Historical notes on vesico-vaginal fistulas

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Perhaps there is no disease which, without endangering life, tends to render it more truly miserable, than that species of urinary fistula which occurs in females, in consequence of sloughing of the vagina after parturition.[1]

Case report: Successful Treatment of Urine Incontinence[2]

A young woman, after a labour of some days' continuance, was delivered by the perforator and crotchet[3] *of her first child, which had been dead apparently about two days…*[4]*After delivery the urine was discharged involuntarily...The parts about the perineum were considerably swelled, and a very fœtid and dark-colored discharge followed the delivery… and lasted for about a week. During the 5th and 6th days she had the power of retaining the urine for more than three hours…from the 7th day, she lost all power of retaining it…*

When I saw this patient at the end of three weeks from her delivery, the urine was constantly flowing when in bed. She retained it but for a short time when sitting up, and under the latter circumstances she was utterly unconscious of its coming until she felt wetted by its presence…

On introducing a catheter through the urethra, and a finger into the vagina, an opening was immediately discovered just about the neck of the bladder, which exposed the instrument for more than an inch in length, and through which the point of the finger could be passed into the bladder. The edges of the aperture were irregular, soft and yielding, the touching them caused no pain, nor did any blood make its appearance on withdrawing the finger. The swelling of the parts about the entrance of the vagina had subsided quickly under the use of a decoction of chamomile flowers[5]*…*

A flat silver catheter was left in the bladder, and a few days after an elastic gum[6] *bottle was introduced into the vagina. A firm one was selected , capable of containing two ounces of water; and had sewn on the convexity of its side a thin fine piece of sponge as large as a dollar. A double string was passed internally through its bottom, and left hanging through its neck. The sponge was smeared with calamine cerate,*[7] *the bottle dipped in oil, folded longitudinally and passed into the vagina with the sponge in front. From its elasticity it immediately expanded, and by a finger introduced through the neck it was readily placed in its proper situation, so as to bring the sponge immediately opposite the perforation in the bladder. The catheter was then withdrawn. In this situation it filled the vagina, and kept up a gentle and equable pressure on the injured part, so equable and so effectual that whilst the bottle was in the vagina the urine was perfectly retained for a little more than two hours. If the bladder was not then emptied by the catheter, the urine continued to ooze away until it was drawn off.*

Guided by this, the catheter was introduced every two hours during the day. This was preferred to keeping the instrument constantly in the bladder, as she found much inconvenience from its remaining there when sitting, and without further mechanical aid it was not possible to keep it steadily in its

situation when walking…Provided no urine passed through the opening, the principal object appeared to be obtained, and the patient was enabled at the same time to get out of doors. When in bed a short flat catheter was kept constantly in the bladder…

The comfort afforded by this plan in keeping her dry during the day was exceedingly great…In a short time she learned to pass the catheter herself, and felt happy in being thus relieved from much of her anxiety and dependence…At the end of two months, the opening was not more than large enough to admit the catheter to pass into the vagina…at the end of five months…the aperture had closed. The same means were continued however for a fortnight longer, after which the bottle was left off by day, as it was found she remained perfectly dry without it. The catheter however was still introduced every two hours whilst up, and at night the bottle and catheter were employed as at first, it being thought most prudent still to keep up a moderate pressure. And to prevent any distension of the bladder, or even the natural action of it which would be required if the urine were expelled without the aid of the catheter.

After a short period the time of drawing off the water was gradually lengthened, until it was retained six hours. The use of the catheter was still continued for some weeks longer, though the bottle had been for some time left off. At the end of nine months she resumed her natural habits, in every respect as well as before her labour."

Vesico-vaginal Fistula: Causes and Prevention

Where there has been a great deal of pressure in laborious labors, whether from the abuse of instruments or other causes, sloughing may occur…The method of preventing these sloughs I have already stated: …you should never permit a woman to be in labour too long, especially when the pulse is rising…you are never to allow the urine to accumulate too largely…when using instruments, you are always to have the dread of contusion, lacerations, and slough before you, being on guard against too much force. When the sloughing of the bladder occurs, I am sorry to say we are not at present in possession of any effectual remedy for it…without denying the possibility of closure, I may be allowed to observe, that I never saw a single case, and I have been called to many, in which the aperture has been completely healed.

Blundell J. The Principles and Practice of Obstetricy. London 1834

Craniotomy

Of all the obstetric operations, there is none more easily performed than that of perforation…Of all the operations of our art, however, there is none more awful…for call it embryotomy, craniotomy, cephalotomy, or by whatever elegant term you please, in this operation a dagger is struck in the head of an innocent child,ofen still living. And the brains being reduced to a soft pulp, are suffered to escape at the opening…Dreadful as the operation is, the safety of the mother sometimes peremptorily requires its performance.

Blundell 1834

Smellie perforator and blunt hook.

Laborious Labour

You should measure the term from the dilatation of the os uteri and the discharge of the liquor amnii, that being the...time, at which the heavier pressure begins to bear upon the softer parts; after which, therefore, the pressure is likely to become injurious. ..

It may be laid down as a sort of general rule, that no woman should be left in strong labour for more than twelve or twenty-four hours after the discharge of the waters.

Blundell 1834

Although VVF has been known since antiquity, its successful treatment was rare enough to warrant reporting in 1815. Barnes' approach was influenced by the French surgeon Pierre-Joseph Dusault (1744-1795), who emphasized two principles:

1. Minimizing urine leakage into the vagina. This required a catheter with large holes, held in a fixed position low in the bladder by means of an apparatus of his own design.
2. Approximating the edges of the fistula to favor healing. He advised introducing a vaginal obturator (e.g. a piece of cork covered with latex or beeswax), large enough to fill the vagina without distending it. He believed this would convert a circular defect into a transverse one, favoring healing. It would also reduce urine leakage.

Using this technique Dusault cured a number of chronic, finger-sized VVFs, although this took from 6-12 months.[8]

In 1824, Cumin reported another successful case: [9]

H. Millan, a married woman, aged 22, became my patient in the Royal Infirmary, November 11th, 1818, when the following particulars were collected from her.

Five weeks ago, at the period of full gestation, she was seized with labour-pains about noon, and the waters came away about an hour thereafter. On the evening of the third day, the head having made no progress, an attempt was made to deliver by the forceps, but without success. After an interval of two hours, the instrument was again introduced, and the child extracted.

Eight days after this the lochial discharge ceased, and the patient then observed that her urine escaped by the vagina. After another week…a slough of one inch in length, and a quarter of an inch in breadth, was discharged from the vulva..Since that time, her urine has continued to drain away from the vagina without interruption, attended by severe scalding pain…her clothes were so completely impregnated with putrid urine as to render her highly offensive to everyone near her, as well as to herself…The nymphae were swollen and inflamed; and the neighbouring skin was extensively excoriated, and rapidly falling into ulceration…

On introducing a catheter into the bladder, and the finger into the vagina, the catheter was felt bare for at least an inch, through a longitudinal opening which commenced rather more than half an inch from the external orifice of the urethra…

Cumin introduced a sponge into the vagina to collect the urine, and a catheter used to drain the bladder —held in place by an apparatus similar to that described by Dusault. Over the next 45 days, the fistula gradually closed, and the patient returned to normal except for some frequency, urgency and mild stress incontinence. Cumin disagreed with Dusault's contention that a vaginal obturator would help approximate the edges of the fistula:

> *But in all cases…occurring after laborious parturition, when the new opening is the consequence of sloughing and the loss of substance, the effect of filling the vagina must be to impede, and not assist the cure.*

He attributed the rapid healing in this particular case to

> *…the very highly irritated and inflamed state of the wound and the parts around it, at the time this poor woman came under treatment. The very sufferings of this unfortunate person were instrumental in accelerating her recovery; for the moment that the inflamed surfaces from which the slough had separated were relieved from the irritation of the urine, a healthy action commenced, and the parts began to contract and close up the fistulous opening.*

From this observation he surmised

> *That when the edges of such fistulae have become callous, it will be of essential benefit to apply ointment of cantharides, or some such vesicant, so as to detach completely the thickened cuticle, and dispose the parts to contract and unite.*

Bladder drainage and scarification of the wound edges using cautery, vesicants or silver nitrate would remain the mainstay of VVF therapy until the 1850s, when surgical techniques developed by Marion Sims (1813-1883) and others perfected a reproducible surgical approach.

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[1] Cumin W. Edinburgh Med Surg J. 1824;21:62-8.
[2] Barnes S. Medico Chirurgical Transactions (London) 1815;6:583-600.
[3] See inset. Much of the work of the early men-midwives consisted of destructive operations. Anesthesia was not used in Obstetrics until the late 1840s.
[4] In the absence of obvious maceration, it was difficult to diagnose fetal death in-utero. Auscultation of the fetal heart was not done before the 1830s.
[5] Anthemis Nobilis (Roman Chamomile).
[6] Sticky latex rubber
[7] Calamine is zinc carbonate which has been heated (zinc oxide) and then processed into a fine powder. Mixed with beeswax and lard it was known as Calamine Cerate or Turner's cerate. Calamine Lotion is still used today to relieve the itching of contact dermatitis.
[8] Dusault PJ. Oeuvres Chirurgicales de J.P. Dusault. Paris. Méquignon l'aîné. 1813 V 3, 3^{e} Ed 296-299. Dusault's work was published posthumously by his pupil Xavier Bichat.
[9]Cumin W. Edinburgh Med Surg J. 1824;21:62-8