Episiotomy in Low-Risk Vaginal Deliveries

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Purpose: **The object of this study was to determine factors leading to episiotomy in low-risk vaginal deliveries, including a comparison of family physicians with obstetricians. The research was also to assess the incidence of episiotomy in a large community hospital and compare it with a national rate of 40%.**

Methods: **A retrospective cohort design was used with computerized records from one hospital. Demographic and clinical information was extracted from the database, including parity, age, physician type, anesthesia, induction, fetal complications, and other factors. Only low-risk vaginal deliveries (n = 3120) from the year 2003 were included.**

Results: **There was an overall episiotomy incidence of 48%; obstetricians performed episiotomy in 54% of their low-risk patients and family physicians in 33% of similar women ($P < .001$). Adjusted for multiple factors, the odds ratio for obstetricians performing episiotomy was 2.38 [1.98 to 2.87 (95% confidence interval (CI))]. Instrument-assisted delivery was the strongest predictor for episiotomy, with an adjusted odds ratio for forceps of 5.08 [3.75 to 6.88 CI], and vacuum 2.86 [1.78 to 4.58 CI].**

Conclusion: **Episiotomy in this hospital is being performed in almost half of all vaginal births. Obstetricians are more than twice as likely to perform episiotomy as family physicians in similar patients. Instrument-assisted delivery is a strong risk factor for episiotomy. (J Am Board Fam Pract 2005;18: 8–12.)**

Episiotomy remains the most frequent surgical procedure performed on women in the United States, occurring in nearly 40% of all vaginal deliveries and is still as high as 73% in some hospitals.[1,2] Experts note that a rate of 20% is achievable, meaning that as many as 600,000 annual episiotomies may be avoidable in this country.[1,3]

The *routine* use of episiotomy for low-risk vaginal deliveries has become unfavorable in modern obstetric practice.[3,4] A systematic review of research has shown midline episiotomy to be the strongest risk factor for anal sphincter tear.[5] Liberal use of episiotomy increases severe perineal damage, and may be the cause of incontinence, chronic pain, and sexual dysfunction,[5,6] without added benefit for the infant.[7] Many would argue that even with instrument-assisted delivery (vacuum or forceps), a surgical cut to the perineum is unnecessary and increases harm.[4–8]

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Based on experience and preliminary research, we hypothesized that obstetricians perform episiotomy more frequently than their family medicine counterparts in matched low-risk patients.[9–11] We also believe that the overall incidence of episiotomy is still high and wanted to explore associated risk factors. High episiotomy rates might have important implications for patients, hospitals, and insurers.

Our study was designed to match antepartum characteristics of low-risk vaginal deliveries and then compare episiotomy use by obstetricians and family physicians. The study was performed at a large Western community hospital with more than 4000 annual deliveries. Family medicine is the only residency program in the hospital.

Materials and Methods

Data were extracted from computerized records for all deliveries in 2003 at this hospital. The hospital uses electronic peripartum charting that automatically feeds the information into a database. Paper charts are also maintained and include physicians' hand-written notes. Technicians perform manual paper chart review to pick up and code this additional charting. The database was given to the investigators without personal patient identifiers, in compliance with the Health Insurance Portability

and Accountability Act of 1996. The Institutional Review Board approved the collection and analysis of these data, and all investigators have signed confidentiality agreements with the institution.

Diagnoses and procedures were determined by codes defined in the International Classification for Diseases, Ninth Revision (ICD-9). To verify the accuracy of the computerized records in the database, 100 paper charts were chosen at random and reviewed by one of the investigators.

The study population consisted of all women who delivered at this institution in the year 2003, for a total of 4387 patients. There were 797 Caesarean sections, which were excluded from the cohort. We further restricted the cohort to "low-risk" vaginal deliveries, according to our predetermined criteria. This eliminated 470 patients with at least one of the following factors: vaginal birth after Caesarean, gestational age <37 weeks, multiple gestation, breech, infant low birth weight (<2500 g), pre-eclampsia, oligohydramnios or polyhydramnios, diabetes, and severe medical complications such as maternal cardiovascular disease.

Statistical analysis was performed using Stata version 8 software (StataCorp LP, College Station, TX). Bivariate associations between practitioner and demographic or clinical variables were tested using Pearson's χ^2 test. Risk ratios are reported, and probability of less than 0.05 was considered significant. Backward stepwise multiple logistic regression was then performed to control for factors that might independently have been associated with episiotomy. Some nonsignificant factors such as induction and dystocia were locked into the final regression model for complete reporting on factors of clinical interest. Adjusted odds ratios are reported.

Results

In the final 3120 patients of this low-risk cohort, the overall episiotomy incidence was 48%. Obstetricians (OB) performed deliveries in 2318 of the women, and performed episiotomy in 54% of them, whereas family physicians (FP) performed deliveries 802 patients, with an episiotomy rate of 33% ($P < .001$). The unadjusted Risk Ratio for obstetricians performing episiotomy was 1.65 [1.49 to 1.84 CI (95% confidence interval)].

Demographic characteristics differed slightly between OB and FP patients. Table 1 illustrates that obstetricians' patients were somewhat older, with more patients older than 35 years category and fewer younger than 20 years. Gestational age and parity did not differ significantly between OB and FP patients.

Table 1. Demographic Characteristics in Low-Risk Groups by Specialty

Characteristic	OB* (n = 2318)	FP (n = 802)	*P* Value for Difference
Age [Mean (SD)]	26.3 (4.9)	25.8 (4.7)	.01
Age			
≤19	83 (3%)	47 (6%)	.01
20 to 34	2066 (89%)	717 (89%)	NS
≥35	169 (7%)	38 (5%)	.01
Gestational age [mean weeks (SD)]	39.0 (1.1)	39.0 (1.2)	NS
Parity			
Nulliparous	879 (38%)	284 (35%)	NS
Multiparous	1439 (62%)	518 (65%)	NS
Time of day			
7:00 AM to 5:59 PM	1340 (58%)	414 (52%)	0.01
6:00 PM to 10:59 PM	445 (19%)	169 (21%)	NS
11:00 PM to 6:59 AM	533 (23%)	219 (27%)	0.02

* OB, obstetrician; FP, family physician; NS, not significant at $\alpha = 0.05$ level.

Obstetricians were three times more likely to use forceps, whereas their use of vacuum extraction was one tenth that of family physicians. Table 2 shows these pertinent clinical outcomes, as well as factors of intrapartum management. Epidural anesthesia was used in more than 84% of both groups. OBs were 33% more likely to induce labor ($P < .01$). Malposition and shoulder dystocia were more commonly reported by family physicians, whereas abnormal fetal heart tracings and infant weight >4000 g were slightly higher in the OB group (not statistically significant). Third- or fourth-degree perineal lacerations were seen 25% more frequently in the OB patients ($P = .34$), but the overall incidence was very low at 3.4%.

The adjusted odds ratio for obstetricians performing episiotomy was 2.38 [1.98 to 2.87 CI]. Table 3 demonstrates the control for several variables that may have otherwise been causes of the higher episiotomy rate. Adjusting for the effects of forceps, epidural anesthesia, age, and other factors listed, obstetricians were more than twice as likely to perform episiotomy as family physicians.

Instrumented delivery was the most substantial predictor of episiotomy, with an adjusted odds ratio of 5.08 for forceps [3.75 to 6.88 CI] and 2.86 for

Table 2. Clinical Management and Outcomes by Physician Specialty

Outcome	OB* (n = 2318)	FP (n = 802)	Unadjusted Risk Ratio [95% CI]
Episiotomy	1248 (54%)	261 (33%)	1.65 [1.49 to 1.84]
Epidural anesthesia	2097 (91%)	677 (84%)	1.07 [1.04 to 1.11]
Induction	742 (32%)	193 (24%)	1.33 [1.16 to 1.52]
Forceps extraction	342 (15%)	34 (4%)	3.07 [2.18 to 4.33]
Vacuum extraction	16 (1%)	74 (9%)	0.08 [0.04 to 0.13]
Third or fourth degree perineal laceration	83 (4%)	23 (3%)	1.25 [0.79 to 1.97]
Malposition	37 (2%)	17 (2%)	0.75 [0.43 to 1.33]
Shoulder dystocia	14 (1%)	13 (2%)	0.37 [0.18 to 0.79]
Abnormal fetal heart rate/rhythm	105 (5%)	27 (3%)	1.35 [0.89 to 2.04]
Infant weight >4 kg	214 (9%)	59 (7%)	1.26 [0.95 to 1.66]

* OB, obstetrician; FP, family physician; CI, 95% confidence interval.

vacuum [1.78 to 4.58 CI]. Also significant were nulliparity, which increased the odds of episiotomy by 2-fold, and epidural anesthesia, which showed an adjusted odds ratio of 1.38 [1.07 to 1.77 CI]. Induction, age, and fetal complications did not significantly alter the use of episiotomy.

Table 3. Multivariate Analysis of Episiotomy Use and Associated Risk Factors

Characteristic	Episiotomies (%)	Adjusted Odds Ratio* [CI]†
Practitioner		
FP	261 (33%)	1.0
OB	1248 (54%)	2.38 [1.98 to 2.87]
Parity		
Multiparous	782 (40%)	1.0
Nulliparous	727 (63%)	2.13 [1.81 to 2.48]
Anesthesia		
Local or none	119 (34%)	1.0
Epidural	1390 (50%)	1.38 [1.07 to 1.77]
Induction		
None	1040 (48%)	1.0
Induction	469 (50%)	1.01 [0.85 to 1.19]
Instrumented delivery		
None	1136 (43%)	1.0
Forceps	317 (84%)	5.08 [3.75 to 6.88]
Vacuum	56 (62%)	2.85 [1.78 to 4.58]
Fetal complications		
None	1111 (43%)	1.0
Shoulder dystocia	15 (56%)	1.92 [0.85 to 4.34]
Heart rate or rhythm	94 (71%)	1.22 [0.79 to 1.89]
Weight >4 kg	142 (52%)	1.13 [0.86 to 1.48]
Time of day		
Night	324 (43%)	1.0
Day or evening	1185 (50%)	1.22 [1.02 to 1.45]
Age		
20 to 34	1359 (49%)	1.0
Teen	67 (52%)	0.83 [0.56 to 1.23]
≥35	83 (40%)	0.83 [0.61 to 1.13]

* Adjusted for all factors shown in table.
† CI, 95% confidence interval; FP, family physician; OB, obstetrician.

Although the intention of this study was to view the low-risk cohort, a simple comparison was made with the 470 "high-risk" patients reincluded. Of the grand total of 3590 vaginal deliveries, the overall incidence of episiotomy was the same at 48%, with obstetricians again using the procedure in 54% of their patients and family physicians performing episiotomy in 33%. Further subgroup analysis was not conducted.

A random sample of paper charts was found to correlate perfectly with computerized records in episiotomy, practitioner specialty, epidural anesthesia, nulliparity, and instrumented delivery. There were a few discrepancies between paper charts and computerized records in total number of pregnancies for multiparous patients and in exact gestational age for "term" deliveries.

The use of ICD-9 procedure code 734 "medical induction of labor" seemed to be used for both oxytocin induction and also for prostaglandin cervical ripening. This may partially explain the high incidence of "induction" at 30%. Although we initially attached code 734 with oxytocin use only, it was later changed to signify all forms of induction when the paper chart review revealed this point. Other ICD-9 codes were found to match paper records completely.

Discussion

Our findings are consistent with previous studies and further emphasize that (1) the overall rate of episiotomy in low-risk deliveries remains high and (2) obstetricians are more than twice as likely as family physicians to perform an episiotomy.

The study was limited to a single center, and may not be representative of other community hospitals throughout the country. Crude data from other hospitals within the same managed-care system showed a similar incidence of episiotomy, representing approximately 18,000 deliveries annually. Although this episiotomy incidence is higher than the 40% national average, and the 84% epidural rate is also high, the Caesarean section rate of only 18% is notably lower than average.

Data on insurance and marital status, race, and education were not available to us. Other studies have shown a slight increase in episiotomies in educated white women with private insurance.[9,12] The mechanism by which uninsured or publicly insured patients have fewer episiotomies is unclear. Whether race makes a biological or a sociological difference is also something to be determined.

Increased length of time in pushing (second stage) has previously been shown to increase risk for episiotomy,[20] although these data were not available in our study. Time of day may also be a factor, allowing the physician to spend more or less time with the laboring woman. Although barely significant, our study showed a slight increase in episiotomy during daytime and evening hours. Additional research might evaluate the effects of actual time that the provider spends at the bedside.

An unexpected factor that arose in preliminary research was the patient's preference for or against episiotomy. Although the lay press has covered some of the evidence opposing episiotomy use,[13] some women may prefer the intervention based on beliefs, prior experience, or nonreputable publications. It is also likely that some women choose a physician based on high- or low-interventional style of practice, and this choice may further skew the difference between OB and FP procedures.

Eason and Feldman[14] have postulated several possible explanations for the high rate of episiotomy. Obstetricians are trained in gynecologic surgery and are perhaps more at ease with incising and repairing the perineum. Surgeons are more likely to have the "surgical style," which would lead them to use episiotomy as a means to delivery. Some doctors simply do not believe in the "stretchability" of the perineum, preferring to incise in the final moments of labor.[15,16] Regardless of specialty, many physicians still feel that episiotomy is more humane because it prevents a tear and allows faster delivery. But evidence suggests that it is better to tear than to cut, and some feel that episiotomy, rather than being "humane," is in fact a form of cruelty to women.[17,18]

Although not specifically demonstrated in this study, the high rate of episiotomy has significant implications for the health-care system. Hueston[9] calculated hundreds of millions of dollars lost in extended length of stay and other complications from excess episiotomy. Other studies have confirmed an increased length of stay.[10] Insurers and hospitals might also consider the increased need for follow up with anal sphincter tears and the long-term complications of chronic pain and dyspareunia. It is also conceivable that women who are alert to the unnecessary use of episiotomy might pursue malpractice claims with their physicians, although we are unaware of any such cases. Expectant women might discuss episiotomy with their physician as part of routine prenatal care.

Howden et al[19] recently showed a significant difference in episiotomy use between private and academic practitioners, with an impressive adjusted odds ratio of 7.1 [6.5 to 7.7 CI].[19] Robinson et al[20] also found being a private practitioner to be the strongest predictor of use of episiotomy. Family physicians were not a significant part of either study, and no comparison was made. One limitation to our study is that no physician profiling was available. Because family medicine is the only residency at the hospital, there would be a higher proportion of "academic" family physicians compared with obstetricians. At the same time, family medicine residents assist with almost *all* deliveries, and the effect of their presence on obstetricians is unknown. Physician age, time in practice, and access to continuing medical education might also make a difference in the routine versus liberal use of episiotomy. In addition to these factors, our continuing research will consider episiotomy numbers for each physician, in that a few high-volume physicians with liberal episiotomy use could change the outcome.

The results of this research led us to question how physicians, especially private practitioners, might be influenced to avoid liberal use of episiotomy in low-risk deliveries. Some hospitals have been successful at this, such as a Philadelphia group lowering their episiotomy from 70% to 20% over the last 20 years.[12] A Canadian study on continuous quality improvement programs showed some limited benefit, whereas another study using an evi-

dence-based educational visit to obstetric group leaders showed no change.[21,22] The best process by which to change practices and influence physicians in this and other areas is a matter of continued interest.

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