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Suspected placenta accreta and cesarean hysterectomy: observational cohort utilizing an intraoperative decision strategy☆,☆☆

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ABSTRACT

Introduction: Planned cesarean hysterectomy (CH) is recommended to minimize morbidity for suspected placenta accreta (PA), yet this ends fertility. We examined CH frequency and post-operative morbidities for suspected PA cases when an intra-operative decision strategy to perform CH was used.
Methods: Suspected PA cases were pre-operatively identified in one tertiary care center. Women were assessed intra-operatively, prior to uterine incision, for immediate CH or for attempted placental separation. We compared outcomes among women with versus without PA (surgical and/or pathologic diagnosis), and examined outcomes following immediate CH versus attempted placental separation.
Results: Our cohort, from 2002 to 2012, comprised 99 women with suspected PA; 54 (54.5%) had PA diagnosed by surgery/pathology, and 45 (45.5%) did not. Among women diagnoses surgically or pathologically with PA, CH was performed for 46/54 (85%); 8 women with suspected PA had successful placental separation. 27 of the 46 CH were performed immediately following uterine wall examination and 19 were performed following attempted placental separation. We received histological confirmation of the clinical placenta accreta diagnosis for 24/46 (52.2%) cases, and in 22/46 (47.8%) cases the histology did not confirm the clinical diagnosis. Surgery duration, packed cell transfusion requirement and postoperative outcomes were similar among women with PA regardless of immediate CH versus attempted placental separation, except for a higher cystotomy rates following attempted placental separation. Emergency deliveries were performed at significantly earlier gestational ages.
Discussion: Among women with suspected PA, an intra-operative CH decision allows some women to avoid CH. Consideration of attempted placental separation did not increase blood transfusion or post-operative complications, but was associated with a higher rate of cystotomy.

Introduction

Placenta accreta is a potentially catastrophic obstetric condition due to associated maternal hemorrhage [1]. Cesarean hysterectomy (CH) is frequently performed for suspected placenta accreta [2], and placenta accreta has a reported 7% mortality rate [3]. Preterm planned cesarean hysterectomy without attempted placental delivery is a strategy recommended by the American College of Obstetricians and Gynecologists (ACOG) [4] to minimize the risks associated with placenta accreta such as massive bleeding and associated risks of disseminated intravascular coagulation, infection, acute respiratory distress syndrome, renal failure, and death [3,5–7].

Placenta accreta is often suspected antenatally based on imaging, together with risk factors such as placenta previa and prior cesarean delivery (CD) [5], that enables pre-emptive measures to reduce morbidity such as multidisciplinary management [8] and transfer to a tertiary care center [9–12]. Despite risks

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of massive bleeding, obstetricians may prefer attempted uterine salvage due to the potential for a false positive sonographic diagnosis of placenta accreta, and concerns for future fertility [8,13,14]. Almost two-thirds of maternal-fetal medicine providers across the United States prefer attempted placental separation according to a 2011 survey of 361 responding Maternal-Fetal Medicine specialists [15].

ACOG acknowledges that an individualized strategy may be undertaken: "it is reasonable to await spontaneous placental separation to confirm placenta accreta clinically" [4]. The challenge is to distinguish between women who require planned CH without attempted placental separation [8] from women are candidates for attempted placental separation.

Our objective was to assess maternal morbidity for women with suspected placenta accreta when an intraoperative decision categorization was used to assess whether women require immediate CH or may undergo attempted placental separation.

Materials and methods

This was a prospective cohort study of women with suspected placenta accreta that delivered at a single tertiary care center, Hadassah Hebrew University Medical Center, between 2002 and 2012. Institutional Review Board approval was obtained with waiver (0528-14-HMO and 0398-12-HMO) of informed consent due to the non-interventional observational nature of this study.

Our database was described previously [16]; in all cases, placenta accreta was strongly suspected prior to surgery. The depth of trophoblastic invasion may vary from accreta to increta and percreta, from here referred to collectively as placenta accreta [17].

We included women with suspicion for placenta accreta based on ultrasound for whom the surgeon planned to make an intraoperative decision for CH based on external examination of the uterine wall. We excluded women with suspicion for placenta accreta for whom CH was planned prior to intraoperative examination. During pregnancy, all women with sonographic signs suggestive of placenta accreta on routine second trimester ultrasound, and all women with history of at least one prior cesarean delivery and a suspicious placental location (central placenta previa covering the internal os, or low lying anterior or marginal placenta), undergo an additional placental evaluation with at least one ultrasound assessment. MRI is not routinely performed. The placental evaluation ultrasound assessed the presence of placental lacunae, obliteration of the echo lucent area between the uterus and placenta, myometrium thickness <1 mm, and interruption of the posterior bladder–uterine border. Suspicion for accreta was based on the judgment of the sonographer, and was stated in the ultrasound report [16].

Women with suspected placenta accreta were scheduled for cesarean delivery between 34 and 36 weeks of gestational age. Women who had vaginal bleeding and or uterine contractions had cesarean delivery prior to this date, either as an emergency procedure, or expedited (not emergency yet prior to the planned date). All women with suspected placenta accreta who underwent elective/expedited or emergency surgery were managed by a multidisciplinary team that included maternal-fetal-medicine specialists, gynecologic oncologists, anesthesiologists, intensive care physicians, neonatologists, hematologists and in some cases vascular and urology surgeons. Our population does not include women who underwent planned CH [18].

Our primary outcome was performance of CH. Prior to cesarean delivery, all women with antenatal suspicion of placenta accreta were consented for the possibility of CH.

Three potential intraoperative management strategies were considered: (i) immediate CH performed in women not considered candidates for placental separation, based upon the surgeon's judgment after examination and assessment of the size and complexity of vascularity on the external uterine wall, (ii) CH performed after failure of attempted placental separation, and (iii) successful placental separation, not requiring CH. Prior to surgery the anesthesiologist routinely requested that the lead surgeon verbally communicate the anticipated placental management strategy – immediate CH or attempted placental separation. In cases where the surgeon decided not to perform attempted placental separation, hysterectomy was performed immediately following delivery, leaving the placenta in situ. In cases of attempted placental separation, this was performed with gentle exterior uterine massage and gentle traction to peel the placenta from the uterine wall. The surgeon recognizes the signs of separation as the placenta peels away from the uterine wall. In some cases vessel loops were placed around the internal iliac arteries prior to the attempted placental separation. Resistance to placental separation or heavy bleeding signaled that CH is required, when the placenta would not separate, or based on excessive blood loss after placental separation. There were no attempts at partial placental separation.

Data were collected prospectively for 24 h following surgery, and beyond 24 h were collected from chart review. These data included maternal/obstetric characteristics: maternal age, gravidity, parity, prior cesarean deliveries, prior dilatation and curettage, vaginal bleeding, urgency of surgery and placental location (central placenta previa, low-lying or marginal); neonatal characteristics (data not presented here): birth weight, gestational age; and maternal morbidities: CH, length of surgery, cystoscopy, and intensive care admission, and packed cell requirements. Post-surgical complications reported are post-operative ventilation, fever, additional surgery, angiography, wound infection, intensive care admission and length of hospital stay.

Among our cohort with suspected placenta accreta we compared women with high-grade placental invasion (true positives) with women who did not have high-grade placental invasion (false positives). The diagnosis of placental invasion was either based upon clinical judgment during surgery, or confirmed histologically when a CH was performed. The surgeons were unaware that their judgment of the external uterine wall appearance and decision for CH was a study outcome, thus avoiding potential observer bias.

Data analysis

Data were analyzed using SPSS 19.0 (SPSS Inc. Chicago, IL) with chi-squared test or Fisher's Exact (counts and percentages), *t*-test (mean and standard deviation) and Mann–Whitney *U* (median and quartiles) where appropriate. In order to identify women in the cohort at high-risk for placental invasion, we performed logistic regression analysis to identify clinical variables significantly associated with the diagnosis of placental invasion. No imputation of missing data was performed. A *p*-value of 0.05 or less was considered statistically significant.

Results

During the study period 99 women met criteria for suspected placenta accreta and were included. There were no women who underwent elective planned CH for suspected placenta accreta, Fig. 1. The cohort demographics are shown in Table 1 grouped according to whether placental invasion was diagnosed; 54 (54.5%) women with suspected placenta accreta had placental invasion diagnosed (true positives) and 45 (45.5%) women did not (false positives). The diagnosis of placenta accreta was made at surgery in 52/54 (96.3%) cases, and the pathological diagnosis was confirmed