Impact of Episiotomy at Vaginal Delivery
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Abstract
A comparison was made of episiotomy rates and the rates of advanced perineal lacerations (APL) between different modern times, in order to view the likely consequences of performing episiotomy at vaginal delivery, and to consider applying this to obstetric quality standards.

Study design: A Structured Query Language (SQL) perinatal database, used in a community hospital, was used to investigate the prevalence of episiotomy performed at vaginal delivery and the incidence of APL, for a comparison between different time periods. The type of obstetric provider, the type of episiotomy if performed, any associated operative procedures, neonatal birth weight and Apgar scores, estimated blood loss, and other obstetric variables were reviewed.

Results: The average episiotomy rate steadily declined from 1996-1998, 2003-2005 and 2012-2014. The rate of advanced perineal lacerations coincidently rose during these time period comparisons.

Conclusion: Obstetric providers may need to consider the likely outcome at vaginal delivery when considering performing an episiotomy. Quality standards may need to more properly focus on the incidence of APL, rather than the episiotomy rate, given the clinical data that the authors examined.

Keywords: Episiotomy; Severe perineal lacerations; Mediolateral episiotomy

Introduction
The use of episiotomy at vaginal birth has long been part of the traditional armamentarium of obstetricians, as introduced over a century ago by Dr. Joseph De Lee. The published evidence of its association with advanced perineal laceration (APL), defined as 3rd and 4th degree lacerations, has caused a decline in its usage over the past few decades. While there appears to be many factors that contribute to the potential risk of APL (e.g., neonatal birth weight, the performance of operative obstetrical techniques, and other obstetrical variables), episiotomy has been primarily looked at as an important avoidable risk factor to recognize. Viewing the history and context of its use can potentially influence its current obstetric utilization, in view of the various recommendations that have been offered over time [1].

In terms of the risk of APL from the performance of an episiotomy, the type of episiotomy may need to be considered (midline or mediolateral), as a difference in the relative risk between these types of episiotomy may exist [2]. It is clear though, that the risks of vaginal delivery morbidities associated with episiotomy may not be as significant as those associated with 3rd or 4th degree perineal lacerations. Selecting the most appropriate obstetric quality measures needs to be based on this relevant evidence.

To that end, the authors have identified its use over time at a community hospital, its association with APL, and the comparison of its use by different provider types, to see the optimal practical utility of episiotomy in obstetric practice. We compared our findings of the declining incidence of episiotomy along with the coincident rising incidence of APL with that seen elsewhere [3,4].

Materials and Methods
The specific performance of episiotomy at vaginal delivery has been collected in a perinatal database, which we have used in our department for a few decades, along with many other data elements as part of clinical practice at our community hospital. Recently, this system morphed into a Structured Query Language (SQL) database, which we continue to use. This has allowed for the accumulation of these clinical data, even though the recording of the performance of episiotomy is absent from the Revised Certificate of Live Birth, which is generally used for the documentation of perinatal procedures and conditions for most of the births in the United States today. Hence, the possibly associated consequences resulting from episiotomy have not been systematically viewed within a larger context outside of an individual hospital such as ours (e.g., for the millions of annual vaginal births nationally), as would be desired.

Episiotomy performance at vaginal births was analyzed over different time periods, along with many other associated clinical events and measurable conditions. Though an electronic health record (EHR) is used by all practitioners in our practice setting, we have utilized the described SQL perinatal database in addition to its use, for collecting our clinical data, to include those additional elements requiring regulatory reporting. Some of the elements recorded in the SQL database include prenatal risk factors, delivery type, attendant, whether episiotomy was performed, the type of episiotomy (if performed), the parturient gravidity and parity, number of prior cesareans, the estimated gestational age at delivery, the estimated blood loss at delivery, the newborn birth weight and Apgar scores. While these specific data elements are manually recorded by a team of individuals, there are numerous measures that are employed to ensure the quality and completeness of this clinical information gathering.

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This investigation was approved by the Advocate Investigational Review Board (IRB). The statistical analyses were performed with Chi-Square for categorical variables, and Students t for continuous variables.

Results

The demographics of this community hospital reveals a diversity of patients (with a large percentage of Latinas), a diversity of provider types (Attending obstetricians, Attending Family Physicians, Resident physicians and Certified Nurse-Midwives), and a diversity of payer-types that are typically included. This demographic description may allow for easily generalizing our own hospital findings.

This report provides the number of episiotomies performed during different time periods (1996-1998, 2003-2005, and 2012-2014), the number of APLs found and repaired, the delivery types, neonatal birth weight and Apgar Scores at birth, that were associated with the recorded vaginal births at this hospital. We have seen the expected decline in the performance of episiotomy, but have also seen a concomitant increase in the incidence of APL in the absence of its use. We also compared the APL incidence seen with midline episiotomies versus mediolateral episiotomies, from 2012-2014, and no statistically significant difference was found (p = 0.07).

Retrospectively, in our institution during the years of 1996-1998, for 9,289 vaginal deliveries, 26% of women received an episiotomy, with APL occurring in 4% of these women. In the 74% of women who did not have an episiotomy, only 0.6% had an APL. However, when compared to 2003-2005, a change in episiotomy rate was noted. In our institution from 2003-2005, 6,833 vaginal deliveries occurred, and the episiotomy rate was noted to fall to 17%, with 1.6% incidence of associated APL. Women who did not receive an episiotomy during this time had a 1.5% incidence of APL (with no significant difference between episiotomy and no episiotomy). Finally, this is contrasted to our most current data. We found that for the 5,206 vaginal deliveries that occurred from 2012 through 2014, there were only 10.0% of women who received episiotomies, and 7.1% of these episiotomies were associated with APL (or 0.7% of all vaginal deliveries). Yet, 1.4% APLs (per vaginal delivery) occurred in the absence of episiotomy. This comparison results in a significantly higher risk of APL with no episiotomy compared to when episiotomy occurs (p = 0.001), which is very different from these data from prior years. These described results can be found in Table 1.

The numbers of spontaneous and operative vaginal deliveries (forceps and vacuum extractions) during this most recent time period are listed in Table 2, along with the associated episiotomies and APLs. One can see that 294 operative vaginal deliveries occurred during 2012-2014 (5.6% of vaginal deliveries), of which 132 episiotomies performed (44.9%), and 19 were APLs were found (14.4% of episiotomies). As can be seen, an operative vaginal delivery increases the likelihood of an episiotomy being performed, which also increases the APL rate as well. The overall rate of operative vaginal deliveries, however, does not appreciably contribute to the phenomenon described, relative to the likelihood of APL, with and without an episiotomy. As can be seen, this analysis remains the same for when only spontaneous (non-operative) vaginal deliveries occur, versus when all vaginal deliveries are considered.

Comment

One may suggest the significant difference in rate of APL between episiotomy and no episiotomy may be secondary to the increased use of mediolateral episiotomy at our institution. However, when looking at the years of 2003-2014, 0.3% of mediolateral episiotomies compared with 0.3% of midline episiotomies resulted in APL (p = 0.12), reflecting no statistically significant difference in episiotomy type for this. This is not consistent with what has been found elsewhere, though it has been suggested that attention may need to be paid to the angle of that mediolateral episiotomy, to properly label it as sufficiently “mediolateral” [5,6]. In fact, when the sequelae of episiotomy have been compared between those types of episiotomy, a difference was found in the incidence of APL, but not blood loss, infection, pain, dyspareunia or patient satisfaction [7]. Addressing and standardizing this associated nomenclature, relating to the identification of the type of episiotomy has also been raised [8].

As APLs are often associated with operative vaginal deliveries, the analysis reported here specifically considered only spontaneous vaginal deliveries during the most recent era. In looking at all spontaneous vaginal deliveries, however, the same conclusion was reached, regarding the presence or absence of episiotomy performed, relative to whether APL occurred. This is supported by viewing the increasing number of APLs occurring in recent years, as was identified in England [9]. This is even apparent during this recognized trend of diminishing incidence

| Total Vaginal Deliveries | 1996-1998 | 2003-2005 | 2012-2014 |
|--------------------------|----------|----------|----------|
| Episiotomies             | 2,434    | 1,136    | 520      |
| Midline                  | 2006 (82% of all epis.) | 752 (66% of all epis.) | 173 (33% of all epis.) |
| Mediolateral             | 428 (18% of all epis.) | 383 (34% of all epis.) | 338 (65% of all epis.) |
| Advanced Perineal Lacerations with Episiotomy | 368 (-4%) | 110 (-1.6%) | 37 (-0.7%) |
| Advanced Perineal Lacerations without Episiotomy | 53 (-0.6%) | 104 (-1.5%) | 74 (-1.4%) |

Epis. = episiotomy

Table 1: Episiotomies and advanced perineal lacerations at all vaginal deliveries in each of three time periods.

| Total Vaginal Deliveries | 2012-2014 |
|--------------------------|----------|
|                           | 5,206    |

| Total Operative Vaginal Deliveries | 294 (5.6% of vaginal deliveries) |
|------------------------------------|----------------------------------|
| Episiotomies                        | 520 (10.0% of vaginal deliveries) |
| Advanced Perineal Lacerations with Episiotomy at Spontaneous Delivery | 18 (0.4% of spontaneous deliveries) |
| p                                   | 0.0001 |
| Advanced Perineal Lacerations without Episiotomy at Spontaneous Delivery | 64 |

Table 2: Episiotomies and advanced perineal lacerations at vaginal deliveries 2012-2014.
of episiotomies being performed [10]. It has been illustrated that the selective use of episiotomy in general, at vaginal delivery, offers an advantage for the occurrence of APL [11], though this has not been always confirmed [12].

This retrospective review highlights the importance of applying what we know to be valuable clinical techniques at vaginal delivery. We may need to carefully examine proposed quality measures regarding the incidence of episiotomy, rather than directly viewing the more clinically important incidence of APL in obstetric practice [13]. Perhaps we may need to additionally view the practical methods that are employed at vaginal delivery, so as to minimize the potential of APL occurring, which poses considerably more associated morbidity than episiotomy itself [14].

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