will retract far backward toward the root of the penis when the incision is made through it in removing the foreskin, and will leave the underlying penis bared of its natural outer covering to a greater or less extent. The writer has one seen this unfortunate accident happen in the case of a patient who was operated on by a young practitioner, and has therefore thought it worth while to take the space to give the above warning with regard to this particular part of the operation. The proper points upon which to place the forceps when drawing the foreskin forward are seen in Fig. 63.

Circumcision with Clamps.-Preparation.- The prepuce and glans should be thoroughly cleansed immediately before the operation. A probe or director should be swept over the surface of the glans to learn if there are any adhesions between it and the inner surface of the prepuce, and to break them down should they exist. The operation may be done under cocaine anesthesia in the cases of adults, but it is better to employ general anesthesia for children.

Instruments.- The instruments are shown in Figs. 62, 63, and 64. One scalpel; 1 pair os straight scissors; 1 director; 2 pairs os single-toothed forceps; 1 clamp; straight surgical needles threaded with No. o catgut.

Operation.- Catch the prepuce with toothed forceps at the mid-points of its upper and lower margins and at the junction of its skin and mucous membrane, and draw it well forward beyond the tip of the glans penis.

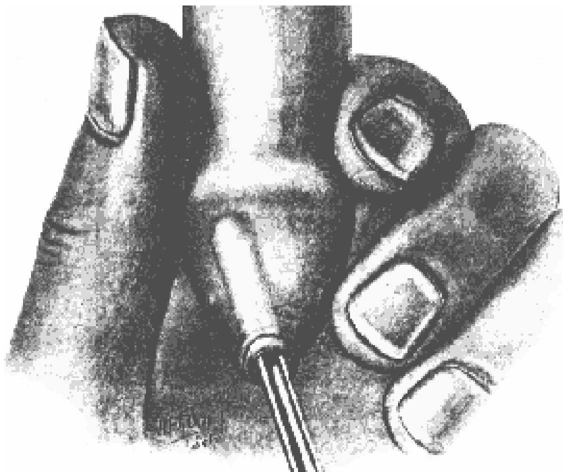

Fig. 62 Showing a director passed through the phimosis opening and between the prepuce and glans, to destroy ashesions between the two.

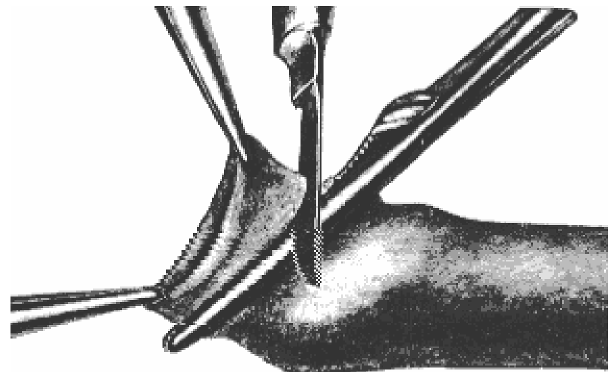

Fig. 63 The free border of the prepuce is drawn forward by the forceps. The clamp is placed at an angle which will preserve the frenum.

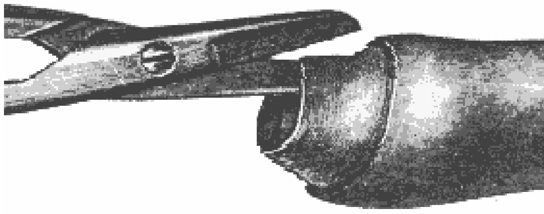

Fig. 64 Showing the position of the scissors to divide the mucous membrane after the cutaneous surface ofthe prepuce has been cut away and the clamp removed.

Adjsut the blades of the clamp forceps upom the prepuce in the manner shown in Fig. 63 and close them jsut in front of the glans (note the angle of the blades of the clamp forceps with reference to the prepuce), and do not include the attachment of the frenum to the glans in the forceps.

Divide the prepuce by an incision which passes just above and close to the upper margin of the blades of the clamp forceps, as shown in Fig. 63.

Remove the clamp. The inner layer of the prepuce, still intact, is now exposed, as seen in Fig. 64, while the outer layer retracts, as shown in the same illustration.

Pass one blade of the scissors beneath the inner layer of the prepuce in the median line, and divide it as far back as the margin of the corona glandis.

Turn back the cuff of the mucous membrane thus made and unite its edges to those of the divided integument with interrupted catgut sutures. From six to eight sutures are usually required in the case of an adult; four or five ordinarily suffice for children. Whatever number may be needed to secure complete and perfect adaptation of the edges of the wound should be used (Fig. 65).

The sutures are to be tied, leaving the ends long. Place a roll of sterilized or iodoform gauze around the penis and upon the wound and retain it in place by tying the long ends of the individual sutures together over the gauze (Fig. 66).

The dressing is not to be disturbed until the catgut sutures are absorbed, when it will drop off or can readily be detached from its place. The time at which this occurs is usually about a week after the operation.
The patient should remain in bed for the first day, after which he may get up and move about. The penis can be protected from friction by enveloping it in a dressing of absorbent cotton, held in place by a diaper. The steps of the operation are shown in Figs. 62, 63, 64, 65, and 66.

Comment.-Hemorrhage rarely occurs. If it does, it should be controlled by firm pressure, without disturbing the dressing.

Occasionally there is a good deal of oedema of the area about the wound. If this becomes very pronounced, it may be reduced by multiple superficial punctures, made with a needle point, and by gently squeezing out the fluid from the tissues.

A better adaptation of the edges of the two incisions can be secured if the inner layer of the prepuce is trimmed off by a crescentic cut made through it with scissors anterior to and following the line of the corona glandis, between the end of the dorsal incision and the frenum, on either side.

This incision should not be made too close to the corona.

If the operation is done under cocaine anesthesia, the clamp is applied before injecting the drug beneath the skin. A I or 2 per cent. solution is employed, and is injected just above the upper margin of the blades of the clamp until enough has entered the subcutaneous tissue to infiltrate it along the line of the incision.

Previous to placing the clamp, a little of the cocaine solution may be thrown into the cavity of the prepuce.

Circumcision by a Single Dorsal Incision.-This procedure is applied more especially to the cases in which there is a chancroidal or inflammatory process beneath the prepuce, which it becomes necessary to have exposed in order to apply the proper treatment, and to supply free drainage of the preputial cavity. It is not a desirable method to employ under other conditions, for the reason that it leaves two redundant flaps, one on either side of the incision, and these may be a source of inconvenience and trouble with respect to coitus. If, however, these flaps are trimmed off at the time at which the dorsal incision is made, and the cut edges of the two preputial layers are united by suture, the operation becomes to all intents the same as the one first described .

If it is done in cases in which the inflammatory conditions referred to above are present, the edges of the incision should not be brought together by suture, except for the purpose of controlling hemorrhage from them.

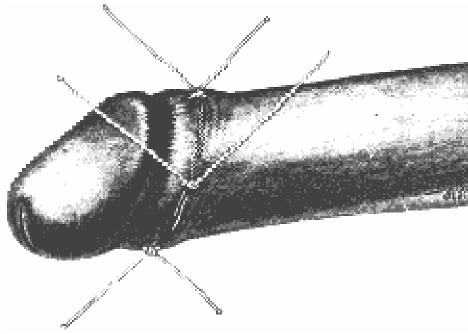

Fig. 65 Showing the mucous membrane rolled back and sutured to the skin by fine catgut sutures. The knot has been tied and the ends left long.

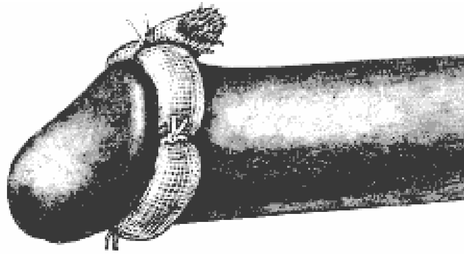

Fig.66 Showing the iodoform gauze covering the line of union and held in position by tying the long ends of the sutures over it.

Operation.-The operation consists in passing a director beneath the prepuce to the farthest end of the pocket formed bv it, and in the mid-line of the dorsum of the foreskin. The prepuce is then slit up along this line to a point a little in front of the corona. Two pairs of forceps hold the prepuce steady while the cut is made.

Circumcision by Ventral and Combined Ventral and Dorsal Incisions.-The operation may be done by a single ventral incision, instead of the dorsal cut just described, or by combined ventral and dorsal incisions. The latter procedure is known as "Remondino's operation." In this method the prepuce is slit in the middle line of the dorsal and also of the ventral surface of the prepuce. A flap is thus formed on either side of the glans. Each of the flaps is turned back and held in place by a dressing having the form of a Maltese cross, with a window cut in the centre to allow the head of the penis to pass through it. The arms of the cross are turned down over the flaps and ache incisions, and the latter heal under one dressing.

Woodward's Operation.-This operation is designed for the purpose of relieving the preputial constriction, when it is accompanied by infection of the parts within the cavity of the foreskin (gonorrheal balanitis, chancroid, etc.), without infecting the wound.

Operation.- Compress the glans until it is reduced to a size that will permit the prepuce to be drawn backward over it.

The phimosis will then have been converted into a paraphimosis. Cleanse the glans and inner surface of the prepuce. Place a rubber tube around the root of the penis as a tourniquet.

Inject a 2 per cent. solution of cocaine into the subcutaneous tissue, one inch behind the corona glandis. Pick up the skin at this point and make an incision in it large enough to admit a director. Pass a grooved director through this incision and as far as the attachment of the mucous membrane of the prepuce to the glans. This will carry it beneath and beyond the preputial constriction (Fig. 67).

Pass a narrow, probe-pointed tenotome along the groove of the director - the blade Iying flat and its cutting edge being horizontally directed - until half the blade lies beneath the constricting ring of the prepuce. Turn the cutting edge upward and divide the constriction. The glans is then to he compressed again in order to allow the foreskin to be drawn forward over it, after the director and knife have been withdrawn. The small skin incision is closed by one or two sutures.

Allis' Operation.-Make a circular incision around the end of the prepuce (Fig. 68). From the central point on the ventral surface of the prepuce, and beginning at the circular cut just made, carry a diagonal incision downward and outward on either side of the median line, then backward, still diagonally, in a crescentic line; these incisions are continued over either side of the foreskin until thev meet in the middle line of the dorsal aspect a short distance anterior to the corona glandis (Fig. 68). This gives the incisions on the ventral surface the form of an inverted V. The skin, but not the mucous membrane, is divided throughout these incisions.

The area of skin included within the line of these cuts is now dissected from the inner layer of the prepuce. Cut through the two layers of the prepuce transversely at the line marked by the first circular incision. This will remove the tip of the prepuce, which is in front of the circle. The inner layer of the prepuce is now exposed, as shown in Fig. 69, and the edge of the skin incision has retracted behind the corona.

Divide the mucous membrane of the prepuce in the middle line of the ventral surface, as indicated by the dotted line in Fig. 69. By so doing, the condition shown in Fig. 70 is produced. Turn back the cuff of the mucous membrane thus formed in the manner shown in Fig. 7I. Unite the edges of this cuff to those of the skin incision with interrupted catgut sutures (Figs. 68, 69, 70, 7I).

OPERATIONS FOR PARAPHIMOSIS.

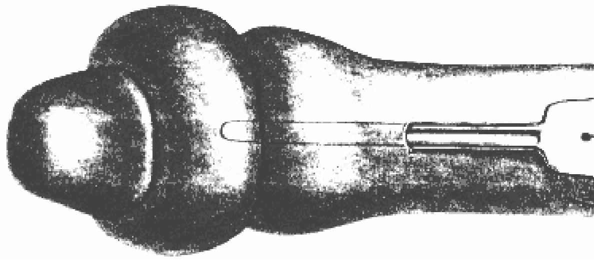

Fig. 67 Showing director inserted beneath the constricting ring to be divided by the introduction of a tenotome.

By Simple Incision.-Instrument.-A curved bistoury, such as that shown in Fig. 72.

Operation.-Draw down the tip of the glans in such a way as to arch the dorsal surface upward, and hold it in this position with the left hand. Pass the point of the bistoury through the mucous membrane just anterior to the constricting ring, at a point a little to one side of the median line, in order to avoid injury to the dorsal vein of the penis. Pusll the point of the knife through the constriction and divide the latter by cutting through all the tissue, including the skin Draw the prepuce forward over the glans (see Fig. 72).

Subcutaneous Division.-Incise the skin of the dorsum of the penis, introduce a director, and push it forward beneath the skin and under the constriction. Pass a small, narrow-bladed tenotome on the director beneath the constricting ring, the blade being held horizontally. Turn the cutting edge of the blade upward and divide the constriction subcutaneously.

The point selected for the entrance of the knife should be posterior to the constricting ring and a little to one side of the median line of the dorsum of the penis (see Fig. 67). When the swelling of the prepuce is very great, it can be reduced by making multiple superficial punctures in it with the point of a needle.

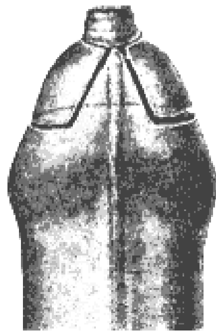

Fig. 68 Showing the tip of the prepuce snipped off and the area of skin outlined which is to be removed, leaving the mucous membrane beneath.

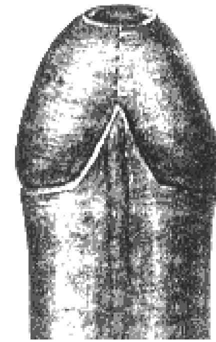

Fig. 69 Showing the skin removed, leaving the raw surface of mucous membrane. The dotted line represents the line of division of the mucous membrane.

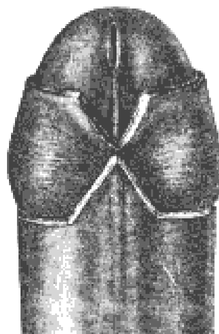

Fig. 70 Showing the mucous membrane gaping from the relief of tension due to dividing it through the dotted line shown in Fig. 69.

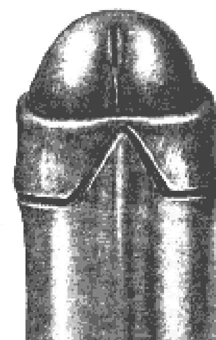

Fig. 71 Showing the mucous membrane turned back and approximated to the skin to which it is to be sutured.

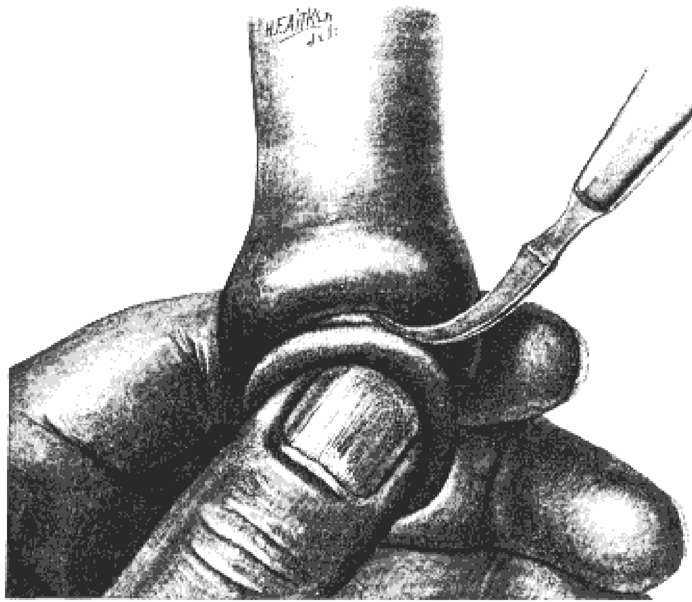

Fig.72 Showing the curved bistoury being introduced under the constricting ring to one side of the median line

AMPUTATION OF THE PENIS.

I. Amputation through the Pendulous Portion of the Penis. - By Galvanocautery Wire. - Instruments. - Two pairs of fine-toothed forceps; one pair of scissors; straight needles, threaded with fine catgut sutures; galvanocautery wire ecraseur

Operation.-Pass a soft-rubber catheter into the urethra as far as the prostatic portion.

Place the wire of the cautery around the penis at a point at least 2cm behind the diseased area.

Turn on the electric current and slowly tighten the wire until the penis and the catheter lying in the urethra are burned through.

Withdraw the catheter. Catch the edges of the mucous membrane of the urethra on either side with fine-toothed forceps and draw the urethra forward. Pass a number of catgut sutures through the edges of the urethra and suture it to the adjacent tissues a short distance outside of it. Patency of the newly formed orifice of the canal will be insured by making a short longitudinal

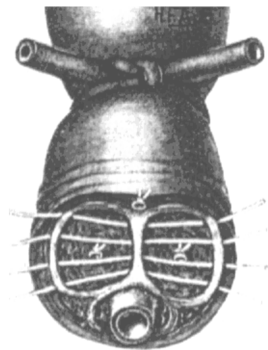

Fig.73 Showing the tourniquet in position. The diseased portion of the penis removed. The cuff of skin pushed back. The body of the penis divided. The vessels ligated. The sutures placed to bring together the fibrous sheaths of the corpora cavernosa. The urethra projecting for a short distance beyond the division of the body of the penis.

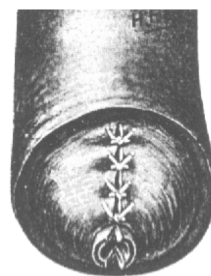

Fig. 74 Showing the fibrous sheaths of the corpora cavernosa united by sutures and the projecting urethra divided.

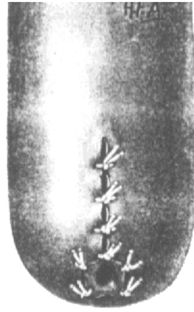

Fig. 75 Showing the skin incision closed and split urethra everted and sutured to the skin.

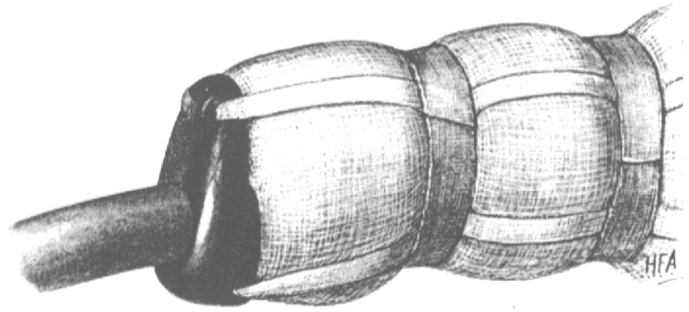

Fig. 76 Showing the dressing of gauze held in position by adhesive plaster strips. A catheter is maintained in the bladder by means of a Watson button.

cut through the middle line of the divided end of the urethra, above and below.

Tie a catheter into the bladder.

The seared surface of thewound should be kept clean, and should heal under wet dressings. Sloughs should be removed as they form and become loose.

2. Amputation by Transverse Section (Humphrey's Operation).-
Instruments.- A large scalpel; rubber tourniquet; straight needles, threaded with No. o catgut sutures; 2 pairs of fine-toothed forceps.

Operation.-Applv rubber tourniquet around the penis behind the proposed line of incision.

Carry a circular incision around the penis, through the skin only. Free the skin for half an inch and turn back the flap thus formed.

Divide the corpora cavernosa with another circular incision on a level with the line of attachment of the skin flap to the underlying tissues. Divide the corpus spongiosum and urethra about a quarter of an inch in front of the line of incision through the corpora cavernosa.

Pick up and tie the dorsal artery and vein.

Pass four or more catgut sutures transversely across the cut surfaces of the corpora cavernosa, through their envelopes on either side and through the fibrous septum, which lies between the two corpora. When these sutures have been placed, tie the two ends of each of them together This closes the open ends of the sheaths of the corpora and compresses their blood spaces, thus checking hemorrhage.

The arteries of the corpora cavernosa should he tied previous to placing these sutures.

Remove the tourniquet. Make a dorsal incision through the middle line of the skin flap. Bring the edges of the circular part of the slain flap to the edges of the urethral orifice which projects beyond the surface of the now closed ends of the corpora cavernosa. Adapt the skin flap to the edges of the urethral orifice and suture the two structures together, incising the latter in the middle line of its circumference above and below before so doing, in order to guard against subsequent contraction. Unite the dorsal incision of the skin flap by interrupted sutures. Place a catheter through the urethra and in the bladder, and attach it by the contrivance shown in Fig. 76. The tapes or strips of adhesive plaster which hold the button are placed external to the dressing, as is shown in Fig. 76. Figs. 73, 74, 75, and 76 show the steps of Humphrey's operation.
3. By Dorsal Flap Method.-Instruments.-Same as in last operation.

Operation.-The tourniquet being placed, an assistant draws forward the penis and holes it steadily while the operator proceeds as follows: Make a skin flap with a long dorsal upper and a short ventral lower circular incision, as seen in Fig. 78. Free the dorsal flap to its base and reflect it backward. Transfix the penis with a narrow-bladed, straight bistoury passed between the corpora cavernosa and the corpus spongiosum. The knife is passed with the blade held horizontally. The transfixion is made on a line which will correspond to the base of the dorsal skin flap.

Separate the corpus spongiosum and urethra from the corpora cavernosaby cutting directly forward above the roof of the urethra and between it and the lower parts of the corpora cavernosa in the line of the long axis of the penis, and continuing the incision through the whole length of the anterior part of the organ.

Divide the corpora cavernosa by a perpendicular incision at right angles to the last one described close to the base of the dorsal flap and directed upward at right angles to the long axis of the penis.

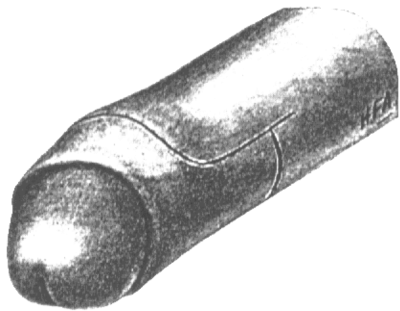

Fig. 77 Dorsal flap method, showing the outline of the skin incision.

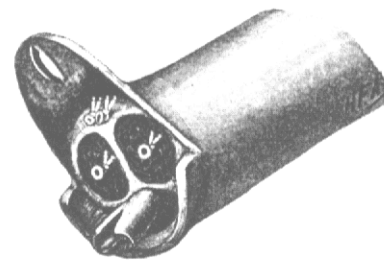

Fig. 78 Dorsal flap method, showing the dorsal and ventral flaps. The body of the penis divided; the vessels ligated; the projecting urethra divided, and a slit in the dorsal flap for its reception.

Divide the urethra and corpus spongiosum by an incision through them, about half an inch in front of the incision which divided the corpora cavernosa and directed at right angles to the long axis of the organ.

Ligate the dorsal vessels and the arteries of the corpora cavernosa. Remove the tourniquet, and, if necessary, control hemorrhage by, means of transverse sutures passed through the cut ends of the corpora cavernosa and their sheaths.

Slit the newly made urethral orifice in the manner described in the last operation.

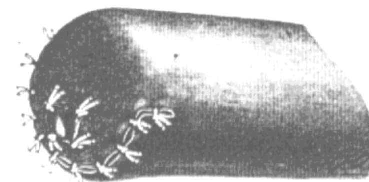

Fig. 79 Dorsal flap method, showing the amputated stump with the split urethra brought through the slit in the dorsal flap, everted and sutured to the skin.

Make a small opening in the middle of the dorsal flap, a short distance behind its edge. Slip the end of the urethra through this hole, and attach the edges of the one to the other by interrupted catgut sutures. Tie a catheter into the bladder, as in the previous operations, and dress the wounds in the same manner as in those operations. (The steps of this operation are shown in Figs. 77, 78, and 79.)

Comment.-Care should be taken to avoid wounding the urethra when separating it from the corpora cavernosa. The placing of a catheter in the canal enables the operator to do this.

EXTIRPATION OF THE PENIS.

Instruments.-Two scalpels. 1 pair curved, blunt-pointed scissors; 1 periosteum elevator; 1 needle-holder; curved and straight needles; catgut ligatures and sutures; 2 pairs of vulsellum forceps; 2 pairs of toothed forceps; 8 pairs of artery forceps; 1 steel sound; 1 soft-rubber catheter; 1 Watson's perineal hard-rubber button for retaining catheter in the bladder; 2 medium-sized retractors; 2 tenacula; 2 aneurysm needles.
Position of the Patient.-As for lateral perineal lithotomy.

Operation.-Split the scrotum in two longitudinally, following the line of the septum which separates its chambers, and carrying thc incision down to the corpus spongiosum; the incision is then to be carried in an ellipse around the base of the penis, dividing the skin only.

Pass a sound through the urethra into the bladder for the purpose of defining the urethra. Clear the corpus spongiosum from adjacent structures-including the corpora cavernosa-beginning this separation about half an inch in front of the bulb of the corpus spongiosum, and working backward. The spongriosum and urethra should be cut across transversely before

undertaking to free them in this way. They should be dissected from the surrounding structures as far back as the face of the triangular ligament.

The sound is, of course, to be withdrawn before dividing the urethra.

Pass a suture through each side of the proximal end of the divided urethra; leave the sutures long, and knot their ends so as to form a loop of each thread. This step is often useful in helping the operator to draw the severed urethra forward into place later in the operation. Expose the suspensory ligament of the penis above the symphysis and divide it.Isolate the blood vessels of the dorsum of the penis and ligate them.

Clear the corpora cavernosa down to their attachments on either ramus of the pubic bone. Separate the crura from the bone

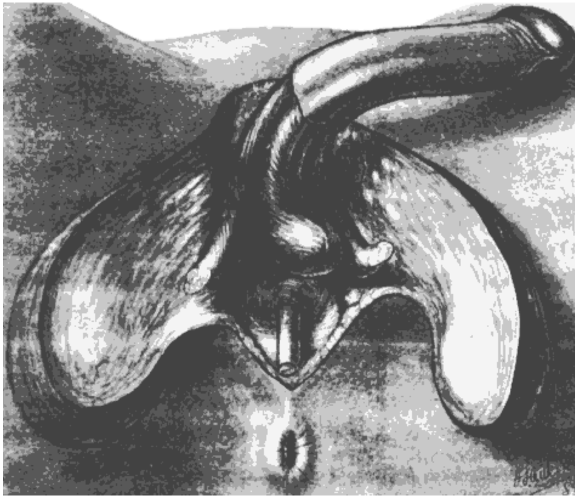

Fig. 80 Extirpation of the penis, showing the scrotum split and the two halves separated; the dorsal arteries of the penis ligated; the urethra severed from the bulb; the crura freed and turned forward.

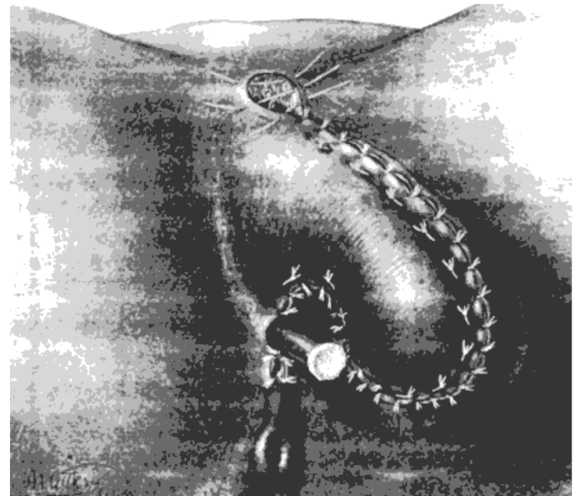

Fig. 81 Extirpation of the penis, showing the two halves of the scrotum united by Siegle's method; the cigarette drain at the most dependent point of the wound; the split urethra everted and united to the skin.

on each side with a periosteum elevator, and by snipping through the tissues with scissors whenever it may be required. The two arteries of the crura are encountered during this step of the operation, and are to be tied. Hemorrhage is severe during the separation of the crura and when exposing them. It may be in part avoided by carrying a ligature around the blood vessels, which lie on the lateral aspects of the root of the penis and beneath the suspensory ligament, with an aneurysm needle and ligating them en masse, previous to dividing the attachments of the crura or to wholly exposing them. Split the presenting end of the divided urethra and suture it to the edge of the incised scrotum with fine silk or catgut sutures, as may be preferred.

It is unnecessary to tie a catheter into the bladder, but it is desirable to do so in order to keep the dressings dry.
Close the scrotal incision up to the point of emergence of the cut end of the urethra (Figs. 80 and 8I). Inguinal nodes, when infected, should be removed.

Comment.-The newly made meatus does not tend to contract so readily as is the case with that made in the operation of partial amputation. It is well, however, to pass a sound through it from time to time to insure lts patency. The disagreeable wetting of the thighs when urinating, which is so trying to the patient after the operation, may be avoided by applying a small funnel to the surface of the scrotum and passing the urine through it and a short rubber tube attached to the other, or small, end of the funnel; in this way the urine can be kept from coming in contact with the parts lying adjacent to the end of the stumps of the urethra.