

Low-lying or malpositioned intrauterine devices and systems

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ABSTRACT

Introduction The intrauterine device (IUD) and intrauterine system (IUS) are widely used forms of long-acting reversible contraception.

Occasionally, IUD/IUS users have an ultrasound scan that shows a low-lying IUD/IUS or an IUD/IUS is found incidentally on scan to be low-lying within the uterus. No formal guidelines exist on the clinical implications of this scenario or the most appropriate management. We report here on a systematic review of the literature.

Methods A search of the online database PubMed was performed to identify articles relating to low-lying or malpositioned IUD/IUS.

Results A total of 1101 articles was identified, and 15 were determined to be relevant to the research question.

Discussion There is little published evidence to determine the nature and extent of the clinical relevance of a low-lying IUD. We recommend individualised management of these women, with particular caution in younger women and those with a history of previous IUD/IUS expulsion. Consideration may be given to attempting to readjust the IUD/IUS position, but if removal is performed, immediate replacement is essential if provision of alternative effective contraception has not been established.

INTRODUCTION

There are two main types of intrauterine contraception: the copper intrauterine device (IUD) and the levonorgestrel-releasing intrauterine system (LNG IUS). Pregnancy rates are low; 1–2% after 5 years of use.¹ Complications include infection, expulsion and uterine perforation.² The optimal position of a T-shaped IUD/IUS is traditionally described as vertically within the uterine cavity, up against the fundus, with the arms projecting horizontally.³ Occasionally, on ultrasonic examination of the pelvis either incidentally or in a symptomatic woman, it is noted that an IUD/IUS is lying lower down in the uterine cavity, or even partially or completely within the cervical canal.

Key message points

- ▶ An ultrasound scan may pick up a low-lying or malpositioned intrauterine device/intrauterine system (IUD/IUS) and the clinical significance of this finding is uncertain.
- ▶ Automatic replacement of the IUD/IUS may be unnecessary and an individualised approach to management is suggested.
- ▶ If the decision is made to remove a low-lying or malpositioned device, another highly effective method of contraception should be instituted without delay.

At present, there is no clear evidence of the clinical implications of a low-lying or malpositioned IUD/IUS and no formal published guidance on the most appropriate management of this situation. Prior to carrying out this literature review, we conducted a questionnaire survey of senior doctors working in sexual and reproductive health to identify trends in current practice.⁴ This confirmed the current uncertainty amongst clinicians and lack of consensus on the best way to manage a low-lying IUD/IUS. We then performed a systematic review of the literature to appraise the risks of a low-lying IUD/IUS, with particular regard to risk of failure, whether or not women experience more symptoms, whether the IUD/IUS may move spontaneously to a correct position and, finally, whether postpartum insertion is a time of high risk for low-lying placement.

METHODS

A search of the online database PubMed was performed from inception through to March 2013 for peer-reviewed articles



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concerning a malpositioned IUD or IUS, the risks, symptoms and failure rates. Search terms included were 'intrauterine device', 'intrauterine system', 'malposition', 'migration', 'misplaced' and 'failure'. Reference lists from articles that had been identified from the search were examined for further eligible articles.

RESULTS

The primary literature search identified 1101 results, but only a small number of these met the inclusion criteria for relevance for this review. We included studies that described a malpositioned intrauterine IUD/IUS, and that reported on risks for misplacement, contraceptive failure, symptoms or on spontaneous movement of the IUD. A large number of the papers concerned extrauterine migration of an IUD and were therefore excluded. Uterine perforation and extrauterine migration are important complications of IUD insertion, but we wished to focus on the risks and implications of the IUD that is intrauterine, but displaced within the uterus or cervix. In total, 15 studies met the inclusion criteria and are discussed below.

Is contraceptive failure more likely with a malpositioned IUD/IUS?

Anteby *et al.*³ reported on transvaginal sonographic (TVS) assessment of 25 pregnant women with an IUD and 100 non-pregnant women who had had an IUD fitted 45–60 days previously. The control women had Multiload 375® devices, and it is implied but not specifically stated that the case women had these devices also. The IUD was found to be displaced to the cervix in 13/25 (52%) of the pregnant women and 7/97 (7%) of the non-pregnant women. The authors concluded that failure may be due to a malpositioned device and recommended replacing an IUD that is incidentally found to be low-lying.

A retrospective case-control study of 216 pregnant women with an IUD and 657 non-pregnant women with an IUD was described by Thonneau *et al.*⁵ Risk of failure was associated with lower age of the woman and lower copper content of the IUD. There was no effect of polyps, fibroids or medication, but previous IUD expulsion was a risk factor for failure, odds ratio (OR) 3.31 [95% confidence interval (CI) 1.4–7.8]. Thonneau *et al.*⁶ also published a review article in 2001 that looked at risk factors for IUD failure. They commented that displacement of the IUD reduces effectiveness but this was based solely on the data from the Anteby *et al.* paper.³

Moschos and Twickler⁷ published a retrospectively derived case series of 42 women with IUDs in early pregnancy, and included a TVS-derived description of position of the IUD. Thirty-one (74%) of the pregnancies were intrauterine, three (7%) were ectopic and eight (19%) were diagnosed as pregnancies of unknown location. Of the 31 intrauterine

pregnancies, 8/31 of the IUDs were normally positioned, 17/31 were 'low-lying' and 6/31 could not be seen.

A retrospective case-control study was published by Braaten *et al.*⁸ looking at 182 women with malpositioned IUDs and 182 women with correctly situated IUDs, as determined by TVS. All ultrasound reports from a 5.5-year period at one centre that referred to an IUD were searched and 1748 reports with IUDs *in situ* were identified. Of these, 10.4% were found to have a malpositioned IUD, the majority of which were in the lower uterine segment or cervix (73%). Embedded or rotated IUDs were also classified as malpositioned, as were expelled or extrauterine devices, which made up 14% of the total. The 182 controls were patients with normally sited IUDs and each was the next consecutive patient in the database after a study case. The main aim of this study was to determine whether malpositioning was more common after postpartum insertion, and the authors reported no statistically significant difference. Of the 182 women with a malpositioned device, 121 had the device removed, but only 30% then took up another highly effective method of contraceptive. Two years later there were more pregnancies in the case group who had had their IUD removed around the time of diagnosis than in the control (normally sited IUD) group whose IUDs were removed electively (19.2% vs 10.5%). No pregnancies were reported in the 28 women who had their malpositioned IUD left *in situ*.

Finally, Pakarinen and Luukkainen⁹ described a randomised trial of an intracervical device releasing 20 µg LNG/day. Some 151 women had the device placed intracervically and 147 had the device placed at the uterine fundus. Failure rates, continuation rates and removals for bleeding issues were no different between the two groups. However, expulsion rates were high. This study is suggestive that LNG-releasing devices are likely to have contraceptive efficacy even if they are not placed fundally within the uterus.

Are women with a malpositioned IUD/IUS more likely to experience symptoms of pain and/or bleeding?

Benacerraf *et al.*¹⁰ wished to determine whether abnormally placed IUDs were associated with a higher incidence of pain and/or bleeding than normally placed IUDs. They looked retrospectively at the case records of 167 women with an IUD who had had three-dimensional (3D) TVSs, which were performed for a variety of clinical indications. Twenty-eight (16.7%) of the IUDs were abnormally placed within the uterus, either low-lying or within the cervix, or with abnormally lying side arms. Of these 28 women, 21 (75%) complained of pelvic pain and/or abnormal bleeding. However, statistically significantly fewer women with a normally sited IUD [38/139 (34%)] complained of pelvic pain and/or abnormal bleeding. Twenty-one of the abnormally sited IUDs in women

with symptoms were removed and 20 of these women reported an improvement of their symptoms. This study was retrospective and there are no data on the progress of the symptoms of women with normally placed IUDs. However, it does demonstrate the use of 3D ultrasound to improve detection of abnormally placed IUDs, which may be an additional tool in the investigation of women with pain or bleeding.

However, Faundes *et al.*¹¹ published a case-control study of 236 women with an IUD who complained of bleeding and/or pain, and 245 women who had an IUD but no symptoms. In contrast to Benacerraf *et al.*'s findings,¹⁰ they found no difference in the uterine position of the IUD between the two groups, concluding that a low-lying IUD was not more likely to cause symptoms of pain or bleeding.

De Groot *et al.*¹² published a case report of four women who complained of pain, abnormal discharge and/or dyspareunia with the LNG IUS. Two of the devices were found at hysteroscopy to have perforated the uterine wall and one was lying transversely within the cavity. They recommended consideration for hysteroscopy to determine the cause of symptoms and possible correction of the IUD position.

Can an IUD/IUS move within the uterine cavity?

Faundes *et al.*¹³ published a study in 2000 in which they monitored by TVS the position of T-shaped IUDs within the uterus for 90 days following insertion. Two hundred and fourteen women underwent TVS on Days 1, 30 and 90 following copper IUD insertion. Seventeen IUDs were classified as malpositioned at insertion, but 15 of those migrated upwards towards the fundus during the next 90 days. However, at 90 days post-insertion, 21 IUDs were classified as malpositioned, only six of which had been malpositioned at insertion. The authors concluded that the T-shaped IUD does accommodate its position within the uterine cavity and can move both upwards and downwards.

Similarly, Morales-Rosello *et al.*¹⁴ performed TVS monitoring at 2 months post-insertion on a group of 32 women whose IUD was noted to be low-lying immediately after insertion. They found that 97% of the IUDs moved upwards towards the fundus over 2 months. They also concluded that there is movement of IUDs within the uterus in the first few months after insertion.

Faundes *et al.*¹⁵ analysed data on TVS measurements of IUD placement within the uterus from the group of 481 women on which they had previously published. They demonstrated a correlation between endometrial thickness and IUD-myometrium distance and concluded that an IUD can move vertically within the uterine cavity with endometrial thickness changes during the menstrual cycle.

De Kroon *et al.*¹⁶ performed a prospective comparative study in which TVS was used to determine

the position of the IUD immediately after insertion and at 6-week follow up. A total of 195 women were included initially with 181 available for follow up. After IUD insertion, the clinician was asked if they felt the IUD was correctly sited. Of 175 IUDs felt to be positioned correctly, 172 were within 5 mm of the fundus on TVS [negative predictive value (NPV) of clinical evaluation 0.98, 95% CI 0.96–1.00]. Of 20 IUDs felt to be incorrectly positioned, 12 were low-lying on TVS [positive predictive value (PPV) 0.6, 95% CI 0.39–0.81]. At follow-up, women were interviewed and examined and clinicians again asked if they felt the IUD was correctly sited. NPV was 1.0 ($n=160$) and PPV was 0.54, 95% CI 0.26–0.81. Of seven incorrectly sited IUDs that were left *in situ*, five had migrated to a correct position by the 6-week follow up.

As an alternative to replacing the incidentally found low-lying IUD, Ber *et al.*¹⁷ reported on a case series of 18 patients who were asymptomatic but found to have a low-lying LNG-IUS. Alligator forceps were used to grasp the device in the cervical canal and push it up towards the fundus. This was confirmed to be successful on TVS in 17/18 cases, but 3/17 had become malpositioned again 2 months later. The authors suggest consideration of this technique as a cheaper option to removing and replacing a low-lying LNG IUS.

Is postpartum insertion associated with increased malpositioning of an IUD/IUS?

The systematic review found just one study that directly looked at postpartum insertion as a risk factor for IUD malpositioning. Braaten *et al.*⁸ performed a retrospective case control study with a group of women with normally situated IUDs and a group of women in whom the IUD was malpositioned. Malpositioning was not specifically associated with insertion at 6–9 weeks postpartum (OR 1.46, 95% CI 0.81–2.63).

DISCUSSION

Is contraceptive failure more likely with a malpositioned IUD/IUS?

Early studies showed that in women who had become pregnant with an IUD *in situ*, the IUD was more likely to be found low-lying within the cavity than at the fundus.³ The conclusion was that low-lying devices are more likely to fail. In support of this is the finding that failure is more likely when a previous IUD has been expelled,⁵ suggesting that downward displacement of the IUD could be a cause of failure. However, if this is the case, with reported rates of incidental findings of malposition of between 7% and 16%,^{6, 8, 9} it seems surprising that failure rates are not higher. The studies varied in the level of detail given on what constituted a malpositioned device, which makes comparison of the various study findings difficult.

It may be that an IUD that has failed is pushed out of a normal position by the enlarging gestational sac. It has been shown that IUDs move within the uterus during the menstrual cycle¹⁵ and may move from a normal to an abnormal position or vice versa over time.^{13–14} Thus, it is likely that IUDs do move within the uterus during early pregnancy if failure has occurred. Indeed, one published case study reports on an IUD that was noted to be low-lying in the uterus and cervix in early pregnancy but which migrated vertically during pregnancy, perforating the fundus and ultimately migrating into the peritoneal cavity.¹⁸

The IUS has a different mechanism of action to the copper IUD, and the Pakarinen and Luukkainen⁹ trial does suggest that a similar device may be equally effective even when displaced to the cervix. Ultimately, whilst it may be that the IUD and IUS still provide contraceptive effect when displaced from their optimal position at the fundus, there is no definitive evidence that this is the case. To be sure of providing the best contraceptive effect, it may remain best practice to replace an incidentally-found low-lying device, although an attempt may be made to correct the position of an IUS.¹⁷ This is particularly relevant for younger women, who have higher fertility.¹⁹

Are women with a malpositioned IUD/IUS more likely to experience symptoms of pain and/or bleeding?

The published evidence regarding symptoms when an IUD is malpositioned is contradictory and no randomised trials have been conducted. The advent of 3D ultrasound technology may provide more accurate data to help answer this question in the future.¹⁰ Given that some studies have shown a link, it may be worth considering replacing a low-lying device in symptomatic women. A cautionary tale is provided by Braaten *et al.*,⁸ who showed a higher unplanned pregnancy rate in women whose malpositioned devices were removed and who did not adopt another highly effective method of contraception. If a low-lying IUD is removed because of symptomatology or ultrasound findings, it is important to initiate another method of contraception at the same time.

Can an IUD/IUS move within the uterine cavity?

The evidence demonstrates that IUDs can move within the uterine cavity, both in an upward or downward direction, particularly in the initial months after insertion.^{13–17}

Is postpartum insertion associated with increased malpositioning of an IUD/IUS?

Braaten *et al.*⁸ was the only study identified by our systematic review that looked at postpartum insertion and malpositioning directly and these authors reported no statistically significant increase in malpositioned IUDs after postpartum insertion. This was a

small, retrospective study and so prospective data would be a valuable addition to this area of research.

CONCLUSIONS

The clinical significance of a low-lying IUD/IUS is, at least in some cases, uncertain. There is insufficient evidence to confirm the efficacy of a low-lying IUD/IUS and it is not clear whether replacement is helpful in women complaining of pain or abnormal bleeding. With relatively high reported rates of incidentally found low-lying IUDs/IUSs, automatic replacement may be unnecessary. However, reducing the risk of an unwanted pregnancy is paramount.

Future research will be valuable in helping to answer the questions posed in this article. In the meantime, we recommend individualising management of the woman found to have a low-lying IUD/IUS. Options for an asymptomatic woman include:

- 1 Wait and see if the device moves itself with alternative contraceptive cover, and review using ultrasound at a later date.
- 2 Consider attempting to move the device with forceps, although this depends on operator skill and whether the patient tolerates this.
- 3 Replace the IUD/IUS with ultrasound review at 6 weeks. The patient should be advised that the replacement IUD/IUS may also become displaced.
- 4 Remove and choose an alternative contraceptive method.

In a woman with symptoms, the decision may lean more towards device removal, although the evidence for a relationship between a malpositioned IUD/IUS and bleeding or pain is still unclear.

Particular caution is required in younger women and in those who have a history of IUD expulsion. If the decision is made to remove a low-lying IUD, it should be replaced immediately, either with another device or with another highly effective method of contraception, established prior to removal, to avoid the risk of unplanned pregnancy.

Competing interests None.

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