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Short Communication

Site and incidence of birth canal lacerations from instrumental delivery with mediolateral episiotomy

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ABSTRACT

Objective: Instrument-assisted vaginal delivery is a significant risk factor for birth canal lacerations. Although many obstetricians recently are recommending restrictive rather than a routine episiotomy, reports have shown restrictive episiotomy to be associated with more extensive anterior birth canal trauma compared with routine episiotomy.
Materials and Methods: We retrospectively reviewed 110 cases of forceps and vacuum deliveries and investigated the site of birth canal lacerations. Birth canal lacerations were divided into four sites according to direction—anterior, ipsilateral, contralateral, and posterior.
Results: The frequency of lacerations were, from most to least, posterior (34%), lateral (21.7%), and anterior (1.9%). Moreover, among the lateral lacerations, they were more frequent in the contralateral side of episiotomy than the ipsilateral side (18.9% vs. 4.7%, $p < 0.01$).
Conclusion: Our results indicate that caution is also needed concerning not only the anterior site, but also the contralateral site of an episiotomy to prevent laceration in an instrument-assisted vaginal delivery.

Instrument-assisted vaginal delivery is a significant risk factor for severe perineal lacerations [1–3]. It has been reported that severe perineal laceration may be associated with midline episiotomy with more frequency than with mediolateral episiotomy; thus, mediolateral episiotomy is often recommended for instrument-assisted vaginal deliveries [3]. The angle of the mediolateral episiotomy incision is designed to prevent extensive trauma to the anal area, but there is still anterior birth canal damage. A systematic review revealed that restrictive episiotomy, although less invasive compared to routine episiotomy, is associated with more anterior birth canal trauma [4]. Anterior birth canal damage occurs during delivery because there is limited space and thus extensive stretching and tearing if there is no episiotomy. Furthermore, despite the incision of a mediolateral episiotomy on one side of the perineum, the opposite side is often lacerated in an assisted vaginal delivery. Our retrospective study, under the approval of the Institutional Review Board (Jichi Medical University, Saitama Medical

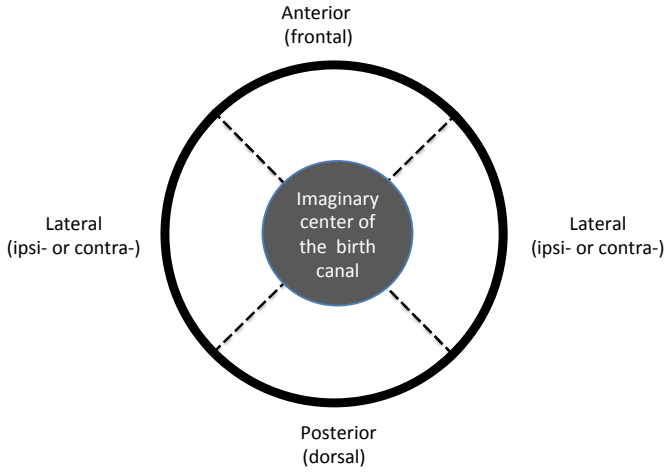

Figure 1. Schematic of birth canal site laceration as viewed from the maternal caudal side. Birth canal lacerations sites defined by direction: anterior, posterior, and lateral (ipsi and contra).

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Table 1
Patient characteristics.

	Assisted delivery		*p*
	Forceps ($n = 49$)	Vacuum ($n = 59$)	
Age (y)	33.2 ± 5.4	34.6 ± 6.4	ns (0.25)
Nulliparity	45 (91.8)	47 (82.5)	ns (0.13)
Occipito-posterior delivery	6 (12.2)	6 (10.5)	ns (1.00)
Blood loss (g)	611.8 ± 319.3	478.0 ± 277.6	0.023
3rd or 4th degree perineal lacerations	1 (2.0)	5 (8.8)	ns (0.21)
Neonate gestational age at birth (wk)	38.2 ± 1.9	38.4 ± 1.8	ns (0.58)
Birth weight (g)	2979.6 ± 494.5	2973.3 ± 418.6	ns (0.94)

Data are presented as *n* (%) or mean ± standard deviation.
ns = not significant.

Table 2
Incidence of birth canal lacerations from forceps and vacuum delivery.

	No. of patients (*n*)	Anterior	Posterior	Lateral			No additional laceration
				Lateral total	Ipsilateral	Contralateral	
All cases	106	2 (1.9)	36 (34.0)	23 (21.7)	5 (4.7)	20 (18.9)	45 (42.5)
Forceps delivery	49	1 (2.0)	16 (32.7)	12 (24.5)	3 (6.1)	10 (20.4)	20 (40.8)
Vacuum delivery	57	1 (1.8)	20 (35.1)	11 (19.3)	2 (3.5)	10 (17.5)	25 (43.9)
p	–	ns (1.00)	ns (0.84)	ns (0.64)	ns (0.66)	ns (0.81)	–

Data are presented as *n* (%).
ns = not significant.

Center), investigated the direction to which birth canal lacerations occur in assisted vaginal deliveries with a mediolateral episiotomy. We reviewed the medical records from January 2013 to July 2015 of patients at our center that had either a delivery by forceps or vacuum extraction. The study conformed to the provisions of the Declaration of Helsinki in 1995 (revised in Tokyo, 2004). A total of 110 cases of delivery by forceps or vacuum delivery were identified. Four of the cases were found to not have had an episiotomy and were excluded from the study. Fifty-two (49.1%) patients had an episiotomy with no birth canal laceration. The birth canal lacerations data were divided into four groups according to direction from the imaginary center of the birth canal—anterior, ipsilateral, contralateral, and posterior—as shown in Figure 1. Patient characteristics are shown in Table 1. The incidence of third or fourth degree lacerations from forceps delivery was not significantly different than from vacuum delivery ($p = 0.21$). The amount of bleeding in the forceps group was significantly higher than in the vacuum group (mean ± standard deviation: 611.8 ± 319.3 g vs. 478.0 ± 277.6 g, $p < 0.05$). Incidence of birth canal laceration by group according to forceps and vacuum extraction is shown in Table 2. The Fisher's exact test and the McNemar test were used to evaluate the association between forceps delivery and vacuum extraction. We used JMP 10 Statistical Discovery for Windows (SAS Institute Inc., Cary, NC. USA) for statistical analyses; a two-sided *p* value < 0.05 was considered significant. The frequency, from most to least, of laceration by group was posterior (34%), lateral (21.7%), and anterior (1.9%). Moreover, lateral lacerations were more frequent at the contralateral side of the episiotomy than at the ipsilateral side (18.9% vs. 4.7%, $p < 0.01$). There was no significant difference in laceration sites between forceps- and vacuum-assisted deliveries (Table 2). Reports from both Chia and Huang [1] and Hsieh et al [2] indicated that more of the tearing of the birth canal is toward the posterior perineum with instrument-assisted vaginal delivery and support the warning that instrument-assisted vaginal delivery is a significant risk factor for severe birth canal lacerations. Even though extensive tearing occurs mainly to the posterior site, the contralateral, or opposite, site of a mediolateral episiotomy may also be subjected to lacerations. Medical providers involved in the management of a vaginal delivery need to select the most appropriate delivery assistance and take precautions to prevent lacerations. Protection against extensive perineal tearing may prevent obstetric anal sphincter injuries [5]. However, lacerations on the contralateral site of the episiotomy are also of concern. In conclusion, with instrument-assisted vaginal deliveries, although posterior birth canal, perineum, lacerations occur most frequently, tearing also occurs on the site contralateral to an episiotomy. Further study is needed to clearly understand how to prevent this type of laceration.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

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