

TUCKER (E.F.)

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of the pelvic floor



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THE MECHANISM OF LACERATIONS OF THE PELVIC
FLOOR.

BY ERNEST F. TUCKER, M. D.,

Lecturer on Clinical Gynæcology in the Medical Department of the University of Oregon; Attending Gynæcologist to the Woman's Hospital and Sanitarium, Portland, Oregon.

As a rule, the more numerous the remedies proposed for any disease, the less is the pathology of that disease understood, and the less is it amenable to cure. So would it almost seem with lacerations of the pelvic floor, for there is hardly any gynæcologist of note who has not his own pet operation for the remedy of this injury, and which only too often he applies to all cases alike. That they are not all satisfactory is proved by the fact that new operations are being continually invented, and in the hands of many take the place of the old, for a varying period of time, until it either proves itself unworthy or a new one makes its appearance and claims a trial.

This unfortunate state of affairs comes, it seems to me, not only from a lack of a due appreciation of the injury undergone, but also from the fact that the manner in which it is incurred has not been sufficiently taught and explained.

In most of our text-books, if we look up the ætiology of this injury, I think the impression would be gained that these injuries are caused by an overdilatation of the vagina or vulvar orifice by the child's head, while, as a matter of fact, the real damage is caused by an overstretching or a loss of continuity of some of the fibers of the levator ani muscle.

The true nature of this injury was first made public about eleven years ago by Dr. Emmet¹ in this country and by Dr. Schatz² in Europe, each one unaware of the labors of the other in this direction. Since then considerable has been written on this subject, all tending to prove that these muscles are really the parts involved in injuries to the pelvic floor; but, in spite of this, operations are continually per-



formed that certainly can not possibly have in view the restoration of the injured tissues, judging either from their results or the manner of their performance. The fact of the matter is, that it seems impossible to rid the general practitioner—to whom so many of these cases come for relief—of the idea of a “perineal body,” and of the necessity, in its absence, to construct an artificial one by building up a barrier of scar tissue at the vulvar orifice. Some of our even more recent text-books seem to have a tendency to maintain this idea by devoting space to anatomical descriptions of the perineal body.

The symptoms and anatomical results of lacerations of the pelvic floor have been well and thoroughly described, more particularly in America by Emmet,³ Skene,⁴ and Kelly.⁵ The anatomy of the levator ani muscle and its physiological functions have been thoroughly studied by Dickenson⁶ and others; but the special part played by this muscle in delivery of the head does not seem to me to have been sufficiently dwelt on.

In an ordinary normal occiput anterior position the head descends flexed, pushed on by a force from above, acting more or less in the direction of the axis of the superior strait; rotation gradually takes place, and the occiput comes under the pubic arch; the head meets with the resistance of the pelvic floor, extension follows, and the head is born. The interest of the gynæcologist begins at that point where the head commences to press on the pelvic floor. The direction of the force which is pushing the child downward remains about the same throughout labor; so that, although the occiput may be under the pubic arch and protruding through the vulva, the contractions of the uterus and abdominal muscles tend to drive the anterior portion of the head toward a point somewhere between the tip of the coccyx and the anus. These parts yield to this pressure, the coccyx being forced backward, the anus backward and downward, to such an extent that it gapes wide open. The posterior commissure of the vulva is forced almost directly downward a distance corresponding to the cervico-bregmatic diameter of the head, whereby the distance from the tip of the coccyx to the vulvar opening is about doubled; and the child would now be pushed right into the world through the rectum—as has happened—were it not for the restraining influence of the levator ani muscles, which by their contraction tend to drag the head forward and out under the pubic arch so long as their continuity is intact. I believe that at this period in delivery the head rests, as it were, in a sling formed by the pubo-coccyge portion of the muscle, and that the perinæum itself is never put on the stretch

so long as these muscles hold; a rigid perinæum is a rigid levator ani; furthermore, that the lower fibers of this muscle aid in the act of the delivery of the head, favoring extension by drawing up the occiput and expulsion by drawing forward the head, the ischial portion at the same time tending to retract and slip back the perinæum over the advancing head. I do not know if this action of the levator ani has before been published, but, by careful observation of obstetrical cases and a study of the function of this muscle, I have been led to believe that in this very way safe delivery is accomplished. If it were not for the resistance offered by this muscle, the vaginal wall and the skin perinæum would not hold out long against the pressure exerted from above by the uterine contractions and the voluntary efforts of the abdominal muscles brought into play at this stage; if the levator ani acted merely as a sling to support the head and nothing more, it seems to me it would merely be a question which muscular force was the greater, whether the uterus would succeed in tearing the levator ani, or whether the levator ani would completely arrest labor, either of which accident sometimes happens. But grant this muscle the power of shunting the head forward, as it were, and the child is born with perhaps no further injury to the mother than a slight nick of the vulvar orifice, which possesses no clinical significance. Referring to Dickenson's article, already mentioned, it will be found that the contractile force of this muscle, which can be exerted toward the pubic arch, has been actually measured and found to "average ten pounds, running up in certain cases to twenty-seven pounds." This is in the unimpregnated state; but during pregnancy this muscle is found to hypertrophy just as other pelvic tissues do, and it is only fair to suppose that at the time of parturition it would be able to exert a still greater force—quite sufficient to change the direction of the force from above, throwing the head forward.

As I have already stated above, unless this muscle tears or gives way, the pelvic floor or perineal tissues can not be injured; but if any of its fibers become sufficiently torn or separated to allow the head to press on the vaginal wall, rectum, or perinæum unsupported, they must necessarily give way under the force from above, and the tissues are torn, as a rule, proportionately to the tear of the levator ani muscles. I say as a rule, because sometimes in complete lacerations through the recto-vaginal septum we find no obliteration of the fold between the buttocks, and the anus and vagina drawn pretty well forward toward the pubic arch—conditions generally absent when the levator ani is extensively damaged. In these cases, I believe, the fibers

which are inserted around the vagina are torn through or away from their attachments, but those which pass behind the rectum are merely torn loose from the rectum, and slip backward and upward from under the head, thereby saving themselves but sacrificing the recto-vaginal septum. Again, we find cases of "relaxed perinæum" where there has been no external wound apparent, and yet evidences of injury to the pelvic floor are manifest. In these cases there has occurred a submucous tear of some of the fibers of the levator ani, or else the muscle has become more or less paralyzed from overstretching, and has failed to regain its normal tone.

It would further seem to stand to reason that when lacerations of the vaginal wall and perinæum take place they must start inside the vagina, at some distance above the vulvar orifice, as this is the point of greatest pressure, and are continued downward from that point. Dr. George F. Wilson, of this city, who has a large obstetric practice, recently called my attention to the fact that he always knew when to expect a laceration of the perinæum by finding bright arterial blood coming down from the vagina in front of the child's head. In a case that I saw in consultation some time ago—a primipara, thirty-six years of age, who suffered a complete laceration—blood came from the rectum before the birth of the child, and the vagina was torn on both sides internally as far up as the cervix. Forceps were used in this case, but I do not think all the blame could be attached to their use, as I do not see how the blades can possibly cut the vagina so long as they do not extend beyond the child's head. Indeed, forceps are often blamed for lacerations when, I believe, if properly used, they will often prevent injury.

Injuries to the pelvic floor occur more frequently in malpositions of the head, simply because some longer diameter of the head comes under the pubic arch, thereby increasing the strain on the levator ani muscles—that is, forcing their point of attachment further down and away from their point of origin.

Most of the directions given to save the perinæum by introducing one or more fingers into the rectum and pushing the head forward are merely efforts to assist the levator ani to do its work. Support of the perinæum by pressure directed upward can be of no avail if the head can not be pushed forward, as the levator ani must stretch downward sufficiently to allow the head to pass under the pubic arch. Violent voluntary contractions of the abdominal walls at this period, I believe, often cause lacerations, while chloroform and artificial assistance would prevent them.

As to the best method of repairing these injuries, I can only quote from Dr. E. C. Dudley,⁷ who, I think, struck the keynote to the whole question when he told his students: "You will have learned the greatest lesson in perineorrhaphy when you apply the elementary principle, that in the repair of a wound the essential purpose is to restore the wounded part to its original state."

The pelvic floor has a function, and it is that function which needs to be restored.

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