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ORIGINAL ARTICLES.

THE PRODUCTION AND PREVENTION OF PERINEAL LACERATIONS DURING LABOR, WITH DESCRIPTION OF AN UNRECOGNIZED FORM.¹

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In order to bring my subject before you within the allotted time, it will be necessary for me to confine myself largely to general statements, and to omit many desirable but time-consuming details.

First let me call attention to the peculiar qualities of the obstetric perineum, which, during the previous eight or nine months of passive congestion, has undergone an astonishing amount of development. The muscular tissue has become hypertrophied, the fascia thickened and strengthened, and the loose connective tissue² proliferated, until the vaginal and vulval mucous membrane, under the stimulus of labor, roll out at the vulva, in much the same manner as the mucous membrane of the cervix rolls out at the os during prolonged congestion or inflammation about the broad ligaments. Towards the end of the first stage of labor in healthy young primiparae, the vaginal orifice will admit a small hand with but little more inconvenience than, nine months before, it would have admitted two fingers.

For the purpose of illustration we may divide the obstetric perineum into two parts: the vulval or external, and the vaginal or internal. The vulval portion may be said to be bounded above, or anteriorly, by the labia majora and vestibule; below, or externally, by the cutaneous surface between the thighs, the fourchette and the anus; and behind, or internally, by the muscles of the perineum. It is composed mainly of skin, mucous membrane, and loose connective tissue, containing fat, vessels, etc. The internal or vaginal portion may be said to include the remaining structures belonging to what is ordinarily described as the perineum. It is composed of the fascia, muscles, ligaments, etc.

In labor, when the occiput presses against the perineal body, so as to put the muscles and fascia slightly upon the stretch, we can, by hooking the finger over the fourchette into the fossa navicularis, and pulling

outwards just as a pain is ceasing, and the head commencing to recede, demonstrate two perineal rings. The external or vulval ring, formed by the edges of the labia majora and fourchette, is elastic, of a well-defined oval shape, and attached to the pubic bone above the clitoris. The internal, or vaginal, ring corresponds with the labia minora and edge of the external perineal muscles and fascia. It feels like a whip-cord stretched from the clitoris down through one of the labia minora, across the lower edge of the vaginal orifice, up through the other to its starting point. In figure 1 these rings are represented as separated below by the finger over the fourchette, as already indicated. (The vulval and vaginal tissues about the rings are not drawn.)

FIGURE 1.—A, anus; B, bladder; F, fourchette; M, muscular edge; U, urethra.

When the head recedes so as no longer to put the vaginal orifice on the stretch, the external ring collapses, and the internal ring disappears. Later, when the parts bulge and become distended, the internal ring, especially the lower edge, is lost in the flattened or quasi-membranous body of the perineum, as in figure 2. But of course it has a definite place, viz., the beginning of the muscular tissue; and extends as far below the fourchette as the length of the antero-posterior diameter of the somewhat stretched fossa navicularis, which connects them internally.

¹ Read before the Chicago Medical Society, February 15, 1886.

² The term fascia here is confined to the firmer tissue, and not to loose connective tissue, to facilitate distinction of parts.

Above or external to this vaginal, or internal, ring there is, practically speaking, no muscular tissue, but only skin, mucous membrane, loose connective tissue, fat, vessels, etc.

FIGURE 2.—A, anus; B, bladder; F, fourchette; M, muscular edge; U, urethra. (After Schröder.)

When the perineum becomes stretched four to five inches antero-posteriorly, the lower edges of the rings become still farther separated, and more than an inch of the upper edge of this quasi-membrane is devoid of muscular structure, or firm fascia, as seen in figure 3. It will be noticed that the external ring remains the smaller of the two.

FIGURE 3.—A, anus; B, bladder; F, fourchette; M, muscular edge; U, urethra. (After Schröder.)

In determining how the perineum will be affected in labor, we must take into consideration its advance over the pelvic floor, where its direct descent is arrested. If the progress of labor at this stage be slow, the liquor amnii, pressing under the chin of the foetus,

will have time to extend the head before the propelling force will have driven the occiput forwards, so as to put the perineum very much upon the stretch. When this submental pressure has produced extension as far as it is capable, if the orifice of the parturient canal be sufficiently relaxed or dilated for the apex to engage in it, then the head will easily pass through

FIGURE 4.—A, anus; B, bladder; F, fourchette; L, liq. amnii; M, muscular edge; U, urethra.

it (figure 4). If, however, this orifice be not so relaxed or dilated, then the advancing foetal head will stretch the perineum from four to five inches antero-posteriorly, push the fourchette upwards instead of downwards, and drive the perineal rings before it, instead of dilating them and passing through them; and will cover itself with the flattened perineum, in which the muscular fibres are separated, and the fascia stretched to their limit of resistance. (Compare figures 2 and 3 with figure 4.) As the forehead passes beyond the coccyx and ligaments, the propelling force acts against this quasi-membrane somewhere near the region of the anus, for there is now no directing force left except these attenuated muscles and fascia of the perineum.

Now if the pains still be moderate and the tissues unusually strong and elastic, they will finally work up the occiput and draw the edges of the vulvar opening over the head. But the difficulty is this: If the pains be moderate, their pressure being against the neighborhood of the perineal centre of resistance, is counteracted by the almost direct counter-pressure from that centre, and the retractibility of the over-stretched and flattened tissues being but feeble, the head remains almost stationary until, as Barnes expresses it, "the circulation becomes impeded, and, after a time, the tissue half necrosed, becomes as brittle as wet brown paper, yielding under the slightest force." ("Obstetric Medicine and Surgery.") Rupture is thus almost certain to result. If, on the other hand, the pains be very strong, the resistance at the perineal centre is not powerful enough, and a rupture must occur. The lost link in the delivery of the head is thus seen to be the absence of an efficient

directing force towards the vulval outlet. Or, to express it differently, the head has got beyond the reach of its efficient directing forces, before it is delivered. This great mistake of nature, as it thus appears, has led to the invention of numerous devices for supporting or, more properly speaking, managing the perineum.

There are five methods of doing this:

1. Supplying the directing force, by pressing up the head so as to hold the sub-occiput under and against the pubic arch.
2. Supplementing the resisting force of the perineal centre by pressing against the advancing head, and thus gaining time for relaxation above.
3. Goodell's manœuvre of pulling forward the deeper portions of the perineum, and so diminishing the tension.
4. Artificial dilatation.
5. A combination or modification of some of these four methods for the purpose of securing the delivery of the head between pains.

Almost all lacerations that occur may be described under three heads: Lacerations of the vulval perineum; of the vaginal perineum; and compound lacerations, or those which involve both of the structures.

Laceration of the Vulval or External Perineum.—We may have a rupture of the perineum extending from the external to the internal perineal rings, viz., through the mucous membrane of the fossa navicularis down to the edge of the muscles (from F to M, figure 3), and through a corresponding amount of skin externally. After delivery the torn surfaces represent two isosceles triangles, whose bases meet in the median line, and whose apices are the torn corners of the fourchette. The tear through the cutaneous surface will in some cases be extended much further, laying open the loose connective tissue down to the external anal sphincter. In addition to this lesion we may have a transverse rupture across the posterior portion of the vestibule, just in front of the vaginal orifice, giving to an almost harmless form of laceration an exceedingly ragged and threatening appearance, especially in fat persons.

Such lacerations are produced when the perineum is stretched from four to five inches antero-posteriorly, and the internal, or vaginal, ring being larger and extending about an inch and a half lower than the external, or vulval, ring, suddenly slips over the advancing forehead and drags the insufficiently dilated vulval ring so rapidly after it as to tear it. The transverse rupture may occur first, and the other afterwards; or efficient management may enable the head, and even the shoulders, to be born without tearing through much, if any, of the skin. Forceps, by rapid extraction or faulty shape, rupture these parts in a large percentage of cases in which they are used.

The simplest and most rational way of preventing this form of laceration is to stretch the external, or vulval, ring until its lower edge corresponds to the lower edge of the internal, or vaginal, ring, and keep it there. Both rings being practically of the same

size, will then slip over the head together, and the external perineum be protected behind the internal.

Laceration of the Vaginal Perineum.—We may have lacerations of the vaginal perineum involving the vaginal mucous membrane only, or the submucous tissues only, or both together.

The mucous membrane may give way from friction against the head, or from over-distension, yet need not concern us here unless it involve muscles and fascia underneath. They are produced by a rapid advance of the head not giving time for normal stretching, or by the failure of a directing force to push the occiput above the upper edge of the muscles and fascia. Just as the fascia gives way in the median line, a falling off in the pain, a timely management of the perineum, or a relaxed condition of the outlet, either by checking the too rapid advance or finally directing the occiput through the vulva, allows of delivery without extension of the rupture through the vulva and skin.

In this class belongs the variety described by T. A. Emmet, in which a transverse, or circular, laceration takes place at the internal or vaginal ring, separating "the pelvic fascia just where it is reflected from the sulcus on each side over the muscles at the vaginal outlet." (*Medical News*, January 23, 1886.) When this "transverse tear takes place, and the head continues to advance, the connective tissue between these muscles separates, and the muscles themselves are drawn aside, as a curtain, with often not the slightest injury to the skin in front, or the mucous coat of the vaginal canal." (*Op. cit.*)

If, however, the vaginal mucous membrane be sufficiently loose and voluminous to remain intact during the separation of fascia along the median line, or the rending of muscle laterally, and the progress of the occiput be then checked and guided by a proper directing force, we may have a purely submucous rupture. But we may also have a descent of the head which will not be rapid enough to thus tear whole muscles apart, yet so rapid that, when the perineum is stretched to its utmost limit, and the line of advance of the head is pointing towards the perineal centre of resistance, the muscles and fascia will become over-distended, and the fibres and tissues give way all through the membranous cap without implicating either the vaginal or cutaneous surfaces. Such is not a very uncommon occurrence in malpresentations, and in forward rotations of the occiput. The main evidence of this form of diffuse laceration is a soft and dilated condition of the parts, persisting after several hours have elapsed, when we expect at least some evidence of returning tonicity. The condition is similar to that of the anus after one of those rapid dilatations from which the sphincter never recovers its former contractility.

Sometimes the posterior tissues are thus lacerated, especially along the curve of the advancing forehead, or of the forward rotating occiput, without any injury to muscles about the vaginal outlet. I have known the sphincter ani, in such cases, to require many weeks to recover its power to retain thin fluids. The expulsive power of the lower rectum has been generally lost, at the same time. Sometimes, on the other

hand, the muscles about the vaginal orifice will be the only ones to suffer. While these diffuse submucous lacerations, whether general or regional, have not been recognized as lacerations, their effects have been noted. They have been called "over-distension of the entire pelvic floor" (Mundé); "over-stretched muscles and fascia" (Emmet, Polk); "sub-involution of the uterus and vagina" (Murray, Polk, Cleveland, and others), etc.

In order to bring the ends of broken fibres together, the perineal body should be gathered up by two or three stitches taken from the cutaneous surface, and avoiding puncture of the vaginal and rectal mucous membranes. Otherwise normal involution and contraction may never occur, and permanent displacements of the pelvic viscera will result. The perineal tissue may then be likened to a worn-out elastic suspender, in which the rubber threads are broken and the elasticity gone. Its length may be reduced by removing a piece and sewing the ends together, but its elasticity can never be restored without putting new rubber into it. A fortunate circumstance in connection with such cases is that in some portion of the tissues enough unruptured muscular fibres, or uninjured fascia, may be left to act with the skin as a brace to the rest, and, with the aid of hot douches at 115° to 120° F., and rest in bed, may restore a fair degree of usefulness to the perineum.

Care, however, must be taken not to confound this form of laceration with that condition of the parts in old primiparæ, in which there is but little or no rupture of muscular fibre, or of the superficialies; but extensive and severe bruising, and a subsequent delay in contraction until the preventing inflammatory induration abates. Contraction may not commence for several days and may not be completed for a couple of weeks. In such cases the parts are of course very much discolored and benumbed. The perineum seems like a thick piece of soaked or softened leather, and retains a somewhat wrinkled cap-shape for many hours. The introduction of stitches to draw the parts, thus injured, into shape is not only difficult, but decidedly harmful.

Laceration of the vaginal perineum is prevented by securing a slow advance of the head over the deeper and posterior portions, and by directing the occiput upwards, under the pubic arch. The proper way to secure this directing force is to dilate the vulval and vaginal rings, so that the occiput will engage in them before the forehead has got beyond the ligamentous perineum. Then the lower edges of the two rings become a directing power and lift the occiput up under the symphysis through the already dilated outlet. This descent of the lower edge of the rings brings the tissues together in a solid mass near the anus, and renders them capable of meeting any ordinary propelling force without danger of rupturing. The meddlesome and unnatural practice of using hot vaginal douches, for relaxing the perineum before delivery, cannot be too strongly condemned. They wash out the natural secretions and leave a comparatively dry and irritable mucous membrane, thus increasing friction and danger; they either contract the tissues or lessen their tonicity, seldom relax-

ing without weakening, as does a normal advance and recession of the ovum; they can with difficulty be used without increasing the discomfort and anxiety of the patient; they are less efficient for the relief of irritability of the parts than hot applications to the abdomen and external perineum, or hot hip baths.

Compound Lacerations.—Of the remaining class of perineal lacerations, or those in which both the vulval and vaginal portions are concerned, the simplest form is that in which the superficial muscular fibres give way in the median line along with the fourchette. This occurs with a rapid delivery of the head, as in forceps cases; and especially during great bulging of the perineum, when the posterior portions have been dilated, and the last few insufficiently dilated fibres about the vaginal ring unable to stand the stress of a strong pain. The advancing forehead may extend the laceration down to or through the sphincter ani. Emmett's T-shaped laceration may result from this kind of strain, and then involve the vulval portions. Or the laceration may commence in the vagina, below the vaginal orifice, and then be completed externally by the advancing head or shoulders. Or if pains be strong, and particularly if the sacrum and coccyx be insufficiently curved, the head may push on through the perineum at the sphincter of the anus, and leave an upper portion intact. Or the head may rapidly distend the perineum above the anal sphincter until a central rupture will occur, and then be made to pass through the vulval orifice without doing any further injury. But the head and body of a child can hardly pass through a central median rupture without involving either the sphincter below or the septum above. Finally, we may have a diffuse submucous laceration, becoming complicated, later, with other varieties.

These, though by no means all, may, I think, be taken as a representation of the usual forms, and methods of occurrence, of perineal lacerations. Prevention, applied to them as a class, would, according to the observations presented, involve two principles:

1. To make the advance of the head slow enough to allow the parts to dilate to their utmost without tearing.

2. To secure sufficient dilatation or relaxation of the vulval and vaginal orifices to bring their axes to correspond with the axis of the parturient canal, so as to enable the head, as it gets beyond the influence of uterine and pelvic directing forces (the amniotic fluid, the pubes, sacrum, coccyx, ligamentous perineum, etc.), to find a directing force in the vulval and vaginal orifices or rings.

In endeavoring to diminish the rapidity of the progress of the head, it is well to take two points into consideration: 1. That uterine action becomes more efficient, as labor advances, on account of the increased length and frequency, rather than the increased force, of the contractions (Schatz). 2. That when the head is capped by the membranous perineum, and therefore is not delivered until it has passed entirely beyond the bony pelvis (figure 3), the uterine contractions have at last almost no direct effect upon its advance, and the abdominal pressure

or straining of the mother becomes the chief propelling force (Schröder).

Hence, if we wish to diminish the propelling power during the passage of the head through the pelvis, we may often with advantage give remedies which will act between the pains to diminish their frequency, such as opium, chloral, etc., yet without very much affecting their force. Chloroform, given only during pains, diminishes their force without much affecting their frequency. Later, when the abdominal muscles are the prime forces, we may regulate the advance of the head by controlling them.

The prevalent practice of accelerating the progress of labor until the head greatly distends the perineum, and then using counter-pressure to keep the vulva from being lacerated, is to deliberately injure the pelvic floor, and then court rupture of the uterus.

Perhaps the best means of securing a normally slow advance of the head is to preserve the pouch of membranes. This may be done by keeping the patient quiet, discouraging all violent bearing down efforts, making but few digital examinations between, and none at all during pains.

Artificial dilatation of the vulval and vaginal orifices has been advocated by Ernest Trestrail (1875), Mossman (1880), Alex. Duke (1883), and Alfred Carr (1883). Latterly, Professor Leon Dumas has developed a very efficient method of digital dilatation of these orifices, and has practiced it with gratifying results (*Montpellier Médical*, August, 1883,—"Dilatation Præ-fœtale de la Vulve"). In my own practice I utilize the pouch of membranes for this purpose also. The vulval and vaginal orifices, being relaxed and everted, are, in most normal cases, less resisting to the pouch than was the os uteri. After being dilated by the pouch, they allow of the rapid passage of the head, thus shortening, and greatly lessening, the usual anguish of the last moments of labor; and reversing the fashionable mode of hurrying up the second stage to save pain, and then checking the advancing head at the final period of severest suffering.

A comparison of figures 3 and 4 will show that when the bag of waters persists, the perineal rings are better prepared for the delivery of the head while the forehead is still on the sacrum, than they are after the chin has passed the coccyx, in those cases where the membranes have been ruptured at the end of the first stage. Besides this, the head has a third less distance to travel during the second stage until born, and thus takes a third less time at a given rate of advance.

In thus advocating a bringing down of the fourchette, I only seek for an imitation, in all cases, of the mechanism that sometimes occurs in young primiparæ, and often in multiparæ, where the vulval and vaginal outlets are normally, and therefore greatly, relaxed; and where neither pouch presents nor fingers interfere. There is much less work either for the pouch, if left alone, or the fingers, if *properly* used, than is generally supposed. But that little work is often of prime importance.

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A PLEA IN BEHALF OF A NAVAL HOSPITAL FOR INEBRIATES.¹

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In this paper it is proposed to discuss: *First*, the history and origin of hospitals for inebriates; *Secondly*, the presentation of facts to prove that inebriety is a disease; *Thirdly*, the value and results of institutional treatment; and *Fourthly*, the present necessity of a special hospital for the treatment of inebriates of the Navy.

First.—Dr. T. D. Crothers, in a paper read before the London Branch of the British Medical Association, states that "the earliest organized effort in modern times to prevent inebriety was a temperance society which began in New York State in 1828." I may add that two years previously, in 1826, a like organization was started in Boston. The object of these societies was to aid others in pledging themselves to abstain from the use of all intoxicants, and to help each other to carry out this resolution. The Washington societies began in 1840; this movement was greatly promoted by the labors of Father Mathew, an Irish prelate, by Mr. Gough, and Neal Dow, who gave to us the Maine liquor law. Subsequently friends and Sons of Temperance carried on this great work, and since the late civil war the Gospel Temperance and Good Templar societies, perfecting the system which at present embraces the social, moral and religious elements of man's nature. The need is for these classes fully to comprehend the fact that inebriety is a true disease—a widespread epidemic—and to be successfully treated comes within the domain of preventive medicine, and to be relieved and cured must be submitted to the treatment of special and fully enlightened physicians. In the exhaustive address of Dr. Crothers, he adds that "the first period, the rational or scientific epoch, began in 1790, when Dr. Rush, a distinguished physician of Philadelphia, urged that inebriety was a disease and should be studied as such; a physiological and not a moral condition. In Europe this theory was taken up and made the subject of several papers which have become historical."

In 1852, Dr. I. Edward Turner projected the first asylum for the medical care and treatment of inebriates. A new era dawned when the labors of this great philanthropist culminated in the opening of the New York State Hospital. During its brief existence of fourteen years 2,344 inebriates were treated. This enterprise attracted the attention of the world, and clearly demonstrated the disease of inebriety and its curability. In 1859 a similar hospital was begun in Boston, now known as the famous Washingtonian Home, with Dr. Albert Day as Superintendent. During the twenty-five years of its existence almost 8,000 patients have been cared for, "some of whom are now heard from, now honored citizens and performing well the duties of life." During fifteen years the Binghamton Asylum received 7,000 patients for treatment, and from the study of over 2,000 cases five years after the period of treatment in the asy-

¹ Read before the Naval Medical Society.