

Uterine inversion after controlled cord traction during caesarean section: a case report

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Summary

Introduction: Inversion of the uterus during caesarean section is a rare but life-threatening complication of the procedure that requires immediate treatment, which is reversion and awareness due to the very serious adverse effects that it may have. **Materials and Methods:** The authors present a case of a 34-year-old para 1 woman of Greek ethnicity who underwent a scheduled caesarean section at 39 weeks of gestation. During the procedure, a uterine inversion occurred as a controlled cord traction was applied in order to achieve placental detachment, after the delivery of the baby. It was managed by immediate manual uterine reversion, which was performed after exteriorization of the uterus. There were no adverse effects. **Conclusion:** Uterine inversion during caesarean section is a serious complication, but fortunately very rare. However, the obstetrician should be aware that the complication should be quickly identified and act without hesitation because it is critical for the well being of the patient.

Key words: Uterine inversion; Postpartum bleeding; Caesarean section.

Introduction

Inversion of the uterus after caesarean section is the inversion that takes place through the uterine incision. It is a complication of the procedure, which happens very rarely but its importance is quite significant due to the fact that it could be a life-threatening situation. To the authors' knowledge there are no more than 15 reports of this condition, accounting for a very small number of cases worldwide, although there might be a number of unreported cases [1-13]. The purpose of this paper is to attribute to the current knowledge and keep the obstetricians alerted concerning this serious complication. The authors present an interesting case of uterine inversion during caesarian section. The authors have used papers written in English, published in PubMed, in order to briefly review the management and outcome of these cases.

Materials and Methods

A 34-year-old para 1 woman, underwent a scheduled caesarean section, at 39 weeks of gestation because of previous caesarean section at 28 weeks of gestation due to chorioamnionitis.

She was of Greek ethnicity, 1.62 m in height and had a body mass index (BMI) of 24.1. She was a smoker of ten cigarettes per day for about ten years but reported stopping as soon as she found out that she was pregnant. She reported no alcohol consumption, and had no iron or vitamin supplementation during pregnancy. Her family and past medical history was unremarkable. Conception was spontaneous. She had a regular follow up during pregnancy in the present outpatient department. She un-

derwent all routine ultrasound examinations at 11 weeks, 20 weeks, and 32 weeks and regular blood test screening. All findings were unremarkable until the 24th week of gestation when she was found to have an abnormal 75-gram oral glucose tolerance test (fasting glucose levels was 113 mg/dl, one hour later 170 mg/dl, and 109 mg/dl at two hours). She was diagnosed with mild glucose intolerance and was treated successfully during pregnancy only by dietary means.

At the time of the delivery, coagulation screening and full blood count, was within normal limits. Cardiotocograph (CTG) was reassuring and the patient signed an informed consent for the operation. Caesarean section was performed under spinal anesthesia using the Joel-Cohen technique, and the delivery of the fetus was uneventful. After delivery of the baby ten IU of oxytocin were administered bolus intravenously, and slight cord traction was applied for placenta delivery. During controlled cord traction, placenta did not detach from the uterine anterior wall and remained firmly attached to it, while a partial inversion of the uterus was noted through the uterine incision. Immediately, the inverted uterus was exteriorized and was manually reverted successfully at first attempt. Afterwards the uterus was repositioned intra-abdominally, and 0.2 mg of ergometrine maleate was administered bolus intravenously, as well as 40 IU of oxytocin diluted in 1,000 cc of normal saline solution, for four hours (250 ml/h). There was no postpartum bleeding and hospitalization was uneventful.

Discussion

Uterine inversion is a rare complication of labor. Calder supports the results coming from the analysis of data collected from large studies in India and the Middle East reporting an incidence of one in 20,000 to one in 25,000 deliveries for uterine inversion [14]. This complication may occur after vaginal delivery or during caesarean section. Uterine inversion during caesarean section is con-

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sidered to be less likely to happen than the inversion of the uterus after vaginal delivery. Basket *et al.* reported that the incidence of acute uterine inversion following vaginal birth was one in 3,737, and following caesarean section, one in 1,860 [12]. However, the present authors agree with Vavilis *et al.* who in their paper consider that this incidence of uterine inversion during caesarean section is an overestimation [1].

It is very difficult to identify the causes of uterine inversion after caesarean section [4]. It is suggested that an inherent weakness of the uterine musculature might be partly responsible for the inversion [1,6,7]. This factor, though, is extremely difficult to prove as Vavilis *et al.* comment [1]. The fundal insertion of the placenta is also thought to be associated to uterine inversion [7, 14]. Placenta accrete might be a cause of uterine inversion as well [3]. Other factors that could contribute to this adverse event are traction applied on the umbilical cord and the administration of oxytocin [1, 9-11].

The implications of uterine inversion are quite severe, but rare. The most important adverse events of uterine inversion are pain, neurogenic shock, cardiac arrest, and post partum hemorrhage [14]. It is worth mentioning, and somewhat expected, that uterine inversion after vaginal delivery has a higher incidence of massive symptoms than after caesarean section [13]. Cardiac arrest is the most severe complication. There are reports of cardiac arrest following uterine inversion after caesarean section [2, 5], and cases of acute hypotension. Hypotension is associated with delay in re-inversion [8, 9]. These complications are thought to take place due to vagal stimulation caused by traction on the ligaments supporting the uterus (i.e. infundibulopelvic and broad ligaments) [1, 5]. In the presented case, uterine inversion had absolutely no intraoperative or postoperative consequences. There was no hypotension or any other symptoms of vagal stimulation and no abnormal postoperative bleeding. However, the uterus was reverted immediately after the identification of the inversion, and thus, it remained inverted for only ten seconds.

The management of uterine inversion after caesarean section is usually simple [6]. The time interval between inversion and reversion of the uterus should be minimized, so the attempt to revert the uterus should be performed with the placenta being attached, meaning no time is lost in attempting to separate the placenta first. Also, it should be noted that no oxytocin should be administered with the uterus being inverted. In case of general anesthesia the uterus could be relaxed after the administration of volatile inhalational agents. If the patient was subjected to spinal or epidural anesthesia, i.e., she is awake, the relaxation of the uterus, which is necessary in order to facilitate the obstetrician's attempts for reversion, could be achieved by administering ritodrine [1, 9], or nitroglycerin intravenously [15].

Conclusion

As a conclusion, the authors report that uterine inversion during caesarean section is a serious complication, but fortunately very rare. However, the obstetrician should be aware that the uterus might become inverted even after caesarean section because it is critical for the patient that it is reverted quickly, without any delay or hesitation.

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"KC, PC, and FC performed the operation. KC, NV, PDL, MT reviewed the literature, KC and AD analyzed and interpreted the patient data and were the major contributors in writing the manuscript.

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