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Original Research Article

Clinical study on the relationship of scar tenderness with scar integrity at repeat caesarean section

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ABSTRACT

Background: Caesarean section is an operative process whereby the fetuses after the end of 28th weeks are delivered through an incision on the abdominal and uterine wall. This excludes delivery through an abdominal incision where the fetus lying free in the abdominal cavity following uterine rupture or in secondary abdominal pregnancy. The first operation carried out on a patient is referred to as a primary caesarean section. When the operation is carried out in subsequent pregnancies, it is referred to as repeat caesarean section. Caesarean section is used in cases where vaginal delivery is not either feasible or would impose undue risks on mother or baby. The aim of the study to assess the Relationship of Scar Tenderness with Scar Integrity at repeat caesarean section.

Methods: This is an observational study. The study used to be carried out in the admitted patient's Department of Obstetrics and Gynecology, Dhaka Medical College Hospital, Dhaka, Bangladesh. The duration of the period from April 2017 to October 2017.

Results: This study shows that the according to age of 50 Patients aged 20 to 35 years. Here out of 50 mothers the highest 23(46%) mothers belonged to 21-25 years age group. Subsequently, 15(30%), 9(18%), 2(4%) and 1(2%) belonged to 26-30 years, ≤20 years, 31-35 years and >35 years respectively. The mean age of the respondents was 23.16±5.79 (age range: 17-38) years.

Conclusions: The scar complications are highly associated with the intensity of scar tenderness. Henceforth, it can be concluded here that scar tenderness is a vital factor responsible for scar complications.

Keywords: Caesarean section, Abdominal, Uterine wall, Incision, Uterine rupture

INTRODUCTION

Caesarean section is an operative procedure whereby the fetuses after the end of 28th weeks are delivered through an incision on the abdominal and uterine wall. This excludes delivery through an abdominal incision where the fetus lying free in the abdominal cavity following uterine rupture or in secondary abdominal pregnancy. The first operation performed on a patient is referred to as a primary caesarean section. When the operation is performed in subsequent pregnancies, it is called repeat caesarean

section.¹ Caesarean section is used in cases where vaginal delivery is not either feasible or would impose undue risks on mother or baby.² The maternal mortality rate associated with caesarean section varies in different series from 4 to 8 per 10000 live births.³ In general, the risk of death following caesarean delivery is at least twice the risk following vaginal delivery. The caesarean section rate has increased, both in the developed and developing countries alike. It is partly due to availability of safe anesthesia, excellent blood transfusion services, and advances in operative technology and development of broad-spectrum

antibiotics. The relative safety of the operative procedure had led to relaxation of indications, resorting to the procedure for relative indications and even 'caesarean on demand' by some women. This tendency needs to be controlled as it puts a great drain a health care resources, is costly and associated with serious risks to the mother and baby, all the recent advances notwithstanding. This rising caesarean section rate has created and expanding high risk obstetric sub-population "Women with scarred uterus."⁴ Risk of rupture of uterus in subsequent pregnancy led Craigin to introduce the concept "Once a caesarean, always a caesarean" in 1916. This concept met a lot of criticism both in the West and East and most obstetricians now favour a trial of scar policy in well-equipped hospital for women who have undergone a caesarean section for non-recurrent cause.⁵

Uterine scar dehiscence may present as an acute event in the antenatal or intrapartum period, leading to significant fetal and maternal morbidity. The frequency of uterine rupture is estimated at 0.2-3.8% and that of uterine dehiscence is between 0.6 and 3.8%.⁶ In a later pregnancy, pain in the area of the scar may suggest scar dehiscence. About 50% of all ruptures of classic uterine scars occur before the onset of labour. Complete uterine rupture can be an obstetric catastrophe, which causes maternal and fetal morbidity and mortality worldwide. The risk of uterine rupture in the presence of a defective scar is related to the degree of thinning of lower segment.⁷ Due to a rise in the rates of primary caesarean section globally, repeat caesarean section has also become very common. Indeed, the chances of a repeat caesarean are quoted at 90% after a primary caesarean according to data from the United States.⁸ In order to bring down these high rates, trial of labor after caesarean (TOLAC) or vaginal birth after caesarean (VBAC) has emerged as an important tool. The reported success of VBAC varies from 56-80%, and is dependent on a multitude of antepartum and intrapartum factors. The chief concern during labor with scarred uteri is that of scar rupture which can have devastating fetal and maternal consequences, including mortality (6% and 10% respectively).^{9,10} Monitoring for the features of scar rupture is thus one of the prerequisites of VBAC. These include abnormal cardiotocography (CTG), severe abdominal pain persisting between contractions, acute onset scar tenderness, hematuria or abnormal vaginal bleeding, maternal tachycardia or shock, cessation of uterine activity and loss of station of the presenting part.¹¹ Of these, an abnormal CTG is the most consistent finding and present in almost 80% patients with scar rupture.¹² Abdominal pain is reported in 22%, abnormal vaginal bleeding in 11-67%, maternal shock in 22-46%, and cessation of uterine activity was not reported in any of the 76 women in the study by Rodriguez.^{13,14} Thus other features are less sensitive and specific for uterine rupture, with the exception of scar tenderness which has not been evaluated separately in any study. Repeat elective caesarean section avoids scar dehiscence/rupture remarkably but at cost of increased bleeding, thromboembolism, prolonged recovery and increased risk

of placenta previa and accreta in subsequent pregnancies. It is therefore very crucial to sort out the impact of primary scar on repeat CS. In low resource country like our clinical evaluation of scar is of utmost importance in preventing scar complications. Through this study an effort is given toward evaluating the complain of scar pain as a factor for understanding repeat caesarean section.

METHODS

This is an observational study. The study was carried out in the admitted patient's in Department of obstetrics and gynecology, Dhaka medical college hospital, Dhaka, Bangladesh. The period of the study is from April 2017 to October 2017. This study was carried out on 50 pregnant women having previous one c/s with scar tenderness in the third trimester of pregnancy and admitted in the department of obstetrics and gynecology, Dhaka medical college hospital during the study period. The data for the study was collected by using a structured of questionnaire containing all the variables of interest. The data for this study about had been accumulated from patients sociodemographic & obstetrics information, physical examination and per-operative findings. Statistical evaluation of the results used to be got via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24).

RESULTS

Out of 50 mothers the highest 23 (46%) mothers belonged to 21-25 years age group (Table 1).

Table 1: Distribution of mothers according to age (n=50).

Age group (years)	N	%
≤20	9	18
21-25	23	46
26-30	15	30
31-35	2	4
>35	1	2
Mean age±SD (years)		23.16±5.79
Age range (years)		17-38

Subsequently, 15 (30%), 9 (18%), 2 (4%) and 1 (2%) belonged to 26-30 years, ≤20 years, 31-35 years and >35 years respectively. The mean age of the respondents was 23.16±5.79 (age range: 17-38) years. Out of 50 mothers 21 (42%), 13 (26%), 9 (18%) achieved education category up to SSC, primary and illiterate/only can sign respectively. Subsequently, 5 (10%) and 2 (4%) mothers achieved education category up to HSC and graduate and above respectively (Figure 1).

Among 50 mothers 33 (66%), 8 (16%), 6 (12%) and 2 (4%) mothers were housewife, service holder, garments worker and teacher respectively.

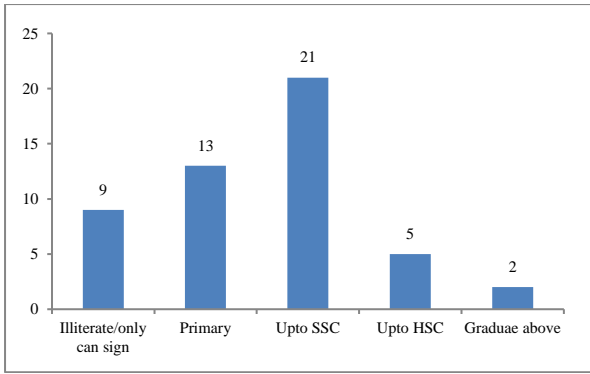


Figure 1: Distribution of mothers according to educational category (n=50).

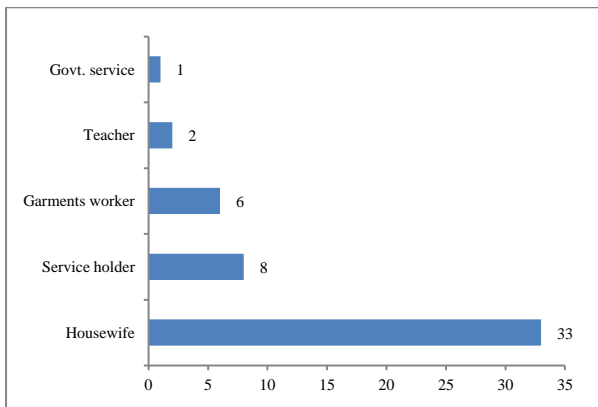


Figure 2: Distribution of mothers according to occupational status (n=50).

Only 1 (2%) mother was doing govt. service (Figure 2). Out of 50 mothers, 16(32%), 26(52%) and 8(16%) household income <10,000 BDT, 10000-25000 BDT and >25000 BDT respectively (Figure 3).

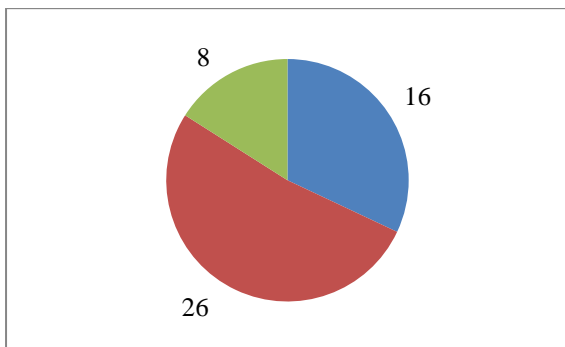


Figure 3: Distribution of mothers according to household income (n=50).

Association of scar integrity with household income is depicted in (Table 2). According to Household income, <10,000 BDT, 10000-25000 BDT, >25000 BDT were 10 (34.5%), 16(55.2%), 3(10.3%) when it is thin and 6 (28.6%), 10 (47.6%), 5 (23.8%) were Normal respectively.

Table 2: Association of scar integrity with household income (n=50).

Household income	Thin N=29 Frequency (%)	Normal N=21 Frequency (%)	P value
<10,000 BDT	10 (34.5)	6 (28.6)	0.438 ^{ns}
10000-25000 BDT	16 (55.2)	10 (47.6)	
>25000 BDT	3 (10.3)	5 (23.8)	

Table 3: Distribution of mothers according to obstetric profile (n=50).

Obstetric profile	N	%
Gravida		
2-3	38	76
4+	12	24
Parity		
0-1	26	52
2-3	15	30
4+	09	18
Interval between caesarean section (years)		
1-2	12	24
3-5	23	46
>5	15	30
Contraceptive history before index pregnancy		
Nil	17	34
Oral pill	13	26
Injectable	6	12
Condom/Barrier	12	24
Others	2	4
Indication of previous caesarean section		
Fetal distress	31	62
Prolong labour	2	4
Postdated pregnancy with oligohydramnios	1	2
Hypertensive disorder	6	12
BOH	4	8
Mal presentation	3	6
Others	1	2
PROM	2	4

There is no significant relationship between scar integrity with household income ($p>0.05$). Total 38 (76%) and 12 (24%) mothers had gravida 2-3 and 4+ respectively. Parity showed that 26 (52%), 15 (30%), 9 (18%) had 0-1, 2-3 and 4+ parity respectively (Table 3). Out of 50 mothers, 23 (46%), 15 (30%) and 12 (24%) mothers and interval between caesarean section for 1-2, 3-5 and >5 years. Contraceptive history before index pregnancy showed 17 (34%) adopted no contraception whereas 13 (26%), 12 (24%) and 6 (12%) adopted oral pill, condom/barrier and injectable contraceptive respectively. Only 2 (4%) mothers adopted other contraceptive methods. Out of 50 mothers, 31 (62%), 6 (12%), 4 (8%) and 3 (6%) had the indication of previous caesarean section were fetal distress, hypertensive disorder, BOH and mal presentation

respectively. 2 (4%) mothers each had the indication like prolong labour and PROM.

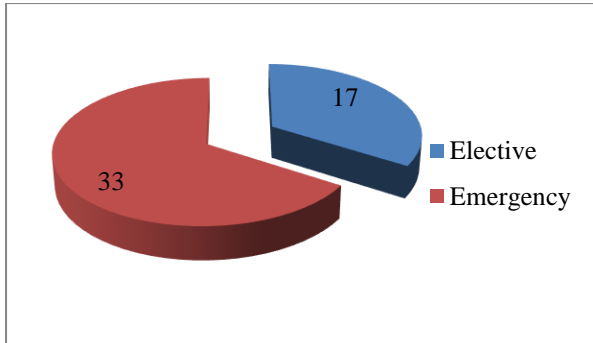


Figure 4: Pattern of caesarean section performed (n=50).

Table 4: Distribution mothers according to gestational age (n=50).

Gestational age group (weeks)	N	%
<37	38	76
37-40	9	18
>40	3	6
Mean gestation age±SD (weeks)		37±2.32
Age range (weeks)		28-40

Table 5: Distribution of mothers according to scar status (n=50).

Peroperative findings	Frequency (%)
Peroperative adhesions	
Present	18 (36)
Absent	32 (64)
Level of previous scar	
Lower segment	47 (94)
Others	3 (6)
Thickness of scar	
Thin	29 (58)
Normal	21 (42)
Any defect in scar	
Yes	2(4)
No	48 (96)

On the contrary, 1 (2%) patient each represented postdated pregnancy with oligohydramnios and others. Out of 50 mothers, 33 (66%) and 17 (34%) cases were performed as emergency and elective caesarean section respectively (Figure 4). Among 50 mothers, 38 (76%) and 9 (18%) mothers presented at <37 weeks and 37-40 weeks respectively. Rest 3(6%) presented in >40 weeks of gestational age. The mean gestational age was 37±2.32 (range: 28-40 weeks) (Table 4). Out of 50 mothers, 18 (36%) had found adhesions. Besides in 47 (94%) cases previous scar was observed in lower segment whereas rest 3 (6%) were found in other areas. Regarding thickness of scar, it was evident that 29(58%), and 21 (42%) were found thin, and normal scar respectively. Scar defect was

observed in 2 (4%) case (Table 5). Scar integrity significantly associated with 2nd and 3rd gravida, primi para and interval between caesarean section 1-2 years (p<0.05) (Table 6).

Table 6: Association of scar integrity with obstetrical profile (n=50).

Obstetrical profile	Thin (N=29) Frequency (%)	Normal (N=21) Frequency (%)	P value
Gravida			
2-3	17 (58.6)	21 (100.0)	<0.001
4+	12 (41.4)	0 (0.0)	
Parity			
0-1	7 (24.1)	19 (90.5)	<0.001
2-3	13 (44.8)	2 (9.5)	
4+	9 (31.0)	0 (0.0)	
Interval between caesarean section (years)			
1-2	11 (37.9)	1 (4.8)	0.021
3-5	10 (34.5)	13 (61.9)	
>5	8 (27.6)	7 (33.3)	

DISCUSSION

The study was carried out to ascertain the significance of scar tenderness as a subjective sign of disruption of scar integrity in repeat caesarean section. Its importance arises from being a relatively easily elicitable sign in women who may not have access to continuous CTZ monitoring. It also appears early as compared to other features of scar rupture such as maternal shock, loss of station of the presenting part or hematuria. The age range of the patient in our study was 17-38 years with a mean of 23.16±5.79 years. Gestational age was between 27-40 weeks with a mean of 37±2.126 weeks. These findings are comparable to the findings by Masaaki et al who performed the study in third trimester as well.¹⁵ While it differs from the findings of Qureshi et al., who started assessing lower segment as early as 16 weeks of gestation.¹⁶ Many studies in literature assessed the lower uterine segment even before conception.¹⁷ The benefit of performing ultrasound at later gestation is that lower uterine segment has been developed and the presenting part is engaged in the pelvis. Although not many studies are available regarding uterine scar status especially in non- pregnant condition, Alfred Warionch in his study in 1967, using hystero-graphy concluded that as the number of caesarean sections increase, the scars become thinner. Osser et al also found that myometrial thickness at the level of isthmus uteri decreases as the number of caesarean sections increase; the frequency of the large scar defect increases.¹⁸ We have got thin scar in case of 29(58%) cases, whereas 21(42%) were evident as normal scar.

Many studies have been done to assess the scar thickness by ultrasound. The lower segment scar is visible in only 30% of the patients.¹⁹ Study have suggested that there is an inverse relationship between scar thickness, assessed

sonographically, and risk of uterine rupture.²⁰ The risk factors associated include induced labour, reduced inter-delivery interval, the number of previous caesareans, type of closure of uterus, previous vaginal delivery, maternal age, gestational age at delivery, and fetal birth weight.²¹ The findings of our study regarding frequency of scar tenderness during trial of labour and frequency of scar dehiscence among scar tenderness are consistent with a study showing that there was a total of 2 cases of complete and partial scar dehiscence (4%). Only 1 of 2 cases (50%) of scar dehiscence was associated with preoperative scar tenderness.²² Rageth et al disclosed an elevated risk of uterine rupture in patients who had a history of caesarean delivery and were undergoing a trial of labour versus elective repeat cesarean.²³ In the alternative to date, the overall risk of uterine rupture for women undergoing a trial of labour after caesarean delivery has been reported to be between 0.2% and 0.1%. Naef et al retrospectively received the delivery outcomes of 262 women with lower vertical uterine incisions over a 10-year period, fifty four percent experienced a trial of labour with 83% having a successful vaginal delivery rate. The uterine rupture rate was 1.1% in the trial of labour group versus nil in the elective repeat caesarean group. No serious adverse sequelae were observed following uterine rupture.²⁴ In present study, showed that scar integrity significantly associated with 2nd and 3rd gravida, primi para and interval between caesarean section 1-2 years ($p < 0.05$). Scar complication rates were not affected by onset of labor, indication for previous caesarean, interconceptional period, gestation at delivery and birth weight. Similar findings have been reported in the study by Davey et al.²⁵ In an extensive review of literature, no studies have been conducted on the predictive accuracy of scar tenderness, although there are multitude studies on trial of labor after caesarean delivery.²⁶ The highlights of this study are that it is a prospective study and focuses only on caesarean deliveries done for scar tenderness.

Limitations

The present study was conducted at a very short period of time. Sonographic assessment of scar thickness was not done. Absence of previous operative records of patient with previous caesarean section.

CONCLUSION

Actually, the scar complications are highly associated with the intensity of scar tenderness. Henceforth, it can be concluded here that scar tenderness is a vital factor responsible for scar complications. The result of this study showed that scar tenderness was a sensitive sign of scar complication in patient undergoing repeat caesarean section. But scar tenderness alone should not be considered as a factor for disrupting scar integrity. For increasing VBAC and decreasing repeat CS rate protocol have to made to monitor labour after a primary CS.

Recommendations

A multicenter double blinded study in the divisional/tertiary hospitals of whole Bangladesh can reveal the real picture. The study period should be long. Multi-disciplinary approach of research work can make a study precise and more authentic in this regard.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Dutta DC. Text book of obstetrics, hypertensive disorders in pregnancy. India: New central book agency; 2004;6(1);222-7.
2. Ofili-Yebovi D, Ben-Nagi J, Sawyer E, Yazbek J, Lee C, Gonzalez J, Jurkovic D. Deficient lower-segment Cesarean section scars: prevalence and risk factors. *Ultrasound Obstet Gynecol.* 2008;31(1):72-7.
3. Mozurkewich EL, Hutton EK. Elective repeat cesarean delivery versus trial of labor: a meta-analysis of the literature from 1989 to 1999. *Am J Obstet Gynecol.* 2000;183(5):1187-97.
4. Durnwald CP, Mercer BM. Vaginal birth after Cesarean delivery: predicting success, risks of failure. *J Maternal-Fetal Neonat Med.* 2004;15(6):388-93.
5. David M, Gross MM, Wiemer A, Pachaly J, Vetter K. Prior cesarean section-An acceptable risk for vaginal delivery at free-standing midwife-led birth centers? Results of the analysis of vaginal birth after cesarean section (VBAC) in German birth centers. *Eur J Obstet Gynecol Reprod Biol.* 2009;142(2):106-10.
6. Gaikwad HS, Aggarwal P, Bannerjee A, Gutgutia I, Bajaj B. Is scar tenderness a reliable sign of scar complications in labor?. *Int J Reprod Contracept Obstet Gynecol.* 2007;1(1):33-7.
7. Vikhareva OO, Valentin L. Risk factors for incomplete healing of the uterine incision after caesarean section. *BJOG.* 2010;117(9):1119-26.
8. Ventura SJ, Hamilton BE, Mathews TJ. Pregnancy and childbirth among females aged 10-19 years—United States, 2007-2010. *MMWR.* 2013;62(3):71-6.
9. Grivell RM, Barreto MP, Dodd JM. The influence of intrapartum factors on risk of uterine rupture and successful vaginal birth after caesarean delivery. *Clin Perinatol.* 2011;38(2):265-75.
10. Gaikwad HS, Aggarwal P, Bannerjee A, Gutgutia I, Bajaj B. Is scar tenderness a reliable sign of scar complications in labor?. *Int J Reprod Contracept Obstet Gynecol.* 2012;1(1):33-7.

11. Gutgutia I, Bajaj B. Is scar tenderness a reliable sign of scar complications in labor?. *Int J Reprod Contracept Obstet Gynecol.* 2010;5(1):23-7.
12. American College of Obstetricians and Gynecologists. Vaginal birth after previous cesarean delivery. *ACOG Prac Bull.* 1995;1:1-8.
13. Johnson C, Oriol N. The role of epidural anesthesia in trial of labor. *Regional Anesthesia and Pain Medicine.* 2010;15(6):304-8.
14. Rodriguez MH, Masaki DI, Phelan JP, Diaz FG. Uterine rupture: are intrauterine pressure catheters useful in the diagnosis? *Am J Obstet Gynecol.* 1989; 161(3):666-9.
15. Sawada M, Matsuzaki S, Nakae R, Iwamiya T, Kakigano A, Kumasawa K, Ueda Y, Endo M, Kimura T. Treatment and repair of uterine scar dehiscence during cesarean section. *Clin Case Rep.* 2017;5(2): 145-9.
16. Sen S, Malik S, Salhan S. Ultrasonographic evaluation of lower uterine segment thickness in patients of previous cesarean section. *Int J Gynecol Obstet.* 2004; 87(3):215-9.
17. Tazion S, Hafeez M, Manzoor R, Rana T. Ultrasound Predictability of Lower Uterine Segment Cesarean Section Scar Thickness. *J Coll Physicians Surg Pak.* 2018;28(5):361-4.
18. Cheung VY. Sonographic measurement of the lower uterine segment thickness in women with previous cesarean section. *J Obstet Gynaecol Canada.* 2005; 27(7):674-81.
19. Jastrow N, Chaillet N, Roberge S, Morency AM, Lacasse Y, Bujold E. Sonographic lower uterine segment thickness and risk of uterine scar defect: a systematic review. *J Obstet Gynaecol Canada.* 2010; 32(4):321-7.
20. Mohammed AB, Al-Moghazi DA, Hamdy MT, Mohammed EM. Ultrasonographic evaluation of lower uterine segment thickness in pregnant women with previous cesarean section. *Middle East Fertil Soc J.* 2010;15(3):188-93.
21. Ragoth JC, Juzi C, Grossenbacher H. Delivery after previous cesarean: a risk evaluation. *Obstet Gynecol.* 1999;93(3):332-7.
22. Naef III RW, Ray MA, Chauhan SP, Roach H, Blake PG, Martin JN. Trial of labor after cesarean delivery with a lower-segment, vertical uterine incision: is it safe?. *Am J Obstet Gynecol.* 1995;172(6):1666-74.
23. Davey MR, Moodley J, Hofmeyr GJ. Labour after caesarean section--the problem of scar dehiscence. *South Af Med J.* 1987;71(12):766-8.
24. Al-Zirqi I, Stray-Pedersen B, Forsén L, Daltveit AK, Vangen S, NUR group. Validation study of uterine rupture registration in the Medical Birth Registry of Norway. *Acta Obstet Gynecol Scand.* 2013;92(9): 1086-93.
25. Thisted DL, Mortensen LH, Hvidman L, Rasmussen SC, Larsen T, Krebs L. Use of ICD-10 codes to monitor uterine rupture: validation of a national birth registry. *European J Obstet Gynecol Reprod Biol.* 2014;173:23-8.
26. Macones GA, Cahill AG, Stamilio DM, Odibo A, Peipert J, Stevens EJ. Can uterine rupture in patients attempting vaginal birth after cesarean delivery be predicted? *Am J Obstet Gynecol.* 2006;195(4):1148-52.

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