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Improved overall delivery documentation following implementation of a standardized shoulder dystocia delivery form

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Abstract

Objective—Our objective was to evaluate whether using a standardized shoulder dystocia delivery form improved documentation. A standardized delivery form was added to our institution's obstetrical record in August 2003.

Methods—A retrospective cohort study was conducted comparing 100 vaginal deliveries complicated by shoulder dystocia before, and 81 after implementation of the standardized delivery form. The two groups were compared in terms of obstetric characteristics, neonatal outcomes and documentation components.

Results—Charts that included the standardized delivery form were more likely to contain documentation of estimated fetal weight (82.7% vs. 39.0% without the form, $P < 0.001$) and head-to-shoulder delivery interval (76.5% vs. 15.0% without the form, $P < 0.001$). Both groups were statistically similar in terms of documenting estimated blood loss and fetal weight, umbilical cord pH, type and order of maneuvers utilized to relieve the shoulder dystocia, and second stage duration.

Conclusions—Inclusion of a standardized form in the delivery record improves the rate of documentation of both shoulder dystocia-specific and general delivery components.

Keywords

Documentation; litigation; medical records; shoulder dystocia

Introduction

Shoulder dystocia affects 0.6–1.4% of all vaginal deliveries. The major maternal and neonatal morbidities associated with it include a 4–40% rate of brachial plexus injury, 11% rate of postpartum hemorrhage and 3.8% rate of fourth-degree lacerations [2]. Because of its

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potentially long-term sequelae, it is among the four leading causes of medical litigation brought against obstetricians [7]. In addition to timely identification, team coordination and proper medical management, the accuracy and completeness of the medical record are also paramount in shoulder dystocia cases as that can become the only reflection of intrapartum events.

Even when cases of shoulder dystocia are optimally managed, the medical record remains deficient for most of them [3], therefore making clinicians more vulnerable to future litigation. Recent evidence supports significant improvement in documentation following the inclusion of an electronic checklist [4]. Simulation training has become incorporated in the educational curriculum of most US hospitals, with overall encouraging results, both in terms of shoulder dystocia management and documentation [5, 6]. Our institution has adapted department-wide simulation training and “skill drills” for this and other obstetric emergencies. In August 2003, we also changed the standardized delivery form to include an area for documentation of shoulder dystocia interventions, namely the type of maneuvers utilized, order of maneuvers, use of episiotomy and time lapse between delivery of head and shoulders (T_{H-S}).

The objective of our study was to evaluate the effect of incorporating the new standardized shoulder dystocia delivery form on overall compliance with critical documentation components.

Methods

We conducted a retrospective cohort study of vaginal deliveries complicated by shoulder dystocia at Abington Memorial Hospital, a teaching community hospital. Inclusion criteria included singleton pregnancies with documented shoulder dystocia, requiring any degree of intervention. We reviewed the charts of all consecutive deliveries that met inclusion criteria in the 1.5 years preceding and the 2.5 years following the introduction of the new standardized delivery form. Approval from the hospital’s Institutional Review Board was obtained prior to onset of the study.

Data collected for all patients included patient age, gestational age (GA) at delivery, as well as several components of obstetric history, antenatal and intrapartum course. Obstetric history elements reviewed were parity and prior deliveries complicated by prematurity, macrosomia, shoulder dystocia, or gestational diabetes (GDM). The antenatal characteristics of interest included estimated fetal weight (EFW), maternal weight gain during pregnancy, body mass index at delivery, elevated 1-h glucose tolerance test and diagnosis of GDM. Lastly, intrapartum events noted were induction or augmentation of labor with oxytocin, use of epidural anesthesia, length of second stage of labor, operative delivery (vacuum or forceps), episiotomy, fourth degree laceration, and T_{H-S} . Neonatal outcomes of interest included gender, birth weight, APGAR scores at 1 and 5 min of life, brachial plexus injury and clavicular fracture.

Medical records were reviewed for the presence of several documentation components in the summary delivery form. These elements included EFW, umbilical cord pH, maneuvers utilized, T_{H-S} , second stage duration and estimated blood loss (EBL). At our institution, we utilize non-electronic medical records that are completed by the resident and/or attending physician who performs the delivery.

All statistical analyses were performed using the Statistical Analysis System (SAS 9.2; SAS Institute, Inc., Cary, NC, USA). Continuous data are presented as mean±standard deviation if normally distributed, or medians with the interquartile range if not, and were compared between the two groups using the unpaired *t*-test. Categorical data are presented as

proportions and were compared using χ^2 or Fisher's exact test. All P-values are two-sided, and statistical significance was defined as $P < 0.05$.

Results

We reviewed all 100 charts that met inclusion criteria prior to the use of the new standardized delivery form ("no form") and 81 charts that included the new standardized form ("form"). Patient characteristics are summarized in Table 1. The only statistically significant differences between patients in the "no form" and "form" groups were age (29.2 ± 6.0 years vs. 31.2 ± 5.5 years, respectively, $P = 0.021$), incidence of advanced maternal age (17.0% vs. 32.1%, respectively, $P = 0.018$), use of episiotomy (4.0% vs. 25.9%, $P < 0.001$) and length of T_{H-S} [35.0 (30.0–90.0) vs. 60.0 (60.0–60.0), $P = 0.03$]. Otherwise, the two groups were statistically similar in terms of antenatal, intrapartum and neonatal characteristics.

The documentation elements present in the delivery note are summarized in Table 2. Records with the new standardized delivery form were much more likely to contain documentation of EFW (82.7% vs. 39.0%, $P < 0.001$) and T_{H-S} (76.5% vs. 15.0%, $P < 0.001$) than records without the form. Conversely, use of the standardized delivery form did not affect documentation rates of umbilical cord pH, type and order of maneuvers, second stage duration or EBL (all $P > 0.2$).

Discussion

Accurate and complete documentation in cases of shoulder dystocia certainly does not eliminate the risk for litigation, but can definitely provide the most representative account of the events as they occurred at the time of delivery, devoid of recall bias and inconsistency. In an effort to improve documentation in these cases and using previously published sample forms as a template [1], our department modified the pre-existing standardized delivery forms and included a separate section specifically for shoulder dystocia.

The present study reviewed obstetric components, neonatal outcomes and documentation elements before and after onset of use of the shoulder dystocia. Our results are in agreement with previous studies that emphasized the importance of a standardized form in improving documentation [5]. We demonstrated that the implementation of this new form did not alter the rate of documentation of EBL, umbilical cord pH, maneuvers utilized to relieve the shoulder dystocia, second stage duration or EBL. However, it significantly increased the percentage of charts with documented EFW and T_{H-S} . What is important to note is that the standardized delivery form did not include EFW. This remained a component of the history and physical form completed upon admission to labor and delivery. However, the implementation of the standardized delivery form was part of a department-wide effort to increase awareness of the frequency, management and sequelae of shoulder dystocia for the entire obstetric team. We therefore hypothesize that it was due to this increased awareness that clinicians were more likely to assess and document EFW.

A recent study by Deering et al. [4] compared electronic medical records before and after implementation of a shoulder dystocia checklist and noted improved documentation of several shoulder dystocia components. Similar to that study, we also noted an identical incidence of shoulder dystocia regardless of use of the standardized delivery form. However, their study separated charts by the time when the standardized delivery form was implemented, regardless of whether the form was indeed used in the medical record or not. Instead, we analyzed charts according to the presence or absence of the completed standardized delivery form. Therefore, our findings not only support their conclusions, but

also provide further evidence that a shoulder dystocia standardized delivery form could improve overall delivery documentation, even of elements that are not included in the shoulder dystocia-specific section. It can thus prove a beneficial intervention that promotes better physician documentation habits and medical record accuracy.

Additional elements that could be included in a revised standardized delivery form are EFW, the team members involved (including nursing staff and neonatologists), comments on which shoulder was anterior, the condition of the infant's extremities, whether the clavicular fracture was intentional as part of the maneuvers used to relieve the shoulder dystocia or only a postnatal incidental finding, and whether the events, including potential implications for future pregnancies, were discussed with the patient. Analyzing documentation outcomes following implementation of these additional components could be clinically very helpful.

In summary, our study demonstrates that the use of a standardized delivery form specific for shoulder dystocia can significantly improve overall delivery documentation in these cases and be proven invaluable to obstetricians.

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Table 1

Patient characteristics.

	No form (n=100)	Form (n= 81)	P-value
Age (years)	29.2±6.0	31.2±5.5	0.021
Maternal age ≥ 35 years	17 (17.0)	26 (32.1)	0.018
Obstetric history			
Parity			0.84
0	38 (38.0)	28 (34.6)	–
1	36 (36.0)	29 (35.8)	–
2	26 (26.0)	24 (29.6)	–
Prior pregnancy complications			
Preterm delivery	0 (0.0)	2 (2.5)	0.20
Macrosomia (>4000 g)	14 (14.0)	18 (22.2)	0.15
Shoulder dystocia	2 (2.0)	4 (4.9)	0.41
Gestational diabetes mellitus	1 (1.0)	1 (1.23)	1.00
Preexisting diabetes mellitus	1 (1.0)	2 (2.5)	0.59
Antenatal course			
Gestational age at delivery (weeks)	40.0±1.1	39.9±1.1	0.76
Estimated fetal weight (g)	3628.0 (3175.0–3855.0)	3401.0 (3175.0–3855.0)	0.61
Maternal weight gain (kg)	15.8±6.2	16.4±5.5	0.48
BMI at delivery (kg/m ²)	30.8±6.0	32.1±7.1	0.17
Elevated 1-h glucose tolerance test	15 (15.0)	20 (24.7)	0.10
Gestational diabetes mellitus-A1	3 (3.0)	3 (3.7)	1.00
Gestational diabetes mellitus-A2	0 (0.0)	2 (2.5)	0.20
Intrapartum course			
Induction of labor	41 (41.0)	28 (34.6)	0.38
Labor augmentation	72 (72.0)	60 (74.1)	0.75
Epidural anesthesia	82 (82.0)	68 (84.0)	0.73
Second stage (min)	36.0 (16.0–93.0)	41.5 (19.5–84.5)	0.69
Operative delivery	21 (21.0)	19 (23.5)	0.69
Episiotomy	4 (4.0)	21 (25.9)	<0.001
Fourth degree laceration	6 (6.0)	2 (2.47)	0.30
T _{H-S} (s)	35.0 (30.0–90.0)	60.0 (60.0–60.0)	0.03
Neonatal data			
Sex			0.44
Male	60 (60.0)	44 (54.3)	–
Female	40 (40.0)	37 (45.7)	–
Birth weight (g)	4014.6±440.2	4081.1±456.9	0.32
APGAR			
1 min	8.0 (7.0–8.0)	7.0 (6.0–8.0)	0.18
5 min	9.0 (9.0–9.0)	9.0 (9.0–9.0)	0.11
Brachial plexus injury	10 (10.0)	10 (12.4)	0.62

	No form (n=100)	Form (n= 81)	P-value
Clavicle fracture	2 (2.0)	2 (2.5)	1.00

Data are presented as n (%), mean±standard deviation, or median (interquartile range).

T_{H-S} = Head-to-shoulder delivery interval, BMI = Body mass index.

Table 2

Documentation components.

	No form (n=100)	Form (n= 81)	P-value
Estimated fetal weight	39 (39.0)	67 (82.7)	<0.001
Umbilical cord pH	3 (3.0)	6 (7.4)	0.30
Maneuvers	97 (97.0)	79 (97.5)	1.00
T _{H-S}	15 (15.0)	62 (76.5)	<0.001
Second stage duration	97 (97.0)	80 (98.8)	0.63
Estimated blood loss	75 (75.0)	67 (82.7)	0.21

Data are presented as n (%).

T_{H-S}=Head-to-shoulder delivery interval.