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Six-week retention after postplacental copper intrauterine device placement

Alyssa Covelli Colwill[a,*,1], Courtney A. Schreiber[a], Mary D. Sammel[a,b], Sarita Sonalkar[a]

[a]*Department of Obstetrics & Gynecology, University of Pennsylvania Perelman School of Medicine, 1000 Courtyard, 3400 Spruce Street, Philadelphia, PA 19104, USA*

[b]*Department of Biostatistics, Epidemiology and Informatics, Perelman School of Medicine, University of Pennsylvania Perelman School of Medicine Rm. 605 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104-6021, USA*

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Abstract

Objectives: We sought to evaluate the 6-week clinical outcomes (intrauterine device [IUD] retention, recognized expulsions, ability to visualize or palpate strings, and need for ultrasound evaluation) in women who received a TCu380A postplacental IUD (PPIUD) after vaginal (VD) or cesarean delivery (CD).

Study design: We conducted a retrospective cohort study to examine the 6-week retention of TCu380A IUDs placed within 10 min of placental delivery in VD (n=137) and CD (n=73). We used Student's t test and Wilcoxon rank sum tests for continuous data and Pearson χ^2 test and Fisher's Exact Test for categorical data.

Results: Of the 169 women who had follow-up, 151 (89.3%) retained their IUD at 6 weeks (95% CI 84.7%–93.9%). All women who underwent CD retained their IUD at 6 weeks postpartum (56/56), whereas 95/113 (84% [95% CI 76.0%–90.3%]) who underwent VD retained their original IUD (p<.01). Strings were detected more frequently in women who had a VD (93.1% [95% CI 85.6–97.4]) compared to those who delivered by CD (44.2% [95% CI 30.5–58.7]; p<.01). Women who underwent CD had an ultrasound to evaluate IUD location more frequently (42.9% [95% CI 29.7–56.8]) compared to women who underwent VD (13.7% [95% CI 7.5–22.3]; p<.01).

Conclusion: Women are more likely to retain a PPIUD after CD compared to a VD (p<.01); however, women who have a PPIUD placed after CD are more likely to have nonvisible strings with a pelvic exam (p<.01) and undergo pelvic ultrasound evaluation (p<.01) compared to a PPIUD placed at the time of a VD.

1. Introduction

The postpartum period provides an opportunity for immediate initiation of contraception to prevent unintended pregnancy and short interval birth. Postplacental intrauterine device (PPIUD) insertion occurs within 10 min of placental delivery; does not impede breastfeeding; is convenient for women; and allows women to obtain safe, long-acting, highly effective contraception [1,2]. The reported expulsion rates with postplacental insertion vary greatly across the literature, ranging from 2.4% to 28.5% as compared with interval insertion expulsion rates of 0%–7% [1–6]. Although prior research suggested that an IUD inserted after cesarean delivery (CD) has a lower risk of expulsion than one inserted after vaginal delivery (VD) [4,7,8], recent data are conflicting [6,9]. Thus, we sought to expand the literature by retrospectively evaluating the 6-week clinical outcomes (IUD retention, recognized expulsions, ability to visualize or palpate strings and need for ultrasound evaluation) in women who received a TCu380A PPIUD after vaginal or cesarean delivery.

2. Materials and methods

We conducted a retrospective cohort study of a convenience sample of all women who received an

* Corresponding author.

E-mail addresses: Colwill@ohsu.edu (A.C. Colwill), Courtney.schreiber@uphs.upenn.edu (C.A. Schreiber), Msammel@mail.med.upenn.edu (M.D. Sammel), Sarita.sonalkar@uphs.upenn.edu (S. Sonalkar).

[1] Current affiliation and present address: Oregon Health & Science University, 3181 SW Sam Jackson Park RD, Mailcode: L466, Portland, OR 97239.

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immediate postplacental TCu380A IUD after VD or CD at the Hospital of the University of Pennsylvania between April 1, 2014, and March 31, 2015, after receiving University of Pennsylvania Investigational Review Board approval. PPIUDs were placed by ring forceps or hand insertion at the time of VD. During CD, a PPIUD was placed at the fundus prior to uterine closure with the strings left untrimmed. Our primary objective was to determine the retention of the original PPIUD at 6 weeks postpartum.

We reviewed clinical documentation in the electronic medical record to assess our primary outcome, including outpatient documentation of visible IUD strings at a postpartum or other exam or ultrasound confirmation of correct placement if strings were not visible. Clinicians ordered pelvic ultrasounds at their discretion; most requested ultrasounds in the setting of nonvisible IUD strings. We administered telephone questionnaires after verbal consent for patients who did not follow up at our institution up to 1 year after loss to follow-up. During the phone query, we asked patients if they had been evaluated by any provider, knew their IUD status or experienced expulsion. We asked women unsure of their IUD status to perform a string check.

Our secondary outcomes included the proportions of women with (a) retention of the PPIUD by mode of delivery, (b) IUD strings visualized at a postpartum appointment and (c) ultrasound ordered for assessment of their IUD.

We defined retention as having the original device in place at 6 weeks postpartum. We defined a complete expulsion as no IUD inside the uterus and a clinical history consistent with expulsion or an abdominal radiograph confirming the absence of the IUD [4]. We defined a partial expulsion as an IUD protruding from the cervical os or transvaginal ultrasound showing the distal end of the IUD below the internal os of the cervix [4]. We defined a malpositioned IUD as displacement from the proper positioning within the fundus but above the internal os of the cervix. A sample size of 200 women allowed us to estimate an 85% retention rate with a 95% CI of ±5% [1–6,9]. This sample size was inflated to 210 to account for up to a 5% loss to follow-up.

We performed statistical analyses using SAS v9.4 (Cary, NC, USA). We used Student's *t* test and Wilcoxon rank sum tests for continuous data and Pearson χ^2 test and Fisher's Exact Test as necessary for categorical data. We used multivariable logistic regression model using backward selection including race, marital status and insurance type as covariates to assess the associations with risk factors for IUD discontinuation.

3. Results

Two-hundred ten women received a copper PPIUD (Table 1): 137 after VD and 73 at the time of CD. We had follow-up information on 169 (80.5%) women including 113 (82.5%) after VD and 56 (76.7%) after CD. Overall, 151 (89.3%, 95% CI 83.7%–93.6%) women retained their original IUD at 6 weeks. Multivariable regression found single marital status as the only risk factor for loss to follow-up compared to those who had a follow-up visit (p=.02).

Table 1
Demographic characteristics of patients who received a PPIUD and had follow-up (*n*=169)

Demographic characteristics	Mean ± SD or *n* (%)
Age (years)	28.3±5.7
Gestational age (weeks)	38.4±1.7
Route of delivery	
Vaginal	113 (66.9)
Cesarean	56 (33.1)
Parity	
1	51 (40.5)
2	37 (29.4)
3	20 (15.9)
4	10 (7.9)
>4	8 (6.4)
BMI at delivery	33.5±7.7
<24.9	18 (10.7)
25–29.9	51 (30.2)
30–39.9	34 (20.1)
>40	66 (39.0)
Race	
African American	126 (78.8)
Other	34 (21.2)
Insurance	
Private	40 (25.0)
Public	120 (75.0)
Marital status	
Single	121 (71.6)
Married	48 (28.4)

Route of delivery was the only factor associated with retention (Table 2). Of the 56 women with follow-up who underwent CD, all retained their IUD at 6 weeks postpartum, whereas 95/113 (84% [95% CI 76.0%–90.3%]) who underwent VD retained their original IUD (Table 2) (p<.01). Age, gestational age, parity, body mass index (BMI), race, insurance and marital status were not associated with retention.

Eighteen patients did not retain their IUD by 6 weeks postpartum: providers removed the IUD in three women (1.8%, 3/169) in the setting of a postpartum hemorrhage on PPD#0. Eleven women (6.5%, 11/169) had recognized complete expulsions prior to their 6-week postpartum visit, three of them on postpartum day #0. Two women (1.2%, 2/169) requested removal within 6 weeks postpartum. Two women (1.2%, 2/169) had partial expulsions and subsequent removal.

Providers were more likely to visualize strings at a postpartum visit and women were more likely to palpate strings if the delivery occurred vaginally (81/87, 93.1% [95% CI 85.6–97.4]) as compared to via cesarean (23/52, 44.2% [95% CI 30.5–58.7%]) (p<.01).

Twenty-six women who did not have clinical follow-up were reached via phone query. Five of these women who underwent VD and two who underwent CD reported the ability to feel their strings at 6 weeks or later after delivery, or