

A case of extroversion of the bladder treated by preliminary narrowing of the gap existing in the pubic symphysis by means of division of the sacro-iliac synchondroses / by G.H. Makins.

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A CASE
OF
EXTROVERSION OF THE BLADDER

TREATED BY PRELIMINARY NARROWING OF THE
GAP EXISTING IN THE PUBIC SYMPHYSIS BY
MEANS OF DIVISION OF THE SACRO-
ILIAC SYNCHONDROSES.

BY
G. H. MAKINS.

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IN the 'Centralblatt für Chirurgie' of December, 1885,¹ Professor Trendelenburg, of Bonn, published a case of extroversion of the bladder, in which immediate union of the lateral margins was obtained by a previous division of the sacro-iliac synchondroses. The operation attracted some notice at the time, and has since received the stamp of approval by Professor Thiersch,² one of the pioneers in the treatment of this defect, but as far as I know no surgeon in this country has repeated the method there detailed.

I feel I should make my apology to the originator of the method for bringing forward this case, since it is a

¹ 'Centralbl. f. Chir.,' No. 49, Dec., 1885.

² 'Verhandl. d. deutsche-Gesell. f. Chir.,' 1886, p. 13.

failure in one of the essential particulars, that of immediate union of the cutaneous margins of the incomplete bladder ; but although not a complete success it admirably illustrates the advantages which the preliminary operation offers, in contracting the area which has to be covered. I think, moreover, that all surgeons who have been called upon to treat cases of this nature must allow that much still remains to be wished for in the methods hitherto at our disposal. The case is as follows :

A. J—, æt. 5, male, one of seven healthy children. No hereditary history of malformations to be obtained, and the mother does not attempt to assign any cause.

The patient first came under the writer's care, by the kindness of Sir William Mac Cormac, in May, 1883. He was then one year and nine months of age, and his condition was as follows :

A fairly healthy-looking child with an extroverted bladder. The surface of the bladder is red and granular, in places encrusted with phosphates ; it measures about one and a half inches in diameter both from above downwards and from side to side. There are one or two excoriated patches encrusted with phosphates near the margin ; the surrounding skin is otherwise healthy. The penis is small and ill developed, complete epispadias exists, and there is a large pendulous prepuce. The scrotum is perfect, but both testes are undescended, and the inguinal rings are open. On the right side there is a tendency to hernial protrusion of the abdominal contents.

There is no umbilicus, but in the situation of the linea alba in its lower half is a shallow groove, bounding the margins of which are the recti abdominales, passing down to the unclosed symphysis, across which there is a gap of about three quarters of an inch.

On June 12th, 1883, chloroform having been administered, a flap of skin two and a half inches wide by five long was raised to thicken, with a view to covering the exposed bladder. Only a single flap was raised, although it was intended to raise a second one for the upper half

at a later date should the first flap do well. The operation unfortunately proved a failure, for on the sixth day the centre of the flap sloughed through. The resulting granulating surface quickly healed, leaving a cicatrix, which has proved the principal difficulty in all subsequent procedures. The child left the hospital in August, 1883, and was not seen again until his readmission on November 2nd, 1886, when he was brought to the hospital by his mother on account of some slight hæmorrhage occurring from the bladder surface.

The condition differed little from that existing in 1883, the only changes consisting in the greater size of the child, and the presence of a firm white cicatrix about one inch in length, which extended outward from the margin of the bladder on the left side, and was closely united to the subjacent aponeurosis of the external oblique. The scrotum was inflamed and red, and on its surface, as well as on the neighbouring skin of the thighs, were numerous ulcerated spots with raised margins, encrusted with phosphates, somewhat resembling mucous tubercles. The exposed bladder surface now measured three and a quarter inches in each direction. The patient was kept in bed twenty-seven days, and during this time the surrounding skin was got into a much better condition, and the bladder surface much improved by the application of pine-wood bags to absorb the urine as it passed.

On November 29th, 1886, the following operation was performed:—The bowels having been thoroughly cleared out during the previous day the patient was anæsthetised with chloroform. The space between the anterior superior spines of the ilia was measured, and found to be seven inches, that between the gaping symphysis one and a quarter inches, and the position of the great sciatic notch was determined by rectal examination. The boy was placed on his face, and incisions three inches in length were made over each synchondrosis. The posterior sacro-iliac ligaments were exposed and freely divided,

and the knife was then passed into the cleft, dividing the interosseous and superior ligaments, and also the interarticular cartilage. There was very little hæmorrhage. It was now found that slight pressure would allow the anterior superior spines to be approximated seven eighths of an inch, the joints gaping sufficiently posteriorly to allow the introduction of the forefinger.

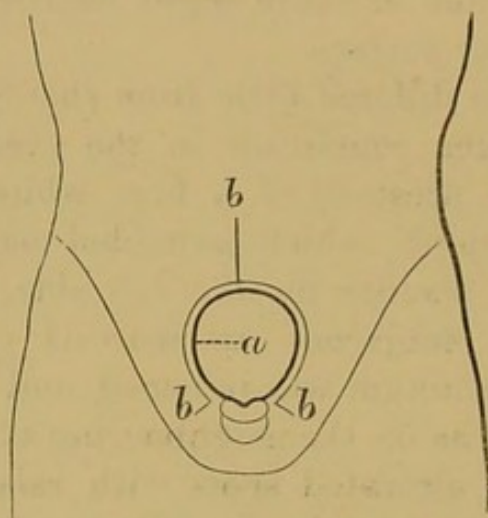


FIG. 1.—The outline, *a*, shows exposed posterior wall of bladder (when patient five years old), measuring $3\frac{1}{4}$ in. \times $3\frac{1}{4}$ in; *b* shows line of incision made to connect margins.

Considerable pressure caused no further approximation, and this being deemed sufficient, the wounds were closed by suture, a split drain having been inserted at the lower angle. The surface was dusted with iodoform, some layers of iodoform gauze, covered with a stratum of salicylic wool, were applied, and the whole was covered in with a piece of thick gutta-percha tissue fixed to the skin around the edges of the dressing by chloroform. It was hoped that this would ensure the wound against the fouling which might result from the trickling down of urine. The surface of the bladder was covered with a pine-wood bag, which was to be removed as soon as it became soaked with urine.

The patient was then placed in his cot, and extension of the joints was provided for by placing him in a pelvic

belt, to the anterior borders of which three strips of strong webbing provided with loops had been sewn. These strips were crossed as a many-tailed bandage, carried over the opposite side of the cot, and there a piece of wood, to which a sandbag weighing 5 lbs. was appended was passed through the loops. Later in the day the bags were changed for others containing 7 lbs., and on the second day they were further increased to 10 lbs. on either side.

30th.—Comfortable. Temperature 99° . Some urine has found its way to the back. Dressing changed, as gutta-percha covering was giving way; some blood-stained serum in the gauze, quite sweet.

December 2nd.—Dressing changed, can kneel without much pain; skin around wound looking rather congested; left wound almost healed, so drain removed; right wound suppurating slightly. Sleeps badly but complains of no pain. Temperature 98.6° , has reached 100° twice. Tongue furred but moist. Appetite poor. Bowels not open since 30th. Signs of pressure over left anterior superior spine.

3rd.—Small slough over left anterior superior spine. The skin surrounding the bladder is lax, and the exposed surface is at least one third smaller than before the division of the synchondroses.

The patient continued to progress slowly; the wounds both gaped slightly and healed by granulation.

29th.—The sacro-iliac wounds, although still unhealed, are granulating healthily, the right being a linear surface only. The small slough over the left anterior superior spine has separated and the wound is granulating. The anterior superior spines are now six and one eighth inches apart, a gain of seven eighths of an inch. Does not suffer at all, and general condition is on the whole better than before operation, no doubt on account of the better nourishment he has been receiving. Kneels or can be shifted without any sign of pain.

January 22nd, 1887.—General condition good. Wounds

healed, except a small granulation on the left side. The exposed surface of bladder now measures only one and a half inches in each direction, and the anterior superior spines are one inch nearer than before operation. The decrease in the size of the exposed surface of the bladder

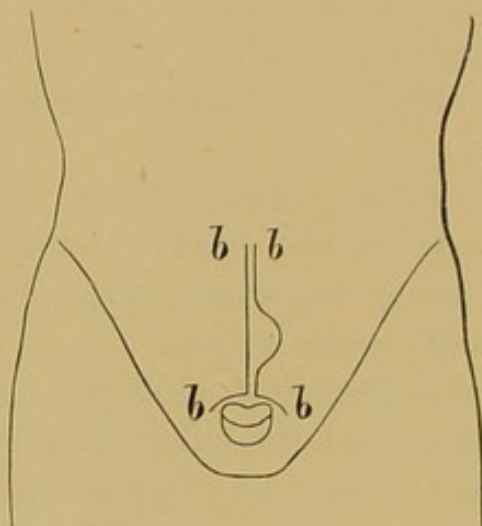


FIG. 2.—*b* Shows line of sutures.

is due not to mere contraction from relief of tension but to the formation of a deep groove on either side sufficient to contain some small quantity of urine as the patient lies on his back.

9.15 a.m., anæsthetised with chloroform. An incision, commencing one inch above the top limit of the bladder in the mid-line, was carried downwards on each side of the bladder to the lateral margins of the urethra; the skin was raised for about an inch and then drawn over the exposed bladder; the lower half was easily closed without the least tension, but the old cicatrix on the left side prevented the upper half meeting without tension, so that the skin had to be freed in an upward direction on that side for three quarters of an inch and then drawn down to fill the gap, the cicatrix being quite immovable. This portion of the operation is explained by diagrams 1 and 2. The lower margin of the abdominal skin was sutured to the margins of the penis, but no attempt was made to close the urethra.

The patient was again slung in his cot, and the flaps covered with a warm pine-wood bag, a large drainage-tube being inserted into the bladder from below.

The after-progress of this operation may be briefly disposed of; the skin became inflamed on the second day

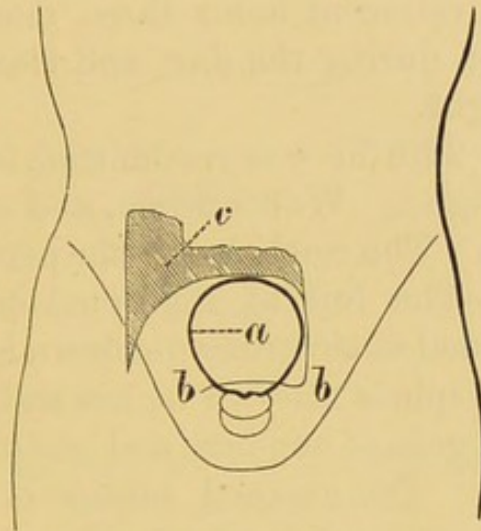


FIG. 3.—*a* Shows outline of exposed bladder at operation of May 4th, 1887; *b* shows large flap turned across and small flap turned down from upper margin; *c* shows raw surface.

and the whole gave way, some sloughing occurring at the edges. It is doubtful whether the warm pine-wood bags, which had been impregnated by soaking in a mercurial lotion, were not in some measure answerable for this failure. The granulating surface left rapidly healed, and forty-one days later it was decided to raise a skin flap on the right side. A flap, three inches by two, with its base at Poupart's ligament and its left edge close to the bladder margin, was lifted. This was allowed to thicken for two months, and on May 4th, 1887, it was turned across and united to the left margin, a small flap three quarters of an inch in width being turned down from above to close the upper limit of the cavity. The upper flap, however, consisted mainly of cicatricial tissue and sloughed, while the large flap, after holding for about ten days, became inflamed, and the wound suppurating, the bond of union completely gave way.

The wounds again cicatrised, and on June 16th he was sent to a convalescent home ; the flap projected from right margin of the bladder, and looked thick and healthy. The belt for compressing the pelvis had now been worn 198 days, and the space between the anterior superior spines was reduced by one inch and an eighth. He stayed at the convalescent home three months and three weeks, getting up during the day, and sleeping in a cot in the belt at night.

On September 29th he was readmitted, looking exceedingly well and bright. Walks firmly, and complains of no weakness in loins. The condition of the pelvis and bladder was as follows :—The line of the synchondroses is more palpable than normal as cicatrices dip down into them. The anterior superior spines are five inches and seven eighths apart, so that the gain of one inch and one eighth has been fully maintained. The exposed surface of bladder measures one inch in either direction, now amounting to less than one third of the superficial area previous to division of the synchondroses, and being less by half an inch than when it was first seen at one year and nine months of age. Surrounding skin thoroughly healthy in appearance, and the flap made for the last operation shifts readily on the subjacent structures.

October 27th, 1887.—Patient anæsthetised with chloroform. The old Thiersch's flap raised, and a small flap three quarters of an inch in width raised on the left side of the bladder.

The small flap was turned with its cutaneous surface towards the bladder, and three sutures were passed from the margin of the incision beneath the raw surface, emerging at the base of the flap just at the margin of the bladder. The large flap was now turned over and the three deep stitches made to pierce it just to the left of the centre. The refreshed end of the large flap was fastened by a deep and superficial row of fine sutures to the raw surface made by raising the small one, and finally the deep sutures were twisted so as to hold the whole in

apposition. A small incision was made across the old cicatrix to relieve tension, but no attempt was made to connect the lower margin of the flap with the penis. A

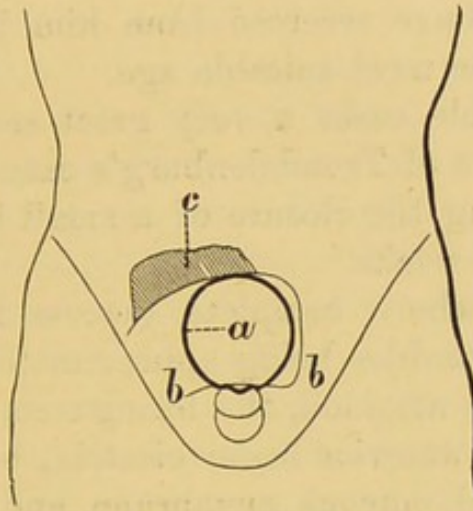


FIG. 4.—Shows flap turned across on Oct. 27th, 1887. The shaded part, *c*, shows raw surface.

piece of oiled lint was placed over the raw surface, but the flaps were left uncovered, a cradle containing a hot bottle to heat the air being placed over the patient.

The flap healed perfectly, entirely covering the exposed bladder, but leaving a gap one inch and a quarter long at the upper limit, through which the mucous membrane could be seen on holding the surfaces apart. This gap was bounded at each end by cicatricial tissue, but above and below by skin, and on November 28th the edges were refreshed, and the opposing surfaces sutured.

The gap at the upper border of the bladder has since been closed, except a small sinus, but any further operation in the direction of forming a urethra is for the present deferred on account of the troublesome disposition to phosphatic deposit.

I will shortly point out the advantages which seem to belong to this operation, especially in their bearing on my case, and answer as far as I am able the only objection which seems likely to be raised.

The operation is necessarily somewhat limited in appli-

cation, since the consolidation of the synchondroses would render it impracticable in any but young subjects. Prof. Trendelenburg originally placed the limit between two and four years, but has since raised it to five, and in a private letter I have received from him he says he now considers five the most suitable age.

1. In favorable cases a very great saving of time is effected. In one of Trendelenburg's cases the whole procedure, excepting the closure of a small fistula, occupied only some eight weeks.

2. In cases where complete success is attained, the margins of the bladder being approximated with the skin an ideal result is attained, the lining membrane, with the exception of the anterior linear cicatrix, being formed by the actual vesical mucous membrane, and irregular cicatricial pouches are avoided. As a consequence, the probabilities of phosphatic incrustations, or the formation of calculi, is greatly lessened.

3. Failure of the primary operation in no way prejudices further measures such as the raising of flaps.

4. Should flaps be subsequently needed, as in my case, the area to be covered is so much decreased in size that the procedure is easier and more likely to be followed by success, since less than half the ordinary amount of skin is needed.

5. The superficial area is not only lessened, but an important preliminary to the formation of a receptacle is developed in the sinking backward of the bladder wall, especially as a deep groove around the margin.

6. This lessening of the area to be covered especially adapts the method to cases such as mine in which cicatrices already exist and render the lifting of bilateral flaps difficult or impossible.

7. The closure or approximation of the symphyseal gap affords a better support for the abdominal viscera, while the rotation of the ilia corrects in some measure the acquired rotation outwards of the lower extremities often noted in these patients.

8. Lastly, Prof. Trendelenburg expresses the hope that in some of these cases the sphincter apparatus may still exist, and that by union of the posterior portion of the urethra a fairly retentive viscus may be obtained.

The chief objection no doubt lies in the possible weakening of the joints. On this matter I can only say that my own patient walks well, and that in Prof. Trendelenburg's cases the same result has been noted.

I would point out, however, that although the posterior, interosseous, and superior ligaments are divided, that the ilio-lumbar and sacro-sciatic ligaments remain entire. The latter would still be equally able to resist possible rotation of the sacrum forwards, the ilia being connected and fixed above by the ilio-lumbar ligaments to the transverse process of the last lumbar vertebra, and moreover the slightly increased forward obliquity of the latter ligaments would tend to prevent displacement of the sacrum backwards, or movement of the ilia forwards; the latter rotating forwards in the movement approximating the anterior superior spines on the combined axes of this ligament and the anterior margins of the joint.

It must be remembered also that during the maintenance of the compression, although the posterior aspects of the joints are caused to gape, yet the compression is lateral, and consequently the irregular surfaces offered by the opposing bones would still tend to prevent gliding movements in either direction, the division of the joint-union having of necessity followed to a considerable extent these inequalities.

As to the mode of repair, the gap must at first necessarily become filled with soft connective tissue, and for the fulfilment of this object slight suppuration, such as occurred in my case, is perhaps to be regarded as favorable. I would point out, however, that the result of the compression is to relieve the ossifying structures bounding the posterior aspect of the joint from pressure, while pressure is considerably increased in the anterior segment. Reasoning from the analogy of what is observed in the

case of other growing bones when pressure is exerted on one portion of the ossifying cartilage, as in the treatment of genu valgum by splints, or the deformity of the upper surface of the astragalus developing in talipes equinus, I think it may be regarded as probable that the bone bounding the posterior part of the gap may develop more extensively than that of the anterior portion, and hence that the fissure may eventually be little wider than a normal one.

It has also been objected that the method is inapplicable to females (Sonnenburg) since it would no doubt materially contract the pelvic openings. Prof. Trendelenburg writes me that he has lately successfully operated on a female child, and the case will be published at the next German Surgical Congress. In any case, however, the objection is the less important from the comparative infrequency of the condition in females.

In my own case one or two particulars still require mention. In the operation I contented myself with division of the greater portion of the joint, not breaking the two sides free, as has been done by Prof. Trendelenburg. My reason for this was that the amount of division allowed approximation of the spines one inch with moderate pressure, and as a result of trial I found very considerable force would be needed to entirely separate the joints, while I had already passed the knife as far forwards as I felt was safe. With entire freeing of the joints Prof. Trendelenburg has, however, gained as much as two inches in a child of two and a half years. In connection with this point mention should be made of the proposal of Dr. Hirschberg to apply compression of a similar character to the pelves of young infants without any division of ligaments, a method which in the light of my own case certainly deserves a trial.

The very great decrease of the area to be covered has already been mentioned, the exposed surface being considerably smaller than it was three and a half years previously. I would mention here also a minor point with regard to

the treatment of the bladder surface. When first admitted it was granular, easily bled, encrusted with phosphates, and small ulcers existed on the skin of the thighs, scrotum, and abdomen. Washing with antiseptic lotions and dilute nitric acid caused very little improvement, but after the application of the pine-wood bags, impregnated with perchloride of mercury, the surfaces rapidly cleaned, healed, and remained sound.

Lastly, the operation has been performed by Trendelenburg in at least five cases, four males and one female. In one of these cases a failure occurred at fourteen months of age, but the operation was repeated at three years of age successfully. In only one of the five cases had flaps to be resorted to, and in two the result was typical success.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' New Series, vol. ii, p. 359.)

