GYNECOLOGY

Six-month expulsion of postplacental copper intrauterine devices placed after vaginal delivery

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BACKGROUND: Immediate placement of an intrauterine device after vaginal delivery is safe and convenient, but longitudinal data describing clinical outcomes have been limited.

OBJECTIVE: We sought to determine the proportion of TCu380A (copper) intrauterine devices expelled, partially expelled, malpositioned, and retained, as well as contraceptive use by 6 months postpartum, and determine risk factors for expulsion and partial expulsion.

STUDY DESIGN: In this prospective, observational study, women who received a postplacental TCu380A intrauterine device at vaginal delivery were enrolled postpartum. Participants returned for clinical follow-up at 6 weeks, and for a research visit with a pelvic exam and ultrasound at 6 months. We recorded intrauterine device outcomes and 6-month contraceptive use. Partial expulsion was defined as an intrauterine device protruding from the external cervical os, or a transvaginal ultrasound showing the distal end of the intrauterine device below the internal os of the cervix. Multinomial logistic regression models identified risk factors associated with expulsion and partial expulsion by 6 months. The area under the receiver operating characteristics curve was used to assess the ability of a string check to predict the correct placement of a postplacental intrauterine device. The primary outcome was the proportion of intrauterine devices expelled at 6 months.

RESULTS: We enrolled 200 women. Of 162 participants with follow-up data at 6 months, 13 (8.0%; 95% confidence interval, 4.7—13.4%) experienced complete expulsion and 26 (16.0%; 95% confidence interval, 11.1—22.6%) partial expulsion. Of 25 malpositioned intrauterine devices (15.4%; 95% confidence interval, 10.2—21.9%), 14 were not at the fundus (8.6%; 95% confidence interval, 5.2—14.1%) and 11 were rotated within the uterus (6.8%; 95% confidence interval, 3.8—11.9%). Multinomial logistic regression modeling indicated that higher parity (odds ratio, 2.05; 95% confidence interval, 1.21—3.50; $P = .008$) was associated with expulsion. Provider specialty (obstetrics vs family medicine; odds ratio, 5.31; 95% confidence interval, 1.20—23.59; $P = .03$) and gestational weight gain (normal vs excess; odds ratio, 9.12; 95% confidence interval, 1.90—43.82; $P = .004$) were associated with partial expulsion. Long-acting reversible contraceptive method use at 6 months was 80.9% (95% confidence interval, 74.0—86.6%). At 6 weeks postpartum, 35 of 149 (23.5%; 95% confidence interval, 16.9—31.1%) participants had no intrauterine device strings visible. Sensitivity of a string check to detect an incorrectly positioned intrauterine device was 36.2%, and specificity of the string check to predict a correctly positioned intrauterine device was 84.5%. This corresponds to an area under the receiver operating characteristics curve of 0.5.

CONCLUSION: This prospective assessment of postplacental TCu380A intrauterine device placement, with ultrasound to confirm device position, finds a complete intrauterine device expulsion proportion of 8.0% at 6 months. The association of increasing parity with expulsion is consistent with prior research. The clinical significance of covariates associated with partial expulsion (provider specialty and gestational weight gain) is unclear. Due to the observational study design, any associations cannot imply causality. The proportion of partially expelled and malpositioned intrauterine devices was high, and the area under the receiver operating characteristics curve of 0.5 indicates that a string check is a poor test for assessing device position. Women considering a postplacental intrauterine device should be counseled about the risk of position abnormalities, as well as the possibility of nonvisible strings, which may complicate clinical follow-up. The clinical significance of intrauterine device position abnormalities is unknown; future research should evaluate the influence of malposition and partial expulsion on contraceptive effectiveness and side effects.

Key words: copper intrauterine device, intrauterine device, intrauterine device complication, intrauterine device expulsion, intrauterine device retention, long-acting reversible contraception, postpartum contraception, postpartum intrauterine device, postplacental intrauterine device, TCu380A intrauterine device, vaginal delivery

Introduction

Facilitation of reproductive life planning and commensurate contraception counseling and provision are key elements of postpartum care.[1] The use of a postplacental intrauterine device (IUD) for postpartum contraception offers several advantages: the IUD is a highly effective method,[2,3] women are often highly motivated to begin contraception after giving birth, and most have ready access to health care during delivery.[4] Offering long-acting reversible contraception (LARC) at delivery has become increasingly popular in the United States, and 35 states have proposed or accepted guidelines to enable Medicaid coverage of LARC placement during the hospitalization for delivery.[5]

Although postplacental IUD placement has a long safety record,[6] literature describing TCu380A (copper) IUD expulsion after immediate insertion at vaginal delivery has been limited to self-reported outcomes,[7] small sample sizes,[8,9] and international data that may not be generalizable to the United States.[10—12] Reports of 3- to 6-month expulsion rates range from 7.0—19.5% after vaginal delivery.[9—12]

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AJOG at a Glance

Why was this study conducted?

We sought to describe positional outcomes of postplacental copper intrauterine devices (IUDs) placed after vaginal delivery.

Key findings

Of immediate postplacental IUDs, 8% were completely expelled, and 16% partially expelled, by 6 months postpartum. Only 55.6% of participants continued using their original IUD at 6 months, but 80.9% were using a long-acting reversible contraception method. The sensitivity of a string check to detect an incorrectly positioned IUD was 36.2%, and the specificity of a string check to predict a correctly positioned IUD was 84.5%. Three quarters of immediate postplacental IUD users were happy or extremely happy with the IUD.

What does this add to what is known?

This study provides a detailed description of postplacental IUD position at 6 months postpartum, and finds that a string check is a poor test to confirm correct IUD position.

This prospective, observational study of IUD position outcomes after postplacental placement of copper IUDs after vaginal delivery was designed to determine the proportion of IUDs expelled, partially expelled, malpositioned, and continued by 6 months postpartum, to evaluate contraceptive method use at 6 months, and to determine risk factors for IUD expulsion and partial expulsion.

Materials and Methods

All study activities were approved by the Hospital of the University of Pennsylvania Institutional Review Board. We recruited women from April 2015 through August 2016. We included English-speaking women who were ≥18 years of age, delivered vaginally at ≥34 weeks 0 days' gestation, received a postplacental TCu380A IUD, and were willing to participate in study follow-up after hospital discharge. We excluded women who were unwilling or unable to comply with the study protocol.

Provision of postplacental IUDs was initiated as a part of clinical care at our university hospital starting in January 2014. We made efforts to increase awareness by providers and patients of the option for postplacental IUD placement from January 2014 onward, unrelated to the research study setting. Levonorgestrel IUDs were not available on our obstetrics ward. Obstetric providers were trained in postplacental IUD placement with both ring forceps and manual insertion, and booster trainings were provided to the labor and delivery service monthly. Transabdominal ultrasound to guide or confirm IUD placement was used at the discretion of the provider. IUDs were provided through philanthropic funding[13] or, after April 2015, through a combination of philanthropic and research funding. Medical assistance did not cover immediate postpartum LARC during the study period.

Potentially eligible participants were approached prior to postpartum discharge by a study coordinator. Eligible women provided written informed consent in the postpartum unit, or were given the option to enroll by telephone after discharge. Women wishing to enroll after discharge were contacted within 6 weeks by a study coordinator and provided verbal consent. A baseline questionnaire including demographic information, obstetric and contraceptive history, and satisfaction with the postplacental IUD was administered at the time of enrollment. Labor characteristics, delivery information, and neonatal information were abstracted from the medical record after delivery using a standardized form.

The primary outcome for this study was the proportion of IUDs expelled at 6 months. Secondary outcomes were IUD position (partial expulsion, malposition, or correct position), elective removal, and contraceptive method use at 6 months postpartum. We defined a partial expulsion as an IUD protruding from the external cervical os, or a transvaginal ultrasound showing the distal end of the IUD below the internal os of the cervix. Malposition was defined as an IUD that was >1 cm from the fundus, or in an abnormal orientation, but not partially expelled.

IUD location and participant satisfaction with the IUD were assessed at 6 weeks and 6 months postpartum. At 6 weeks postpartum, the research staff extracted data from the medical record to obtain information about IUD position. Participants with incomplete documentation of IUD status in the medical record (that is, no documentation of strings on exam, documentation of absent or long strings but no ultrasound ordered, or ultrasound ordered but not performed), and those who did not follow up with their provider, were recalled for a visit in the research office at 6 weeks. Research visits included a pelvic examination and transvaginal ultrasound to evaluate IUD position. Participants who were diagnosed with an IUD problem during this visit were offered a same-day clinical appointment for contraceptive counseling, and if necessary, IUD removal and initiation of a new method, including all LARC methods. Additionally, a questionnaire was administered either in person or over the telephone to assess satisfaction (using a 5-item Likert scale, "How happy are you with your choice to get the IUD immediately," with the bounds "extremely unhappy" to "extremely happy"), participant-reported IUD status (reported as "in place" or "expelled"), and performance of self-string check (reported as "yes" or "no").

Participants returned at 6 months for an in-person study visit with a research clinician. Procedures at this visit included a pelvic exam with string check and a transvaginal ultrasound. Participants diagnosed with an IUD problem at 6 months were also offered a clinical appointment for same-day contraceptive