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L. Ghulmiyyah, S. Sinno, F. Mirza, E. Finianos & A. H. Nassar

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Episiotomy: history, present and future – a review

L. Ghulmiyyah, S. Sinno, F. Mirza, E. Finianos and A. H. Nassar

Department of Obstetrics and Gynecology, American University of Beirut Medical Center, Beirut, Lebanon

ABSTRACT

Childbirth has always carried traumatic stress to the woman's body. To deliver with less perineal trauma, obstetricians have used episiotomies. Episiotomy is still a common practice despite the controversy regarding its use. Weighing the risks and benefits, the scientific literature supports its selective use. With the worldwide trend to reduce the rate of episiotomy, several techniques have been proposed to achieve that. However, further research is still needed to prove their efficacy. This review will shed light on the historical background of episiotomy, its different techniques, indications, and the future of its practice.

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Introduction

It has always been recognized that the female body is subject to a traumatic experience during the process of childbirth. In 1742, a surgical incision; episiotomy, was first performed by Sir Fielding Ould to widen the birth canal and minimal trauma to the mother [1]. However, its use has been extensively debated ever since its introduction and reduction in its rate has been a target for a while. With accumulating evidence in favor of restrictive use of episiotomy rather than its routine use [2], action needs to be exercised in an attempt to decrease the rate of unindicated episiotomies with their short-term and long-term complication potential.

This review will describe the history of episiotomy, techniques, indications, risks and benefits, its present and future.

Background

Episiotomy is performed during the second stage of labor to enlarge the vagina from its posterior facet to facilitate the delivery of the baby. With the shift from home to hospital births, the episiotomy rate increased from 5% in 1900 to 80% in 1950. With that, more complications were encountered, and the trend shifted toward a more conservative approach. Accordingly, in 1996, WHO recommended a 10% rate based on a 1984 English trial [3]. Consequently, the episiotomy rate dropped in parts of the world and

reached 14% in USA [4]. However, the numbers remain high in many places worldwide with rates reaching 100% in Taiwan [1].

Techniques

There are four episiotomy techniques currently performed. The most common are the medial and mediolateral.

Mediolateral episiotomy

More widely used in Europe, this technique is larger and requires more analgesia than others. It is performed by separating the labia and using two fingers to flatten the skin to protect the presenting fetus pulling outward. In the posterior fourchette, 3 mm from the midline, it is directed laterally at an angle of 30–60° toward the ipsilateral ischial tuberosity [5].

Medial (midline) episiotomy

This is the preferred technique in USA, owing it to its easier repair and less associated pain healing. Two fingers are used to flatten the skin by outward pull and an incision is made in the midline of the posterior fourchette, extending between 0 and 25° toward the anus [5]. Because it has the highest rate of extension to higher degree lacerations, care should be exercised to avoid injury of the anal sphincter or the rectal mucosa.

Lateral episiotomy

A rarely used technique except in Finland, lateral episiotomy is done by an incision 1–2 cm lateral to the midline of the posterior fourchette toward the ischial tuberosity [5]. However, it carries with it the risk of damaging the Bartholin's gland and ducts [6].

J incision

This is a hybrid of medial and mediolateral incisions. It was introduced to avoid lacerations whereby a median incision is performed but at the tip, the operator curves the incision laterally (at 2–5 cm from the anus) to mimic the letter J. The incision is made toward the ischial tuberosity away from the anal sphincter [5].

Potential benefits

Long before episiotomies were utilized, lacerations following childbirth were regarded as normal and ranged from 10 to 90% in nulliparas and 5 to 15% in multiparas [7]. There are four degrees of perineal lacerations [8]. First-degree lacerations, where the injury is confined to the perineal skin, are superficial, painless and rarely require treatment. Second-degree lacerations are injuries to the perineum, involving the perineal muscles without extending to the anal sphincter; these are painful and bleed often with distortion of the anatomy thus require suturing. Third-degree lacerations involve the anal sphincter and are differentiated into 3 subtypes: (1) where <50% of external anal sphincter thickness is torn, (2) where >50% of external anal sphincter thickness is torn and (3) where both the external and internal anal sphincters are torn. Finally, fourth-degree lacerations involve the anal sphincter complex (third-degree) along with the anal epithelium [8]. Third- and fourth-degree lacerations are severe and are referred to as obstetric anal sphincter injuries (OASIS) and require careful inspection with proper suturing to ensure anatomical integrity. It is postulated that a big majority of delivering mothers will sustain some kind of laceration, most commonly during the progress of the head [8]. However, the higher degree lacerations often occur in first pregnancies as the perineal tissue is new to the shearing stress and pressure that occur during delivery [6]. Lacerations can occur in the anterior perineum including periclitoral and periurethral region and are usually not associated with high maternal morbidity [1]. Episiotomies were originally introduced to prevent these types of spontaneous lacerations. However, since the early days after introducing episiotomy,

many reports emerged to suggest that episiotomies were themselves a cause of higher degree lacerations due to the potential extension of the cut [2]. Many argue that making the cut instead of waiting for spontaneous tears, makes it easier to fix and suture; closure of a known cut with clear margins and architecture is easier than closing a spontaneous laceration where tissue and muscles are haphazardly torn apart, especially in primigravid women. But it is as simple as that?

The role of episiotomy in preventing or in part controlling future consequences on the pelvic floor, such as pelvic floor relaxation, cystoceles, enteroceles, uterine and vaginal prolapses remains controversial. Early studies proposed that episiotomy confers a protective role in maintaining pelvic floor muscle integrity [1]. However, pelvic relaxation syndrome is the result of several interplaying factors that include gravidity and parity, obesity, age, and a history of chronic straining. Even if some studies address this issue, they are either limited by type of episiotomy or have contradictory results. In a randomized controlled trial, the liberal use of episiotomy was not protective against perineal trauma or pelvic floor relaxation among 703 women [9]. Restricting the use of episiotomy in multiparous women lead to improved perineal integrity and medial episiotomy was associated with severe perineal trauma [9]. It can be concluded that the use of episiotomy for the prevention of future pelvic floor relaxation is not strongly supported in the literature [10].

Episiotomy was thought to prevent trauma to the baby and shorten the duration of the second stage of labor. However, several studies in the early 90s contradicted this perception. It is now believed that most cases of cerebral palsy occur as a result of several interplaying factors during preconception, antenatal and perinatal [11]. No studies had long-term follow-ups to truly study the prevention of cerebral damage by episiotomy. There seems to be no significant difference between the duration of the second stage of labor in women undergoing episiotomy (32.5 min) and those with spontaneous lacerations (35 min) [12], with no differences in the neonatal outcome [13]. Moreover, it was shown that episiotomy rates were higher (63%) when women were urged to push compared with those who were not (39%). As a result, giving time for the perineum to stretch and distend its tissues decreases the rate of lacerations and the need for episiotomy. Even in the context of shoulder dystocia, there are no clear benefits of episiotomy [14]. This is expected given that episiotomy mainly aims at widening the perineum whereas shoulder dystocia is a

disproportion between the fetal shoulder and the bony pelvis [14].

Risks

The most feared risk of episiotomy is the extension into a larger incision, generating higher degree perineal lacerations. In a study on 40,923 primiparas, episiotomy (odds ratio (OR) 3.23; confidence interval (CI) 2.73–3.80) and forceps delivery (OR, 2.68; CI 2.17–3.33) were strongly associated with anal sphincter lacerations [15]. In another study of 24,114 women, medial episiotomy had a 50-fold higher risk of developing severe lacerations compared with mediolateral episiotomy, which in turn had an 8-fold increased risk compared with no episiotomy [16]. However, after adjusting for risk factors, such as macrosomia and small pelvis, mediolateral episiotomy had a 2.5-fold reduction in primiparas and a 2.4-fold statistically insignificant increased risk in multiparas for developing lacerations compared with no episiotomy. Medial episiotomy, however, was associated with a 4.2-fold and 12.8-fold increased risk of developing lacerations in primiparas and multiparas, respectively compared with no episiotomy [16]. Medial episiotomy is also believed to be an independent risk factor for third- and fourth-degree perineal lacerations. Routine mediolateral episiotomy was also found to protect against anterior perineal lacerations, but not posterior lacerations [1]. In a study of 17,483 women, a decrease in the use of episiotomy over 18 years resulted in less perineal lacerations except in the case of nulliparas with macrosomic infants [17]. More recent studies confirm that medial episiotomy carries a higher risk of extension in any delivery and that mediolateral episiotomy has increased risk for extension in subsequent deliveries [18,19]. The interim analysis of an ongoing randomized controlled trial failed to show a significant difference in the rates of advanced (including third- and fourth-degree) perineal tears between primiparas receiving standard care versus no episiotomy [20]. Concerning the effect of episiotomy, specifically mediolateral episiotomy, on OASIS in spontaneous vaginal deliveries, there is no clear consensus. A recent meta-analysis of observational data suggested that mediolateral episiotomy may reduce OASIS and should not be withheld, especially in nulliparous women (RR 0.67; 95% CI 0.49–0.92) [21]. On the other hand, another meta-analysis concluded that both episiotomy and third- and fourth-degree perineal lacerations are associated with anal incontinence after vaginal birth [22]. More recently, mediolateral episiotomy was not

found to protect against OASIS, but the study was not powered enough to provide substantial clinical conclusions given the small sample size [23].

Other risks can occur acutely, and these include blood loss, pain and infection. Episiotomy increases blood loss [24] and if deemed necessary, should be repaired before delivery of placenta [25]. Mediolateral and lateral episiotomies can result in more postpartum perineal pain and dyspareunia compared with medial episiotomies [26]. However, at least one study reported no such differences [25]. The main limitation of this study is that it evaluated pain at one point in time. Women with an episiotomy seem to experience more pain compared with those with a spontaneous laceration [13]. Perineal pain can extend to 6 weeks postpartum in 12.8% of women [27]. Another type of pain described following episiotomy is dyspareunia, but the association is not yet well established. One study reports a significantly higher rate of dyspareunia in the episiotomy group at 12–18 months postpartum (69% versus 49%; OR 2.11; CI 1.04–4.29) [28]. Another study reported a 30% dyspareunia rate, with a 66.7% sexual dysfunction rate three months postpartum [29]. However, other studies failed to find such an association [30], irrespective of the episiotomy type [31]. With the introduction of sterile techniques, the infection rate post episiotomy dropped, but continues to be higher than that reported with spontaneous perineal lacerations [13].

Regarding the effect of episiotomy on future vaginal deliveries, a study on 6052 women (47.8% with previous episiotomies) reported that 51.3% of women with previous episiotomy suffered from second-degree lacerations compared with 26.7% in those without prior episiotomy ($p < .001$) [32]. In addition, third- and fourth-degree lacerations were significantly higher in the episiotomy group (4.8% versus 1.7%; $p < .001$) [32].

Present

Many authors have advocated selective use of episiotomy rather than its routine practice. A Cochrane review showed that a selective episiotomy approach resulted in a 30% reduction in severe perineal or vaginal trauma (relative risk (RR) 0.70; 95% CI 0.52–0.94) [2]. No differences in the pain scale, long-term dyspareunia, long-term urinary incontinence or neonatal outcome were noted even after adjusting for parity [2]. However, there is a worldwide misinterpretation of all evidence against episiotomies, leading physicians to withhold the procedure on any patient to promote “naturalization” of delivery [33]. This has led many

institutions to even consider episiotomy as an “obstetrical violation” [33]. Episiotomy is a procedure with indications and techniques that can sometimes help rather than harm women by preventing serious lacerations and expediting delivery in fetuses who are believed to be hypoxic. Therefore, “if performing episiotomy in all patients is not beneficial, the failure to perform episiotomy when there is an indication may be just as detrimental” [33].

When it comes to operative vaginal deliveries (OVD), studies showed that episiotomy increases the risk of perineal trauma in vacuum-assisted deliveries but not in forceps deliveries [34]. A study on 2041 women showed that a significant reduction in the use of episiotomy at their institution during OVD did not influence the rate of third-degree lacerations but increased vaginal laceration rate and protected against fourth-degree lacerations [35]. In a large population-based observational Dutch study on 28,732 women, mediolateral episiotomy decreased the risk of third-degree perineal tears associated with vacuum deliveries (OR 0.11; 95% CI 0.09–0.13) and forceps deliveries (OR 0.08; 95% CI 0.07–0.11) [36]. They concluded that mediolateral episiotomies should be routinely performed during operative vaginal delivery. Medial episiotomies are associated with increased risk of both third- and fourth-degree perineal tears in OVD [37], more so in vacuum assisted vaginal deliveries [38]. Therefore, it seems that clinical judgment on the value of episiotomy should be exercised while performing an OVD. If deemed necessary, a mediolateral episiotomy seems to be a safer approach.

Future

Several strategies were tested to decrease the incidence of perineal trauma and reduce episiotomy rates. One of these is to perform perineal massage (before delivery and during the second stage of labor). In a Cochrane review, four trials comparing antenatal perineal massage with no massage in 2480 women were analyzed [39]. Digital perineal massage starting at 34 weeks was correlated with 16% decreased chance of having an episiotomy (RR 0.84; 95% CI; 0.74–0.95) in women with a previous vaginal birth and a decrease in perineal trauma requiring repair (RR, 0.61; 95% CI, 0.86–0.96) [39]. In a meta-analysis involving 2147 women, perineal massage during the second stage of labor reduced third- and fourth degree lacerations compared with no massage (RR 0.52; 95% CI 0.29–0.94) [40]. Another massaging technique involves perineal massage with glycerol for 10 min four times

during the first stage and once during the second stage of labor, which was found to decrease the episiotomy rate compared with hands off controls (31% versus 69.7%; $p < .001$) [41].

Another strategy is to apply warm compresses (38 to 44 °C) on the perineum during the contraction in the second stage of labor, which reduced third- and fourth-degree tears (RR 0.48; 95% CI, 0.28–0.84) [40]. However, both strategies were not found to leave an intact perineum post-delivery. Applying warm compresses twice; at 7 cm and at 10 cm dilation, for 15–20 min, was associated with an intact perineum (27% versus 6.7%; $p < .001$) and fewer rates of episiotomy (45% versus 90.7%; $p < .001$) compared with standard care [42]. Post-delivery pain and length of episiotomy were also found to be lower in the intervention group at the expense of a higher rate of spontaneous lacerations [42]. In a trial including 6148 women (17 studies), the upright position during labor was associated with reduction of episiotomy rate (RR 0.75, 95% CI, 0.61–0.92) with a probable increased risk of second-degree perineal tears (RR 1.20, 95% CI 1.00–1.44), and no difference in higher degree perineal tears or blood loss (RR 1.59, 95% CI 0.90–2.80) [43].

Finally, delaying pushing does not seem to influence spontaneous high degree tears (RR 0.94; 95% CI 0.78–1.14) or even the rate of episiotomy (RR 0.95; 95% CI 0.87–1.04) [44].

The technique

In general, it is usually recommended to perform the episiotomy when the perineum is bulging with the presenting fetal part [45]. Most believe that a length of 4 cm is enough, but the French recommendations advise to elongate the cut to 6 cm [46].

As for the ideal angle of the cut, an angle between 45° and 60° seems to be associated with a decrease risk of OASIS [47]. In fact, there is growing evidence in favor of the more obtuse incision angle of 60° to protect the perineum [48]. It therefore appears important to adhere to an incision angle >45°. Studies show an increased risk of anal sphincter injuries when the episiotomy suture angle is 25° reaching 10% and a halving of this risk for each additional 6° away from the midline [45]. To permit cutting a mediolateral episiotomy at fixed 60° angle from midline of the perineum a scissor instrument (Episcissors-60) was evaluated for use at crowning. It resulted in a 45° cut angle after delivery [49]. This instrument was proven to be expensive and therefore a cheaper paper episiotometer is being studied for common use.

Conclusion

There is a worldwide trend to adopt the restrictive/selective use of episiotomy over the routine use. Episiotomy should be employed with care, only when clearly needed to salvage any imminent maternal and/or fetal risks during the delivery. Although numerous studies showed that strategies are needed and currently performed to decrease the need for an episiotomy, further research and larger studies are required to prove the efficacy of each technique on its own or combined in reducing the episiotomy rate. Furthermore, and despite its difficulty, new trials should be performed comparing the different types of episiotomy with all the risks they carry on outcomes, mainly comparing medial and mediolateral episiotomies and the rising lateral episiotomy in northern Europe.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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