

Review article

Society of Family Planning Guidelines: Postplacental insertion of intrauterine devices

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Received 3 June 2017; revised 27 September 2017; accepted 28 September 2017

Abstract

Postplacental intrauterine device (IUD) placement, defined as IUD placement within 10 min after delivery of the placenta, is an appealing strategy for increasing access to postpartum IUDs because it does not require a separate postpartum visit. These guidelines present an evidence-based assessment of postplacental IUD placement after vaginal and cesarean delivery. Postplacental IUD insertion is safe and does not have higher risks of complications than interval insertion. Most studies find that the risk of IUD expulsion is higher after postplacental insertion than after interval insertion for both vaginal and cesarean deliveries. Most studies find higher rates of expulsion after vaginal delivery than after cesarean delivery. However, expulsion rates vary widely across studies, without clear evidence about the factors that may influence expulsion. In settings where replacement of expelled IUDs is available, patient populations with low rates of return for the postpartum visit are most likely to benefit from provision of postplacental IUD placement with appropriate counseling about risks and benefits.

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Keywords: Postpartum contraception; Intrauterine device; Intrauterine system; Contraception; Levonorgestrel; Postplacental IUD; Postpartum IUD; IUD expulsion

1. Background

Intrauterine device (IUD) placement within 10 min after delivery of the placenta is an appealing strategy for increasing access to postpartum IUDs because it does not require a separate postpartum visit. The American College of Obstetricians and Gynecologists (ACOG) strongly encourages the practice of immediate postpartum provision of long-acting reversible contraception (LARC) [1]. To increase access to postpartum LARC, 27 states and the District of Columbia have published proposed or final guidelines for Medicaid reimbursement for in-hospital provision of postpartum LARC, including IUDs [2]. In the United States, the rate of postpartum IUD insertion prior to hospital discharge has been increasing, from 0.10 per 10,000 deliveries in 2001–2002 to 0.55 per 10,000 deliveries in 2007–2008 [3].

An updated analysis found an overall LARC insertion rate of 13.5 per 10,000 deliveries in 2012–2013 with significant increases in both IUDs and implants [4].

In these guidelines, we use a modified version of the 1983 World Health Organization (WHO) definitions for insertion after delivery [5]:

1. postplacental (or immediate postpartum): IUD insertion within 10 min of delivery of the placenta;
2. early postpartum: IUD insertion >10 min to 1 week postpartum;
3. delayed postpartum: IUD insertion 1 week through 6–8 weeks after delivery;
4. interval: IUD insertion unrelated to timing of delivery, usually after 6–8 weeks.

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2. Short-interval pregnancies

Contraceptive options should be discussed during antenatal care and if desired should be initiated as soon as possible postpartum [6] because repeat pregnancy within the first year postpartum can be as high as 10–44%, with higher rates in high-risk adolescents [7–10]. Women who have consecutive pregnancies with less than 12 months between delivery and conception are more likely to experience adverse health outcomes, including uteroplacental bleeding, preterm premature rupture of membranes, and uterine rupture among women attempting a trial of labor after cesarean delivery [11]. Infants born from short-interval pregnancies are at higher risk for preterm delivery, low birth weight, and small for gestational age [12]. Use of a highly effective contraceptive method has been found to lead to more healthy interpregnancy intervals [10,13–17].

3. Advantages of immediate IUD placement

IUDs are recommended as first-line contraceptives by ACOG [18] and the American Academy of Pediatricians (AAP) [19]. The Centers for Disease Control and Prevention U.S. Medical Eligibility Criteria for Contraceptive Use (USMEC) places no restrictions on use, and states advantages generally outweigh the risks for immediate postpartum use of IUDs [20].

Postplacental IUD insertion offers convenience, assurance that the patient is not pregnant, and insurance coverage that may last only through the pregnancy and postpartum period. In a survey of postpartum women, 23% stated that they would have chosen a postplacental IUD if it had been available [21]. Studies that have investigated return for IUD insertion after delivery have consistently found low rates of insertion for women who desired an IUD (27–60%) [22–25].

The objective of this guideline is to provide evidence-based recommendations for clinicians, programs, and institutions that would like to offer postplacental IUD insertion, with a focus on modern IUDs available in the United States.

4. Clinical questions and recommendations

1. What risks are associated with postplacental IUD insertion?

Postplacental IUD insertion has risks similar to insertion at other time points [26,27]. Theoretical risks have been assessed in a number of trials and observational studies.

Perforation

Small trials and observational studies of postplacental insertion suggest that perforation is rare, and large systematic reviews have not found higher rates of perforation [26,27]. In a prospective study of 8343 women receiving a Copper T 380A (CuT380A) at different postpartum timings, there was

only one documented case of perforation after 460 postplacental insertions (0.2%). This risk was not greater than the risk of insertion more than 6 months after delivery [28].

Infection

Risk of infection after postplacental insertion is low, and randomized trials have not demonstrated a difference in infection based on insertion timing [25,29–31]. Welkovic et al. assessed infection at 10 days postpartum in 145 women who chose a postplacental CuT380A after vaginal delivery and 157 who did not choose an IUD. They found no difference in clinical signs of endometritis between IUD acceptors and non-acceptors (3% vs. 5%, $p=.65$) or in leukocyte ratio with a left shift (16% in both groups, $p=.99$) [32].

Vaginal bleeding

Vaginal bleeding does not appear to be increased after postplacental IUD insertion. Elsedeek et al. examined postplacental IUD insertion at the time of cesarean delivery in 191 women. They compared bleeding patterns among women receiving no IUD (control) to those of women receiving the copper-containing Nova-T IUD and the IUD containing 52 mg of levonorgestrel (LNG-IUD). The mean duration of bleeding was similar for the control group and the Nova-T group, but shorter for the LNG-IUD group (27 days vs. 33 days vs. 20 days, respectively, $p<.0001$). The same was true of mean pads per day (4.9 vs. 5.0 vs. 3.1, $p=.012$). [33]. Welkovic et al. also compared heavy vaginal bleeding between women who had a postplacental CuT380A inserted after vaginal delivery and women who did not. They found no significant difference in the proportion of either women or their nurses reporting heavy vaginal bleeding. Women in both groups had similar hemoglobin concentrations at 10 days postpartum (11.9 g/dL in both groups) [32].

2. What is the rate of expulsion after postplacental IUD placement?

Most recent studies agree that IUD expulsion after postplacental insertion is higher than after interval insertion (Table 1). There is wide variability in reported expulsion rates, ranging from 2% to 27% after vaginal delivery and 0% to 20% after cesarean [25,29–31,34–40]. Uncontrolled studies in the 1980s often reported expulsion rates of less than 10% [41–45]. However, these findings have not been replicated in more recent studies using modern IUDs.

In a large randomized controlled trial (RCT) of postplacental IUD insertion, Chen et al. randomized 102 women to postplacental insertion of the 52-mg LNG-IUD or delayed insertion 6–8 weeks later. Expulsion was higher in the postplacental group than in the delayed group (24% vs. 4%; $p=.008$). However, 10 out of the 12 women who experienced expulsion after postplacental insertion had a new LNG-IUD inserted, and both groups had similar rates of IUD use at 6 months (84% vs. 77%, $p=.32$) [25].

A 46-person 3-arm pilot RCT by Dahlke et al. that compared postplacental to early postpartum (>10 min to 48 h)

Table 1
Expulsion of the intrauterine device after postplacental insertion, from studies that included devices currently available in the United States.

Study	Sample size	IUD type		Delivery type	Follow-up (months)	Expulsion ⁱ			p value ⁱⁱ
		Copper	Hormonal			Postplacental	Early postpartum	Delayed or interval	
A. Comparative – RCTs with randomization of insertion timing									
Levi 2015 [31]	112	CuT380A	52 mg LNG-IUD	C	6	4/48 (8%)		(≥6 wk) 1/50 (2%) ⁱⁱⁱ	p=.20 ^{iv}
Lester 2015 [30]	68	CuT380A		C	6	1/34 (3%)		(6 wk) 1/18 (6%)	p=1.0
Whitaker 2014 [29]	42		52 mg LNG-IUD	C	12	4/20 (20%)		(4–8 wk) 0/22 (0%)	p=.04
Dahlke 2011 [34]	46		52 mg LNG-IUD	V	6	4/15 (27%)	(>10 m-48 h) 4/15 (27%)	(≥6 wk) 0/16 (0%)	p=.026
Chen 2010 [25]	102		52 mg LNG-IUD	V	6	12/50 (24%)		(6–8 wk) 2/46 (4%)	p=.008
B. Comparative – cohort studies and RCTs with randomization based on factor other than insertion timing									
Sucak 2015 [47]	160	CuT380A		C (no labor), C (during active labor), V	12	C (no labor): 4/51 (8.7%) C (active labor): 4/47 (8.9%) V: 7/62 (11.3%)			p>.05 in all pairwise comparisons
Elsedeek 2012 [33]	140 ^v	Nova-T IUD	52 mg LNG-IUD	C	24	LNG-IUD: 0/65 (0%) Nova-T: 5/75 (7%)			p=.06 ^{iv}
Eroğlu 2006 [46]	268	CuT380A		V & C, results combined	12	Complete: 12/84 (14%) Partial: 19/84 (23%)	(>10 m-72 h) Complete: 8/43 (19%) Partial: 22/43 (51%)	(>6–8 wk) Complete: 5/130 (4%) Partial: 4/130 (3%)	p<.001
Lara-Ricalde 2006 [48]	157	CuT380A & ML Cu375		V & C	12	V: 4/32 (13%) C: 3/32 (9%)	(>10 m-48 h) V: 5/41 (12%) C: 2/52 (4%)		V: p=1.0 ^{iv} C: p=.36 ^{iv}
El-Shafei 2000 [36]	1378 ^{vi}	CuT380A		V & C	12	V: 2.4 ^{vii} C: 2.4 ^{vii}	(>10 m-48 h) Total: 2.6 ^{vii}		p>.05
Morrison 1996 [49]	Kenya: n=224 Mali: n=110	CuT380A		V & C, results combined	6	Kenya: 0.01 ^{viii} Mali: 0.15 ^{viii}	(>10 m-72 h) Kenya: 0.05 ^{viii} Mali: 0.27 ^{viii}		Kenya: p=.05 Mali: p=.20

C. Non-comparative studies

Study	Sample size	IUD Type		Delivery Type	Follow up (mo)	Expulsion
		Copper	Hormonal			Postplacental
Eggebroten 2017 [64]	211	CuT380A	52 mg LNG-IUD	V & C	6	CuT380A: 3/78 (4%) LNG-IUD: 18/108 (17%)
Jatlaoui 2014 [35]	99	CuT380A	52 mg LNG-IUD	V	6	17/88 (19%)
Singal 2014 [37]	300	CuT380A		C	12	16/300 (5%)
Levi 2012 [38]	90	CuT380A		C	6	0/43 (0%)
Çelen 2011 [39]	245	CuT380A		C	12	43/245 (18%)
Çelen 2004 [40]	235	CuT380A		V & C, results combined	12	12.3 ^{ix} (12-month follow-up data available for 183 women)

RCT, randomized controlled trial; CuT380A, Copper T380A; LNG-IUD, levonorgestrel intrauterine device; V, vaginal delivery; C, Cesarean delivery; ML Cu375, Multiload Copper 375 intrauterine device. Denominators may not match sample size due to loss to follow-up or failed insertions. Denominator is the number of women who had follow-up information available.

ⁱ Expulsion is in n/N (%) unless otherwise noted.

ⁱⁱ Significance is for comparison of expulsion only, not utilization.

ⁱⁱⁱ Denominator includes all women with follow-up at 6 months, even those who did not have an IUD placed. (Only 34 women in the delayed group had IUD placed.)

^{iv} *P* value not reported; calculated based on data within paper.

^v Does not include 40 women who had no IUD placed.

^{vi} Does not include 56 participants who had IUD placed post-abortion.

^{vii} Expulsion per 100 woman-years.

^{viii} Life table expulsion rates at 6 months.

^{ix} Gross cumulative event rate per 100 women.

and delayed insertion (≥ 6 weeks) of the 52-mg LNG-IUD after vaginal delivery reported expulsion rates of 27% (4/15) in both the postplacental and early postpartum groups, compared with none in the delayed group. Most women who experienced expulsion had a second IUD placed, and use at 3 and 6 months was similar across groups [34]. In an observational study comparing postplacental placement of the 52-mg LNG-IUD and the CuT380A after vaginal delivery, 19% (17/88) of women who had at least one follow-up contact experienced an expulsion [35]. In another observational study of 84 women who had a postplacental insertion of the CuT380A, complete and partial expulsion at 12 months was 37% (14% complete expulsion; 23% partial expulsion) compared to 7% in the delayed group. However, this study included both vaginal and cesarean deliveries and did not report results stratified by delivery type [46]. Similarly, Cohen et al. found a 25% expulsion rate (17/67) after postplacental IUD insertion, of which 15 of the expulsions were recognized, but results were also not stratified by delivery type [16].

Expulsion after postplacental insertion at the time of cesarean delivery appears to be lower than after vaginal delivery, but there is also wide variability [29–31,38,39]. Several RCTs have directly compared postplacental IUD insertion after cesarean delivery to delayed insertion. Levi et al. randomized 112 women to intracerebral insertion of either a CuT380A or 52-mg LNG-IUD versus insertion 6 or more weeks postpartum. Expulsion after intracerebral insertion was 8% compared with 2% in the delayed-insertion group, but the difference did not reach statistical significance. The intracerebral group had higher IUD use at 6 months postpartum compared to the delayed group (83% vs. 64%; RR 1.3, 95% CI 1.02–1.66), primarily because fewer women in the delayed group received an IUD [31].

In a small ($n=42$) RCT of postplacental insertion of the 52-mg LNG-IUD at the time of cesarean section versus delayed insertion 4–8 weeks postpartum, the expulsion rates were 20% (4/20) and 0% (0/22), respectively ($p=.04$). This trial was stopped early because of difficulties with recruitment and follow-up. Confirmed use of the LNG-IUD at 12 months postpartum was 60% in the postplacental group and 41% in the delayed group ($p=.35$) [29]. Another small ($n=68$) RCT conducted in Uganda found no difference in the number of expulsions between intracerebral and delayed CuT380A insertions (one expulsion in each group). In this RCT, the intracerebral group also had higher IUD utilization at six months (93% vs. 50%, $p<.0001$) [30].

Two descriptive studies of the CuT380A at the time of cesarean delivery showed markedly different results. Çelen et al. reported a 12-month expulsion rate of 18% after postplacental insertion of the CuT380A at the time of cesarean in 245 women. Removal rates for pain and bleeding and for medical reasons were 8% and 2%, respectively, and use at 12 months was 62%. The authors reported no loss to follow-up [39]. Levi et al. followed 90 patients who had the CuT380A inserted at the time of cesarean. Although they had

no reported cases of expulsion, loss to follow-up was 53% at 6 months, which makes definitive conclusions about expulsion in this study less reliable [38].

Prior studies on postplacental IUD placement at time of cesarean delivery have generally included both laboring and nonlaboring patients, or have not specified the patient population. In a prospective cohort pilot study of women receiving a postplacental CuT380A IUD, Sucak et al. followed women who underwent planned cesarean delivery ($n=51$), cesarean delivery during active labor ($n=47$), and vaginal delivery ($n=62$). They found 12-month cumulative expulsion rates of 8.7%, 8.9%, and 11.3%, respectively. This study was designed as a pilot study and was not expected to be large enough to detect a statistically significant difference between groups [47].

3. How does the rate of expulsion after postplacental insertion compare to the rate after insertions at other postpartum intervals?

Data are conflicting when comparing expulsion after postplacental insertion to early postpartum insertion [34,46,48,49]. In the Dahlke et al. pilot RCT of the 52-mg LNG-IUD after vaginal delivery, expulsion at 6 months was the same (27%) for postplacental as for early postpartum (>10 min to 48 h) insertion. However, 14 of the 15 women who had early postpartum insertions underwent insertion within 30 min after placental delivery, and only 15 women in each group received an IUD per protocol [34]. A small trial by Lara Ricalde et al. used two types of copper IUDs, the CuT380A and the Multiload 375, and found no difference in 12-month expulsions ($p=.3$) when comparing postplacental to early postpartum (>10 min to 48 h) insertion after either vaginal delivery (13% postplacental, 12% early postpartum, $n=73$) or cesarean section (9% postplacental, 4% early postpartum, $n=84$) [48]. In the Eroğlu et al. cohort study of the CuT380A, cumulative complete expulsion within 1 year was similar for postplacental and early postpartum (>10 min to 72 h) insertion (14% vs. 19%, respectively). However, partial expulsion was much lower in the postplacental group (23% vs. 51%, respectively) [46].

A systematic review of 18 comparative studies of IUD insertion at varying points in the postpartum period determined that both postplacental and early postpartum insertion result in higher expulsion rates than delayed or interval insertion, but that expulsion after postplacental insertion and early postpartum insertion at >10 min to 48 h are generally similar [26]. However, this review did not contain results from two studies conducted by Stuart et al. that found expulsion rates of 38–41% in the early postpartum period (6–48 h after vaginal delivery) [50,51]. A planned RCT comparing postplacental and early postpartum insertion was terminated early because in the early postpartum arm, the combined rate of expulsion (7/17) and early removal (3/17) was over 50% [51].

4. What are the risk factors for expulsion after postplacental IUD insertion?

No studies have been designed specifically to assess what factors influence risk of expulsion after postplacental insertion.

Type of delivery

Several studies compared postplacental IUD insertion after cesarean versus vaginal delivery [36,48,52–55]. Although most studies had limited power, expulsion was higher in the vaginal group in all except one study [36].

Provider experience

Provider experience may play a role in expulsion. In a multinational study of postplacental insertion after vaginal delivery, pooled data from all sites showed that insertions performed in the first half of the trial, when investigators had little prior experience, were associated with higher expulsion rates than insertions in the second half (12% vs. 7%, $p < .001$). [41]. In one RCT of postplacental insertion of the 52-mg LNG-IUD after cesarean delivery, two sites were involved. At the secondary site, providers had less experience with IUD insertion, and four of six (67%) participants experienced expulsion after intracasean placement compared with none of 14 (0%) expulsions at the primary site ($p < .01$). No providers at either site had prior experience with intracasean insertion [29]. However, a study of postplacental insertion after vaginal delivery did not find a difference in expulsion rates by training level of provider (first- or second-year resident physician vs. third-year resident physician or above), although the study did not have adequate power to examine this outcome [35].

Parity

Data are conflicting regarding the relationship between parity and expulsion after postplacental IUD insertion. Two studies found that the risk of expulsion increased with higher parity [47,56], but one study found the opposite [35]. However, none of these studies were designed specifically to look at parity, and further research is required to resolve their conflicting results.

The wide variability of expulsion across studies suggests that there are modifiable factors that could reduce the occurrence of expulsion. Further research will be required to identify these variables.

5. Are there any techniques, device modifications, or device types that can reduce expulsion after postplacental IUD insertion?

A systematic review found little or no evidence suggesting that expulsion rates vary with insertion technique, design modifications, or IUD type [27]. However, most published data on this topic are sparse and date from the 1980s and 1990s.

Insertion technique

Older studies examining postplacental insertion technique, such as hand insertion, forceps insertion, or use of

an IUD inserter, showed mixed results, with most finding no difference [57–59]. In an RCT using currently available IUDs, Xu et al. randomized 910 women to postplacental insertion of the CuT380A using a ring forceps or manual insertion after vaginal delivery. Expulsion at 6 months was 13% in each group. They also found no difference in removal for pain and bleeding or for nonmedical indications [60]. A recent pilot proof-of-concept study examined a dedicated device inserter for IUD insertion up to 48 h after a vaginal delivery. The inserter was similar to the standard CuT380A inserter but had a longer insertion sleeve and longer IUD strings. By 6–8 months postpartum, 5 of 80 women (7.5%) experienced a complete expulsion and 8 of 80 women (10%) experienced an asymptomatic partial expulsion. Ongoing research on the dedicated inserter is under way [61].

Device modifications

Several IUDs were designed specifically for use in the postpartum period. A modification of the GYNE-T 380 (a copper IUD almost identical to the CuT380A), the GYNE-T 380 Postpartum, included a chromic suture on the top of the vertical arm. In a quasi-randomized trial of 592 women, expulsion at 1 year in the GYNE-T 380 arm was 13.2 per 100 cases versus 16.2 per 100 cases in the GYNE-T 380 Postpartum arm. No perforations or significant pelvic infections occurred in either group [62]. Other studies involving modifications of older IUDs specifically for postpartum insertion also showed no benefit [45,57,58,63].

Device type

Hormonal IUDs may have a higher rate of expulsion compared to copper IUDs though data are not consistent. Older trials comparing the progesterone-releasing Progestasert IUD to the CuT200 IUD provide limited evidence that progestin-containing IUDs may have higher expulsion rates [58,59]. A more recent cohort study found a 7% expulsion for the Nova-T copper IUD and 0% for the 52-mg LNG-IUD after postplacental insertion at the time of cesarean [33]. In Levi et al.'s RCT, 10% (4/40) of the 52-mg LNG-IUDs placed at time of cesarean section were expelled, compared with 0% (0/15) of the CuT380A IUDs, but the study did not have adequate power to look at a difference in expulsions by IUD type [31].

Eggenbroten et al. also found a difference in expulsion by IUD type in their prospective observational study of women requesting a postpartum IUD or implant. Of 186 women who received an immediate postpartum IUD and were successfully contacted at 6 months postpartum, 17% (18/108) of LNG-IUD users and 4% (3/78) of CuT380A IUD users reported expulsions (adjusted hazards ratio 5.9 (CI 1.3–26.4) [64]. The question of whether IUD type (CuT380A IUD or LNG-IUD) is associated with increased risk of expulsion warrants further study.

6. What is the role of ultrasound in postplacental IUD provision?

Use of ultrasound during insertion

Recent studies that reported use of ultrasound during postplacental insertion after vaginal delivery showed expulsion rates of 19–24% [25,35], whereas studies that do not report ultrasound use showed expulsion rates of 27–37% [34,46]. However, there are no studies directly investigating whether use of ultrasound during postplacental insertion reduces expulsion rates, and there is not sufficient evidence to support routine use of ultrasound. Therefore, it is reasonable to perform insertions with or without ultrasound guidance. If there is concern about fundal placement of the IUD, clinical judgment may be used to employ ultrasound at the time of insertion when it is available. Lack of ultrasound guidance should not prohibit provision of postplacental insertion after vaginal delivery.

Use of ultrasound for follow-up and surveillance

Published data about malpositioned IUDs after postplacental IUD insertions are limited. One observational study of 100 women who underwent CuT380A insertion after vaginal delivery or cesarean section found that 44% had malpositioned IUDs. Women with malpositioned IUDs were more likely to have had the IUD placed after vaginal delivery than after cesarean delivery and were more likely to report complications by 6 months postpartum, including expulsion, irregular bleeding, and lower abdominal pain [65].

It is uncertain whether asymptomatic partial expulsions or malpositioned IUDs, found after IUD placement in any time frame, are clinically significant. While many studies examining IUD failures, i.e. pregnancies with IUDs in utero, have noted malpositioned IUDs, it is unclear if IUD failure occurred due to the malpositioned IUD or if the IUD became displaced due to the enlarging gestational sac [66]. The importance of malpositioned IUDs has not been studied specifically for postplacental IUD insertions. However, a case–control study of 364 women found no association between IUD malpositioning and placement at 6–9 weeks postpartum. No pregnancies occurred among women with malpositioned copper or LNG-IUDs left in situ, but there was an increased risk of pregnancy among women who underwent removal of malpositioned IUDs without initiation of another highly effective contraceptive, which highlights the importance of avoiding unnecessary removals [67]. One study randomizing women to intracervical or intrauterine placement of an investigational LNG-IUD found similar low pregnancy rates for both groups over 5 years [68]. This supports the hypothesis that position is not likely to adversely affect LNG-IUD efficacy due to the effect of progestin on cervical mucus. While there is concern that copper IUDs may be less effective if not located at the uterine fundus, no well-designed study has confirmed this theory [69].

Studies have attempted to correlate IUD distance from the fundus or internal os after postplacental insertion with risk of expulsion [53,61,70]. However, since multiple studies document movement of an IUD within the uterine cavity without expulsion [71–73], these measurements are not a useful clinical measure. Based on this evidence, we do not recommend routine ultrasound for surveillance after postplacental IUD insertion. If incidental displacement of an IUD is diagnosed on ultrasound, removal is not mandated but may be considered after appropriate patient counseling if immediate IUD replacement or initiation of alternate highly effective contraceptive is feasible and desired.

Missing strings

Use of ultrasound to confirm intrauterine location of an IUD may be necessary if the IUD strings are not visible or palpable at the external cervical os. Inability to visualize the IUD strings during speculum exam occurs more frequently after postplacental IUD insertion than after interval insertion, especially after placement during cesarean delivery. Inability to visualize IUD strings after postplacental insertion ranges from 5% for LNG-IUD placement after vaginal delivery [25] to 44–79% for IUD placement during cesarean delivery [30,31,38,74]. This finding may be due to the technique of IUD placement during cesarean delivery in which the IUD strings may not be traversing through the cervix into the vagina at time of placement [75]. Women undergoing postplacental IUD insertion should be counseled that confirmation of the intrauterine location of an IUD may require use of ultrasound. After postplacental insertion at the time of cesarean delivery, IUD strings may be more likely to be visualized for LNG-IUDs than for CuT380A IUDs [31], likely because of the LNG-IUD's longer strings. In addition, strings may descend into the vagina with further involution of the postpartum uterus and thus may become visible over time after postplacental insertion [74,76,77]. One prospective cohort study of 348 women who received a CuT380A IUD after vaginal or cesarean delivery found an increase in IUD string visibility over time, with 90% and 32% of strings visible at 6 weeks after vaginal and cesarean deliveries, respectively, compared with 98% and 72% at 12 months [74]. A prospective randomized study evaluating string visibility after intracesarean placement of a Cu375 IUD (19.4 cm string length) to a CuT380A IUD (11.5 cm string length) found higher rates of string visibility in women receiving the Cu375 IUD (100% vs 47.9% at 3 months, respectively, $p < .001$) [77]. A CuT380A IUD designed for postpartum use with longer strings may help increase identification of IUD strings after insertion [61].

7. Which patients are not candidates for postplacental IUD insertion?

There are few restrictions on postpartum insertion of IUDs. The USMEC gives only one absolute contraindication to

postplacental or other postpartum insertion: puerperal sepsis. Both copper IUDs and LNG-IUDs have no restrictions (Category 1), or the advantages outweigh the risks (Category 2), for use in any postpartum time frame, regardless of breastfeeding status and mode of delivery [20]. Almost all research involving postplacental IUD insertion excluded women with risk factors for postpartum infection, including rupture of membranes more than 18–24 h before delivery or chorioamnionitis prior to delivery, so safety of placement in these situations has not been demonstrated. Clinical judgment should be used to assess risk of postpartum endometritis. In addition, many studies have excluded women with uterine anomalies or fibroids. Presumably the greatest risk for these women would be IUD expulsion, therefore informed counseling should be performed to advise women about the increased risk of expulsion. Unresolved postpartum hemorrhage or other intrapartum events may prevent IUD insertion within 10 min of delivery of the placenta, which by definition precludes postplacental insertion but may permit early postpartum placement.

8. *Does postplacental IUD insertion have any effect on breastfeeding?*

There is no evidence that copper IUDs have any effect on breastfeeding. A large body of research provides evidence that progestin-only contraception in the postpartum period is safe for mother and infant, and does not adversely affect lactation [78,79]. Early studies of postplacental insertion of the LNG-IUD showed mixed results, with one pilot RCT finding similar breastfeeding continuation among users of the 52 mg LNG-IUD regardless of timing of postpartum insertion [34] and another cohort study finding no difference in mean duration of breastfeeding between women choosing no IUD, immediate copper IUD and immediate 52-mg LNG-IUD [33]. However, a subanalysis of the Chen et al. RCT found a significantly lower median duration of breastfeeding among women receiving a postplacental 52-mg LNG-IUD compared to delayed insertion [80].

A large noninferiority randomized trial was specifically designed to compare breastfeeding outcomes between postplacental and delayed insertion of the 52-mg LNG-IUD. For the primary outcome of any breastfeeding at 8 weeks postpartum, postplacental insertion was noninferior to delayed insertion (79% vs. 84%, respectively, $p=.28$). Time to lactogenesis was also noninferior in the postplacental compared to delayed insertion groups (65.3 vs. 63.6 h, $p=.61$) [81]. Based on the results of this definitive study, we do not recommend withholding the option of postplacental LNG-IUD for breastfeeding women.

9. *What is the risk–benefit ratio of postplacental IUD insertion?*

Postplacental insertion of copper IUDs and LNG-IUDs is as safe as insertion at other time frames and may offer advantages over delayed insertion. However, expulsion

rates are higher after postplacental insertion. In determining if postplacental IUD insertion is a reasonable approach in any individual situation, various factors must be considered, including availability of replacement IUDs after expulsion and the patient population return rate for the postpartum visit. Randomized trials of postplacental versus delayed insertion have shown either no difference in usage or improved usage of postplacental IUDs at 6 and 12 months postpartum [25,29–31,34]. In these studies, participants were able to receive a new IUD after expulsion. Thus, in a clinical environment where replacement of expelled IUDs is feasible, increased expulsion rates after postplacental insertion may be less clinically relevant. Given the multiple barriers that exist for IUD insertion in routine practice [22,24,25], a patient population with low return rates for the postpartum visit is more likely to benefit from the option of postplacental IUD insertion.

Two studies have looked at cost implications of postplacental IUD placement. A retrospective cost–benefit analysis focusing on underinsured immigrant women concluded that although individual hospitals may lose money if they initiate an in-hospital postpartum IUD program, the state would save \$2.94 for each dollar spent on a state-financed program [82]. A decision-analysis model evaluated the cost-effectiveness of postplacental IUD insertion. That analysis overwhelmingly supports the potential for financial savings with postplacental IUD insertion, predicting a cost savings of \$282,540 over 2 years for every 1000 women who desired a postpartum IUD [83].

For programs that offer postplacental IUD insertion, comprehensive counseling regarding risks and benefits is essential. It is especially important to avoid contraceptive coercion or perception of coercion in this setting. LARC methods may be particularly susceptible to potential coercion due to dependence on a health care provider to insert and remove the device [84]. Given the history of forced sterilization in the United States and patient perceptions about directive counseling and coercion by health care providers [85], providers must ensure that women receive nonjudgmental patient-centered counseling and maintain autonomy in their contraceptive decision-making. The health care team must make sure that women have the information and time necessary to make informed decisions without coercion based on their personal preferences and reproductive goals [86–88]. To this end, a patient-centered, shared decision-making approach to contraceptive counseling should be utilized throughout the antepartum and early postpartum periods.

5. Conclusions and recommendations

The following recommendations are based on good and consistent scientific evidence (Level A):

- The rate of expulsion is higher after postplacental insertion than after delayed insertion.
- Usage of the IUD is similar or greater after postplacental insertion than after delayed insertion in settings where replacement of expelled IUDs is readily available.
- Postplacental insertion is safe and does not have higher risks of perforation or infection than insertion at other time frames.

The following recommendations are based on limited or inconsistent scientific evidence (Level B):

- The rate of expulsion is lower after cesarean delivery than after vaginal delivery.
- The rate of expulsion after early postpartum insertion is similar to or possibly higher than the rate of expulsion after postplacental insertion.
- Provider experience may play a role in expulsion rates.
- IUD insertion techniques and modifications do not influence expulsion rates.
- Inability to visualize IUD strings at the external cervical os may be more common after postplacental insertion than after interval insertion, and is higher after insertion at the time of cesarean delivery compared to insertion immediately after vaginal delivery

The following recommendations are based primarily on consensus and expert opinion (Level C):

- Lack of ultrasound guidance should not prohibit provision of postplacental insertion.
- Contraceptive coercion or perceived coercion may be more likely with LARC methods. Comprehensive patient-centered counseling on contraception with full disclosure of risks and benefits of postplacental IUD insertion must be undertaken for all women who are considering this option.

6. Important questions to be answered

Expulsion rates after postplacental insertion vary widely across studies. Research to isolate the modifiable factors that contribute to this variability—e.g., provider experience or IUD type—may serve to reduce expulsion in clinical practice. Other areas of future research include comparisons of intervals for postpartum insertion (e.g., postplacental vs. early postpartum). Furthermore, research is needed on the utility of ultrasound in placement, as well as investigation of potential interventions to decrease the incidence of missing strings on follow-up exams (which can necessitate ultrasound use). Further research is also needed on the incidence and management of malpositioned IUDs after postplacental placement. Studies on antepartum and postpartum contraceptive counseling and decision making, particularly to ensure reproductive autonomy and to avoid coercion, is necessary. Finally, policy research is needed to address barriers to IUD insertion, including cost and insurance

barriers as well as institutional barriers at the hospital and state level.

Sources

Authors used the following search terms in the Ovid MEDLINE databases to identify relevant references published from 1946 to 2017: postplacental, postpartum period, intrauterine devices, intrauterine devices + medicated, intrauterine devices + copper, cesarean, obstetric delivery. Search terms were used singly and in combination with each other to optimize the search. English- and Spanish-language abstracts were reviewed and relevant articles obtained. Authors used similar search terms in PubMed to identify articles in press. Authors used the citations within those references to supply additional sources for review.

Authorship

These guidelines were prepared by Amy K. Whitaker, MD, MS, and Beatrice A. Chen, MD, MPH, and were reviewed and approved by the Board of the Society of Family Planning.

Conflict of interest

Dr. Whitaker has no conflicts of interest to report.

Dr. Chen receives research support from Medicines 360, Bayer Pharmaceuticals, and Merck, managed through Magee-Womens Research Institute & Foundation. Dr. Chen also serves on a Merck & Co. advisory board.

The Society of Family Planning receives no direct support from pharmaceutical companies or other industries.

Intended audience

This guideline is for members of the Society of Family Planning and other health care professionals who are involved in the provision of antepartum, postpartum, or contraceptive care. It may also be useful for policy makers, health care institutions, and insurance companies in determining policies regarding postplacental IUD insertion. The purpose of this document is to review the medical literature evaluating postplacental insertion of intrauterine devices. Although this evidence-based review can be used to guide health care professionals, it is not intended to dictate care.

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