

Cutting an episiotomy at 60 degrees: how good are we?

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Abstract

Introduction and hypothesis Episiotomy is regarded as the most common maternal obstetric surgical procedure. It is associated with a significant increase in blood loss, lower pelvic floor muscle strength, dyspareunia, and perineal pain compared with a perineal tear. We tested the hypothesis that all doctors and midwives can perform an episiotomy when prompted to, specifically cut at 60° from the midline (in a simulation model).

Methods Doctors and midwives attending the BMFMS Annual Meeting (2014), Croydon Perineal Trauma Course and staff at Poole General Hospital were invited to cut a paper replica of the perineum with a commonly used episiotomy incision pad. Participants were prompted to cut an episiotomy at 60° to the perineal midline with the anus as a reference point. The angles and distances were measured using protractors and rulers. A 58–62° band was deemed acceptable to account for measurement errors.

Results A total of 106 delegates participated. Only 15 % of doctors and midwives cut an episiotomy between 58 and 62°. Over one third (36 %) cut the episiotomy between 55 and 65° (inclusive). Nearly two thirds either underestimated the angle (<55°; 44 %), or overestimated the angle (>66°; 18 %). Thirty-six and 7.5 % of episiotomies were cut at <50 and >70° respectively. The

origination point of the episiotomy was 5 mm away from the midline (IQR 1–8 mm).

Conclusions This original observational study shows that doctors and midwives were poor at cutting at the prompted episiotomy angle of 60°. This highlights the need to develop structured training programmes to improve the visual accuracy of estimating angles or the use of fixed angle devices to help improve the ability to estimate the desired angle.

Keywords Episiotomy · OASIs · Episiotomy angle · Obstetric anal sphincter injury

Abbreviations

OASIs Obstetric anal sphincter injuries
NICE National Institute for Health and Care Excellence

Introduction

Episiotomy is regarded as the most common maternal obstetric surgical procedure [1]. It is associated with a significant increase in blood loss, lower pelvic floor muscle strength, dyspareunia, and perineal pain compared with women who had a perineal tear [2]. The Cochrane systematic review recommends restrictive episiotomy owing to the increased morbidity associated with routine episiotomy [3]. When Fodstad et al. compared midline, mediolateral, and lateral episiotomy, there was no significant difference in pain, dyspareunia and infection rates [4]. However, It has been shown that midline episiotomy is associated with high rates of obstetric anal sphincter injuries (OASIs) compared with mediolateral episiotomy [5]. There are as yet no randomised or case-control studies in the literature in which the angle of episiotomy has been controlled for. Hence, there is a need for such a study in

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order to establish the benefits of episiotomy when episiotomies are cut at an angle of 60°.

Treatment of anal incontinence due to sphincter defects including conservative and surgical measures have poor long-term success [6, 7]. There is therefore a need to focus on preventive strategies. The angle of the episiotomy has been attributed to the increased risk of OASIs. It has been shown that an episiotomy with an angle of less than 30° after suturing is associated with an increased risk of OASIs [8–10].

Such acutely angled episiotomies can cause direct injury to the anal sphincters, as shown on the endoanal scan image (Fig. 1). Similarly, episiotomies with sutured angles of more than 60° were found to have increased OASIs [10], as these episiotomies do not relieve the pressure on the central posterior perineum.

According to Eogan et al., the incidence of OASIs with an episiotomy sutured angle of 25° was 10 %, and with a suture angle of 45°, the OASIs rate reduced to 0.5 % [9]. Therefore, for every 6° of the episiotomy sutured angle away from the midline, the incidence of OASIs reduces by 50 %. Hence, there appears to be a “safe zone” of 40–60° in reducing the incidence of OASIs.

Perineal distension data have shown a 10 to 30° difference between the cutting and sutured angle of the episiotomy. An episiotomy performed at 40° results in a sutured angle of 22° [11] and episiotomies performed at 60° result in a sutured angle of 45° [12], 43° [13] and 50° [14]. Therefore, in order to reduce OASIs, the aim should be to perform an episiotomy at 60° [13, 15]. However, evidence from clinical studies and

training situations shows that clinicians are unable to arrive at these angles consistently [8, 16, 17]. This may be due to ignorance about the safe angles required for an episiotomy or the perineal distension that occurs at crowning, or the lack of spatial awareness in determining an assumed angle on a distended perineum.

Current obstetric practice is to cut episiotomies by visually estimating the required angle. We conducted this study to assess the accuracy of doctors and midwives in cutting an episiotomy at 60° away from the midline.

Materials and methods

Participants were recruited at three different sites in the UK: the British Maternal–Fetal Society Annual Meeting (Harrogate, 2014), the Croydon perineal trauma training course, and doctors and labour ward midwives at Poole General Hospital.

All participants were either doctors or midwives. They were invited to cut a paper replica of the perineum with a commonly used episiotomy incision pad, where the anus was denoted by a cross and the posterior vagina by a semi-circle (Fig. 2). Participants were prompted to cut an episiotomy at 60° to the perineal midline with the anus as a reference point, but were free to originate the cut as per their normal clinical practice. They made left- or right-sided cuts as per their preference.

Descriptive statistical analysis was performed. Angles (degrees) and distances (mm) were measured using commonly available protractors and rulers. Twenty percent of all measurements were randomly checked by a second investigator. Data reported includes median and interquartile ranges (IQR) calculated using Microsoft Excel. A 58–62° band was deemed acceptable to account for measurement errors. As this was an educational test survey among clinicians, ethical approval was not required.

Results

A total of 106 delegates participated. Only 15 % of doctors and midwives cut an episiotomy between 58 and 62°. Just over one third (36 %) cut the episiotomy between 55 and 65° (inclusive), as summarised in Table 1.

Nearly two thirds either underestimated the angle (<55°; 44 %), or overestimated the angle (>66°; 18 %). Episiotomies that were cut <50 and >70° were 36 and 7.5 % respectively. The origination point of the episiotomy was a median of 5 mm away from the midline (IQR 1–8 mm, range –5 to 18 mm).

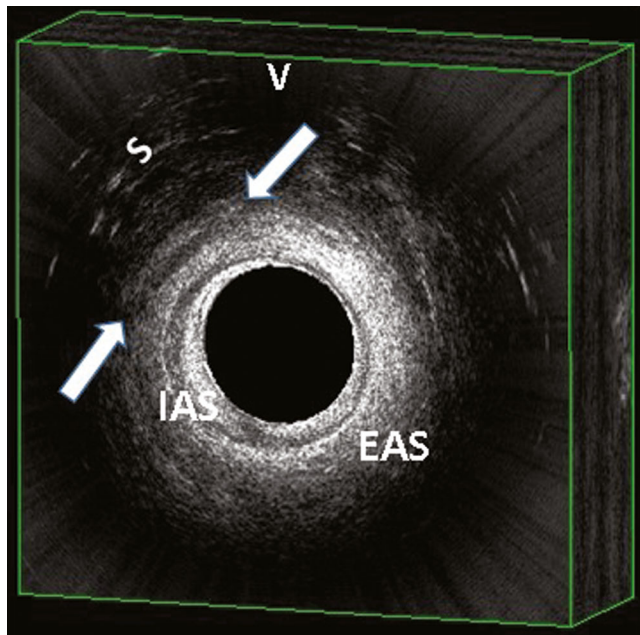
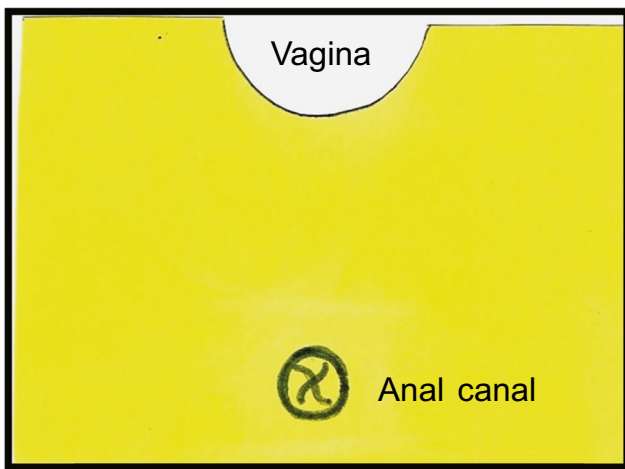


Fig. 1 An endoanal ultrasound picture showing an episiotomy involving the external anal sphincter (EAS). IAS internal anal sphincter, S scarring of perianal tissue, V vagina



A. Paper replica of the episiotomy training pad



B. An episiotomy being made at 60 degrees

Fig. 2 Replica of the perineum on an episiotomy pad showing the angle at which delegates were asked to cut an episiotomy. **a** Paper replica of the episiotomy training pad. **b** An episiotomy being made at 60°

Discussion

We found that only 15 % of doctors and midwives were able to cut an episiotomy at an angle between 58 and 62°. We analysed the episiotomies cut between 55 and 65° to

Table 1 The number of doctors and midwives performing an episiotomy at different degrees

Angle of episiotomy cut in degrees	<i>n</i> (%)
<40	1 (0.9)
40–50	37 (35)
51–55	9 (8.4)
55–60	20 (19)
61–65	18 (17)
66–70	11 (10)
71–80	7 (6.6)
>80	1 (0.9)

accommodate a wider but clinically acceptable error. Only 36 % of clinicians were able to achieve a cut within this extended band, highlighting the inaccuracies of visually estimating angles. Thirty-six percent of the episiotomies cut were less than 50° and these are more likely to result in a suture angle closer to the anus. 7.5 % of the episiotomies cut were angled very laterally (>70°). According to Stedenfeldt et al., an episiotomy angle of more than 60° does not relieve the pressure on the central posterior perineum and therefore increases the risk of OASIs [10].

We are not aware of another study assessing the accuracy of clinicians in cutting at a particular fixed angle. Tincello et al. [16] assessed the angles drawn by clinicians to depict an episiotomy on paper. One third of the angles were greater than 40°. However, clinicians were not prompted to draw an episiotomy at a particular angle, nor were they asked to cut.

Wong et al. [15] found that a majority of doctors and midwives described 45° as an appropriate angle for the episiotomy. Interestingly, clinicians who had attended training courses in episiotomy techniques and perineal repair drew a median angle of 33° compared with the “untrained” who drew them at 40°.

In a series of 100 episiotomies, only one-third of clinicians were able to perform an episiotomy that resulted in a suture angle of $\geq 40^\circ$ [8]. Similarly, Fodstad et al., who evaluated 300 episiotomies, demonstrated a considerable variation in the angle and distance from the midline [17]. Seven percent were median/midline (suture angles <25°), 13 % were mediolateral (suture angle 25–60° and distance from the posterior fourchette ≤ 3 mm), 36 % were described as “non-classifiable”, and 44 % were lateral (sutured episiotomy >10 mm away from the posterior fourchette, with angles between 25 and 60°).

In the UK, the National Institute for Health and Care Excellence (NICE) recommends that a mediolateral episiotomy should be performed between 45 and 60° from the midline [18]. According to a study by Kalis et al., episiotomies performed at 40° angle resulted in a suture angle of 22° [11]. Therefore, an episiotomy performed at 45° would result in a suture angle of less than 30°, thereby increasing the risk of OASIs.

An episiotomy is usually performed during crowning and the perineum is spherical at this stage. Cutting at 45° would bisect the perineal angle between the 6 and 9 o'clock positions. Cutting at 60° would require a visual trisection of this angle. Our study shows that this is being achieved by only 15 % of clinicians. Estimating the angle in a sphere requires customised spherical protractors; therefore, it is technically difficult to perform an episiotomy at a specified angle when the perineum is distended at crowning.

We did not analyse the data according to the level of seniority as the numbers in each group were small. However, in a study by Silf et al., there was no difference between the midwives and trainee obstetricians in performing an appropriate episiotomy on a model [19].

This study highlights the need to create and validate teaching and training programmes on how to perform an appropriate angled episiotomy in order to reduce the risk of OASIs. This can also potentially be addressed by using simple measures such as marking the appropriate angle on the perineum, which may require the presence of a second accoucheur, and be a distraction, especially in situations where expedited delivery of the baby is indicated or devices such as the EPISCISSORS-60 [6, 7] are used that maintain the standard required angle at the time of the episiotomy.

The other strategy that can be adopted is to mark the perineum during the first stage of labour. However, it needs to be recognised that marking the perineum in the first stage at 60° results in an angle of 90° at crowning, but marking at 30° results in 60° at crowning [20]. The limitation of this strategy is that it would involve marking all labouring women irrespective of whether they need an episiotomy.

Conclusion

This study shows that doctors and midwives are not accurate at predicting the angle at the time of episiotomy. This highlights the need for structured training to improve the visual accuracy of estimating the angles and thereby to reduce the risk of OASIs as a result of an inappropriately angled episiotomy.

There is an urgent need for a randomised controlled trial in which the angle, length and depth of episiotomy is standardised so that the effect of a properly conducted mediolateral episiotomy on the incidence of OASIs can be established.

Conflicts of interest M. Naidu, S. Evans, L. Vinayakrao, A.H. Sultan, R. Thakar: none. D.S. Kapoor: co-inventor of the EPISCISSORS-60 episiotomy scissors. He is a shareholder of Medinvent Ltd, the company that owns the commercial rights to the scissors.

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