Outcomes of Routine Episiotomy
A Systematic Review

Katherine Hartmann, MD, PhD
Meera Viswanathan, PhD
Rachel Palmieri, BS
Gerald Gartlehner, MD, MPH
John Thorp, Jr, MD
Kathleen N. Lohr, PhD

Evidence does not support maternal benefits traditionally ascribed to routine episiotomy for prevention of fecal and urinary incontinence or pelvic floor relaxation. Likewise, no evidence suggests that episiotomy reduces impaired sexual function—pain with intercourse was more common among women with episiotomy.

Conclusions

Evidence Acquisition

We searched MEDLINE, Cumulative Index to Nursing and Allied Health Literature, and Cochrane Collaboration resources and performed a hand search for English-language articles from 1950 to 2004. We included randomized controlled trials of routine episiotomy or type of episiotomy that assessed outcomes in the first 3 postpartum months, along with trials and prospective studies that assessed longer-term outcomes. Twenty-six of 986 screened articles provided relevant data. We entered data into abstraction forms and conducted a second review for accuracy. Each article was also scored for research quality.

Evidence Synthesis

Fair to good evidence from clinical trials suggests that immediate maternal outcomes of routine episiotomy, including severity of perineal laceration, pain, and pain medication use, are not better than those with restrictive use. Evidence is insufficient to provide guidance on choice of midline vs mediolateral episiotomy. Evidence regarding long-term sequelae is fair to poor. Incontinence and pelvic floor outcomes have not been followed up into the age range in which women are most likely to have sequelae. With this caveat, relevant studies are consistent in demonstrating no benefit from episiotomy for prevention of fecal and urinary incontinence or pelvic floor relaxation. Likewise, no evidence suggests that episiotomy reduces impaired sexual function—pain with intercourse was more common among women with episiotomy.

Conclusions

Evidence does not support maternal benefits traditionally ascribed to routine episiotomy. In fact, outcomes with episiotomy can be considered worse since some proportion of women who would have had lesser injury instead had a surgical incision.

JAMA. 2005;293:2141-2148
www.jama.com

See also Patient Page.
CME available online at www.jama.com

©2005 American Medical Association. All rights reserved.

(Reprinted) JAMA, May 4, 2005—Vol 293, No. 17 2141
sequences of pelvic floor relaxation, such as bladder prolapse and urinary incontinence. Furthermore, they agree with the statement that they “prefer to employ episiotomy frequently because it is easier to repair than the laceration that results when episiotomy is not used.” 12 12 Simultaneous belief in prevention of future sequelae and ease of repair creates potential for misattributed motivations.

National data on use of episiotomy show a consistent decline over the prior 2 decades.13 12 However, persistent wide practice variation suggests that episiotomy use is heavily driven by local professional norms, experiences in training, and individual practitioner preference rather than variation in the needs of individual women at the time of vaginal birth. Our goal was to refocus attention on routine episiotomy by systematically reviewing the best evidence available about the maternal outcomes of routine vs restrictive use of episiotomy, including type of episiotomy. Specifically, we sought to describe maternal outcomes such as degree of perineal injury and pain close to the time of birth, as well as longer-term outcomes such as urinary and fecal incontinence, pelvic floor defects, and sexual dysfunction.

EVIDENCE ACQUISITION

We sought studies that (1) reported outcomes related to episiotomy and perineal injury at the time of vaginal birth; (2) were published in English; (3) had more than 40 participants; and (4) reported original research.13 For summary of short-term maternal outcomes of routine vs restrictive use of episiotomy or of episiotomy type, we limited searches to randomized clinical trials. For longer-term outcomes, such as incontinence, pelvic floor defects, and sexual function, we included both trials and prospective cohorts.

In collaboration with a research librarian, we searched MEDLINE, Cochrane Collaboration resources, and the Cumulative Index to Nursing and Allied Health Literature using the search terms episiotomy and labor stage, second. We then hand-searched reference lists of research articles, reviews, and texts and consulted with our advisory group to ensure full identification of relevant articles from 1950 through May 2004. We conducted dual independent reviews of abstracts and a single review of full articles to apply the inclusion criteria. Initial data abstraction was done by K.H., M.V., R.P., G.G., and J.T. and a second team member assessed initial entries for accuracy, completeness, and consistency. The 2 abstractors, with the full team as needed, reconciled discrepancies.

To rate quality of individual articles, 2 authors independently rated each article. A third author reviewed scores and flagged differences. We reconciled any differences in component or overall quality classification by consensus. To grade the global strength of evidence relevant to specific outcomes, we used the approach described by West and colleagues.14 That system encompasses 3 domains: (1) quality of the individual studies as assessed by examination of a checklist of specific elements of study design and conduct; (2) quantity of relevant studies identified (including number of studies and adequacy of the sample size); and (3) consistency of findings. Grades for strength of evidence were assigned by consensus.13

Although meta-analysis was not the primary goal, we calculated summary measures when possible. Variation between studies was assessed using tests of homogeneity, including exact tests as required. Sarcity of studies with similar exposure categories, outcome measures, and timing of measurement often prohibited calculation of summary measures and examination of sources of heterogeneity. For summary estimates, we required similar measures in the same time frame. When heterogeneity was observed ($P<.10$), we used DerSimonian and Laird random-effects models to generate summary measures.13 If no meaningful heterogeneity was found, we applied Mantel-Haenszel fixed-effects models to estimate summary measures.

EVIDENCE SYNTHESIS

Our search identified 986 articles; 659 were excluded after reviewing the abstract. We reviewed the full texts of 327 articles. Twenty-six met inclusion criteria.

Maternal Postpartum Outcomes

Seven randomized trials, with a total of 5001 participants, compared restrictive vs routine use of episiotomy.16 22 Six of the 7 trials used mediolateral episiotomy. The only North American trial, conducted in Canada, used midline episiotomy, which is more conventional in the United States.19 Each trial compared 2 groups: a group in which the obstetric health care practitioner was to restrict use of episiotomy and a group with a liberal use policy that endorsed routine use. The strictest definition of restrictive use was to avoid episiotomy unless indicated for fetal well-being.16 22 Other definitions pivoted on instructions to “avoid episiotomy,” use only when “medically necessary,” or not perform episiotomy for the purpose of avoiding a laceration.17-19 21 The largest trial defined restrictive use as only for fetal indications or to avoid severe lacerations.20 Routine use groups were defined in terms such as “routinely conducted,” “usual care,” and “elective.” 17-21 Two studies described routine use as to preempt a tear.16 22

Overall, inclusion criteria for these studies were poorly specified. Generally, participants had term births of singletons with vertex presentation. Three studies enrolled only women having a first birth, which eliminates influence of prior perineal trauma on trial outcomes.17,21,22 In studies without parity restrictions, the proportion of women who were primiparous ranged from 40% to 68%, with good balance between study groups.16,18-20 In 1 exception, multiparous women were somewhat more likely to be in the restrictive use group.18

Each study focused on normal spontaneous vaginal births. To reduce the number of operative vaginal deliveries or cesarean births, most trials allocated women as close to birth as feasible. The
proportion of assisted vaginal births ranged from 0 to 5%\(^{16,19-21}\) up to 15\%.\(^{17,18,22}\) In 2 cases, authors noted the number of cesarean births and exclusion from further analyses.\(^{19,22}\) Both of these studies enrolled women during prenatal care, an approach that improved representativeness of the population, making exclusion from analysis logical.

**Perineal Outcomes.** The strongest trial (good quality) was the first conducted,\(^{16}\) which achieved a wide gradient of episiotomy use: 10.2% in the restrictive use group and 51.4% in the routine use group. Women in the restrictive use group were more likely to have an intact perineum; 33.9% in the restrictive use group had neither posterior perineal lacerations nor episiotomy compared with 24.3% in the routine use group. Third- and fourth-degree lacerations were rare (0.5% overall) and did not differ by group. Among nulliparous women, 74% of the restrictive use group compared with 89% of the routine use group required any suturing, including for anterior or labial lacerations. For multiparous women, 66% of the restrictive use group and 69% of the routine use group required sutures.\(^{16}\)

The largest trial was a multisite Argentine study of fair quality, with 2606 participants.\(^{20}\) This study documented decreased risk of posterior perineal surgical repair (relative risk [RR], 0.72; 95% confidence interval [CI], 0.68-0.75) and a 2.4-fold increase in risk of anterior tears among women in the restrictive use group (95% CI, 1.89-2.94) compared with routine use. Sixty-three percent of women in the restrictive use group had a surgical repair compared with 88% in the routine use group. Pain and healing complications were less frequent in the restrictive use group.

Results of the remaining trials were compatible with these findings (Table 1): intact perineum was uniformly less common in the routine compared with the restrictive use group (RR, 0.46; 95% CI, 0.30-0.70).\(^{16,18,19,21,22}\) With 2 exceptions,\(^{16,19}\) studies reported more third- and fourth-degree lacerations in the routine use group. All trials were underpowered to distinguish differences, with a total of 105 rectal injuries among 5001 participants (RR for routine vs restrictive use, 1.13; 95% CI, 0.78-1.65).\(^{16-22}\) Anterior lacerations, including anterior labial lacerations, were more common in the restrictive use groups in 4 studies\(^{16,19,20,22}\) and in the routine use group in 1 study.\(^{21}\) Anterior lacerations did not contribute to overall higher use of suturing, suggesting that these tears were less severe than posterior tears. Need for any suturing was 26% higher in the routine use groups (RR, 1.26; 95% CI, 1.08-1.48).\(^{16,20,21}\)

**Pain Outcomes.** Five studies assessed pain outcomes (Table 2).\(^{16,18-20,22}\) Sleep and colleagues used midwives masked to group to assess pain at 10 postpartum days.\(^{16}\) Participants reported their pain severity in the prior 24 hours. Severity was virtually identical between groups: in the routine use group, 14.6% had mild pain, 7.8% had moderate pain, and 0.2% had severe pain; respective proportions for the restrictive use group were 14.1%, 7.5%, and 0.9%. Use of oral analgesics by postpartum day 10 was rare and comparable at 2% and 3%, respectively. Pain outcomes were also comparable at 3 months.

House and colleagues reported that level of pain was more severe on the third postpartum day in the routine use group.\(^{18}\) They assessed pain using a visual analog scale during an interview conducted by an author (masking was not noted). On day 3 in the routine use group, 11% had severe pain, 34% had moderate pain, and 55% had mild pain; respective categories for the restrictive use group were 10%, 22%, and 68%. The restrictive use group had less tenderness on examination on the third postpartum day: 79% had mild or minimal pain, 18% had moderate pain, and 3% had severe pain compared with 51%, 39%, and 10% in the routine use group.
respectively. These differences were statistically significant and likely to be clinically relevant. Differences in pain by group were resolved by 6 weeks and 3 months.

The only trial using midline episiotomy found no difference in McGill Pain Scale scores for perineal pain or pain with urination on days 1, 2, and 10. The Argentine study did not adequately define how they measured pain and reported “pain on the day of discharge.” The routine use group was described as 42.5% with pain and the restrictive use group as 30.7% with pain. The most recent study provided the most nuanced approach to pain assessment. The investigators used a 100-mm visual analog scale to assess pain with 4 activities. During bed rest, women in the routine use group reported mean scores of 39 mm (SD, 28 mm) compared with 22 mm (SD, 21 mm) in the restrictive use group; during sitting, 69 mm (SD, 23 mm) compared with 51 mm (SD, 25 mm); during walking, 56 mm (SD, 24 mm) vs 37 mm (SD, 24 mm); and during defecation, 36 mm (SD, 30 mm) vs 21 mm (SD, 21 mm). Across all activities the restrictive use group experienced less perineal pain (P = .005-.048), with differences likely to be clinically significant.

None of the 5 studies found pain to be lessened by routine episiotomy. No summary measures were appropriate given the variety of methods and timing of pain measurement.

Healing Outcomes. Two trials reported physical examinations. The Argentine trial reported no differences in hematoma prior to discharge and, at 7 days, infection, healing complications, or dehiscence. Only 44% of the women were evaluated at 7 postpartum days. Twenty trials examined participants at 3 days and at 6 weeks. Risk of infection was assessed for all participants on day 3. Poor wound apposition and granulation tissue, indicating secondary healing, were assessed at the later visit, which included 53% of participants. Each adverse outcome was equivalent.

Other Outcomes. Two studies estimated maternal blood loss. One found no difference in change in maternal hemoglobin. The other found that estimated blood loss (method not defined) was 58 mL greater in the routine use group, a statistically but not clinically relevant difference.

Incision Type

Only 1 trial and no prospective cohorts compared midline and mediolateral episiotomy. The trial allocated women having a first birth to midline episiotomy (“incisions divided 2 cm to 3 cm of the perineal tissue in the midline”) or mediolateral incisions (“made from the midline and carried to the right of the anal sphincter for about 3 cm to 4 cm”). This trial received a poor quality rating. We noted an inadequate randomization method, lack of allocation concealment, and failure to mask outcome assessors as potential sources of bias.

More complications occurred in the midline group (P < .001). Twenty-four percent of the midline group had an extension of the episiotomy into or through the sphincter compared with 9% of the mediolateral group. The midline group had less bruising of the perineum (P < .001). The investigators did not find differences in pain. Of participants, 76% attended 3-month follow-up. Women in the midline group began sexual intercourse earlier (P < .01) and had a better cosmetic appearance of the scar (P < .02) than the mediolateral group. No differences in pain or satisfaction from sexual intercourse were identified.

Urinary Incontinence, Fecal Incontinence, and Pelvic Floor Defects

Sixteen publications prospectively collected data about continence or pelvic floor muscle function (Table 3). These publications include 4 reports from 2 trials of restrictive vs routine episiotomy.

Table 2. Perineal Pain Outcomes of Clinical Trials of Routine vs Restrictive Episiotomy Use

<table>
<thead>
<tr>
<th>Study Group</th>
<th>No./Total Participants</th>
<th>Assessment</th>
<th>Timing of Assessment</th>
<th>Outcome Group</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine</td>
<td>2422/2606</td>
<td>Any perineal pain (not defined), %</td>
<td>Discharge</td>
<td>42.5</td>
<td>Argentine Episiotomy Trial Collaborative Group,21 1993</td>
</tr>
<tr>
<td>Restrictive</td>
<td></td>
<td></td>
<td></td>
<td>30.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>885/1000</td>
<td>Pain severity in prior 24 h, %</td>
<td>10 d</td>
<td>Mild</td>
<td>Sleep et al,16 1984</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>165/165</td>
<td>Pain severity using VAS (1-3, minimal; 4-6, moderate; 7-10, severe), %</td>
<td>3 d</td>
<td>Minimal</td>
<td>House et al,18 1986</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>703/703</td>
<td>Mean perineal pain severity score using 6-point McGill Pain Scale*</td>
<td>1 d</td>
<td>1.56</td>
<td>Klein et al,19 1992</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>53/146</td>
<td>Mean (SD) maximum pain score using 100-mm VAS scale (0 = “not at all”; 100 = “very much”)</td>
<td>1-5 d</td>
<td>Bed rest</td>
<td>Dannecker et al,22 2004</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>39 (28)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22 (21)</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: VAS, visual analog scale.

*Mean perineal pain scores were calculated from stratified numbers in the original article and weighted by parity (primiparous = 359; multiparous = 344).
Neither trial found meaningful differences in measures of urinary incontinence, including perineometry, and self-report of involuntary loss of urine, use of a pad, and loss of urine with coughing, sneezing, and laughing at 3 months or 3 years. Among prospective studies, Sartore and colleagues conducted the most global assessment of continence and pelvic floor function. At 3 months, women who had episiotomy had reduced pelvic floor muscle strength as assessed by perineometry compared with women with spontaneous tears. The clinical significance of this finding is unclear because all self-reported symptoms of urinary and anal incontinence and degree of prolapse on physical examination were equivalent.

In addition to trials, 6 studies (5 study populations) evaluated self-reports of urinary incontinence. Episiotomy and spontaneous-tear groups had the same frequency of in-

<table>
<thead>
<tr>
<th>Table 3. Urinary and Rectal Continence Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
</tr>
<tr>
<td><strong>No./Total Participants</strong></td>
</tr>
<tr>
<td><strong>Timing of Assessment</strong></td>
</tr>
<tr>
<td><strong>Self-reported Symptoms</strong></td>
</tr>
<tr>
<td><strong>Outcome Group</strong></td>
</tr>
<tr>
<td><strong>Study Group</strong></td>
</tr>
<tr>
<td><strong>Urinary Incontinence: Clinical Trials of Routine vs Restrictive Episiotomy Use</strong></td>
</tr>
<tr>
<td>Sleep et al, 16 1984</td>
</tr>
<tr>
<td>Routine, n = 457</td>
</tr>
<tr>
<td>3 mo Involuntary loss of urine, %</td>
</tr>
<tr>
<td>Pad use for loss of urine, %</td>
</tr>
<tr>
<td>Sleep and Grant, 24 1987</td>
</tr>
<tr>
<td>Routine, n = 333</td>
</tr>
<tr>
<td>3 y Involuntary loss of urine, %</td>
</tr>
<tr>
<td>Pad use, %</td>
</tr>
<tr>
<td>Klein et al, 19 1992</td>
</tr>
<tr>
<td>Routine, n = 337</td>
</tr>
<tr>
<td>3 mo Involuntary loss of urine, %</td>
</tr>
<tr>
<td>Urinary Incontinence: Prospective Cohorts Comparing Women With vs Without Episiotomy†</td>
</tr>
<tr>
<td>Rockner, 25 1990</td>
</tr>
<tr>
<td>Episiotomy, n = 140</td>
</tr>
<tr>
<td>4 y Involuntary loss of urine, %</td>
</tr>
<tr>
<td>Karacem and Ergolu, 21 2003</td>
</tr>
<tr>
<td>Episiotomy, n = 50</td>
</tr>
<tr>
<td>3 mo Stress incontinence (not defined), %</td>
</tr>
<tr>
<td>Eason et al, 28 2004</td>
</tr>
<tr>
<td>Episiotomy, n = 223</td>
</tr>
<tr>
<td>3 mo Involuntary loss of urine, %</td>
</tr>
<tr>
<td>Sartore et al, 29 2004</td>
</tr>
<tr>
<td>Episiotomy, n = 254</td>
</tr>
<tr>
<td>3 mo Stress incontinence (not defined), %</td>
</tr>
<tr>
<td>Rectal Incontinence: Prospective Cohorts Comparing Women With vs Without Episiotomy†</td>
</tr>
<tr>
<td>Eason et al, 21 2002</td>
</tr>
<tr>
<td>Episiotomy, n = 223</td>
</tr>
<tr>
<td>3 mo Involuntary loss of stool or flatus, %</td>
</tr>
<tr>
<td>Sartore et al, 29 2004</td>
</tr>
<tr>
<td>Episiotomy, n = 254</td>
</tr>
<tr>
<td>3 mo Anal incontinence (not defined), %</td>
</tr>
<tr>
<td>MacArthur et al, 20 1997</td>
</tr>
<tr>
<td>Episiotomy, n = 188</td>
</tr>
<tr>
<td>10 mo Loss of bowel control, soiling or staining, %</td>
</tr>
</tbody>
</table>

Abbreviation: ST, spontaneous tear.

*Data exclude intermediate measures such as perineometry and physical examination of rectal sphincter disruption and prolapse.
†Two publications for urinary incontinence 16-18 and 1 publication for rectal incontinence did not provide data by study group.
‡Only those with spontaneous tears in comparison group.
continence symptoms (RR for trials, 1.02; 95% CI, 0.83-1.26; RR for cohorts, 0.88; 95% CI, 0.72-1.07). No evidence supports episiotomy to prevent pelvic floor damage. Four cohort studies asked women about rectal incontinence, including 1 that also conducted physical examinations. None found episiotomy to be statistically associated with reduced risk of incontinence of stool or flatus. Indeed, in aggregate the 2 studies with comparable measures suggest an almost 2-fold increase in risk (RR, 1.91; 95% CI, 1.03-3.56).

Five studies included physiologic measures of pelvic floor muscle function. None found an advantage for episiotomy and 1 identified a decrease in muscle strength. These muscle function measures concur with self-report and clinical examination findings of other studies. Episiotomy confers no benefits with respect to preserving continence or pelvic floor muscle function within months or years of birth. Longer-term data are absent.

### Table 4. Sexual Function Outcomes

<table>
<thead>
<tr>
<th>Source</th>
<th>No. of Participants at Follow-Up</th>
<th>Timing of Assessment</th>
<th>Self-reported Symptoms</th>
<th>Outcome Group</th>
<th>Study Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Clinical Trials of Routine vs Restrictive Episiotomy Use</td>
<td></td>
</tr>
<tr>
<td>Sleep et al,16 1984</td>
<td>895/1000</td>
<td>3 mo</td>
<td>Resumption of intercourse, %</td>
<td>Routine</td>
<td>89.9</td>
</tr>
<tr>
<td></td>
<td>Routine, n = 457</td>
<td></td>
<td></td>
<td>Restrictive</td>
<td>90.0</td>
</tr>
<tr>
<td></td>
<td>Restrictive, n = 438</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current pain with intercourse, %</td>
<td>18.0</td>
<td>21.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain with intercourse in prior 3 mo, %</td>
<td>51.1</td>
<td>52.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep and Grant,24 1987</td>
<td>674/1000</td>
<td>3 y</td>
<td>Any painful intercourse since birth, %</td>
<td>Routine</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Routine, n = 329</td>
<td></td>
<td></td>
<td>Restrictive</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Restrictive, n = 345</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klein et al,19 1992</td>
<td>612/703</td>
<td>3 mo</td>
<td>Time to resumption of intercourse, mean (SD), wk</td>
<td>Primiparous</td>
<td>5.8 (2.1)</td>
</tr>
<tr>
<td></td>
<td>Routine, n = 303</td>
<td></td>
<td></td>
<td>Multiparous</td>
<td>5.9 (2.5)</td>
</tr>
<tr>
<td></td>
<td>Restrictive, n = 309*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 mo</td>
<td>Time to resumption of intercourse, mean (SD), wk</td>
<td>Primiparous</td>
<td>5.8 (2.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multiparous</td>
<td>5.4 (2.3)</td>
<td></td>
</tr>
<tr>
<td>Pain at first postpartum intercourse (6-point McGill Pain Scale), mean (SD)</td>
<td>Primiparous</td>
<td>2.2 (1.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multiparous</td>
<td>2.2 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Sexual satisfaction scale (items not provided), mean (SD)</td>
<td>Primiparous</td>
<td>3.1 (0.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multiparous</td>
<td>3.0 (0.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prospective Cohorts Comparing Women With vs Without Episiotomy†</td>
<td>Episiotomy</td>
<td>No Episiotomy‡</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rockner et al,30 1988</td>
<td>200/205</td>
<td>3 mo</td>
<td>Resumption of intercourse, %</td>
<td>92.2</td>
<td>92.0</td>
</tr>
<tr>
<td></td>
<td>Episiotomy, n = 154</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Episiotomy, n = 46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current pain with intercourse, %</td>
<td>20.1</td>
<td>19.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any painful intercourse since birth, %</td>
<td>44.2</td>
<td>43.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Karacam and Eroglu,27 2003</td>
<td>96/100</td>
<td>3 mo</td>
<td>Any pain with intercourse (not defined), %</td>
<td>64.6</td>
<td>54.2</td>
</tr>
<tr>
<td></td>
<td>Episiotomy, n = 48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No episiotomy, n = 48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sartore et al,29 2004</td>
<td>519/519</td>
<td>3 mo</td>
<td>Current pain with intercourse, %</td>
<td>7.9</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>Episiotomy, n = 48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No episiotomy, n = 265</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larsson et al,39 1991</td>
<td>1037/1889</td>
<td>2-3 mo</td>
<td>Pain with intercourse (not defined), %</td>
<td>16.1</td>
<td>11.0</td>
</tr>
<tr>
<td></td>
<td>Episiotomy, n = 410</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ST, n = 627; intact, n = 852</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klein et al,25 1994</td>
<td>607/607</td>
<td>3 mo</td>
<td>Resumption of intercourse by 6 wk, %</td>
<td>61.7</td>
<td>62.5</td>
</tr>
<tr>
<td></td>
<td>Episiotomy, n = 300</td>
<td></td>
<td></td>
<td>76.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Episiotomy, ST, n = 200; intact, n = 107§</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain at first postpartum intercourse, %</td>
<td>Mid</td>
<td>22.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discomforting</td>
<td>34.1</td>
<td>27.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distressing</td>
<td>28.8</td>
<td>24.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual satisfaction scale (items not provided), %</td>
<td>Not satisfied</td>
<td>16.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.8</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Abbreviation: ST, spontaneous tear. Ellipses indicate data not reported.

*Information not available for all respondents: n = 301 to 303 for routine use group; n = 306 to 309 for restrictive use group.

†One publication did not provide data by study group.40

‡Spontaneous tear comparison group.

§Information not available for all respondents: n = 263 to 300 for episiotomy group; n = 183 to 200 for ST group; n = 100 to 107 for intact group.
Episiotomy and Sexual Function

Nine studies (10 publications) prospectively collected data about sexual function: 3 trials of restrictive vs routine use of episiotomy, 16,19,24 1 trial of mediolateral vs midline episiotomy, 23 and 5 prospective cohorts. 25,27,29,38,39 One study described by the authors as retrospective included a time point at 6 months with current rather than recalled data about sexual function. 60

Two trials of restrictive vs routine episiotomy reported intention-to-treat analyses of long-term sexual outcomes (Table 4). In the first trial, 36 37% of the restrictive use group and 27% of the routine use group had resumed sexual intercourse by 1 month after the birth (P < .01). The proportions of women with resumption of intercourse by 3 months, dyspareunia at 3 months, or any dyspareunia within 3 months did not differ by group. By the third year of follow-up, likelihood of “ever suffering painful intercourse” remained comparable. 34

Klein and colleagues 19 reported that women in the restrictive use group resumed intercourse an average of 1 week earlier than those in the routine use group. All measures of sexual function were equivalent by 3 months. This team conducted a separate analysis of type of perineal trauma and sexual function using 3-month interviews. Women with episiotomy had the slowest return to intercourse (P = .02). Pain with first postpartum intercourse was also most common and severe among women with episiotomy (P < .001). 23

Prospective cohort studies did not find differences in sexual function (Table 4). Only 1 study identified differences in dyspareunia at 3 months. 29 However, pooled estimates of prevalence at 3 months can be estimated from 2 cohorts. 29,38 The summary estimate suggests that women with episiotomy tend to be more likely to report pain with intercourse 3 months after delivery (RR, 1.33; 95% CI, 0.93-2.51). 29,38 The 2 studies that assessed any dyspareunia during the first 3 months after childbirth also found no difference in probability of having had painful intercourse.

CONCLUSIONS

Our systematic review finds no benefits from episiotomy. We identified fair to good evidence suggesting that immediate outcomes following routine use of episiotomy are no better than those of restrictive use. Indeed, routine use is harmful to the degree that some proportion of women who would have had lesser injury instead had a surgical incision.

Weak evidence from a single trial suggests that harms of midline episiotomy are greater than mediolateral episiotomy due to greater risk of rectal injury. Multiple retrospective cohort studies also document higher sphincter injury rates with midline episiotomy.41-46 Health care practitioners attending births in the United States are likely to have greater experience performing midline than mediolateral episiotomy. We caution against a shift to an unfamiliar technique; suggesting more restrictive use of episiotomy will avert a larger number of all types of perineal injuries than change in technique.

The overall level of evidence on long-term sequelae—specifically, fecal and urinary incontinence, pelvic floor function, and future sexual function—is fair to poor. With regard to incontinence, the research is consistent in demonstrating lack of benefit in a comparatively early time frame. For women in later adult life, when morbidity is most likely to occur as severe and persistent incontinence or pelvic organ prolapse, the expected results of routine episiotomy are unknown. No evidence suggests that sexual function is improved by episiotomy; those who have episiotomy may be more likely to have pain with intercourse in the months after pregnancy and are slower to resume having intercourse.

While trials with strong definitions restricting use to fetal indications have achieved use as low as 8% to 10% (along with high proportions of births with an intact perineum), 16,17 in contemporary practice episiotomy use remains more than 3-fold higher. In the absence of benefit and with a potential for harm, a procedure should be abandoned. The majority of the data we have reviewed have been available for decades and thoughtfully reviewed by others. As in many discretionary procedures, practice patterns have been slow to change. However, in this instance, clinicians have been the primary agents to exercise choice to conduct or not conduct an episiotomy, rather than patients.

The time has come to take on the professional responsibility of setting and achieving goals for reducing episiotomy use. Much as surgical specialists have reduced use of procedures like knee surgery for arthritis and tonsillectomy in children, clinicians must attend to aligning research evidence and episiotomy use. Rates of episiotomy of less than 15% of spontaneous vaginal births should be immediately within reach. Clinicians need to work within hospitals, practices, and birthing centers to better track the prevalence of circumstances that likely warrant use, such as fetal distress, to refine target rates that fit the characteristics and labor experiences of the populations. In doing so, clinicians must acknowledge that little, if any, evidence is available to define indications for use; however, it is clear that maternal benefit is not an indication. Investigators need to study barriers to decreased use, including the influence of case-mix on use, and to investigate approaches to promoting change in clinician behavior. As episiotomy use is less, opportunities will be gained to better study other techniques intended to prevent or reduce perineal injury. The goals for quality of care must remain focused on both optimizing safety for the infant and minimizing harm to the mother. Given that focus, clinicians have the opportunity to forestall approximately 1 million episiotomies each year that are not improving outcomes for mothers.

Copyright 

©2005 American Medical Association. All rights reserved.

(Reprinted) JAMA, May 4, 2005—Vol 293, No. 17

Financial Disclosures: None reported.

Funding/Support: This review was supported by contract 290-02-0016 from the Agency for Healthcare Research and Quality (AHRQ), Task No. 4.

Role of the Sponsor/Disclaimer: This article was developed through work conducted by the RTI International—University of North Carolina Evidence-based Practice Center under AHRQ contract 290-02-0016. The sponsoring agency provided advice and counsel on the design and conduct of the evidence report on which this
OUTCOMES OF ROUTINE EPISIOTOMY

article is based, review of the draft evidence report, ac-
ceptance and approval of the final evidence report, and 
review and approval of the draft manuscript of this ar-
ticle. The authors of this article are solely responsible 
for its content, including any clinical or treatment recom-
endations. No statement in this article should be con-
strued as an official position of the AHRQ or the US De-
partment of Health and Human Services.
Also Available: A more detailed systematic evidence 
review of episiotomy in obstetrical care will be avail-

Acknowledgment: We acknowledge the continuing 
support of Kenneth Fink, MD, MGA, MPH, director of 
the AHRQ Evidence-Based Practice Center (EPC) 
Program, and Marian James, PhD, the AHRQ task or-
der officer for this project. In addition, we thank the 
members of our technical expert panel, who pro-
vided input and advice for the full evidence report on 
which this article is based: Leah Albers, CNM, DrPH; 
Linda Brubaker, MD, Pierre Buekens, MD, MPH, 
John O. L. DeLancey, MD; William Droegemueller, 
MD; David A. Grimes, MD; and Dwight J. Rouse, MD.

REFERENCES

1. Weber AM, Meyn L. Episiotomy use in the United 
1182.
2. Kozak LJ, Owings MF, Hall MJ. National Hospital Discharge Survey: 2001 annual summary with de-
tailed diagnosis and procedure data. Vital Health Stat 
3. Declercq ER, Sakaia C, Corry MP, Applebaum S, 
Risher P. Listening to Mothers: Report of the First 
National US Survey of Women's Childbearing 
Experiences. New York, NY: Maternity Center Asso-
ciation; 2002.
4. Banta D, Thacker SB. The risks and benefits of epi-
5. Woolley RJ. Benefits and risks of episiotomy: a re-
view of the English-language literature since 1980 
6. Woolley RJ. Benefits and risks of episiotomy: a re-
view of the English-language literature since 1980; part 
7. Thorp JM Jr, Bowes WA Jr. Episiotomy: can its rou-
tine use be defended? Am J Obstet Gynecol. 1989;160: 
1027-1030.
8. Webb DA, Culhane J. Hospital variation in episiot-
omy use and the risk of perineal trauma during 
9. Low LK, Seng IS, Murtland TL, Oakley D. Clinician-
specific episiotomy rates: impact on perineal outcomes. 
10. Webb DA, Culhane J. Time of day variation in rates 
of obstetric intervention to assist in vaginal delivery. 
J Epidemiol Community Health. 2002;56:577-578.
G. A national survey of use of obstetric procedures and 
technologies in Canadian hospitals: routine or based 
on clinical or treatment recommendations. Am J 
12. Klein MC, Kaczorowski J, Robbins JM, Gauthier 
RJ, Jorgensen SH, et al. Does episiotomy prevent 
perineal trauma and pelvic floor relaxation? Online J 
Routine vs selective episiotomy: a randomised con-
14. Eltorkey MM, Nuaum MA. Episiotomy, elective or 
selective: a report of a random allocation trial. J Ob-
15. Dannencker C, Hillemanns P, Strauss A, Hasbar-
gen U, Hepp H, Anthuber C. Episiotomy and perineal 
tears presumed to be imminent: randomized con-
trolled trial. Acta Obstet Gynecol Scand. 2004;83:364-
368.
16. Coats PM, Chan KK, Wilkins M, Beard RJ. A com-
parison between midline and mediolateral episiotomies. 
17. Sleep J, Grant A. West Berkshire perineal manag-
agement: a three year follow up. Br Med J (Clin 
18. Klein MC, Gauthier RJ, Robbins JM, et al. Rela-
tionship of episiotomy to perineal trauma and mor-
biidity, sexual dysfunction, and pelvic floor relaxation. 
19. Rockner G. Urinary incontinence after perineal 
trauma at childbirth. Scand J Caring Sci. 1990;4:169-
172.
20. Karacam Z, Eroglu K. Effects of episiotomy on 
boning and mothers' health. J Adv Nurs. 2003;43: 
384-394.
21. Eason E, Labrecque M, Marcoux S, Mondor M. 
Factors of care during pregnancy and of method of 
delivery on urinary incontinence: a prospective cohort 
E, Guazzonho S. The effects of mediolateral episiot-
omy on pelvic floor function after vaginal delivery. 
23. MacArthur C, Bick DE, Keighley MR. Faecal in-
104:46-50.
24. Eason E, Labrecque M, Marcoux S, Mondor M. 
Risk factors for third-degree perineal tears in vaginal 
delivery, with an analysis of episiotomy types. J Reprod 
factors for third-degree perineal tears in vaginal de-
elivery, with an analysis of episiotomy types. J Reprod 
26. Bodner-Adler B, Bodner K, Kimberger O, Wa-
genbichler P, Mayerhofer K. Management of the peri-
neum during forces delivery: association of episio-
tomy with the frequency and severity of perineal 
trauma in women undergoing forces delivery. J Re-
27. Fenner DE, Genberg B, Brahma P, Marek L, Del-
ancy JO. Fecal and urinary incontinence after vagi-
nal delivery with anal sphincter disruption in an ob-
2003;189:1543-1549.
28. McLeod NL, Gilmour DT, Joseph KS, Farrell SA, 
Luther ER. Trends in major risk factors for anal spinc-

Incidences of third-degree perineal tears in labour and 
outcome after primary repair. Br J Surg. 1996;83:218-
221.

30. Rockner G, Jonasson A, Olund A. The effect of 
edirolateral episiotomy at delivery on pelvic floor 
muscle strength evaluated with vaginal cones. Acta 
31. Fleming N, Newton ER, Roberts J. Changes in post-
partum perineal muscle function in women with and 
S, Grant A. The Ipswich Childbirth Study, I: a ran-
domised evaluation of two stage postpartum peri-
neal repair leaving the skin unsutured. Br J Obstet 
A. Evaluation of episiotomy and spontaneous tears of 
34. Larson PG, Platz-Christensen JI, Bergman B, Wall-
stensson G. Advantage or disadvantage of episi-
tomy compared with spontaneous perineal laceration. 
35. Signorelllo LB, Harlow BL, Chekos AK, Repke JT. 
Postpartum sexual functioning and its relationship to 
perineal trauma: a retrospective cohort study of pri-
881-888.
36. Combs CA, Robertson PA, Larsor RK. Risk fac-
tors for third-degree and fourth-degree perineal lac-
erations in forces and vacuum deliveries. Am J Obstet 
Gynecol. 1990;163:100-104.
37. Shiono P, Klebanoff MA, Carey JC. Midline epi-
siotomies: more harm than good? Obstet Gynecol. 
38. Riskin-Mashiah S, O'Brian Smith E, Wilkins IA. Risk 
factors for severe perineal tear: can we do better? Am 
factors for third-degree perineal tears in vaginal de-

Downloaded From: by a Non-Human Traffic (NHT) User on 10/27/2018