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Can Uterine Scar Dehiscence Affect Hospital's Labor Management for Future Births after Cesarean Delivery? Two Years' Experience of Lithuanian Tertiary Hospital

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Abstract: Objectives: To analyse cases of uterine scar dehiscence after previous cesarean delivery at Vilnius University Hospital Santariškių Klinikos over a two-year period. To identify if uterine scar dehiscence has an effect on hospital's labor management for future births after cesarean delivery.

Methods: The retrospective case study of women with a single, cephalic, full-term pregnancy and a previous cesarean delivery who gave birth at Vilnius University Hospital Santariškių Klinikos over a two-year period was carried out. Cases of uterine scar dehiscence were analysed in this group. The investigation of labor management in Robson group five after uterine scar dehiscence was performed.

Results: We analysed eight labor cases after cesarean delivery which ended up with uterine scar dehiscence. There were no significant differences in Robson group five when the plan of labor management was prepared during the first week, the first two weeks or the first month after uterine scar dehiscence.

Conclusions: Uterine scar dehiscence is a rare complication. Its incidence was 0.82%. In our hospital uterine scar dehiscences did not significantly affect the hospital's labor care plan in Robson group five.

Keywords: uterine scar dehiscence, cesarean section, labor management protocol.

INTRODUCTION

A progressive increase of cesarean sections (CS) had been recorded in the world until 2010, when the rate was 32.9% in U.S. and 25.2% in Northern European countries (Desseauve et al. 2016) (1). The increase of CS numbers led to growing amount of trials of labor after cesarean (TOLAC). One of the main indications for CS repeat is a uterine scar. A significant effort is being put into trying to increase the rate of vaginal birth after previous cesarean section (VBAC). TOLAC is relatively safe but it could be associated with severe complications. The possibility of these complications decrease the rate of women attempting vaginal birth after CS. The number of repeated CS surgeries started to increase in 1980 and the way to stop this growth was the encouragement of TOLAC. As a result, the rate of VBAC increased from 3% in 1981 to 31% in 1998 but the cases of complications appeared more often (Landon 2016) (2). Uterine scar dehiscence during TOLAC is a rare complication but it can be very dangerous. It has been reported that the frequency of uterine scar dehiscence is different and can vary from 0.2% (with prior vaginal birth) to 1.1% (without vaginal birth in the past) and from 0.03% (repeated CS before labor) to 0.47% (TOLAC) (Landon 2016, Hidalgo-Lopezosa 2016) (2,3). Finally, the rate of uterine scar dehiscence is not higher than 1.0% in the whole group of women with a repeated pregnancy after CS (Landon 2016, Hidalgo-Lopezosa 2016) (2,3). The rate of

VBAC has been decreasing until today (up to 10%) (McPherson 2014) (4). This was mainly caused by the increased number of complications. On the other hand, more CS were related with abnormal embryonic implantation and complicated placentation (Li 2016) (5).

Lack of clinical symptoms is the main reason why uterine scar dehiscence diagnosis is delayed. Clinical symptoms which may appear after uterine scar dehiscence are abdominal pain, vaginal bleeding, maternal tachycardia, other symptoms of hypovolemia, abnormalities of the cardiotocogram (Mavromatidis 2015) (6). Laparotomia is the only reliable way to diagnose uterine scar dehiscence.

The uterine scar dehiscence was reported as a very severe complication and appeared to have a significant effect on hospital's future births after CS (Riddell 2014) (7). Therefore, it was assessed that one unsuccessful TOLAC can change labor management of health care providers and their colleagues. Due to the estimated increase of risk, health care providers are more scared of failure and, therefore, CS is done earlier. It was found that unsuccessful TOLAC is registered more often after a case of uterine scar dehiscence (Riddell 2014) (7).

Hospitals prepare their diagnostic and labor management protocols in order to exclude subjective estimations and

scars. These protocols should help health care providers, especially in emergency situations.

OBJECTIVES

To analyse cases of uterine scar dehiscence after previous cesarean delivery at Vilnius University Hospital Santariškių Klinikos over a two-year period. To identify if uterine scar dehiscence has an effect on hospital's labor management for future births after cesarean delivery.

METHODS

The retrospective case study of women with a single, cephalic, full-term pregnancy and a previous cesarean delivery who gave birth at Vilnius University Hospital Santariškių Klinikos was carried out from November 2014 to November 2016. Cases of partial or complete uterine scar dehiscence were analysed in this group. The investigation of women's age, gestation week, amount of previous pregnancies and their results, present pregnancy and labor, specific features of the surgery, neonatal outcomes and course after the surgery was performed.

We picked up and analysed all health data of women with a single, cephalic, term pregnancy and a previous cesarean delivery who gave birth during the first week, the two first weeks or the first month after the uterine scar dehiscence. Labor management was planned considering hospital's protocols and algorithms.

All analysed labors belonged to Robson group five. Different aspects may determine CS, for this reason breech, multiple and preterm pregnancies were excluded. We analysed differences in Robson subgroups 5a, 5b, 5c, relations between subgroups and labor outcomes.

Statistical analysis was performed using "Microsoft Office Excel" and "SPSS 23.0". Chi-square test of independence was used to evaluate and compare data. P value < 0,05 was considered statistically significant.

RESULTS

The total number of women delivered at Vilnius University Hospital Santariškių Klinikos for the period of study was 7179, out of whom 1684 (23.46%) were CS, 726 (10.11% of all deliveries) were preterm labors (delivery at fewer than 37 weeks of gestational period), the other 6453 (89.88%) were full-term labors. Among women who gave preterm labors, 95 (13.08%) had one or more CS before, 33 (34.73%) of them gave birth naturally on this occasion. Among women who gave full-term labors, 875 (13.56%) had one or more CS before, 310 (35.42%) of them gave birth naturally on this occasion.

We analysed 8 cases of complete or partial uterine scar dehiscence during labor in women with previous CS. It made up 0.11% of total birth number and 0.82% of births with at least one CS in woman's history. In seven cases the pregnancies were full-termed (these women were assigned to Robson group five), the scar dehiscence came to 0.80% of full-term pregnancies and 0.83% of total amount of Robson group five. One case of scar dehiscence was in a group of

preterm births and contributed 1.05% of total number of deliveries in this group after CS.

The anamnesis of pregnancies is presented in Table 1. The mean age for women was 33 years. For the vast majority of women it was the second pregnancy, delivery and CS, one woman had two CS before. Seven pregnancies were supervised by an obstetrician and gynaecologist, one pregnancy – by a midwife. The time since the last CS varied from one to seven years,

Features of the current delivery course, the assessment of the newborns health with an Apgar score, number of hospitalization days for women are presented in Table 2. Regular uterine contractions developed in 6 cases, including one woman who gave vaginal birth and afterwards revealed clinical symptoms of uterine scar dehiscence: contraction-like pain remained in the lower abdomen, later, a permanent pain in the uterine scar region appeared (particularly during palpation). The complete uterine scar dehiscence was diagnosed during surgery in 5 cases. The longest surgery took 110 minutes.

The CS before regular uterine contraction development was performed in 2 cases. In the first case, the woman had full-term pregnancy and uterine scarring after two previous cesarean deliveries, therefore she underwent planned CS this time. In the second case the CS was performed on a woman with 34 weeks of gestational period due to the uterine scar dehiscence. This woman underwent miomectomy earlier, had one cesarean delivery because of the uterine rupture during her first pregnancy and *sectio parva* for termination of pregnancy with serious birth defects.

The hypothesis was that after uterine scar dehiscence, successful attempts to give vaginal birth after previous CS are reduced, which is based on subjective health care provider's attitude.

For evaluation of potential changes in obstetric tactics, we were analysing women with full term pregnancy, cephalic presentation of the fetus and previous CS. All these deliveries were assigned to Robson group five.

Robson group five is divided into smaller 5a, 5b and 5c subgroups:

5a - the gestational period ≥ 37 weeks, multipara, CS in the past, induction of labor, one fetus, cephalic presentation;

5b - the gestational period ≥ 37 weeks, multipara, CS in the past, the current CS before labor, one fetus, cephalic presentation;

5c - the gestational period ≥ 37 weeks, multipara, CS in the past, spontaneous onset of the labor, one fetus, cephalic presentation.

CS due to breech presentation, multiple pregnancies and preterm labors were excluded because these possible additional factors may affect the performance of surgery.

During the study period, Robson group five was composed of 843 women, which made up 11.7% of all births. CS were performed in 537 women (63.7%) and 306 women (36.3%) had a vaginal birth (see Table 3).

We evaluated the possibility of changes in Robson subgroups 5a, 5b and 5c. We compared women's who gave birth during the first week, the two first weeks and the first month after the uterine scar dehiscence health data with the other women's who gave birth during the study health data.

Changes in subgroups could resonate with labor management plan formation, help with decision making whether the woman, who has a uterine scarring after earlier CS, should have a vaginal labor or undergo cesarean delivery again. There were no statistically significant differences detected between 5a, 5b and 5c subgroup distribution: during the first week ($p = 0.52$), the two first weeks ($p = 0.69$), the first month ($p = 0.52$) after uterine scar dehiscence. This suggests that previous events and the fear that uterine scar dehiscence might reoccur had no influence on the making of the labor care plan upon the arrival of pregnant women to the hospital.

Labor outcomes in subgroups 5a and 5b could match the vaginal labor management plan (see Table 4). There was no statistically significant difference.

DISCUSSION

The frequency of uterine scar dehiscence was 0.82% in the group of women with a previous cesarean delivery at Vilnius University Hospital Santariškių Klinikos. We compared our data with the rate of uterine scar dehiscence in other hospitals and they are very similar (Landon 2016, Hidalgo-Lopezosa 2016) (2,3). Based on that, we may state that our health care providers choose a proper plan of labor management.

One study performed in 2014 shows the difference of TOLAC and its success rate the first month after uterine rupture (Riddell 2014) (7). The authors claim that the amount of TOLAC is stable but the number of successful VBAC is lower. The main reason is that the estimate of the risk increases and CS, as a safer way, is chosen. Uterine scar dehiscence is a very rare pathology and it can happen even if the plan of labor management is correct. Moreover, these rare cases give a small amount of information for future labors. Despite this, the authors report that health care providers concentrate on similarities and one unsuccessful labor is thought as a danger for other labors (Riddell 2014) (7).

We analysed 843 cases of Robson group five but there were no statistically significant changes neither when the plan of labour was prepared, nor when a scheme was pursued. We examined not only the cases of the first month, but also the first and the two first weeks after all eight incidents. The first week has been chosen because it was thought that this

week have had the largest emotional influence for the colleagues. The two first weeks guaranteed that the changes of the next labor management of the same health care providers, who had to cope with uterine scar dehiscence, would be analysed. The fact that there were no differences in Robson group five shows that our team of health care providers work according to protocols and they can manage their emotions. This successful work can guarantee the efficiency of protocols and algorithms.

CONCLUSIONS

Uterine scar dehiscence is a rare complication. Its incidence was 0.82%.

In our hospital uterine scar dehiscences did not have any significant effect on hospital's future labors in Robson group five.

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Table 1. Anamnestic features of the case group.

Case	Age (years)	Pregnancy	Labor	Gestation week	CS in the past	Years from the last CS
I	30	IV	II	34	1 CS and 1 <i>sectio parva</i> the 16th week of gestation (abnormalities of the fetus)	2
II	32	III	III	38	2	1
III	31	II	II	40	1	4
IV	35	II	II	40	1	2
V	32	II	II	39	1	6
VI	37	II	II	39	1	7
VII	37	II	II	39	1	3
VIII	29	II	II	39	1	3
Average standard deviation (SD)	33 ± 3,09	-	-	39 ± 1,93	-	4 ± 2,07

Table 2 . Specificities of this labor, neonatal outcomes (Apgar score) and complete hospital stay.

Case	Active labor before the operation	Dilatation of the cervix before the operation (cm)	Duration of the operation (min.)	Uterine scar dehiscence	Apgar score (after 5/after 10 min.)	Complete hospital stay (days)
I	No	0	65	Complete	9/9	7
II	No	1	35	Complete	10/10	3
III	Yes	10	57	Partial	9/10	2
IV	Yes	6	35	Partial	8/9	3
V	Yes	6	110	Partial	6/9	7
VI	Yes	10	35	Complete	9/9	3
VII	Yes	10	90	Complete	1/5/7	5
VIII	-	Vaginal birth	60	Complete	9/10	5
Average ± standard deviation (SN)	-	6 ± 4,26	61 ± 27,52	-	8 ± 2,93/ 9 ± 1,64	4 ± 1,92

Table 3. Facts about Robson group five and uterus scar dehiscence.

Subgroup	Cases of subgroup (n)	Cases of subgroup between all labors (%)	Cases of subgroup between all in group 5 (%)	Cases of uterine scar dehiscence of subgroup (n)	Cases of uterine scar dehiscence of subgroup between all labors (%)	Cases of uterine scar dehiscence of subgroup between all labors in group 5 (%)	Cases of uterine scar dehiscence of subgroup between all cases of uterine scar dehiscence (%)
5a	63	0,88	7,47	1	0,01	0,12	12,50
5b	390	5,43	46,26	1	0,01	0,12	12,50
5c	390	5,43	46,26	5	0,07	0,59	62,50

Table 4. Labor outcomes in subgroups 5a ir 5b.

Subgroup	Way of labor	Women who gave birth the first week after every case of uterine scar dehiscence n (%)	Other women n (%)	Women who gave birth the two first weeks after every case of uterine scar dehiscence n (%)	Other women n (%)	Women who gave birth the first month after every case of uterine scar dehiscence n (%)	Other women n (%)
5a	Vaginal birth	3 (75,0)	46 (78,0)	6 (66,7)	43 (79,6)	7 (63,6)	42 (80,8)
	Cesarean section	1 (25,0)	13 (22,0)	3 (33,3)	11 (20,4)	4 (36,4)	10 (19,2)
	p	0,89		0,39		0,21	
5c	Vaginal birth	15 (62,5)	242 (66,1)	35 (71,4)	222 (65,1)	52 (64,2)	205 (66,3)
	Cesarean section	9 (37,5)	124 (33,9)	14 (28,6)	119 (34,9)	29 (35,8)	104 (33,7)
	p	0,72		0,38		0,72	