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Episiotomy

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EPISIOTOMY

BY

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EPISIOTOMY

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INTRODUCTION

In the selection of a subject upon which to write my thesis, several guiding factors were kept in mind, first the subject, be it either a condition or a procedure, must be one commonly dealt with in the practice of medicine; secondly, a thorough knowledge of this condition or procedure to be chosen would benefit many in the general practice of medicine, and lastly, that topic should not have countless articles written about it, for to deal adequately with any subject in a clear, understandable manner means certain limitation. So it was that the subject of episiotomy was selected and approved.

In writing on episiotomy I believe my guiding factors in the selection of such a topic are fulfilled. Too, a dull phase of the obstetrical field is difficult to find.

During the care of a patient a good obstetrician has in mind definite objectives: as comfortable a delivery as is compatible with safety, a well mother after delivery, and a healthy baby. He wishes to see his patient back in the usual routine of life with no distressing sequelae. Every woman coming to him wants to be well; she wants a well baby, but at the same time she wants that baby with as little pain as possible.
INTRODUCTION

Nature has endeavored to establish a favorable relativity in size, axis and diameters between those of the mother and her parts, especially the pelvis and those of the fetus and its parts. When this exists, we have the normal. When such a favorable ratio is present and with the long fetal diameter to the long pelvic diameter given the proper parturient power there will be a natural, unassisted or normal labor without destruction or harmful adaptation of one part to another. If such above relationship does not exist there will be unnatural or abnormal labor, requiring corrective assistance either natural or artificial, be it at the superior strait, in the pelvic cavity or at the outlet, be it upon the mother's part of upon the fetus' parts. As a result of such deviation we may say necessity has invented operations such as forceps, caesarian section, etc. At the outlet nature teaches episiotomy. The anterior posterior diameter of the outlet is the longest, and through it must pass the longest diameter of the fetal part. Since the antero-posterior diameters of the osseous and soft pelvic outlets are not equal in length, that of the soft outlet being shorter, often a fetal part will readily clear the osseous outlet but not so the soft outlet and then with difficult and traumatism nature endeavors to overcome this difficulty and dispro-
portion between fetal part and soft outlet by dilatation of the soft parts to encourage an increase of their diameters and circumference. If such a dilatation does not establish a favorable ratio between fetal and maternal parts, nature again takes a hand and does establish equality through separation of the soft parts of the outlet, and so overcomes the disproportion. We now speak of the soft canal as being lacerated.

DEFINITION

We define episiotomy as being a surgical incision in the vulvar tissues to prevent rupture of the perineum and to facilitate labor. Perineostomy is often used to mean episiotomy, but in the more restricted sense of the term, this means the same as median incision, or a mid line incision between the vagina and the rectum.
The desire for protection of the perineum goes back many centuries to Hippocrates who used oily salves and hot douches to soften the structures of the birth canal. (3). Before his time we can find nothing regarding perineal lacerations in the literature, thus forcing us to believe the ancients were not conscious of these resulting conditions. Then in 110 A.D. the writings tell us that one Soranus of Ephesus attempted to support the perineum by hand during the second stage of the delivery a much believed in act today. (3). At the beginning of the seventeenth century Van Horn wrote of the importance of the levator ani muscle as an obstruction to delivery, and advocated and practised manual dilatation of that muscle. So was the history of perineal protection until the middle of the eighteenth century; nothing remarkable and yet one feels the trend of thought was toward some means of improving the delivery for the sake of both mother and child.

Toward such a goal worked Sir Fielding Auld of Dublin, who in 1742 was, so far as we know the first to call attention to the subject of episiotomy. (41). There may have been many before him who appreciated it and possibly used it, but about them we know nothing. Auld suggested the physician use a central type episiotomy,
yet from his writings nowhere does he tell of his doing the operation. Credit for the actual first performance goes to Michaelis in the year 1799. This man, like Auld advocated a mid line perineal incision. (41).

In 1836 Von Ritgen proposed a new technique be used. He believed in making fourteen small cuts, seven on each side, at the vulvar outlet. These small cuts were to be made at the moment of greatest perineal distention i.e., when the head was from 1/4 to 1/3 expelled. He claimed much for this technique as regarded lessened perineal injury. He also stated the vaginal outlet diameter was increased by at least two inches. (6).

Two other men, Choilly and Honore contributed to the support of episiotomy. They stated in 1867 that they had used it for twenty five years with good results. They taught the incisions should be bilateral, oblique in direction and not exceed 2 cm. in length. They were strong believers in the advantage of incised wounds over lacerated as regarded union. (3).

In 1857 Carl Brown first used the word episiotomy. In the article he stated that he believed incisions of the vaginal orifice seldom necessary. At this time they were only used by those who believed in the importance of supporting the perineum. (6).

However, in 1850 Eichelberg and in 1852 Scanzoni
brought out and recommended lateral episiotomy. In America following an article written by Dr. Anna Browall in 1878 new interest seemed to be awakened and we find physicians here and there trying it out. (41).

A paper by Goodell in 1871 questions the indications, believing only a scarred condition of the vulva as indicative of the incision. He believed lacerations healed as rapidly as the incisions, and so questioned the value of the incisions. (6). For these viewpoints, Goodell is to be gratefully remembered, for he seems to have stimulated thought both pro and con about episiotomy.

Soon after (1873) Leischman admitted occasional cases of rigidity of the perineum believing it was justifiable to make slight incisions with lancet or finger nail, but he too, remained conservative. (6).

One of the most helpful pushes this procedure received was from Sir J.Y. Simpson in 1871, who mentioned lateral incisions of the vulva as a means of preventing central perineal lacerations. The practice by him was to make one or two slight cuts on either side of the fourchet and so that if a laceration must occur there should be a choice of site and direction. (6).

Playfair in 1876, just as Goodell, stated he believed in episiotomy and only when there existed a cicatrical overgrowth in the perineum. (6).
HISTORY

We now enter a period in the history of episiotomy in which it seems to fall into more than usual disrepute. It, like almost any single maneuver in the field of medicine, was subject to cyclic changes of advocation following by a more or less general disfavor. From about 1890 to 1910 ridicule ran strongly against the operation. In 1893 Dr. T.J. McGillicuddy stated that episiotomy was a doubtful operation and that it was questionable if it did what it was intended for, as lacerations occur in spite of its performance. "It is certainly one whose usefulness is very difficult to appreciate," he stated. (31). Still in this era (1895) Frank A. Stohl writes, "Since Culds time more or less interest has been shown in episiotomy, yet more interest than practice; its principle has always been regarded with favor, not so the method," (38). He however, did use the median incision quite frequently.

Another man who professed a dislike for episiotomy a few years later was Adam H. Wright, who in 1905 made the following statement, "I know of no prominent obstetrician in Great Britain or America who approves of episiotomy," (51). Perhaps his statement was exaggerated but it does clearly illustrate the disfavor held by many toward episiotomy.

After the period of strong criticism until about
1919 the subject of episiotomy lay almost untouched as concerned its appearance in the literature. This may be explained by a fear in those believing in it to publish and advocate such an operation in view of the past bitter shower of adverse comment. The presence of a war in Europe may also have had something to do with turning attention to other medical fields at that time.

However, from about 1919 to the present day there have been published a moderate number of articles dealing with all phases of this obstetrical problem. One concludes from these recent articles that the whole situation has swung the other way, i.e., the vast majority of these articles are strong supporters. Each author has developed his own way of reasoning the advantages to be gained as against those to be lost by doing episiotomy. As a result of this, and experience, episiotomy is today strongly advocated where indicated. It is so favored by a few as to be used routinely in every case. I doubt if its popularity will continue until all accoucheurs use it for every delivery, but instead I rather anticipate its use reaching a happy medium. "De Lee has not only been an ardent advocate of the operation, but he has been its champion. He probably has done more than any other contemporary writer to encourage its indications and technique." (30).
ANATOMY

Before one can even begin to understand thoroughly the episiotomy operation and its repair one must understand the relationship of all structures involved and the mechanism played by these structures in the delivery. In other words, the anatomy and the physiology of the perineum, with some consideration of the perineum and with some consideration of lacerations will be discussed at this point.

It is easy to think of the pelvic floor as a partition, a muscular-fibrous partition, which closes the abdominal cavity inferiorly. It closes in the space known as the pelvic outlet, this being an oral space bounded anteriorly by the symphysis pubis, posteriorly by the tip of the sacrum and coccyx, and laterally on either side by the rami of the pubes and ischia and the great sacro sciatic ligaments. Just as the abdominal cavity is separated from the thorax by a muscular fibrous diaphragm pierced by three apertures, so is the pelvic outlet closed by a similar diaphragm which is also pierced by three apertures for the passage of the rectum, the vagina and the urethra. To these structures and the adnexia above them, this muscular fibrous pelvic diaphragm forms the main support, and by its integrity prevents bulging herniation and prolapse of the pelvic and abdominal viscera. To know the meaning of the above word integrity is to know the normal anatomy of the perineum.
If one were to begin within the pelvic cavity and identify all structures outward to the external perineal surface, one would meet successively with the peritoneum, then the subperitoneal connective tissue, the internal pelvic fascia, the levator ani and coccygeus muscles, the external pelvic and perineal fascia, and, included between the latter, the superficial muscles of the perineum, external to which are the subcutaneous tissue and the cutaneous covering of the perineal and vulvar regions.

The levator ani muscle and the fascia covering it upper and lower surfaces are the most important of those mentioned structures. They are so important that in a practical way they are often considered as constituting the pelvic floor. The levator ani muscle helps to close the lower end of the pelvic cavity much as a sling. It presents a concave upper and a convex lower surface. As seen from above it has been described as horseshoe in shape, the open end being anterior. The extent of origin of this muscles varies. On either side it extends across the opening of the obturator foramen, being attached to the fascia covering the obturator internus muscle beneath a tendinous duplication of the superior levator fascia, called the "white line." From their area of origin the muscle fibers pass downward and inward toward the median
Posteriorly they come together on the lower end of the sacrum and the coccyx, anterior to this they interlace in the median line behind the anus; next they fuse into a sling-like hammock under the perineal curve of the rectum; finally a few fibers meet between the anus and vagina in the perineal body. During pregnancy the muscle undergoes considerable hypertrophy. On contraction it serves to draw both the rectum and the vagina forward and upward in the direction of the symphysis pubis and is regarded as the real closer of the vagina. And so we have in the levator ani muscle, the foundation of the perineum.

One must now have some understanding of the pelvic fascia which has been mentioned previously. The internal pelvic fascia which forms the upper covering of the levator ani, is attached to the margin of the superior strait. It is joined by the transverse fascia of the abdominal wall at this point. From the margin of the superior strait it passes downward and is firmly attached to the periosteum covering the lateral wall of the pelvis, the white line indicating its point of deflection from the latter, from where it spreads out over the upper surface of the levator ani and coccygeus muscles.

The inferior fascial covering of the pelvic diaphragm is divided into two parts at a line drawn between
the ischial tuberosities. The posterior portion, composed of a single layer, takes its origin from the sacro-sciatic ligament and the ischial tuberosity, and passes up over the inner surface of the ischial bones to the white line, here helping to form "white line." From this tendinous structure it is reflected over upon the inferior surface of the levator ani. The space found here between the levator ani and the lateral pelvic wall we call the ischiorectal fossa.

We designate the urogenital diaphragm as that structure filling the space between the pubic arch and a line joining the ischial tuberosities. This consists of three layers of fascia, exclusive of skin and subcutaneous fat. First is the deep perineal fascia which covers the anterior portion of the inferior surface of the levator ani muscle and is continuous with the fascia just described. Next is the middle perineal fascia which is separated from that just described by a narrow space in which are situated the pubic vessels and nerves. Lastly, the superficial perineal fascia which, together with the layer just described, form a compartment in which lie the superficial perineal muscles with however, the exception of the vestibular bulbs, and the vulvo vaginal glands.

The superficial perineal muscles deserve
special consideration, for these are the muscles actually encountered in doing episiotomy. In this superficial group are included the following muscles: the bulbocavernosus or sphincter vaginae; the ischiocavernosus; transversus perinei superficialis; sphincter ani; levator ani; and lastly, the coccygeus.

The ischiocavernosus muscle is quite small embracing the crus clitoris. It arises from the inner surface of the ischial tuberosity and is inserted into a fascia which envelopes the posterior part of the body of the clitoris.

The bulbocavernosus muscle surrounds the orifice of the vagina. It arises from the central tendon and passes forward on either side of the vagina to be inserted into the corpora cavernosa and body of the clitoris. It is about one quarter of an inch broad attached behind to the central point of the perineum. It helps in a very small degree to strengthen the floor through its sphincter action on the vagina.

The transversus perinei superficialis arises from the inner part of the ramus of the ischium and is inserted into the side of the sphincter vaginae. It steadies the perineal center.

The sphincter ani externus arises from the apex of the coccyx and superficial fascia and is inserted
ANATOMY

into the perineal center, blending with the levator ani, bulbocavernosus and transversus perinei. It closes the anus.

The last superficial muscle to be described is the coccygeus, for the levator ani was previously described. It arises from the spine of the ischium and sacrospinous ligament, to insert itself into the margin of the coccyx and the side of the two lower segments of the sacrum. It forms the posterior part of the pelvic floor.

With the exception of the ischiocavernosus and the coccygeus muscles, the superficial perineal muscles are all in close relationship with the perineal body. In consideration of episiotomy, this perineal body is one of the most important anatomical structures encountered, for upon it, as we shall later see, is based much of the discussion as to the type of incision to be used, etc. This perineal body is situated between the vagina and the anus. On vertical mesial section is appears triangular in shape, the base being the skin surface; the sides the anal and vaginal walls. Its vertical height is about 1/7/16 (One and seven sixteenths) inches; the base measures from before backward about 3/4 inch. It is the central point of strength of the pelvic floor, it is also the meeting place for important divisions of vesical pelvic fascia
ANATOMY

and of those muscles aforementioned. Above the perineal body the vaginal and rectal walls are in opposition, loosely connected.

In this perineal body we have a structure which might be likened unto the hub of a wheel. The spokes holding the hub in central position and bearing the stress might be represented by the superficial and to some extent the deep perineal muscles and fascia. The axel represents the presenting part being forced through the hole in the hub. If the spokes or hub be weak when such a strain is placed upon them, is there any reason to believe they would not break? When such breaking occurs to the muscles and fascia of the female perineum it is termed a laceration.

PHYSIOLOGY

In the first stage of labor the bag of waters takes part in the dilatation and distention of the upper portion of the vagina, but after rupture of the fluid sac the changes occurring in the pelvic floor are due entirely to the pressure exerted by the presenting part. As this presenting part descends the birth canal, the anterior portion of the pelvic support becomes forced against the inferior and posterior portions of the symphysis. On the other hand the posterior portion of this pelvic support
PHYSIOLOGY
undergoes marked changes, becoming pushed downward and forward, and subjected to great stretching, eventually being converted into a thin walled tubular structure called the perineal gutter. With such a change it is obvious that much stretching must take place, fascial planes are greatly altered and former comparatively heavy muscles are transformed so as to appear almost ribbon like. In cases where the vein or sphincter of the vulva are tense and resisting, the action of these two segments of the pelvic floor is interfered with, and under strong pressure the head will continue downward, tearing the pelvic floor at each side, from its attachments to the pelvic bones and fascia, and tearing the perineum in the central line, through the perineal body and often continuing to the rectum. There are as many structures involved in perineal lacerations as there are directions and extent of tears.

According to many observers the levator ani muscle with its afore described superior and inferior fascia is almost invariably damaged in labor at full term. Yet in studying its anatomy and relationship to pelvic organs, one is impressed with how vital it is to the well being of the patient to have this muscular fibrous structure conserved as much as possible.
PHYSIOLOGY

De Lee believes the intracolumnar fascia which hold the two levator ani pillars in their relation to the rectum, vagina, perineum and each other is the location for the majority of common pelvic floor injuries. Diastasis of these two fascial pillars if it occurs, establishes the site for rectocele formation in spite of those who believed the delivery was accomplished without lacerations.

Vulvar tears are a frequent and familiar finding after delivery. These seldom result in serious consequence but they do, however, leave the vagina open and invite infection.

We may conclude that injuries to perineal structures are due to combined stretching and tearing of the tissues. Pressure necrosis is probably a minor factor. Injuries of the anterior wall usually produce a cystocele and those of the posterior wall a rectocele. These are both a result of the supporting fascia giving way. The most experienced clinicians hesitate to say that lacerations occur according to specific rules. They do agree that there is stretching and tearing of the levator ani muscle and its associated fascia, followed by retraction. The urogenital septum is always ruptured; the perineal body frequently, and all of the tissues are bruised, showing larger or smaller hemorrhages and saggillations.
Our general aims in performing episiotomy may be stated simply. The fetus is to be protected as well as possible from the effects of a prolonged second stage, particularly from certain injuries which often result when the head acts as the dilator of resistant perineal structures. The mother is to be protected from the general effects of a long labor, and the local results of irregular, misdirected lacerations, and uncontrolled stretching of the supporting structures of the pelvic floor.

With the above general purposes of this operation in mind, the following specific indications are submitted:

FETAL INDICATIONS

It is well recognized that the blood vessels, the dura, and especially the tentorium of the premature child are extremely susceptible to changes of tension and stretching. The fragility of these intracranial vessels, coupled with the vulnerability of the falx and tentorium in the premature, readily allows a cerebral hemorrhage or a tentorial laceration to occur even with the slightest of cranial compression. The most important site for the production of this cerebral compression is the vulvar outlet. A rigid vulvar ring as seen in young and especially old primiparas, and in those with a
FETAL INDICATIONS

scarred perineum, possibly due to a former episiotomy, offers a definite obstruction to the advancing head.

We must attempt to remove every obstacle in the passage of the premature child from the uterine cavity to the outside world. The cervix we know is the first obstacle encountered by the presenting part. The vulvar outlet is the next resistance met, and it is here that compression of cranial contents is life threatening. With the knowledge that this so-called soft structure resistance is the actual cause of the majority of intracranial hemorrhage cases in the premature child, routine episiotomy has been advised where the perineum may cause even the slightest compression. (3).

Not only in the premature do these indications hold true, but undoubtedly such is the case with some full term infants. The tissues of the full term fetus are dangerously friable.

If rapid extraction of the fetus be indicated, from any cause whatsoever, episiotomy is nearly always indicated. The actual delivery is much easier, and, of course, more rapid. Since so many of these cases requiring rapid delivery are effected with forceps or breech extraction, these maneuvers are rendered much easier. "In the delivery of breech cases after episiotomy one
PETAL INDICATIONS

is often surprised by the ease with which delivery of the after coming head is accomplished." (28).

PROTECTION OF THE PELVIC FLOOR STRUCTURES

Jewett has been quoted as saying that no method yields a better result for ultimate integrity of the perineum than episiotomy rightly timed and properly executed. (24). Many other contemporary writers agree with this statement and even go further, stating that they advise episiotomy as a routine procedure in all primiparae, and most generally in multiparous patients. The perineum of the average primipara is quite resistant, for it has never undergone the stretching and dilatation caused by the passage of a fetus, and consequently this resistance is used by many men as an indication. However, the majority of obstetricians today do not advise this operation routinely, but believe that like any other operation, well chosen, it should be done only for a definite cause; primiparity is not a definite cause. (43).

When there is a firm, inelastic vulvar ring or perineal body we describe the perineum as being resistant, meaning it is resistant to stretch, and such an existing condition may be an indication for episiotomy. It is only reasonable to suppose that continued expulsive efforts
PROTECTION OF THE PELVIC FLOOR STRUCTURES

through such resistance might easily produce a tear. If such a tear does occur, be it either of fascia, or muscle, or both, the healing process which follows is much less satisfactory than that which follows the opposition of clean cut tissues. The tear heals more slowly; it heals with more scar tissue formation, and there will be more edema and hemorrhage of torn tissues than of cut tissues.

For these reasons beginning laceration is used by many as an indication of episiotomy. However, I do not agree with this entirely for by the time a laceration is visible, much of the damage has already been done to the perineum, and other deep structures. The operator has waited too long. About the only help the incision offers at this late time is in guiding the direction of the external tear, and even for this purpose it is often too late.

The presence of scar tissue in the region of the vulvar outlet is another widely accepted indication. This connective tissue may be due to previous injury, either because of some external traumatic accident; laceration as a result of child birth; previous episiotomy repair; or intermediate perineorrhaphy. A woman whose perineum has been completely sutured at some previous confinement is likely to be as much in need of incision
INDICATIONS

PROTECTION OF THE PELVIC FLOOR STRUCTURES

as is the resistant primipara. The scar tissue present in these cases possesses little or no ability to stretch, and as a result tears will more than likely occur. Again episiotomy is a prophylactic measure against the unwanted tear.

Anomalies of the vulva, vagina or muscular fascial tissues of the perineum, although rather infrequent, often are cause enough for doing episiotomy. If the passage may be inadequate for the passenger, it must be made adequate if at all possible.

Henkel regards a timely episiotomy as the best means for prevention of uterine rupture and prolapse. (25). This belief is perhaps not advocated by as many obstetricians as are some of the other indications, and yet common sense tells us that is must be recognized. If the fetus meets perineal resistance, and uterine expulsive efforts continue, can anyone predict that rupture of the uterus will not ensue?

The ultimate integrity of the perineum must be considered as an indication for episiotomy. The results of pelvic floor damage were discussed in the anatomy and physiology section. If such complications as vestocile and cystocele can be prevented by less stretching and trauma, and episiotomy does accomplish this to a great
PROTECTION OF THE PELVIC FLOOR STRUCTURES

extent, then we are forced to consider the ultimate integrity. If this cannot be decided favorably without question, episiotomy is indicated.

Episiotomy is usually indicated in the patient with syphilis, if the disease has progressed beyond the first stage. In many of these patients the perineum will tear like wet blotting paper, leaving practically none of the perineal floor in any desired anatomic relationship. If, by a median or mediolateral incision we can in any way lessen the strain upon the muscular fascial supports of the perineum we will have prevented many of these lacerations.

MALPRESENTATION AND DISPROPORTION

Usually the head of the fetus is the presenting part, and its attitude is flexion. In the majority of cases the sagittal suture is in a perpendicular plane to the outlet when the head passes through the outlet. These relationships normally constitute the smallest diameter, and consequently the least resistance, for the head. If the head be in partial or complete extension, its diameter in the birth canal will be increased considerably. If the sagittal suture be in an oblique or transverse plane, it will not conform so nearly to the ovoid shape of the
MALPRESENTATION AND DISPROPORTION

outlet. If the fetus be a frank breech presentation, its diameter is considerably increased over that of the normal head. All of these fetal positions tend to increase its diameter with relation to the perineal floor, and with increased diameter, it encounters increased resistance to passage through the soft parts. Episiotomy is often indicated, for by such an incision the diameter of the outlet is altered to meet the demands of the presenting part.

Disproportion, either fetal or maternal in origin may indicate episiotomy. If the head be abnormally large in a normal canal; or if the canal be abnormally small, with a small outlet, the head being normal in size; it is obvious that an incision made at this time might aid the progress of the delivery a great deal and prevent undue lacerations.

EPISIOTOMY WITH OPERATIVE DELIVERY

When delivery is accomplished by the use of forceps, the perineal tissues have not usually had time to stretch, this being especially true when mid forceps are applied. Episiotomy may here be used to great advantage, much tissue tearing being prevented, and the delivery terminating rapidly with a greater element of safety present. (28).
EPISIOTOMY WITH OPERATIVE DELIVERY

The desired direction of pull with forceps in an axis traction manner is more easily and safely accomplished in the patient who has just been incised.

In using the type forceps with wide separation of the shanks, an incision of the outlet is desirable, otherwise the forceps themselves may tear the outlet.

I have mentioned the advantage of episiotomy in breech cases.
In the selection of the episiotomy site, it is essential to consider the anatomy of the perineum and pelvic outlet, and to know which of these structures is most important physiologically and which most liable to birth injuries.

At the present time there are three locations at the vulvar outlet for making the episiotomy incision; one in a lateral direction on one side; another in a mediolateral direction on one side, and lastly, the median incision, the cut being made in the median raphe, and directed toward the anus. One of these three types of incision is always used, however, the individual obstetrician may vary one of them slightly for his own particular purposes. For example, some men advocate making the median incision curve out around the sphincter ani externus, believing that the chances of tearing that muscle are lessened.

The reasons for selecting any one of these three sites for incision are many and varied, but probably the habit on the part of the obstetrician for any one type is by far the most common deciding factor.

LATERAL TYPE

Lateral episiotomy was one of the earliest types
LATERAL TYPE

used, as will be remembered from the history discussion; now it is practically obsolete. Through many years of experience by numerous men it has been found that the incision so placed does not enlarge the outlet to any great extent, and so cannot prevent fetal parts from damaging the pelvic floor, it therefore, does not suit the intended purpose. If it fails to suit the intended purpose, there is no excuse for its use.

MEDIAN TYPE

We must admit that technically, at least, cutting across the belly of a muscle is not the most desirable thing for several reasons; first, there will be difficulty in finding the ends for accurate approximation, healing is known to be poor, especially with the longitudinal muscle fibers, and lastly, fibrous tissue replaces muscular tissue and consequently, a weak spot is left. If the incision be made in the mid line we have cut nothing but fibrous tissue, with no muscle until we get to the sphincter ani. In this fibrous tissue bleeding is negligible. Healing will be by fibrous tissue union.

Since the median raphe contains more connective tissue, sutures placed in it for approximation are less likely to cut through. (39). After the incision has been
MEDIAN TYPE

made the row surface is a symmetrical shaped diamond area making it much easier to coaptate the parts.

However, median episiotomy has two serious objections; first and foremost, extensions of the incision to injure the anal sphincter or rectum and secondly, in repair of the incision, since the rectal wall lies immediately below, perforation of the rectum with following infection is likely to occur. (40).

Because of the danger of sphincter and rectum involvement, median episiotomy may be chosen when a smaller space at the outlet will suffice, as when the head is small, in normal position, well flexed and the perineum high and yielding.

Ott in Germany has used the median perineal incision for thirty-one years during labor, especially in primipares, to prevent rupture and preserve musculature. He has seen no unfavorable results from it. (35).

Titus states "the median operation is much simpler" (43) and I believe that considering the advantages just discussed most men will agree with him. The median episiotomy has been described as the true anatomical operation.
MEDICLATERAL TYPE

"The mediolateral type of incision is the one most commonly used." (7). This choice provides the greatest space at the outlet, for the incision may be extended into the ischiorectal fossa if necessary. Since greater space is provided by this type, its indications for use are to a great extent dependent upon this fact. If the fetal head is large, or presenting abnormally; if it be a breech presentation; or if operative procedures must be done to effect the delivery, the mediolateral incision is preferable.

In using the incision one must be satisfied that its disadvantages are outweighed by its advantages. The incision will be through muscle bellies, the danger of more hemorrhage is greater; there will result some pelvic floor weakness due to scar tissue formation; and too, there is usually considerably more pain and distress to the patient in early post partum days, which may last for three or four weeks.

Of one hundred and thirty cases of episiotomy done at the Philadelphia Lying-in Hospital, Nugent (34) recorded the following percentages:

- Total cases with episiotomy: 130 (100.0 per cent)
- Mediolateral episiotomy: 110 (84.6 per cent)
CHOICE OF TYPE

MEDIO-LATERAL TYPE

Of the mediolateral cases
1. Extension to sulcus 8.2 per cent
2. Extension to sphincter involvement 0.9 per cent

Of the median cases
1. Extension to sulcus 5.0 per cent
2. Extension to sphincter involvement 10.0 per cent

In more of the above cases did the laceration extend into the rectal mucosa. This series is too small to be conclusive, but it supports the theory that when major laceration is unavoidable it is much safer to elect a mediolateral episiotomy.

We may say that both mediolateral and median incisions have their special indications. When only a little increased room is needed to effect delivery, when the perineum is broad and no great laceration is anticipated the median incision is done easily and more quickly repaired so that the patient is subjected to the least anesthesia and surgery. Where there is marked danger of sphincter involvement as in cases of face presentation or in women with a narrow subpubic angle and where wide access is required for some operative procedure the mediolateral
CHOICE OF TYPE

MEDIOLATERAL TYPE

Incision is preferable. Probably in the majority of cases, because of the experience and preference of the operator, the choice of the incision site becomes a matter of individual taste.
ANESTHESIA

Anesthesia is to be considered before beginning this operation. Many types have been suggested, some with good reason and some without. The incision is usually made after the patient has been given the anesthetic for the second stage of the labor. With the anesthesia, no matter if it be ether or chloroform, or any one of the many others, there will be produced in the patient a sufficient dulling of the sensærium so as to considerably lessen the pain caused by the incision.

After the fetus has been delivered (or perhaps after the placenta has been delivered) some anesthetic is desirable in order that the episiotomy repair may be effected with as little pain as possible. Some obstetricians now give more of the same anesthetic which they used for the second stage. Although probably not especially dangerous, such a retake is usually quite disagreeable to the patient, and possibly should be avoided for that reason. The use of a local anesthetic at this time is advised for two reason, it is more agreeable and increases the margin of safety, and it decreases the expense of the delivery. By removing the obstacles of anesthesia, episiotomy is simplified for the general practitioner delivering a mother in the home.
ANESTHESIA

Pudendal anesthesia has been advised, using a 1/100 novocain adrenalin solution injected into the uterine-cervical plexus, and infiltration of the second, third and fourth sacral nerves, those believing this as a second stage anesthesia also state that episiotomy repair is rendered much easier. However, few believe that type anesthesia is indicated for the second stage of labor. (7).

WHEN TO MAKE INCISION

"Consideration of the most advantageous time for the performance of episiotomy is of great importance. Contrary to the opinions of most writers on episiotomy, we do not choose to wait until the perineum is dilated by the oncoming head or until crowning has taken place." (30). Unless the incision is made early before the vaginal outlet is disturbed, and the perineum is thinned out to paper like thinness, the greater part of the damage will already have been done. The incision must be made before appreciable stretching has taken place. If the incision be made when the perineum is greatly distended one is often surprised at the shape of the wound after delivery, especially if the mediolateral type has been used. Instead of being straight it may be triangular, one
WHEN TO MAKE INCISION

angle extending up to the labium minor, another angle in the vagina, and a third near the ischiorectal fossa.

It is difficult to give an exact optimum time at which to perform this procedure during delivery. However, there are a few recommended rules to follow. The head must be well down on the pelvic floor, the caput in sight, and the perineum shows slight bulging except in those operative cases in which special access is required or the manipulations have already begun to injure the perineum, if possible the cut should be made before there is blanching of the vulva and perineal skin and before minute tears are visible in the vagina mucous membrane, because when these are present, permanent damage to the muscular structure of the pelvic floor may already have occurred. The tendency is in most cases to delay too long rather than incise prematurely.

STRUCTURES INVOLVED

Immediately following the episiotomy incision the posterior segment of the pelvic floor moves downward and backward and the tissues gape asunder, leaving a triangular wound whose apex is directed upward toward the cervix, and whose base extends along the lateral wall of the birth canal.
STRUCTURES INVOLVED

The incision may be of two types, a simple, or a deep. If the incision be of the simple type the following structures are cut; the skin, the urogenital septum, constrictor cunni and transversus perinei and a few of the anterior fibers of the levator ani muscle. In the deep episiotomy, as recommended by Dickerssen (5) the incision goes through the levator ani into the ischiorectal fossa, thus making quite an extensive operation. In using the simple type there will be less danger of extension of the wound, and it also seems to heal more readily.

In doing the mediolateral episiotomy, the incision is begun near the midline posteriorly and carried downward and backward about midway between the anus and the tuberosity of the ischium. If a median episiotomy is desired the incision should begin at the midline posteriorly and be carried to a point just anterior to the fibers of the sphincter ani externus. At this point the direction may be changed to pass laterally to one or the other side of the sphincter muscles. Scissors is the usual instrument used, but with care a clean cutting scalpel may be used. The cut involves both the vaginal mucosa and the skin over the ischiorectal space each for a distance varying from 2.0 to 5.0 cm. Most men state that episio-
STRUCTURES INVOLVED

tomy incisions, if mediolateral in location, are placed on the right side. I do not believe this should be true. The pure mechanics of the head passing through the vulva should show us that the greatest diameter of the head will require the most space, so why not make the incision parallel to the sagittal suture. Bleeding may be quite severe if the delivery is delayed at all, especially if the mediolateral site is used, and the ordinary measures for hemostasis should be instituted. Ordinarily most of the bleeding will cease as soon as the delivery is completed.

ACTUAL REPAIR

The patient should be redraped following the delivery, and fresh gown, gloves and instruments given to the operator. The importance of this procedure cannot be overestimated. The placenta, if separated, may be delivered before the repair is begun or after repair has been made. I believe the former method would in the end prove more satisfactory because the placenta may be large enough to cause damage to the repair at the time it is expelled, and too, it may be necessary to extract the placenta normally, in which case the repair would certainly suffer. A gauze pad should be placed in the vagina above the field to keep the blood from obscuring the
ACTUAL REPAIR

The operator now orients himself with the field, locating the vaginal mucous membrane edges.

The repair of the median incision is much simpler than that of the mediolateral because of the muscular fascial elements encountered in the latter. For this reason, only the mediolateral repair will be described; the same general points in the procedure would apply to the median type. The first step is to repair the vaginal portion of the incision. This is done by placing a series of interrupted chromic catgut sutures beginning at the apex of the incision and extending to the mucocutaneous junction. The final suture at the lower margin is kept long and held as a guide. The first suture at the apex must satisfactorily bring the cut edges together, otherwise later herniation of the rectal wall through the weak spot may take place.

The deeper structures are now repaired with another series of interrupted sutures of No. 2 chromic catgut. The cut fibers of the pubococcygial portion of the levator ani are at this time repaired. A gloved finger may be necessary in the rectum to prevent penetration of that organ with the needle. If this is done the glove must be changed before continuing. These deep structures must be brought into close opposition, otherwise a dead space will
ACTUAL REPAIR

be left.

Now above these deep sutures we place a second tier of sutures. In the lower half of the incision these approximate the deep and superficial layers of the urogenital diaphragm and the structures lying above and between these fasciae. The most anterior suture passed upward into the lower segment of the labium minus, should catch the bulbocavernosus muscle and by midline approximation prevent gaping of the vagina and sagging of the perineum.

Last we have the skin to close. This may be done in a variety of ways. A subcuticular continuous suture is probably most frequently employed. Starting near the mucocutaneous junction it is carried posteriorly, where it may be looped and tied to itself or taken beneath the skin lateral to the suture line bringing it back to the starting point and fastening it to its own original end. A series of interrupted sutures should be used when no haste is required.

We must remember the sutures should control blood loss; approximate the tissues accurately; and they must be tied securely, but not too tight so as to cause edema and hence sloughing at a later date.

Probably No.1 twenty day chromic is the best
ACTUAL REPAIR

Type of suture for the entire repair.

In the after care the nurse must be careful
to prevent irritation and infection from voiding, lochia,
and bowel movements, and she must care for the wound with
the least distress to the patient. (50).
In considering any surgical procedure such as this is, one should carefully survey the results obtained from its execution. We are not especially interested in the theoretical side of the question, but more in what actually happens to the patient in the way of benefit derived.

Today we are experiencing the lowest fetal and maternal mortality rates that have ever been known. (19). This applies only to those patients who have been attended by men especially trained in Obstetrics, and working in the well supervised hospital maternity ward. In accomplishing this lowering of mortality rates, the ways of relieving pain and of shortening labor have advanced with equal rapidity, episiotomy being one of these.

Let us first consider the results of episiotomy as a preventative of perineal lacerations. C.E. Galloway of Northwestern University compiled the following statistics. (19).

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women delivered</td>
<td>500</td>
</tr>
<tr>
<td>Episiotomy done in</td>
<td>462</td>
</tr>
<tr>
<td>96 per cent of Primipara</td>
<td>462</td>
</tr>
<tr>
<td>80 percent of Multipara</td>
<td></td>
</tr>
<tr>
<td>Of these 462 episiotomies, 55 or 12 per cent extended a little, either up into the vagina or down in</td>
<td></td>
</tr>
</tbody>
</table>
RESULTS OF EPISIOTOMY

the general direction of the cut or toward the rectum. In no case did the incision extend through the rectum.

Fully 90 per cent of all primipara will have a tear if they are delivered without episiotomy and will have resulting relaxation of the introitus. (19).

In the 32 cases delivered without episiotomy in this series, 25 had tears of the vagina - 8 out of 11 primiparae, and 17 out of 27 multiparae. Five cases developed a hematoma of the perineum.

Nugent (34) also recorded his findings in 202 obstetrical cases.

<table>
<thead>
<tr>
<th></th>
<th>With Episiotomy</th>
<th>Without Episiotomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>130</td>
<td>72</td>
</tr>
<tr>
<td>Age range</td>
<td>15-37 yrs.</td>
<td>13-31 yrs.</td>
</tr>
<tr>
<td>Average age</td>
<td>21.5</td>
<td>21.1</td>
</tr>
<tr>
<td>Average duration of first and second stage</td>
<td>13 hr. 6 min.</td>
<td>13 hr. 54 min.</td>
</tr>
</tbody>
</table>

As might be anticipated the duration of labor is longer in the group subjected to episiotomy because generally they were abnormal before episiotomy was done.

An interesting study was made as regarded morbidity in these 202 patients, it resulting in 21.8 per cent of the total 202 cases.
RESULTS OF EPISIOTOMY

<table>
<thead>
<tr>
<th></th>
<th>With Episiotomy</th>
<th>Without Episiotomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total morbidity</td>
<td>25.4 per cent</td>
<td>15.2 per cent</td>
</tr>
<tr>
<td>Morbidity (Pyelitis</td>
<td>20.5 per cent</td>
<td>13.9 per cent</td>
</tr>
<tr>
<td>excluded)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In this survey we conclude that over 10 per cent more of those cases with episiotomy will suffer from morbidity than will those patients without episiotomy. This increase was explained upon the difference in incidence of intercurrent infection and the differences in the duration of labor, and not local involvement at the episiotomy site.

To further analyse this question of morbidity, Nugent studied it with its relation to the duration of labor and found the following.

<table>
<thead>
<tr>
<th></th>
<th>With Episiotomy</th>
<th>Without Episiotomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 10 hours</td>
<td>20.9 per cent</td>
<td>18.7 per cent</td>
</tr>
<tr>
<td>10 to 20 hours</td>
<td>27.2 per cent</td>
<td>20.0 per cent</td>
</tr>
<tr>
<td>20 to 30 hours</td>
<td>29.2 per cent</td>
<td>0.0 per cent</td>
</tr>
<tr>
<td>30 hours up</td>
<td>27.7 per cent</td>
<td>0.0 per cent</td>
</tr>
</tbody>
</table>

Although the morbidity in prolonged labor is higher than in short labor, the same disproportion in favor of the series without episiotomy is present. Considering the morbidity from these angles we must conclude
RESULTS OF EPISIOTOMY

that there is a substantial increase in morbidity, attributable to the condition of the patient upon which the episiotomy was performed. Factors causing a long labor would probably be responsible for the morbidity.

Perineal results of the same group were divided into three classes. The word perineum was used in its broadest sense to include three anatomical sites, the anterior and posterior vaginal walls and the outlet. Examination was made six weeks post partum and by a single man.

In Grade A group were included those women whose perineum represented as complete a restoration as it was possible to attain. There was present no gaping of the vulva and no bulging of the anterior and posterior vaginal walls on straining.

Grade B included those women whose perineum showed a minor failure of restoration in one anatomical division with good results in the other two.

Lastly, Grade C, that pelvic floor and perineum which showed a minor failure of restoration in two anatomical divisions or a major failure in any one.

<table>
<thead>
<tr>
<th>Grade</th>
<th>With Episiotomy</th>
<th>Without Episiotomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade A</td>
<td>73.9 per cent</td>
<td>55.6 per cent</td>
</tr>
<tr>
<td>Grade B</td>
<td>24.6 per cent</td>
<td>34.7 per cent</td>
</tr>
<tr>
<td>Grade C</td>
<td>1.5 per cent</td>
<td>9.7 per cent</td>
</tr>
</tbody>
</table>
Symptomatic evidence of these cases immediately after delivery showed:

<table>
<thead>
<tr>
<th></th>
<th>With Episiotomy</th>
<th>Without Episiotomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder symptoms</td>
<td>13 per cent</td>
<td>16.6 per cent</td>
</tr>
</tbody>
</table>

Another reference states that it is more difficult to repair a tear than an episiotomy yet in more than seven years survey the author found that patients with a tear and no repair had a more comfortable convalescence than do those with an episiotomy. (50).

The episiotomy wound should be healed in ten days time; and at the end of six weeks all tissues will be as firmly united as before labor began. The argument has often been advanced that these wounds are prone to become infected. To be sure this type of repair requires considerable attention to technique, together with strict surgical asepsis. It is agreed by most men that there has usually been some error in technique when poor results are obtained or when infection and slough occurs.
SUMMARY

The correct use of episiotomy forms one of the niceties of obstetric practice. When considering this operation in a given case, one must carefully balance this known type of surgical injury against the unknown degree of trauma from stretching effects of the presenting part against the perineum.

In as much as 9.4 per cent of primipara can be delivered without laceration and demonstrable anatomic injury at follow up; and as an additional 79.8 per cent though lacerated, show Grade A result, prophylactic episiotomy is questionable. However, one can advise that "When in doubt, cut." Regret for having performed needless episiotomy is probably less frequent and certainly less permanent than that experienced at times for having omitted it.

A routine episiotomy as a prophylaxis against cerebral hemorrhages and tentorial lacerations in the delivery of premature infants is advisable.

The type of incision should depend upon the case at hand. A median incision is advised if the size and presentation of the fetus is normal, the birth canal normal, and the perineal body has a broad base. Medio-lateral episiotomy is indicated when any of the aforementioned conditions do not exist, plus the least fear
that extension of the incision may occur. The medio-lateral incision should be made in the same oblique plane as in the sagittal suture.

Without doubt episiotomy does increase the incidence of morbidity in post partum cases. This knowledge should further stimulate the accoucheur to study each individual case at hand.


