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Immediate postpartum ultrasound evaluation for suspected retained placental tissue in patients undergoing manual removal of placenta

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ABSTRACT

Objectives: Approximately 1% of term deliveries are complicated by retained products of conception. Untreated, this condition may cause bleeding, infection and intrauterine adhesions. This study assessed whether performing routine bedside uterine ultrasound immediately after manual removal of the placenta reduced the occurrence of undiagnosed, retained products of conception and its associated complications.

Study design: A retrospective study was conducted using the records of patients who delivered and underwent manual removal of placenta at a single obstetrics center over a 6-year period. The outcomes of patients who were assessed using immediate bedside ultrasound were compared to a similar group who were treated based on clinical evaluation alone. All patients underwent ultrasound examination prior to discharge. Outcome variables included the rate of additional interventions (medical or surgical), abnormal pre-discharge uterine ultrasound findings, postpartum hemorrhage rate, puerperal fever and length of hospital stay.

Results: A total of 399 charts were reviewed. Immediate post-procedural ultrasound was performed in 235 patients. The remaining 164 women did not undergo immediate post-procedural ultrasound. All patients underwent an ultrasound examination prior to discharge. Among the patients who had an immediate post-procedural ultrasound, 12 (5.1%) received immediate re-intervention (2 methergine, 6 curettage and 4 manual uterine revision) vs. no intervention in the second group ($p < 0.001$).

No statistically significant difference was found between the group of patients who had immediate post-procedural ultrasound and those who did not, in the rates of postpartum hemorrhage (3.1% vs. 0.7%, $p = 0.13$), abnormal ultrasound findings prior to discharge (14.9% vs. 14.8%, $p = 0.96$) or additional late intervention (7.2% vs. 7.9%, $p = 0.79$), respectively.

Conclusions: Our findings suggest that immediate, bedside uterine ultrasound examination after manual removal of placenta might not change patient outcomes. Furthermore, it might increase unnecessary interventions. Further studies are needed to prospectively assess the benefit of routine uterine ultrasound examination after manual removal of placenta.

Introduction

Retained products of conception (RPOC) complicates about 1% of deliveries [1,2]. Its clinical presentation is versatile. Patients can be asymptomatic or incur postpartum hemorrhage (PPH) and less frequently, postpartum fever [1]. Known risk factors include nulliparity, older maternal age, previous uterine surgery and labor induction [3–5]. There are no effective primary preventive strategies. Secondary prevention is accomplished by manual removal of the placenta immediately after the third stage of labor, when residual tissue is suspected. The diagnosis is suspected when the placenta appears incomplete or if PPH occurs, especially in the setting of uterine atony. The diagnosis is supported by ultrasound (US) appearance of an echogenic mass [6–8]. However, it is not mandatory to perform an US exam to justify invasive management once an obvious clinical indication arises, such as persistent uterine atony or PPH.

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When postpartum RPOC is suspected, manual removal of placenta is the standard treatment. Despite the frequency of manual removal of the placenta, the role and optimal timing of bedside post-procedural uterine US have not yet been determined. Therefore, the protocols used by different institutions vary and are primarily based on local expert opinion.

The US appearance of the postpartum uterus has been studied extensively. Hertzberg and Bowie correlated specific US patterns with clinical and pathologic findings [9]. Carlan and colleagues compared immediate postpartum US with gross and histologic findings and concluded that the imaging evidence was not reliable except when an echogenic mass was present [10]. The overall reported sensitivity and specificity of US diagnosis of postpartum RPOC are 44%–85% and 88%–94%, respectively [8,10–13]. Sadan et al. concluded that the use of US is associated with an unacceptably high false-positive rate, mainly after delivery [6].

The benefit of adding Doppler to uterine US was also assessed. Although the presence of Doppler flow is an accurate predictor of RPOC, the lack of flow on color Doppler evaluation does not exclude the diagnosis [14].

Despite its flaws, US is the only noninvasive means available to examine the uterine cavity on delivery wards. A timely diagnosis of postpartum RPOC is of utmost importance, because it enables a relatively easy and safe intervention, such as manual revision of the uterine cavity rather than a delayed procedure such as hysteroscopy or curettage, which has higher complication rates, including uterine perforation and intrauterine adhesions [15]. Therefore, we retrospectively assessed the effect of a confirmatory post-procedural uterine US exam on the outcomes of patients who underwent manual removal of placenta due to suspected postpartum RPOC, which in the context of this paper was either the appearance of an echogenic mass in the uterine cavity, a placenta missing a cotelydon or PPH. A secondary aim was to evaluate whether postpartum RPOC was a recurring condition.

Materials and methods

A retrospective study was conducted using the records of patients who had delivered and underwent manual removal of placenta at a single obstetrics center over a 6-year period. The study was approved by the hospital Ethics Committee. Informed consent was waived. A total of 400 patients were identified through a search of archived records using codes for the following conditions: "RPOC", "retained placenta" "uterine revision" "manual lysis". The study included women who delivered a live born infant and underwent manual removal of either an intact placenta or of placental fragments. Included in the study were patients who had delivered at 23.3–42.6 weeks of gestation. Deliveries of pre-viable fetuses, late abortions, stillbirths and cesarean sections were not included in the study. We divided the cohort into 2 groups. The first group included women who had an immediate transabdominal US exam after manual removal of placenta (immediate US group) and a second group of patients who had undergone the same procedure without an immediate US exam (non-immediate US group). Patients in both groups received a dose of prophylactic antibiotics (intravenous second-generation cephalosporin or clindamycin for penicillin-sensitive patients), as per departmental protocol. It is important to point out that a routine, active third stage is the common practice of the department. This consists of immediate administration of 10 units IV oxytocin after cord clamping, traction of the cord with simultaneous uterine massage and manual removal of placenta if it does not detach after 30 min of these efforts. Both groups of patients were managed according to this active third stage protocol. The decision to perform an US exam was based on the practitioner's preference and personal routine and was influenced by the departmental policy at the time (Fig. 1). To the best of our knowledge and based on meticulous review of the medical records, clinical severity was not a factor in this decision. This provided a natural distribution of the above study groups. An ALOKA SSD-1000 (Aloka, Wallingford, CT, USA) was used for the immediate post-procedural exam, which was performed by obstetric residents and attending senior obstetricians working in the Labor Unit. Women from both groups later underwent routine US exams by an experienced sonographer using a Voluson 8E US (GE Healthcare, Wauwatosa, WI, USA) machine prior to hospital discharge (36–48 h after delivery). This exam was performed using a combined approach, both transabdominally and transvaginally.

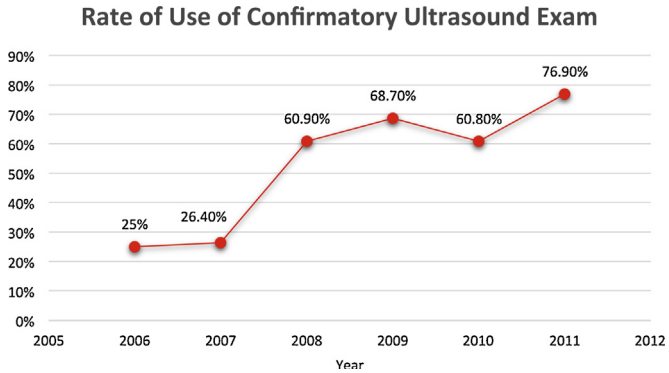

Fig. 1. The rate of performance of immediate confirmatory ultrasound examination in the years 2006–2011 at Meir Medical Center.

Outcome variables were compared between the groups. The primary outcome was defined as the need for an intervention (either pharmacologically with methergine 0.2 mg QDS orally for 4 days or invasively with curettage/hysteroscopy) after discharge from the delivery unit (late intervention). Secondary outcomes were: (1) the need for additional interventions (pharmacologically with IM methergine 0.2 mg, single dose or invasively with manual uterine revision/curettage) immediately after manual removal of the placenta (early intervention) due to suspected RPOC (echogenic mass with or without evidence of blood flow to the uterine wall on Doppler or a clinical presentation of RPOC as previously described), (2) RPOC suspected after hospital discharge, (3) PPH which occurred after manual removal of the placenta or (4) postpartum fever.

In addition, a telephone survey was undertaken regarding the patients' deliveries before and after the index delivery, to query whether these had also been affected by retained placenta or placental fragments. The purpose was to assess if this was a frequently recurring condition. Percentages calculated were compared to the 1% estimated occurrence of RPOC in the general population [1,2].

Assuming a 10% percent difference in outcome measures between the groups and aiming for a statistical power of 95%, each group was calculated to require a minimum of 162 patients. Nominal data are presented as number and percentage. Continuous data are presented as mean ± standard deviation. Qualitative data were tested with Chi-square and continuous data with *t*-test. Values were considered statistically significant when $p < 0.05$. The SPSS-19 software was used for all statistical analyses.

Results

Four hundred charts were reviewed. Due to incomplete records, one patient was excluded. Thus 399 patients were included in the outcome analyses. During the 6-year study period, a total of 29,761