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## Nine Pubiotomies Performed in the Rotunda Hospital during the Mastership of Dr. Hastings Tweedy.

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THE small number of these operations is accounted for by the fact that pubiotomy was undertaken only when other means of delivery failed or were strongly contraindicated. With the experience that we now have of its utility and ease of performance there is no doubt that benefit would have accrued to many patients and their infants by its more frequent adoption as an aid to delivery.

The first pubiotomy was performed in November 1906. It differed from the subsequent cases in the length of time the patient was kept in bed and in the fact that her temperature remained above 100° F. for about 8 days. The degree of contraction was so great that we would now consider the case unsuitable for pubiotomy. No one in the Rotunda Hospital had ever seen the operation performed; the indications and technique were not thoroughly understood; the advisability of preliminary dilatation of the vagina and perineum and the fact that a patient could get up with safety 14 to 16 days after pubiotomy were not recognized.

### CASE HISTORIES.

No. 1. E.L., 28 yrs. 1-para. True conjugate 6½ cm; transverse 10 cm. By Skutsch's pelvimeter.

Döderlein pubiotomy Nov. 16, 1906. Os fully dilated. Head freely movable above the brim. Cord prolapsed when membranes ruptured. Pubiotomy, internal version and extraction. Free hæmorrhage. Transverse laceration of anterior vaginal wall and laceration of perineum. Repaired with catgut. Plugged with iodoform gauze. Infant 7½ lbs. Alive.

Temperature above 100° F. for about 8 days due to slight infection of wound. Never seriously ill. Kept in bed 42 days because it was thought necessary.

*Second Pregnancy.* Transverse. Internal version. Perforation. In extern department.

*Third Pregnancy.* Extraperitoneal Cæsarean section. *X-ray* January 3, 1911. Bony union.

*Present condition.* Normal in every way.

No. 2. C.S., 24 years. v-para. True conjugate  $7\frac{1}{2}$  cm.; transverse 12 cm. Skutsch's pelvimeter.

*Previous Pregnancies.* One miscarriage. Two dead breech deliveries. One living breech.

Döderlein pubiotomy March 28, 1907. Os fully dilated. Membranes ruptured. Head freely movable above brim. Labour 20 hours. Pubiotomy. No hæmorrhage. Walcher's position for an hour. Head advanced into pelvis and stopped. Forceps. Easy delivery.

Child dead.  $6\frac{1}{4}$  lbs. Was alive and foetal heart normal when pubiotomy performed.

Large hæmatoma of vulva. Pulse 140. Up on 17th day. Discharged 25th day.

*Sixth Pregnancy.* Breech  $8\frac{1}{2}$  lbs. Alive. Delivered in Rotunda. 7 hours in labour.

*Seventh Pregnancy.* Vertex. Normal delivery.  $7\frac{3}{4}$  lbs. Alive. Delivered in Rotunda.  $9\frac{1}{2}$  hours in labour.

*X-ray* January 4, 1911. Bony union.

*Present condition.* Normal in every way.

No. 3. B.G., 33 years. v-para. True conjugate 8 cm.; transverse  $11\frac{1}{2}$  cm. Skutsch's pelvimeter.

*Previous Pregnancies.* Instrumental delivery. 2 dead children. 2 alive. At home.

Döderlein pubiotomy April 5, 1907. Os fully dilated. Membranes ruptured. Head freely movable above brim. Labour 5 hrs. Pubiotomy. Head pushed into pelvis. Spontaneous delivery in 10 minutes. No hæmorrhage, lacerations or hæmatoma.

Child  $8\frac{1}{2}$  lbs. Alive.

Up on 14th day. Discharged 24th day. Walked without limp or discomfort on leaving hospital. Returned to her home in Co. Donegal.

Sixth pregnancy normal. Attended by midwife. Writes to say that she is "all right and able to work."

No. 4. L.B., 24 years. i-para. True conjugate 7 cm. Skutsch's pelvimeter.

Döderlein pubiotomy May 22, 1907. Os  $\frac{3}{4}$  dilated. Membranes ruptured 26 hours. Labour 44 hours. Head unfixed. Forceps failed to deliver. Vagina plugged for 3 hours with pledgets of moist sterile cotton wool. Walcher's position  $1\frac{1}{2}$  hours. Pubiotomy and imme-

diate forceps delivery. No laceration, hæmorrhage or hæmatoma. Tear of perineum.

Child  $7\frac{3}{4}$  lbs. Alive.

Up on 15th day. Discharged 25th day.

*Second Pregnancy.* Vertex. Normal delivery.  $7\frac{1}{4}$  lbs. Alive. Six hours in labour. Measurement after delivery  $8\frac{1}{2}$  cm. and  $10\frac{1}{2}$  cm. Apparently fibrous union. Normal in every way on discharge.

*Third Pregnancy.* Normal delivery attended by midwife in the country. Since then cannot be traced, therefore no x-ray taken.

No. 5. S.F., 36 years. iv-para. True conjugate 7 cm.; transverse  $11\frac{1}{2}$  cm. Skutsch's pelvimeter.

*Previous Pregnancies.* 1st. Forceps and perforation at home. 2nd. Induction 33rd week in Rotunda. 3 lbs., living still. Third Induction 36th week in Rotunda. Internal version and extraction. Dead.  $5\frac{3}{4}$  lbs.

Döderlein pubiotomy June 5, 1907. Os fully dilated. Membranes ruptured. Head freely movable above brim. Labour 7 hours. Pubiotomy. Head pushed into pelvis. Spontaneous delivery in 55 minutes. No hæmorrhage, laceration or hæmatoma.

Child 10 lbs. Alive.

Up on 15th day. Discharged 22nd day.

*Fifth Pregnancy.* Normal vertex.  $8\frac{1}{2}$  lbs. Alive.  $2\frac{1}{2}$  hours in labour. May 23, 1911, in Rotunda.

X-ray May 22, 1911. Fibrous union. At least 1 in. separation of bones.

*Present Condition.* Measurements during first stage while head was unfixed 8 cm and 14 cm. Fibrous bands easily distinguishable. Bones 1 in. apart and ends movable. Has never had any trouble since operation.

No. 6. R.W., 30 years. i-para. True conjugate  $8\frac{1}{2}$  cm.; transverse  $12\frac{2}{3}$  cm. (Skutsch's pelvimeter) (2 months after pubiotomy).

Bumm pubiotomy, November 5, 1909. Os  $\frac{3}{4}$  dilated. Membranes ruptured 15 hours. Labour 64 hours. Bandl's ring  $\frac{3}{4}$  way to umbilicus. No sleep for 3 nights. Pulse and temperature normal. Foetal heart normal. Slight mental disturbance. Forceps failed to deliver. Vagina plugged. Pubiotomy in  $\frac{1}{2}$  hour followed by immediate forceps delivery. No hæmorrhage, laceration or hæmatoma.

Child 8 lbs. Alive.

Up on 17th day. Discharged 21st day.

X-ray December 20, 1910. Fibrous union. About 1 cm. separation between ends of bone.

*Present Condition.* Normal in every particular. Pregnant 35

weeks. There seems to be a tendency for greater separation of the bones as pregnancy advances.

No. 7. M.D., 24 years. iii-para. True conjugate 8 cm.; transverse  $12\frac{4}{5}$  cm. (Skutsch's pelvimeter).

*Previous Labors.* Symphysiotomy, July, 1909. Abortion, November, 1909.

Bumm pubiotomy, September 13, 1910.

Os  $\frac{1}{2}$  dilated. Cord prolapsed. Meconium coming away. Internal version. Pubiotomy. Extraction. Cord stopped pulsating as needle entered for pubiotomy. No hæmorrhage or laceration. Bilateral tear of cervix. Tear of perineum.

Child  $6\frac{3}{4}$  lbs. Alive.

Up on 15th day. Discharged 26th day.

*X-ray.* Bony union of symphysis and pubiotomy.

*Present Condition.* Normal in every particular.

No. 8. M.O'T., 27 years. iv-para.

True conjugate 7 cm. (Skutsch's pelvimeter).

*Previous Labors.* Dead born with forceps.

Bumm pubiotomy, October 11 1910. Os fully dilated and membranes ruptured 11 hours. Walcher's position 4 hours. Head freely movable above brim. Vagina plugged for  $\frac{1}{2}$  hour. Pubiotomy. Severe hæmorrhage and transverse laceration at base of vestibule before sawing began. In speaking of this case Dr. Tweedy says, "The sharp needle evinces the greatest tendency to bury itself in the bone, which arrests its advance. The operator, in slightly withdrawing it and pushing it upward, may easily plunge the needle into the venous plexus around the base of the bladder, causing violent hæmorrhage, which will in a few moments burst its way through the vulval and vaginal mucous membrane, giving rise to the extensive and puzzling lacerations too frequently encountered. In my eighth case such an accident occurred, for with unpardonable carelessness the needle was allowed to slip away from the bone. It pierced the bladder and the hæmorrhage above described immediately followed."<sup>1</sup> Bone sawed. Forceps delivery. Bleeding controlled by pressure. Repair of lacerations. Vaginal plug. Wing catheter in bladder 3 days.

Child  $7\frac{5}{8}$  lbs. Alive.

Uninterrupted recovery. Up on 15th day. Discharged 20th day.

*X-ray* January 3, 1911. Incision runs into symphysis at lower end. No bony union. Ends in close apposition.

*Present Condition.* Normal in every particular.

No. 9. M.C., 33 years. iii-para.

True conjugata  $8\frac{1}{5}$  cm.; transverse 13 cm. (Skutsch's pelvimeter).

*Previous Labors.* Perforation at home.

Bumm pubiotomy, November 2, 1910. A week over time. Bougies inserted into uterus October 23rd, October 24th, and October 26th. Castor oil and quinine (15 grains) given 3 times. Bag introduced twice. No labour pains. Finally  $\frac{1}{2}$  oz. boiled glycerin injected between membranes and uterine wall. Labour followed in 37 hours. Membranes ruptured immediately. Walcher's position at intervals for 20 hours. Labour 38 hours. Os  $\frac{3}{4}$  dilated. Liquor amnii all gone. Pulse 120. Temperature normal. Fœtal heart normal. Bandl's ring  $\frac{1}{2}$  way to umbilicus. Forceps failed to deliver. Pubiotomy. Immediate forceps delivery as a brow. No hæmorrhage, hæmatoma, or laceration.

Child 7 lbs. Alive.

Up on 16th day. Discharged 22nd day.

X-ray November 24, 1910. Bones in close apposition. Too soon to determine what kind of union will occur.

*Present Condition.* Writes to say that she has had no trouble since operation and is able to walk and work as well as ever.

From these case histories it is seen that the first five operations were performed by Döderlein's semi-open method and the last four by Bumm's sub-cutaneous method. We consider both operations satisfactory and Dr. Tweedy would not hesitate to perform Döderlein's operation again, but of the two he considers Bumm's simpler, easier, more aseptic and less liable to complications. Having assisted him at the operations I can endorse his opinion in respect to the ease of performance and freedom from complications in the subcutaneous method.

*Indications.* If the os is fully or almost fully dilated, the child alive, and the true conjugate measures 7 cm. or more, pubiotomy should be undertaken when fœtal or maternal distress is manifested, and sooner if the conjugate is less than 8 cm. and spontaneous delivery is obviously impossible. Before the actual performance of the operation forceps should be tried tentatively as delivery may thus be terminated without the necessity of pubiotomy. These indications were not at all times adhered to, nor is it possible to be guided absolutely by any rigid rule. Prolapse of the cord, malpresentations, loss of liquor amnii with manifestations of fœtal distress may necessitate interference before the os is fully open. The special merit of the operation is that it affords a means of delivering a woman with a comparatively slight degree of contracted pelvis when she is unable to deliver herself after labour has been allowed to continue in the hope that spontaneous delivery would occur. (For further discussion of indications see *Med. Annual*, 1911, pp. 536—537.)

Dr. Tweedy's method of performing Döderlein's operation differs in a few details from that described by the author. As a preliminary

the vagina is plugged with pledgets of sterile cotton-wool wrung out of weak lysol solution. These take the place of the colpeurynter in dilating the soft parts with a view to minimizing lacerations. The incision over the crest of the pubes is vertical and not transverse. This severs the fibres of Poupart's ligament which are continued over the pubes, enabling the operator to insert the needle directly on to the bone. This is not so easily accomplished by the horizontal incision as it does not separate the fibres thoroughly down to the bone.

*Technique.* Preparation of the patient. The pubic hair is shaved and the skin of the lower abdomen, vulva, and perineum is washed with soap and water, disinfected with ether and a 1-6000 solution of biniodide of mercury in 70% methylated spirit. The bladder is emptied with a catheter, the vagina douched and plugged. Finally the skin is painted with tincture of iodine.

The patient lies in the cross bed position with her legs hanging down, a modified Walcher's position. Her legs and lower abdomen are covered with sterile leggings, a sterile towel is fastened across the perineum and hangs down to cover the anus. An assistant is seated at each side of the patient's pelvis to prevent too sudden separation of the bone. The operator and all his assistants wear rubber gloves and sterile gowns with sleeves. The vaginal plug is removed at the last moment.

A vertical incision just long enough to admit the index finger is made over the crest of the pubes about  $\frac{3}{4}$  in. to the side of the symphysis and the finger is passed down behind the bone to detach the bladder. The point of Döderlein's needle is inserted above the pubes, pressed firmly against the back of the bone and passed down until it emerges beneath the pubic arch. Döderlein's advice is to insinuate the point between the periosteum and the bone. If this can be done there will be very little hæmorrhage. The curve of the needle should be made to hug the top of the pubes, otherwise it presses back against the bladder and prevesical plexus and is very prone to cause laceration of some of the veins. In practice it is found much harder to keep Döderlein's needle from injuring these vessels than Bumm's and this was the main reason for discarding the former in favour of the latter. When the point of the needle emerges beneath the pubes an assistant pulls the labium strongly towards the opposite side to carry the cavernous tissues of the vestibule out of danger. A small incision exposes the point of the needle on which a Gigli saw is threaded and brought into position as the needle is withdrawn. In using the saw it is kept in as straight a line as possible and the range of motion is limited, to avoid laceration of the soft parts. The division of the bone is made about  $\frac{3}{4}$  in. to the side of the symphysis and parallel to it. If an assistant keeps his finger over the pubes he is able to recognize when the bone is severed. The change in the character of the resistance and the ease

with which the soft parts can be pulled forward with the saw enable the operator to know when the bone is sawn through. The assistants seated at either side of the pelvis prevent too sudden and too much separation. Hæmorrhage, if it does occur, is readily controlled by pressure with the fingers in the vagina and the thumb over the separation in the bones. This may have to be continued some time. A vaginal plug of iodoform gauze presses the soft parts against the bone and ensures against recurrence of hæmorrhage.

As the operation is usually undertaken after some indication of maternal or foetal distress has been manifested, there is nothing to lose and everything to gain by immediate delivery, which is easily accomplished by forceps or version. There is the added advantage that any lacerations can be repaired immediately, the wounds dressed and the patient spared the pain of delivery after regaining consciousness.

The preparations for Bumm's operation are exactly the same as for Döderlein's. An assistant pulls the labium strongly to the opposite side and the sharp needle is inserted to the under surface of the pubic arch  $\frac{3}{4}$  in. to the side of the symphysis. With a finger in the vagina the operator carefully guides the needle up the posterior surface of the pubes, insinuating the point beneath the periosteum. To avoid slipping, the needle is held short and guided upwards with the utmost care. Very often the point of the needle buries itself in the bone and in liberating it the accident described in Case No. 8 may readily occur. The subsequent steps of the operation are exactly the same as in the semi-open method. More care should be taken to limit the range of movement of the saw, allowing the soft tissues to cling to and move up and down with it, lessening the amount of injury.

After delivery in Döderlein's operation the wound above the pubes is sutured with catgut. No drainage is necessary. In the subcutaneous operation the stab holes are covered with collodion and cotton wool. The usual vulvar pad and obstetric binder are applied and to give more support to the patient a broad canvas belt (8 in. wide), with 3 straps, is firmly applied around the pelvis outside the binder.

*After-treatment.* The patient is kept on her back for 24 hours, and is catheterized every 8 hours. She is then moved from side to side until the third day. The bowels are moved the third day. After this, and before if they are allowed, patients move about freely and suffer no pain or inconvenience. None of these women complained of pain or discomfort during the puerperium, thus falsifying our preconceived opinions. This we think is largely attributable to the support afforded by the canvas belt.

To use the bed-pan and for changing bed-clothes, dressings and binder, the patient is lifted on the belt easily and without any pain.

The infant is put to the breast just as after normal labour.

*Subsequent Results.* Two of our nine patients have not been heard of since they left the hospital. They both live in the country and I have not been able to get them to answer letters. They are presumably all right as they left the hospital without any pain or lameness and promised to write if they had any trouble subsequently. Since writing this I have had letters to say that both of these patients are well and able to do their housework as well as ever. One has had a normal delivery since the pubiotomy (Case No. 3). The other seven, including the two cases where hæmorrhage and laceration complicated the operation, I have kept under observation and examined frequently. I am able to say that none of them has been inconvenienced in any particular by the operation. They are all able to walk and work as well as ever and were able to do so shortly after their discharge from hospital. Several of them have washing, scrubbing and heavy lifting to do and those who have become pregnant again have been able to continue at work until full term. Five women have been delivered since operation, four naturally after singularly easy labours. Two of these patients have had two normal deliveries each since the pubiotomy, the other two, one each. The fourth case was the woman with too high a degree of contraction to justify pubiotomy. She was delivered by extra-peritoneal Cæsarean section, as she was admitted to the hospital after 24 hours of labour and repeated vaginal examinations.

*x-ray* photographs were taken by M. R. J. Hayes, F.R.C.S.I., Radiologist to the Mater Misericordiæ Hospital, Dublin. Three patients had bony union, two fibrous union and two were taken too soon after operation to enable one to say what kind of union would eventually result. The patient whose subsequent history we have, but no *x-ray*, has almost certainly fibrous union. She moved to the country after her second normal labour following the pubiotomy, and I have been unable to communicate with her since.

All of the patients who live in Dublin (5) were exhibited at the January meeting of the Obstetrical section of the Royal Irish Academy of Medicine.

It is obvious that the number of these cases is too small to permit dogmatic statements as to the merits of the operation or to establish it beyond controversy; but as one who has assisted at the operations and had charge of the patients afterwards, I have been convinced, by the absence of serious complications and sequelæ and the ease of subsequent labours, that pubiotomy is a very valuable addition to our present methods of treating cases of contracted pelvis.

#### REFERENCE.

1. "Pubiotomy," *Med. Annual*, 1911. E. Hastings Tweedy, F.R.C.P.I.



