

CENTRAL PERFORATION OF THE PERINEUM.

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VARIOUS injuries to the pelvic floor occur consequent to labor, varying from slight abrasions of the posterior commissure to tears involving the lateral vaginal fornices, the sphincter ani, and at times the integrity of the rectovaginal septum. These are all more or less preventable, depending to a considerable extent upon the skill of the accoucheur; but the rare variety, the subject of this paper, occurs most often under circumstances over which the attendant can exercise little if any control. This form of injury, central perforation of the perineum, is decidedly rarely met with; its notice in the various text-books is very meagre, and many of the most experienced obstetricians of the past have doubted its very existence. Because of the decided paucity of description found in the standard works upon obstetrics, it may be well to state that it consists

of a perforating wound in the perineum in front of the anus, of a transverse, rounded, or irregular shape, bounded in front by a bridge of tissue formed by the fourchette and the tissues immediately adjacent posteriorly thereto. It may be either small, as in the case herein reported, or large enough to have accommodated the birth of the child.

In passing, it may be mentioned that the possibility of the birth of the child through the perforation was ridiculed by some of the older observers, and, indeed, this is not to be wondered at, since those who have never seen the mechanism of such an occurrence might well be incredulous. Associated with this injury, there may be no involvement of the sphincter ani; on the other hand, it may be completely torn through, with a corresponding involvement of the rectovaginal septum;

there may be no wounding of the fourchette or even of the hymen, a bridge of normal tissue extending forward from the central tear, or there may be accompanying tears of various degrees involving the anterior portion of the perineum and extending more or less backward toward the perforation. As to the vagina, it may suffer in various degrees from simple sulci tears to a complete destruction of the rectovaginal septum, or, by the occurrence of a vertical tearing at the outlet, an actual separation of the vulva from the vagina may occur. The first recorded tear of this variety is said to have been observed by Harvey, not in a woman, but in a mare, the property of the Queen of England. The first case recorded as occurring in a woman is ascribed to Néday, of Besançon, in 1778, though Birnbaum states that Bianchi and Violet were really the first to observe the condition.

In 1885 Charpentier was able to collect 56 cases of central rupture of the perineum, and in 1891 Delcroix reported 18 additional cases. Among these 74 cases the rupture was caused nine times by the elbow or foot, and in 24 cases by the head or buttocks. In all these 33 cases the delivery was by the vulva. In 38 of the remainder the delivery was completed through the rent. In the other 3 cases the manner of birth was not stated.

The patient presenting this interesting abnormality in the course of the second stage of her labor was the wife of a physician. She was a primipara; an extremely nervous woman about twenty years of age. She gave a history of having always suffered greatly from neuralgia. Her pregnancy, except for rather more than the usual amount of vomiting and what she designated as "nervous spells," was without incident. Her husband kept track of the urinary condition and reported it as normal throughout her gestation. Her last menses occurred on January 10, 1903. She had been married at that time but a few months. Her pelvic measurements were as follows: ext. conj., 18 cm.; interspinous, 23.5 cm.; intercrural, 24.5 cm., and diagonals, 22 cm. each.

At the time of measuring the above diameters an attempt at a vaginal examination was made, but was found to be impossible, since the introduction of the first joint of the index finger within the introitus caused, according to the patient, most exquisite suffering. Feeling that possibly this was largely imaginary and that she might lend herself better to examination at a subsequent visit, it was

not persisted in. About two weeks later another attempt was made to measure the conjugate diagonal, but with no better result. The introitus was so sensitive that it was entirely out of the question to reach the promontory of the sacrum.

There was nothing in the appearance of the genitalia which could explain this sensitiveness, except a certain amount of redness due probably to the rather exaggerated leucorrhœa of pregnancy which she presented. The head at this time was partially within the pelvic cavity.

On October 21, 1903, the patient fell into labor. It was easy and fairly rapid, though the cervix was rather slow in dilating, but the whole course was not over fourteen hours in duration. When the head reached the perineum the patient, though still making a great outcry at the advent of each fresh pain, began to behave somewhat better than formerly. In the earlier course of her labor she was almost violent in her excitement, and reminded one rather strongly of earlier experiences among the insane. When the period of vulvar gaping was reached her excitement again increased. At this time she was again examined with much difficulty, and the head was found in a condition of very decided flexion; the condition of flexion was, indeed, so marked that the small fontanelle was found just below the posterior fourchette. Here it remained without advance. The patient had now become almost uncontrollable. She would not administer an anæsthetic to herself, and her husband and the trained nurse were both useless as anæsthetists, the former from a very natural anxiety, and the latter from sheer incompetence. I, therefore, as the head in its flexed condition was causing a gradual but by this time exceedingly marked distention of the perineum, decided to apply the outlet or Sawyer forceps. Attempts were made in vain to extend the head by elevating the handles of the instruments until finally the head, without extending in the slightest degree, suddenly perforated the perineum just in front of the anus. The tissues of the perineum had been steadily becoming thinner, till at the time of the rupture its thickness was not that of an ordinary piece of paper. As soon as this accident happened the forceps were at once removed and the perineum was incised from the fourchette, which had not been at all injured, down through the perineum to the central perforation. Delivery was at once accomplished without difficulty, and on examination the sphincter

was found intact. The wound was at once sutured with silkworm-gut, two stitches being placed in the left sulcus and four in the external perineum. The puerperium was entirely normal, except that for a few days there was a little incontinence of both feces and gas, probably the result of the extreme pressure to which the tissues had been subjected.

The child was of good size, weighing eight pounds, and was easily resuscitated. The action of the perineum during the latter part of the expulsive stage of this case deserves special consideration. Instead of the normal moderate amount of stretching, with the accompanying alternate periods of relaxation, it soon became permanently stretched by the head, which did not recede between the pains. Then it gradually thinned and stretched anteroposteriorly, so that the distance from the anus to the fourchette became tremendous from the standpoint of comparison with the usual case. Between the points mentioned there was certainly a ten-inch space. It finally, as has been said, became as thin as a piece of paper, particularly in front of the anus, and its nutrition being prevented by the constant and unremitting pressure of the presenting part, it readily ruptured in the manner stated. It will be found that in the histories of other cases of this accident there has been frequent note made of this remarkable distention of the perineum. Its causation is due to the fact that the head as a whole is directed backward toward the rectum, instead of toward the vulvar commissure, and so, instead of the perineum acting as a steering agent for the presenting part, it becomes simply an obstruction to its advance, and thus becomes gradually thinned and distended as the head presses upon it. Perineal injuries of this variety being, as has been said, of considerable rarity, it seems advantageous to rather closely consider some of the previously reported cases.

By one author, Edgar, the total number of cases reported is placed at 75; of course, the accident is not to be considered the rarity this statement would indicate.¹ I have looked up the German and English literature quite carefully, and have found 15 cases. The first 5 of these may have been included in the statistics of Delcroix, but the remainder have not been previously studied collectively. Unfortunately, many of the histories of these cases were

so imperfectly reported that their value is greatly impaired.

Certain facts may, however, be learned. It is, for instance, found that in these 15 cases the duration of labor was only exceptionally abnormal, the longest time noted being forty-eight hours. Moreover, in but 4 of the cases was any mention made as to operative interference having been necessary. Of these 4 cases, there was 1 forceps extraction, attempted after the tear occurred; here the perineal stage was but one and a quarter hours in duration, and interference was not deemed needful until after the injury had resulted. In another case a prophylactic episiotomy was done, and in still another, the third of the operative deliveries, episiotomy was also performed, in spite of which delivery took place through the central rent, while in the last case an incision into the fourchette was made and delivery effected by extension of the presenting part. These four cases are thus the only ones in whom intervention was practised, and we believe that we are correct in making the statement that in each of them the actual occurrence of the injury was the signal for intervention, instead of any previous abnormality of the labor. The longest perineal stage definitely noted in any case was one of three hours; 1 was indefinitely reported to have had a perineal stage lasting many hours, and there were 2 others which lasted a little over an hour, while in the remainder no mention was made of the duration of this stage. Certainly, if prolongation of labor were a common accompaniment of the injury, it would have been more frequently noted in the case histories. With regard to the age of the patients who suffered this traumatism, it is of interest to note that in 9 of the series the women were under thirty years of age, while of the remaining 6 cases but 1 was over thirty-four. Two of the 15 were, indeed, only nineteen years old, while in 1 the age was but eighteen years. It can thus certainly be deduced that changes in the tissues due to advancing years can hardly be predicated as a cause of the accident. In 9 of the cases the patients were primiparæ; in 1 case the question was not answered, while the remaining 5 women each had had two or three children. In 2 cases the fourchette was intact. The manner of birth in 5 of the cases was by the vagina, while in 8 it was through the perineal rent. In 2 cases no mention was made of the manner of birth. In 2 of the cases a forward displacement of the external genitalia was noted, and in 1 of these the

¹ In the discussion of this paper at least four unreported cases were given by those participating.

malposition was so marked that the vulva could be seen when the woman was erect. The condition of the introitus before the birth was mentioned in but 3 cases; in 1 it was described as an atresia, occurring in a girl aged nineteen years; in another as very rigid, the age of this patient not being given; while the third was recorded as narrow and rigid, with a thick and non-elastic perineum. The age of the last-mentioned woman was forty-one years. The pelvis was stated to have been normal in 4 of the cases; there was a low, flat os pubis in 1 case; the pelvic inclination was lessened in 2 cases, in 1 of which there was general contraction of all the diameters, and in the fourth case there was an almost complete absence of the sacral curve, with backward rotation of the sacral bone as a whole. As to the sphincter ani, it was not injured in 6 of the reported cases; a slight tear was found in 3 patients, and a marked tear in 3. Its condition was not reported in 2 cases. A marked anteroposterior lengthening of the perineum was recorded in 6 cases. In the remaining 9 reports there was no mention made of its occurrence. We believe, however, that it was present in all the cases in which either the breech or the head was the presenting part, as in our opinion it is a necessary forerunner of the accident, as, indeed, it must be, if our statement as to the etiology of this tear be correct.

Probably the most interesting phase of this subject is presented by a study of its etiology, which is, in reality, simply a consideration of the mechanism of labor during the last part of the second stage; that is, during the time of the passage of the head through the inferior strait and vulva ring. At this period of normal delivery the base of the occiput will be found to be under the subpubic ligament, and the occipital protuberance will be seen projecting somewhat through the vaginal orifice. The head is practically at this time engaged in the inferior strait of the pelvis, with the parietal protuberances in relation to the tuberosities of the ischium and the biparietal suture corresponding to the middle line of the perineum, the anterior fontanelle being opposed to the extended os coccygis. The posterior commissure at this time stretches over the head, practically coinciding in its direction and position with the lambdoidal suture, so that the posterior fontanelle is covered by the perineum, and is practically at the centre of the inferior strait, and, therefore, must be considered as the true presenting part at the inferior strait. The occipitomen-

diameter is, therefore, coincident with the axis of the inferior strait and the biparietal with the transverse diameter, while the cervicobregmatic diameter of the head is parallel to the anteroposterior diameter. In other words, the head engages in the inferior strait, just as it does at the superior; that is, with its cervicobregmatic circumference. The great flexion normally existing at the superior is, however, changed to a condition of partial extension, to allow for the obliquity of the inferior strait, as compared to the superior.

When the parietal protuberances of the head have passed the ischial rami, the so-called fourth period of the second stage commences. At this period the large diameters of the head are free from the bones of the pelvis, and the head is held simply by the soft tissues of the vagina and perineum, the most important structure being still the levator ani muscle. The direction of the vulvar cleft now becomes approximately horizontal, and the fourchette glides gradually forward from the region of the posterior fontanelle toward the anterior portion of the head, until the parietal eminences escape and the head is born. The actual birth of the head takes place as the resultant of the following factors: first, the arrest of the base of the cranium at the pubic arch, and, second, the uterine action. The direction of this last force is still exerted through the spine of the child, and is thus coincident with the axis of the superior strait, and therefore tends to direct the head backward toward the coccyx. This backward tendency is, however, corrected by the action of the sling-like levator ani muscle, which lifts the head forward; the resultant of these two forces, namely, the uterine expulsive and the perineal resistant, being that the head is moved in the direction of least resistance, in accordance with the law of the parallelogram of forces, namely, toward the vulvar outlet. The movement of extension occurs as the result of the above forces, together with the detention of the suboccipital region under the pubic arch, and the fact that each movement of extension of the head renders its further extension so much the easier, in that the direction of the uterine force is transmitted to a more anterior point of the head with each succeeding pain. A point of decided importance in our study is the exact relation borne by the head to the maternal parts during the last part of the stage of expulsion. This relation may be stated as follows: When the occipital extremity of the head passes the vaginal orifice, the nape of

the neck is at the top of the arch of the pubes, the parietal protuberances are at the vulva on either side, and the apex of the head, or the posterior margin of the great fontanelle, is at the fourchette, the small fontanelle being near the centre of the opening and not below and covered by the fourchette, as in the case reported. In other words, the cervicobregmatic diameter is at this period of a normal delivery coincident with the anteroposterior diameter of the vaginal orifice, the biparietal corresponding to the transverse diameter of the same and the occipitomentale to the axis of its plane. The head, therefore, passes perpendicularly to the orifice of the vagina, just as it did to the plane of the superior strait, the opening of the os uteri, and the plane of the inferior strait.

In the case just reported there was no such mechanism as has been detailed. The occiput never reached the subpubic ligament, but instead the head was directed backward toward the rectum in a flexed condition after its escape from the inferior strait, as is shown by the relation of the posterior fontanelle to the fourchette, as above described. Moreover, not only was all attempt at extension absent, but also all anterior propulsion, as shown by the tremendous distention of the perineum. In other words, in the case reported the head continued to advance in a direction perpendicular to the plane of the outlet after it had passed this plane and struck the perineum with the anterior fontanelle as its presenting part, the latter impinging upon the perineum a little in front of the anus. Now, the only manner in which such a variation from the normal mechanism can occur is by the presence of some abnormal condition of the levator ani muscle, by which its function is abrogated. It is easy to imagine that in a woman whose levator had been badly torn in previous deliveries this abnormal persistence of direction of the head might occur, although it is almost never seen, because of the absence of the muscular action, but in the present case, as has been stated, there had been no previous delivery; moreover, examination subsequent to delivery showed but a slight wounding of the muscle. As has been stated in the history of the case, there had been so great difficulty experienced in making an examination during the pregnancy, that no exact determination of the conjugate had been made, while during her delivery no satisfactory pelvic examinations were possible. In other words, the condition suggested to me was something very

closely akin to vaginismus, and it appeared to me to be plausible in considering the case to attribute the marked persistence of flexion or the absence of attempts toward extension to a condition of spasm of the levator ani muscle, which would prevent its alternate relaxation and contraction, and would, particularly by its anterior fibres grasping the head near the brow, prevent its extension and upward propulsion. Certain other factors which have been considered as etiological by other observers were not present in this case; thus, there was no change in the inclination of the pelvis from the normal, neither was any abnormality of the sacrum or coccyx demonstrable. In my opinion, therefore, the cause of this accident was an alteration in the function of the levator ani muscle, causing or allowing a persistence in the marked flexion which, normal for a higher plane, was abnormal during the stage of actual expulsion of the head. Just what this functional alteration in the levator muscle consisted in I am unable to state, but I believe, as indicated above, that it was a condition of spasm, which, by grasping the advancing head in its anterior region, prevented its extension. In addition, I believe that the presence of a somewhat narrow symphyseal arch contributed to the production of the injury. This factor, while its presence would not alone be a sufficient explanation, would, nevertheless, in conjunction with an abnormality in the action of the levator muscle, manifestly render the occurrence of the perforation more probable by tending to promote backward displacement of the head.

Regarding certain other factors which have been believed to have had an etiological value by various authors, it is our opinion that they can act only secondarily. We do not believe with Dupuytren and Winckel that undue length of the perineum, whether congenital or acquired, can lead to perforation of this structure unless other factors be operative, and neither do we consider a rapid and stormy expulsive period at all likely to result other than in the production of one of the usual varieties of perineal injury. Neither will narrowness of the vulva predispose to a central tear, since the head, if all other factors be normal, will have become extended sufficiently to tear through the vulva and anterior portion of the perineum instead of perforating it. A pendulous abdomen may, indeed, tend to direct the presenting part posteriorly, but, the other factors being normal, such a backward

direction will have been corrected before the head reaches the perineum. Overdistended bladder has even been invoked as the main cause in one reported case; this is fallacious, as, if the head could engage and descend to the perineum in the presence of such a condition, its further progress would not be at all influenced by it, while, if during a long second stage the bladder condition primarily developed, the pressure of the head would tend to sacculate that viscus rather than to be pressed backward by it.

Various procedures have been advocated to prevent the occurrence of this injury. The signs which lead one to anticipate this accident are the development of marked perineal distention, together with failure of retraction of the presenting part between the pains in association with a failure of extension. When such a condition is present, it is very evident that the use of either chloroform or ether is indicated to a degree sufficient to relax the tissues of the outlet. In addition, the indications are to promote extension and upward propulsion by the forceps or the rectal finger. From my experience in the case reported and from the reports given in the literature, I feel convinced, however, that in the vast majority of cases, particularly if the symphyseal angle is lessened, there will be a failure to prevent the central tear by the use of either chloroform or ether, and that if forceps or rectal manipulation be attempted, the only probable result will be the production of the perforation a few minutes before it would otherwise have occurred. I believe the proper procedure is to incise the perineum when the distention has become abnormal, and then, if the head is not promptly delivered, to either apply forceps or rectal expression.

The incision of the classical episiotomy is not advisable, but rather one made in the median raphe of the perineum from the fourchette downward toward the anus, its extent being determined by the exigencies of the individual case. If, as in our case, the tear occur while actively attempting to deliver, it is hardly needful to say that all such attempts should at once cease, and that the perineum should be immediately incised from the fourchette to the anterior margin of the central rupture, and delivery then effected. If this be not done, a much more severe traumatism will result, very generally involving the sphincter ani.

Lest the inexperienced obstetrician become needlessly alarmed in the presence of a normal

condition of perineal distention, it must be remembered, as stated above, that while overdistention is the most evident danger signal of threatening central rupture, that its causation is due to a backward displacement of the presenting part as a whole, with an absence of the movement of extension. In other words, the retaining by the presenting part of the attitude and direction which were normal for its passage through the inferior strait after it had passed that plane. A knowledge of the normal attitude and position of the head in the various planes of the maternal pelvis will prevent uncalled-for anxiety.

It is hardly necessary to-day to state that if a central perforation of the perineum occur, it is advisable to repair it at once, or as soon as the local condition warrants. The same general rules hold good here as for the treatment of other varieties of injury to the pelvic floor after labor. Some authorities believe that better results are obtained by deferring repair until several days have elapsed, thus allowing oedema to subside and rendering the proper preparation of the patient possible, as for other surgical intervention. Others still adhere to the immediate repair of all such injuries. Which ever course is to be followed will depend upon the judgment of the individual obstetrician, the only point to be emphasized being that better results will, in general, be obtained by operative repair than by trusting entirely to nature, as was advocated by Roux and others, although they have reported good results by so doing. There is no question that nature can heal these as well as other injuries, and also that the pelvic floor will not necessarily become weakened by this injury if it be unassociated with other forms of laceration, such as sulci tears; but, practically considered, it will be found that none of these lacerations occur without greater or less injury to the vagina and underlying tissues, and, therefore, if for no other reason, they should be repaired as soon as possible. Moreover, as these injuries so frequently involve the sphincter ani, as well as the rectum and the rectovaginal septum, the danger from sepsis offers an indication for their immediate repair whenever possible. The first step in such repair should always be a median section of the bridge of tissue between the perforation and the fourchette, since by so doing the proper coaptation of the parts will be greatly facilitated, and, more important still, the vaginal tract will thus be exposed, and the tears in its lateral sulci may be

accurately united; a proceeding of much greater importance to the patient than the suturing of the external perineal wound, since the former deprives the pelvic tissues of their normal support, while the latter in no way interferes with the abdominal retentive power, but simply is a menace from the aspect of possible septic infection.

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