

# Missing strings following immediate postpartum IUD placement

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## CASE

A 31-year-old gravida 3 para 3 presents for a scheduled postpartum follow-up 4 weeks following an uncomplicated spontaneous vaginal birth. Immediately following delivery, a postplacental copper intrauterine device (IUD) was placed for contraception.

On pelvic examination, IUD strings are not palpable, nor are they visible at the external cervical os on speculum examination. The patient reports exclusive breastfeeding without return of menses after lochia cessation. No sexual intercourse since delivery.

## INTRODUCTION

IUD placement immediately following birth is an effective and safe contraceptive strategy in the postpartum period.<sup>1–3</sup> As historically defined in guidelines and research protocols, postplacental or immediate postpartum insertion occurs within 10 min of the third stage of labour.<sup>1</sup> Contemporary definitions now include any placement in the delivery room, rejecting the artificially strict timeline.<sup>4</sup> Fundal placement can be achieved with manual insertion, ring or Kelly placental forceps, or with a dedicated postplacental IUD inserter.<sup>1–3</sup>

Postplacental IUD placement decreases barriers to contraceptive access at a time many are highly motivated to avoid another pregnancy. Continuation rates after postplacental insertion—a reflection of contraceptive initiation and thus an important metric in the context of a public health programme—are higher than planned interval (>6 weeks postpartum, office visit) insertion.<sup>5</sup>

In the setting of office or interval IUD insertion, a ‘thread’ or ‘string check’ return clinic visit has generally fallen out of favour since expulsion and perforation rates are low and the strings do not generally interfere with sexual function. However, in the setting of postplacental

## Key messages

- ▶ Non-visibility of IUD strings is more common following postplacental insertion after caesarean birth than vaginal birth.
- ▶ Since unrecognised expulsion or perforation is rare, missing IUD strings following postplacental insertion most likely indicates an intrauterine device.
- ▶ Where readily available, pelvic ultrasonography should be the first-line imaging modality to confirm intrauterine retention of IUD.
- ▶ In settings with limited ultrasound or radiography capacity, it is reasonable to recommend a trial of expectant management awaiting string descent with consideration of a secondary form of contraception. If strings are still not visualised after return of menses, consider an in-office removal, with concomitant insertion of a new IUD if desired.

insertion, it remains best practice to confirm IUD location at the postpartum clinic visit given the higher rate of expulsion and the possible need to trim the strings after the uterus involutes.<sup>2,3</sup> Confirmation of IUD retention at the postpartum visit often coincides with return to sexual activity and subsequent need for contraception, especially in settings where lactation-suppressed ovulation may be of short duration.

## DIFFERENTIAL DIAGNOSIS

The differential for missing strings includes expulsion, extrauterine location, malposition within the uterine cavity or non-descent of strings in an appropriately placed device. The delivery mode, IUD type and insertion method mediate the likelihood of each event. As both counselling and management differ significantly in each of these scenarios, it is important



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for clinicians to appreciate the relative frequency of each event and the appropriate work-up of non-visualised strings.

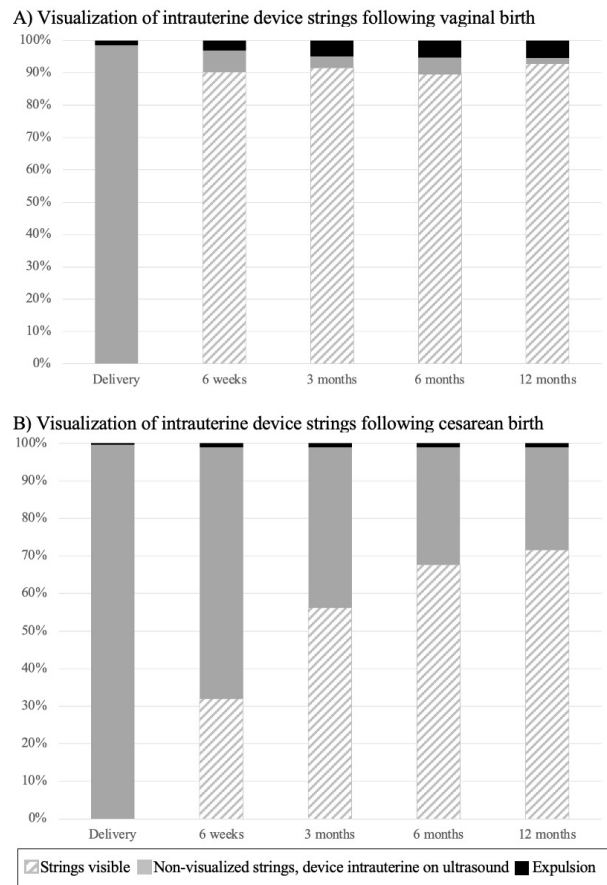
Uterine perforation resulting in an intra-abdominal placement of an IUD placed postplacentally is extraordinarily rare. To date, there are only two reported cases in the literature, one with a copper IUD and the other with a levonorgestrel (LNG) IUD.<sup>6</sup> In the case of the intra-abdominal LNG IUD, the patient presented within 3 weeks of birth with abdominal pain at which time IUD strings were not visualised on speculum examination.

In meta-analyses, the overall rate of postplacental IUD expulsion is less than 15%.<sup>7</sup> Here, the adjusted risk of expulsion after vaginal birth was higher than after caesarean birth, although strings were more commonly visualised after vaginal birth compared with caesarean.

While the risk of expulsion may depend largely on the mode of birth, it also appears to be mediated by the type of IUD placed. In meta-analysis, the risk of expulsion is greater when initiating a postplacental LNG IUD compared with a copper IUD after vaginal birth; IUD type was not associated with an increased risk of expulsion after caesarean birth.<sup>7</sup> The reasons for this difference after vaginal birth are unclear but may result from (1) difference in string length between the two device types, (2) insertion technique differences and (3) ability of the different IUD types to create a local endometrial reaction and potentially 'stickiness' inside the uterus. After caesarean birth, these differences may be reduced by the ability to confirm fundal placement and a cervix that is typically less dilated at the time of placement.

The risk of expulsion appears to be further mediated by the experience of the maternity provider and the method of insertion. In a retrospective review of 116 postpartum people receiving postplacental IUDs, expulsion by 6 months postpartum was more frequent when a first-year resident physician placed the IUD compared with a senior resident or attending physician (37.5% vs 14.5%).<sup>8</sup> There does not appear to be a strong correlation between manual versus ring forceps insertion as postpartum people randomised to insertion technique reported similar 6-month expulsion rates (13.3% vs 12.7%).<sup>9</sup> Similarly, a newly developed dedicated postplacental IUD inserter did not show a difference in expulsion rate between the dedicated IUD inserter and forceps at 6–8 weeks postpartum (7.9% vs 5.4%)<sup>10</sup>; among very experienced providers using the device there was only a 3% expulsion rate.<sup>11</sup> The lack of high-quality data to inform ideal postplacental IUD placement technique remains an area of ongoing clinical inquiry.

Reassuringly, most complete expulsions are identified by patients. In one prospective study all complete expulsions were clinically identified.<sup>12</sup>



**Figure 1** Graphic representation of string visualisation at 1 year after immediate postpartum intrauterine device insertion.<sup>13</sup>

Compared with IUD insertion after vaginal birth, placement at caesarean increases the risk of missing strings. In a prospective study following 348 postpartum people, strings of a CuT380A device were visible on speculum examination at 6 weeks postpartum in 90.1% of those with a vaginal birth compared with only 32.1% of those with a caesarean birth.<sup>13</sup> By 6 months, strings were visible in 94.4% after vaginal birth and 68.4% after caesarean birth, suggesting that the strings naturally descend themselves over time. This same study followed participants for 12 months with serial speculum examinations and ultrasounds to confirm the location of the IUD (figure 1). At all time points, non-visualised strings were more likely to represent a retained device than an unrecognised expulsion. Thus, non-visualised strings most frequently represent an intrauterine IUD, although the strength of this finding decreases for those with vaginal birth and as time passes after IUD placement.

Finally, missing strings may represent an intrauterine but malpositioned device. For some, this may present with pelvic pain, abnormal bleeding or dyspareunia. In the absence of these symptoms, the clinical significance of a low-lying or malpositioned IUD remains uncertain and thus management should be individualised.

## MANAGEMENT OPTIONS

The work-up of missing IUD strings in the postpartum setting depends on the level of resources available to the clinician. In settings where ultrasonography is easily accessible, pelvic ultrasound should be the first-line diagnostic imaging modality to assess the presence and position of the IUD when strings are not visualised on speculum examination.<sup>1 14</sup> Copper IUDs are most easily identified by the echogenicity of the metal body and arms. LNG IUDs have a more characteristic acoustic shadowing and triple line appearance of the stem. In settings where availability of ultrasonography is limited, a clinician could consider placing a uterine sound or similar radiopaque device in utero to identify the uterine cavity relative to the IUD using conventional radiography.<sup>15</sup>

When imaging is not readily accessible there are limited data available to inform clinical management. Therefore, the next steps should involve shared decision making with the clinician describing the potential risk of expulsion modified by the patient's own risk tolerance of an unintended pregnancy. As previously described, most non-visualised strings—particularly after caesarean birth—represent an intrauterine IUD. Providing reassurance that the IUD is likely intrauterine is appropriate.

In low-resource settings with limited access to imaging, a reasonable and cost-effective next step would be to offer expectant management to allow more time for the strings to descend through the cervix. At each encounter with the healthcare system, a pregnancy test should be offered. A secondary form of contraception may be offered to the patient during this period of expectant management. For those exclusively breastfeeding without return of menses, they may choose to rely on the lactational amenorrhea method for the first 6 months while awaiting strings. In an adequately counselled patient, especially those with an IUD placed after a caesarean birth, it is also reasonable to rely on the IUD as a primary form of contraception even if unable to confirm ongoing intrauterine placement as retention rates approach the efficacy level of most user-dependent forms of contraception. When pregnancy is excluded, ongoing amenorrhea after breastfeeding cessation for those with an LNG IUD is also suggestive—though far from diagnostic—of ongoing intrauterine placement. It is important to emphasise that ovulation occurs before first return of menses and any systemic symptoms of subsequent pregnancy should promptly be evaluated with a pregnancy test and medical examination to exclude ectopic pregnancy conceived with an intrauterine IUD.

For these patients choosing expectant management, it is important to establish a follow-up plan. Any new pelvic or abdominal pain should prompt return to the clinic for evaluation. For those using lactational amenorrhea or foregoing a secondary form of contraception, shorter interval follow-up should be discussed with the

patient as the risk of unintended pregnancy increases as time passes since delivery. Return of menses should be considered a clinically important time to follow-up as it represents return to fertility and the menstrual flow may help guide the strings through the endocervical canal. For those comfortable using a secondary form of contraception, it is reasonable to wait a full year postpartum, especially after caesarean birth.

Procedures for retrieval of a device with absent strings should progress stepwise from least invasive to most invasive, although this may be dependent on the country, provider expertise and available equipment. A suggested approach includes: dedicated thread retriever device or cylindrical cytology brush in the endocervix, 'alligator/crocodile forceps' probing of the uterine cavity, manual vacuum aspiration or hysteroscopy.<sup>16 17</sup> Importantly, a new pregnancy should be excluded prior to uterine cavity exploration. Furthermore, great care should be taken to avoid uterine perforation which may be more common in a postpartum uterus.

If the IUD is not found to be intrauterine on either pelvic ultrasound or cavity exploration, abdominal radiography should be performed to differentiate intra-abdominal placement from uterine perforation versus clinically unrecognised expulsion. An IUD located above the pelvic brim, far lateral (on an anteroposterior view) or far anterior or posterior (on a lateral view) is highly suggestive of uterine perforation on conventional radiography.<sup>18</sup>

## PATIENT OUTCOME

On further questioning, the patient reports no symptoms of IUD expulsion. Given the availability of in-office ultrasonography, the clinician offers transvaginal ultrasound to confirm intrauterine retention of the IUD. The patient agrees to an ultrasound which confirms a fundal IUD, thus providing reassurance of ongoing effective contraception.

At 12 months postpartum, the patient returns to the office for a routine health maintenance examination. Menses returned after cessation of breastfeeding. IUD strings are now visible to the level of the hymen during speculum examination, which are trimmed to minimise future risk of unintentional IUD dislodgement. The patient is satisfied with the contraceptive method.

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**Editor's note** The details of this case are fictitious. Any resemblance to actual persons, living or dead, or actual events is coincidental.

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