Prince (D.)

THE TREATMENT

OF

EXTROPHY OF THE BLADDER.

WITH SOME HISTORICAL NOTES AND GENERAL CONSIDERATIONS AND AN ACCOUNT OF A CASE.

BY

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EXTROPHY OF THE BLADDER.

Plastic surgery requires a good conception of the means necessary to secure desired changes of form, and this conception must become well matured before it is put into practice; because from the nature of the case, the modeling cannot often be done over again. There is also required the most careful management of the attending wounds, in order to preserve the vitality of flaps and to secure their union in the new positions in which they are placed. To this end it is necessary to keep their nutritive action as near the physiological state as possible. Freedom from motion is the first condition. Freedom from contact with the septic influence of the atmosphere is the second condition. The early and frequent removal of the exudations in anticipation of their decomposition, or afterward, through the failure of the first two conditions, is the third. When the first two conditions are complete, with the best results, the third has no place for there is nothing irritating to be removed.

For the first condition there are plasters and sutures with fixedness upon splints and quietude of the whole body.

For the second, there are, a blood-clot dried in the open air, the dessicated exudations of lymph, the superposition of plasters and cotton, gauze, or other material to defend against septic influences while the drying influence of atmospheric contact is

permitted. All these coverings may be increased in their efficacy by a coat of varnish over the blood clot or the dried crust of lymph (in what is called the *open air dressing*) by carbolic acid 10 per cent. in oil by dry salicylic acid, and by salicylic acid infiltrated into cotton.*

For the third condition the irrigation and the bath are indicated. These may be of water, pure or medicated with salicylic and carbolic acid.

It is one of the objects in publishing the case detailed in the following paper to give an account of the development of the utility of these agents in wounds in which the realization of the first two conditions cannot be anticipated or in which they fail from any cause. Where there is a strong probability of the failure of the first two, the third should be put into execution as a primitive measure, before any mischief has occurred from the failure of the others. This probability of failure exists in all complicated wounds, involving a large extent of surface, especially, in parts not abundantly supplied with blood.

Prof. Erichsen, of University College, London, speaking of extroversion of the bladder says:—

"The malformation is incurable. Operations have been planned and performed, with the view of closing in the exposed bladder, by plastic procedures, but they have never proved successful, and have terminated, in some instances, in the patient's death. They do not, therefore, afford much encouragement for repetition."†

The following description of this deformity by John Wood of King's College, London, is brief and explicit. "In both sexes the pubic bones are widely separated. The symphyseal projection can be felt under the integument on each side of the genital organs. In both, the hinder wall of the bladder is seen as a red, vascular projecting tumor often ulcerated and discharging muco-purulent fluid and blood, and surrounded by a cicatrix which, above, is blended with and obscures the umbilical mark. In the male, the penis is usually completely epispadiac, with the

* Dissolve 100 grams of salicylic acid in two quarts dilute alcohol. Place in a jar 900 grams of cotton in the form of batting. Pour over this the alcoholic solution of salicylic acid.

After several days remove the cotton and dry it. Preserve for the dressing of wounds where atmospheric filtration is desired.

† Erichsen's Surgery. American Edition 1859, p. 857.

urethra open along its entire length. The corpora cavernosa are stunted, and fail to cover the urethra above, and they are connected below by an imperfect corpus spongiosum forming the lower part of the urethra. The glans penis is grooved above by the urethral gutter, but perfect underneath and is provided with a frenum and an abundant but split prepuce. The stunted penis is placed flat against the lower part of the bladder, usually covering by its roots the orifices of the ureters. The scrotum is perfect and contains the testes, and often an oblique inguinal hernia or a small ventral hernia is present.

In the female, the clitoris is split and the anterior commissure of the labia minora are wanting, exposing more completely than in the male, the orifices of the ureters and laying open the urethra. The normal os uteri can be seen in the vaginal groove.*"

In 1869 Mr. Wood had operated in eight cases. Three methods were employed by him.

First. Two lateral flaps were taken from the sides with their bases toward the groins with their raw surface touching the mucous membrane of the bladder—the success was imperfect.

Second. One reversed lateral flap in combination with a smaller reversed umbilical flap, both turned with their cutaneous surfaces toward the bladder and covered by another larger lateral flap placed with its raw surface upon the exterior raw surface of the two reversed flaps.

Third. A large umbilical flap turned down with its cutaneous surface toward the bladder extending as far down as the root of the penis, covered by two lateral flaps from the groins with their bases toward the penis, scrotum and thigh and united in the median line over the umbilical flap and with their raw surfaces in contact.

He adopted this third procedure in his last five cases, in each case covering the entire bladder by one operation.

In the last two cases, a preputial covering was made by dissecting the skin of the scrotum and implanting it upon the penis previously peeled of a strip of integument on either side

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* *Medico Churugical Transactions*, Feb. 9, 1869.
Lancet, Feby. 20, 1869.
American Journal of the Medical Sciences, April, 1869, p. 551.
Half Yearly Abstract, July 1869 p. 193.

of the fissure, in order to get a line of adhesion. With regard to the hairs which became covered by this inversion of integument it is said by Wood, and by Pancoast of Philadelphia, that they finally disappear in the continual bathing by urine.

It is said that nitric acid taken by the mouth aids in cleaning the hairs and the surfaces from phosphates.

Richard, a colleague of Nélaton, is said to have operated in 1853. A central apron having been turned down, the raw surface of which was covered by a flap from the scrotum. The patient aged 24, died on the 9th day from peritonitis. In 1863, Mr. Holmes had operated five times.

Extrophy of the bladder has been treated (*Boston Med. and Surg. Journal* January 1876), by Dr. Henry J. Bigelow by the obliteration of the mucous membrane in order to get rid of the sensitive surface. For this purpose the mucous membrane is dissected up and integument is drawn over to cover the denuded surface. No attempt on this plan is made to form a pouch over the orifice of the ureters. A case is reported illustrated by lithographs.

Dr. F. F. Maury (*American Journal of the Medical Sciences* July 1871, p. 154) has practiced the expedient of elevating the skin of the anterior portion of the scrotum to cover the imperfect bladder. A hole is cut in the base of the scrotal flap through which the penis is thrust. The raw surface of the flap is left exposed to the air to heal by granulation. Two cases reported were successful.

What Wood calls his third method aided by the elevation of a portion of the scrotum are probably the best expedients for most cases.

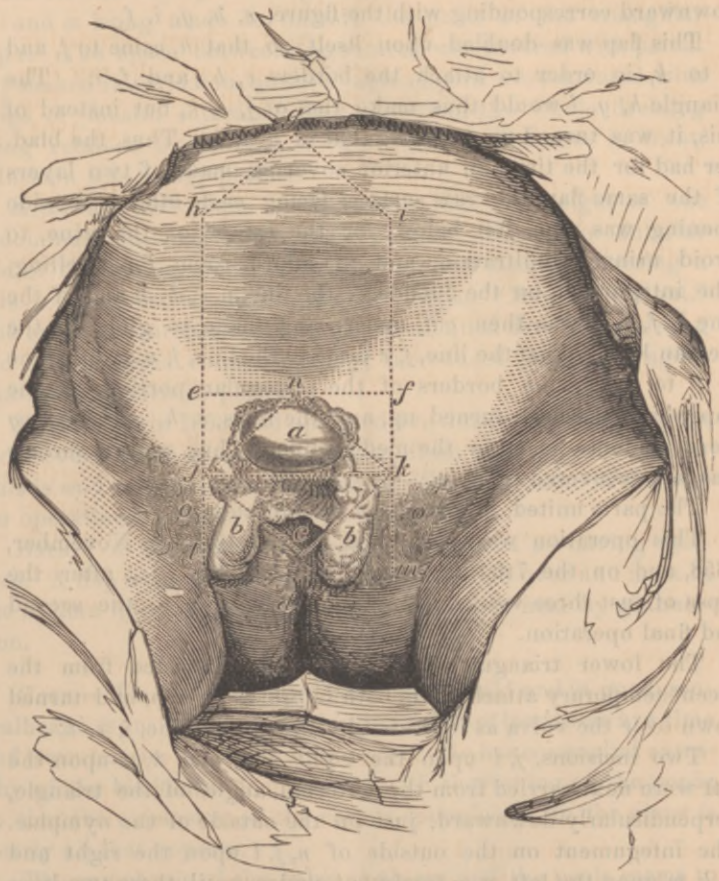
In 1858, a very successful operation was made by Dr. Daniel Ayers of Brooklyn N. Y. an account of which is here copied in some detail from a pamphlet of date 1859 and from *Virginia Medical Journal* January, 1859.

Fig. 1 illustrates the nature of the deformity, and the plan of the operation.

a. The posterior wall of the bladder, continuous with the abdominal parieties (there being no anterior wall for the bladder) one inch and a quarter by two inches, and longer when standing.

b, *b*. Nymphæ, or labia minora, separated wide apart.
c. Orifice of the vagina.
d. Anus.

Fig. 1.



Dr. Ayer's Case of Extrophy of the female bladder. Operation 1858.

e. *e*. Labia majora. There was no trace of urethra or clitoris. There was a deficiency of the symphysis of the pubes, leaving the mons veneris without its natural osseous support, and causing the thighs as shown in the cut, to stand apart in front to an unnatural degree.

The patient, 28 years old, had borne a child at maturity;

and had become afterwards afflicted with procidentia of the uterus, which appeared externally.

Plan of the Operation.—A flap of the integument upon the anterior wall of the abdomen, was dissected from above downward corresponding with the figure, *e*, *h*, *g*, *i*, *f*.

This flap was doubled upon itself, so that *h*, came to *j*, and *i* to *k*, in order to attach the borders *e*, *h*, and *f*, *i*. The triangle *h*, *g*, *i* would thus make that of *j*, *e*, *k*, but instead of this, it was turned up to make that of *j*, *n*, *k*. Thus, the bladder had for the time, an anterior covering made of two layers of the same flap, the raw surfaces facing each other. A wide opening was thus left below, for the escape of the urine, to avoid urinary infiltration, and to afford room for swelling. The integument, on the outside of the line, *j*, *e*, *h*, *g* and of the line *k*, *f*, *i*, *g* was then cut under, and made to glide to the median line, so that the line, *j*, *e* came to the line, *j*, *n* and the line *k*, *f* to *k*, *n*, the borders of the triangular portion of the flap which had been turned up, and the lines, *e*, *h*, *g* and *f*, *i*, *g* were made to meet in the median line. Thus, no raw surface was left uncovered by skin.

The parts united, in great part by adhesion.

This operation was performed on the 16th. of November, 1858, and on the 7th. of December following, *i*, *e*,, after the lapse of just three weeks, the patient submitted to the second and final operation.

The lower triangular flap, *j*, *n*, *k* was dissected from the recent temporary attachments both lateral and deep, and turned down over the vulva as indicated by the dotted line, *j*, *e*, *k*.

Two incisions, *j*, *l* upon the right side and *k*, *m* upon the left were next carried from the external angles of the triangle, perpendicularly downward, just on the outside of the nymphæ. The integument on the outside of *n*, *j*, *l* upon the right and *n*, *k*, *m* upon the left, was freely cut under, until these two lines could be made to approach each other, and coincide in a line drawn from *n* to *c* which was continous with the cicatrix previously established from *g* to *n* occupying the linea alba. The labia majora were thus made to approach each other, and the nymphæ were concealed.

A space was left for the urinary canal, which would admit

the little finger, and the new-formed urethra was an inch and a half in length.

During the operation, torsion and ice were applied to several arteries which bled freely, after which the flaps were confined in the median line by interrupted sutures the most inferior one at *l* and *m* being made to include the point of the triangular flap *c*. The space between the sutures, was covered with patent lint soaked in collodion, and the labia majora were covered with strips of muslin saturated with collodion, the whole dressing being retained by threads of suture-silk, laced across in front. Adhesion was nearly perfect.

After a year's time, it was found that the weight of the abdominal contents, in the erect posture, caused the anterior fold of the vagina, alone, to descend a short distance, forming a pale œdematous tumor of the size of an "English Walnut." The anterior fourchette of the vulva remained firm and resisting and a perforated rubber pessary, introduced into the vagina retained the parts in position.

T. Holmes, in 1863, had operated five times; one flap from the groin everted and covered by a flap from the opposite groin. This is said to have been the plan of Wood in some of his earlier operations.

Barker of Melbourne, Australia, is reported as having operated. A flap from either side was made to glide over and meet in the median line; the raw surface being left to heal by granulation.

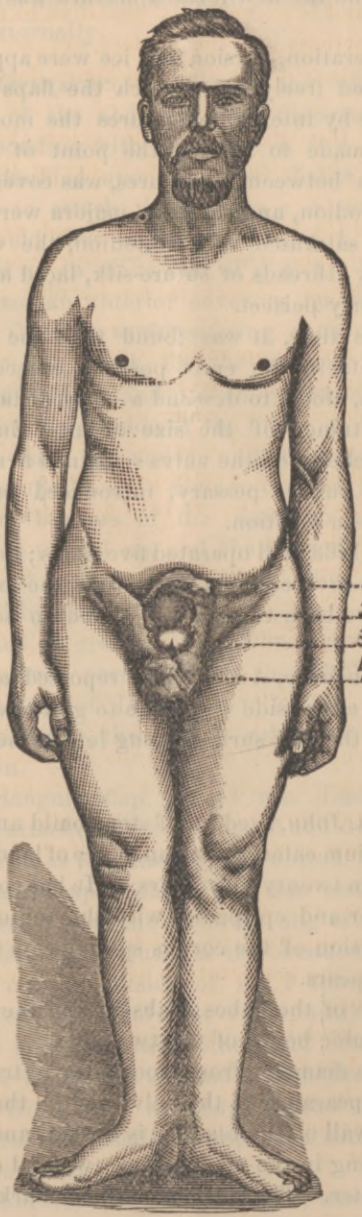
Case.—Wm. St. John, aged 25, of stout build and in good generalhealth is an opium eater, taking an ounce of laudanum at a time and two ounces in twenty-four hours. He has congenital extrophy of the bladder and epispadias with shortening of the penis, so that the expansion of the corpus spongiosum in the glans is nearly all that appears.

The symphysis of the pubes is absent and the penis seems to lie between the pubic bones of the two sides.

The transverse diameter from trochanter to trochanter is 26½ inches and the appearance of the pelvis is like that of a woman.

The anterior wall of the bladder is absent, and the posterior wall fills an opening in the median line two and one-half inches (75 mm) in diameter. There is no umbilical mark. The mucous

Fig. 2.



Wm. St. John.

1. The junction between the the mucous membrane and the skin above.
2. The eminences at the exit of the ureters on the mucous surface.
3. The glans penis.
4. The Scrotum showing numerous scars from old ulcerations occasioned by the irritation of urinary contact,

surface is convex, as if protruded by the pressure of the intestines from behind, and is exceedingly sensitive to touch.

The little projections of the ureters are seen sometimes spirting small streams of urine and sometimes oozing a sluggish diminutive flow.

On account of the spirting of the urine, the patient has invented a plate to be worn in front to arrest the stream and direct it downward.

The prepuce and the frenum are developed, as well as the testicles and the scrotum, which latter is thickened by the constant irritation of urine. There is no hernial protrusion in either groin.

The preparation for the operation consisted in a cathartic the night before, ten grains (.65 grms.) of sulphate of quinia in the morning with one ounce of laudanum (32 c. c.) and two ounces of whiskey and the addition of a hypodermic injection of ½ gr. (.022 grms.) of morphia at the time of beginning the etherization.

The operation was made Dec. 8, 1874 according to the third method of John Wood.

A large apron was dissected from above downward and turned over with its raw surface anterior and outward. The exposed mucous surface was completely covered by this flap.

A flap was then dissected from each inguinal region with its attached base downward. These flaps were brought to meet in the median line where they were retained by sutures.

The raw surfaces were freely bathed in ether for its supposed influence in favoring union by the first intension.

The extensive raw surface above was dressed with ground slippery elm bark.

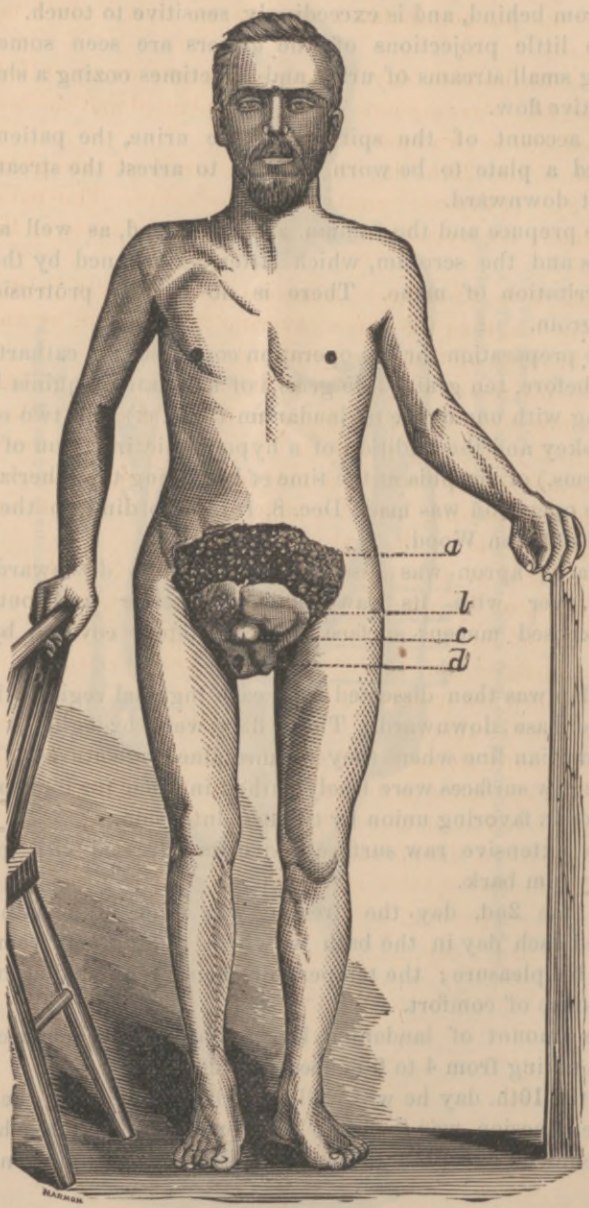
On the 2nd. day the dressing was done in a bath, and repeated each day in the bath in which the patient remained during his pleasure; the temperature being regulated according to his sense of comfort.

The amount of laudanum had to be greatly increased the patient taking from 4 to 6 ounces each day.

On the 10th. day he was well enough to sing.—On the 12th day the adhesion was found to be perfect the sutures having been removed except a single silver wire remaining on each side.

The first dressing was made with slippery elm but alterna-

Fig. 3.



a. Granulating surface speckled with skin grafts.
b. Flap united a little to the right of the apparant median line.
c. Glans penis.
d. Scrotum.

tions were made with oxide of zinc until the zinc oxide was given the preference. The zinc was never removed until lifted up by the pus accumulated beneath, so that it could be easily detached.

Dec. 23 the 15th. day. Forty skin-grafts were applied.

Dec. 26. Seventy-nine grafts were planted and the laudanum was reduced to two ounces a day.

Feb. 3. the 26th. day the patient stood for his photograph (Fig. 3). Fifty-one grafts were implanted. The patient has completely recovered from the depressing influence of the operation.

Feb. 19th. 42nd day. A second operation was performed in order to lengthen the apron covering the bladder, by an attachment brought up from the scrotum.

The dissection was carried sufficiently into the groins and a notch was made under the penis in order to enable the flap to rise readily into its position. It was attached above by a tongue and groove suture, a tongue of the upper margin of the scrotal flap passing into a groove made in the lower margin of the apron made by the first operation.

The trial of this expedient recommended by Dr. Ashurst, and practiced by him in some of his operations, has not afforded inducement for its repetition. It is generally the case that plane surfaces can be brought into more perfect contact than those which are irregular.

A considerable constitutional disturbance followed this operation the pulse rising to 116 and the temperature to 101°F.

The experience in the use of the bath acquired after the first operation led to its more protracted employment At the end of 36 hours after, the operation he had been 32½ hours in the bath.

The following table shows the amount of time spent in the water on succeeding days.

3rd.	day.....	18 hours.
4th.	"	14 "
5th.	"	14 "
6th.	"	14 "
7th.	"	18 "
8th.	"	22 "
9th.	"	16 "
10th.	"	15 "
11th.	"	16 "
12th.	"	15 "

After this date for many days the average time in the water was 12 hours from 9 A. M. to 7 P. M. the nights being spent in bed. An automatic irrigation with weak carbolized water was arranged so as not to require constant attention.

Some sloughing occurred in the scrotal flaps and for the purpose of closing it, the third operation was made Feb. 24th, the 75th day. On the 27, or the 3rd day from this operation he had been 50 hours in water.

Not much constitutional disturbance followed but some additional sloughing occurred.

March 7th. or the 89th day, he was sitting up. March 22nd. or the 104th day, the fourth operation was made to close the fistulous opening in the scrotal flap occasioned by previous sloughing.

No union by adhesion followed this operation, but a good result was finally obtained by the repeated introduction of plastic pins for sutures.

April 1st. the 117th day. The granulation and cicatrization subsequent to the fourth operation have produced a greatly improved condition.

The testicles are supported by a scrotum of greatly reduced size so that they are much less in the way of the urinal which he now wears with much more comfort than before the operation. His urine is now entirely collected while in the erect posture.

The cicatrization is not yet complete over the portion of the abdomen from which the great central flap was taken in the first operation.

It was found impossible to reduce the supply of opium to any great degree while under surgical treatment, and he continued to take as an ordinary daily supply, two fluid ounces of laudanum.

During the greater part of the time he took daily in one dose a drachm of tincture of chloride of iron combined with ten minims (.65 c. c.) of nitric acid taken in a glass of water.

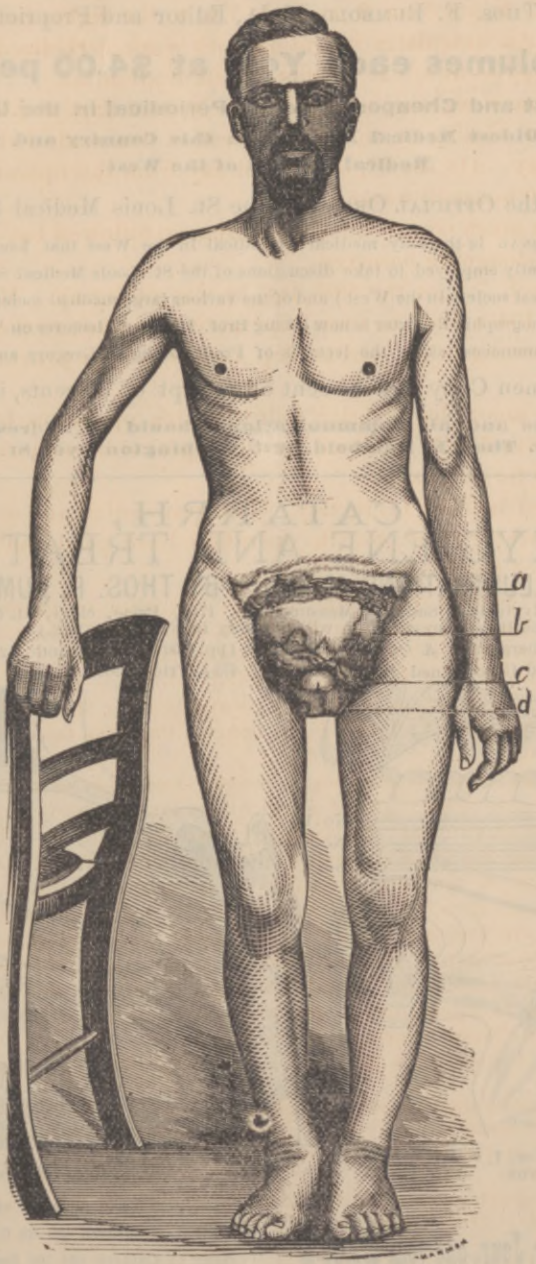
Quinine was freely employed during the greater part of the time of treatment. He went home in greatly improved condition. One of the most important advantages which he has derived from the series of operations is the protection of the delicate mucous membrane from injury by his clothing.

Fig. 4 illustrates his condition at the close of treatment.

The use of the bath after complicated wounds is further exemplified in a report made to the Tri-State Medical Society last year and afterward published in the St. Louis Medical and Surgical Journal (Jan.—May, 1881.

This report is also published and sold by Lindsay & Blakiston, Phila. as a pamphlet of 50 pages.

Fig, 4.



a. Cicatrix.
b. The flap forming the anterior covering of the bladder.
c. The Glans penis.
d. The scrotum reduced in size by the transfer of a portion of its integument to its new position above the diminutive penis.

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