

## CASE REPORT

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# Ectopic pregnancy with levonorgestrel-releasing intrauterine device in situ: A case report

Ana Rita Simões Carvalho, Alina Seixas, Andrea Quintas, Cristina Godinho, João Gonçalves

## ABSTRACT

**Introduction:** Ectopic pregnancy in the presence of an intrauterine device is a rare phenomenon. When compared with copper device, the levonorgestrel intrauterine system appears to be more protective against ectopic pregnancies. Few case reports have described ectopic pregnancies. **Case Report:** A 39-year-old woman with a levonorgestrel-releasing intrauterine device presented at our emergency room complaining of persistent lower abdominal pain and scarce vaginal bleeding. Pelvic ultrasound revealed the intrauterine device properly positioned inside the uterine cavity and the presence of an aneural mass, raising the suspicion of ectopic pregnancy, later confirmed with beta-HCG blood level. She was successfully treated with laparoscopic salpingectomy. **Conclusion:** An ectopic pregnancy with an in-situ levonorgestrel intrauterine device is a rare occurrence. Early diagnosis is of paramount importance in order to prevent its potential catastrophic consequences. Physicians prescribing this type of intrauterine device should be aware of the possibility of this rare event, as the symptoms produced by a tubal

gestation may easily be mistaken for side effects due to the intrauterine device.

**Keywords:** Contraception, Ectopic pregnancy, Intrauterine Device, Levonorgestrel

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## INTRODUCTION

Intrauterine devices (IUD) is one of the most used contraceptive all around the world [1]. The IUD is considered to be safe and one of the most effective methods in preventing pregnancy. Nevertheless, its failure rate is not negligible, leading to unwanted pregnancies and induced abortions [1]. The probability described of first-year pregnancy is approximately 0.6 to 0.8% for the copper IUD (Cu-IUD) and 0.1 to 0.2% for the levonorgestrel-releasing system (LNG-IUS) [2]. The literature is relatively sparse for risk factors to IUD failure. A review published in 2001 doesn't find significant results between skills of the staff, uterine position or length of the endometrium and risk of IUD failure. The only significant risks described are the woman's age and copper content of the device [3].

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It remains uncertain if pregnancies with an IUD in situ have increased risk for complications, like ectopic pregnancies, miscarriages or chorioamnionitis [4]. There isn't direct evidence of potential teratogenic risk to the fetus due LNG-IUS.

Ectopic pregnancies (EP) account for 1.5% of all reported pregnancies in western countries, and is a major cause of morbidity and, occasionally, mortality [5].

The most described risk factors for EP are: history of pelvic inflammatory disease, ectopic pregnancy or pelvic surgery, smoking, induction of ovulation and the use of IUDs [5]. It remains unknown if salpingitis associated with IUD use is the possible cause of ectopic pregnancy [5].

In last decades, the incidence of EP has increased, and contraceptive use has been potentially one of the important factors associated with this increase. Pregnancies resulting from contraceptive failure may be more likely to be ectopic [5]. The majority of case reports concerning ectopic pregnancies and IUD use relate to copper IUDs rather than levonorgestrel ones [6].

## CASE REPORT

A 39-year-old caucasian multiparous healthy woman was referred to our emergency room with persistent lower abdominal pain and scarce vaginal bleeding for one day. For 11 months, she had been using a LNG-IUS as a contraceptive, with long periods of amenorrhea. She had no history of prior EP, pelvic inflammatory diseases or previous tubal-uterine surgery, in vitro fertilization or other assisted reproduction procedures. She did not smoke.

On admission, she was haemodynamically stable and complained of a persistent tenderness in her right lower abdominal quadrant. The threads of the LNG-IUS and scarce bleeding were visible on speculum examination. On bimanual examination, the uterus was on nongravid size, and there was cervical tenderness and a palpable mass on right vaginal fornix. Her haemoglobin was 13.6 g/dl and quantitative human chorionic gonadotropin level was 36478 mIU/mL.

A two dimensional transvaginal ultrasound revealed no evidence of intrauterine pregnancy, and the LNG-IUS was properly positioned inside the uterine cavity, as shown in Figure 1. There was a gestational sac situated on right adnexa containing an embryo measuring 22 mm with positive heart rate consistent with a nine-week pregnancy (Figure 2). Free fluid in scarce quantity was also noted in the pouch of Douglas.

Emergency laparoscopy was performed. Both the uterus and the left adnexa appeared normal. An unruptured mass on the ampullary portion of the right tube was identified. A right total salpingectomy and left sterilization were done. Blood clots in the pouch of Douglas were removed and peritoneal lavage performed. The LNG-IUS was removed after the procedure.

The postoperative period was uneventful, and she was discharged home on the following day.

Histology of the tube confirmed the presence of a gestational sac containing first-trimester chorionic villi and placental site trophoblast. There were no features suggesting salpingitis and there were no other abnormalities.

Informed consent was obtained from the patient for publication of this case report and any accompanying images.

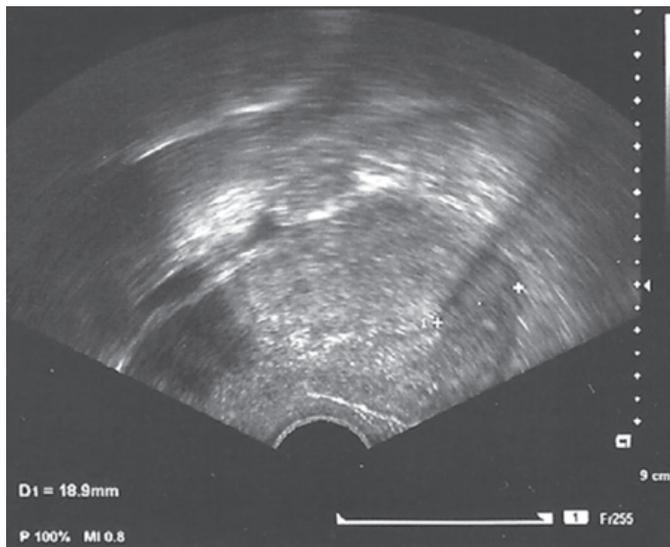


Figure 1: Transvaginal ultrasound of the uterus, showing no evidence of intrauterine pregnancy, and LNG-IUS properly positioned inside the uterine cavity.

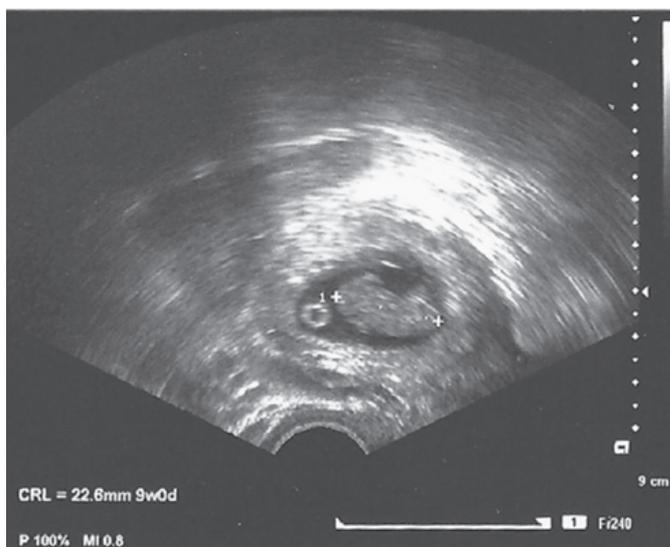


Figure 2: Transvaginal ultrasound showing a gestational sac situated on right adnexa containing an embryo measuring 22mm with positive heart rate.

## DISCUSSION

The rate of ectopic pregnancy after natural conception is 1-2%, and has increased in recent decades. Although ectopic pregnancies during contraception with LNG-IUS have been reported previously, the risk of ectopic pregnancy with the use of LNG-IUS has been minimally investigated [5].

Most of the risk factors of ectopic pregnancies are known. The most common include previous ectopic pregnancy, previous tubal surgery, any documented tubal pathology, previous pelvic inflammatory disease, in vitro fertilization with embryo transfer and intrauterine contraceptive device. However, these pre-existing risk factors are present in only around 75% of the cases [5]. Factors that do not affect ectopic pregnancy risk are previous induced abortion, previous cesarean section and previous oral contraceptive use [7, 8].

Almost all of the literature concerning ectopic pregnancies and IUD use relate to copper IUDs rather than levonorgestrel IUDs.

Some studies have demonstrated that a considerable number of ectopic pregnancies occur when a pregnancy occurs while women is on progesterone-only contraceptives, most probably because progesterone decreases smooth muscle activity, limiting the propulsive effect of the tube at the ampullary part [9].

The LNG-IUS used (Mirena®) is a progesterone-only system containing a total of 52mg levonorgestrel. Initially, levonorgestrel is released at a rate of approximately 20 µg/day. This rate decreases progressively to half that value after 5 years [10].

The local mechanism by which levonorgestrel enhances contraceptive effectiveness of Mirena® has not been conclusively demonstrated. Studies have suggested several mechanisms that prevent pregnancy: thickening of cervical mucus preventing passage of sperm into the uterus, inhibition of sperm survival, and alteration of the endometrium [10].

Mirena® has been studied for safety and efficacy. According to the information provided by manufacturer, the estimated 12-month pregnancy rates were around 0.2 per 100 women, while the cumulative 5-year pregnancy rate was approximately 0.7 per 100 women. Up to half of pregnancies that occur with Mirena® in situ are ectopic (about 1 ectopic pregnancy per 1000 users per year) [10].

EP can be frequently misdiagnosed at the initial visit despite technological advances. Clinicians always have to evaluate woman who became pregnant while using LNG-IUS for ectopic pregnancy. When indicated, laparoscopic salpingectomy is the surgical treatment of choice for tubal EP, with a low rate of surgical complications.

## CONCLUSION

The aim of presenting this case is to emphasize that high-level awareness should be maintained at all times by

clinicians. In cases like this, the symptoms produced by a tubal gestation may easily be mistaken for side effects due to the intrauterine device.

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## Author Contributions

Ana Rita Simões Carvalho – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Alina Seixas – Substantial contributions to conception and design, Drafting the article, Final approval of the version to be published

Andrea Quintas – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Cristina Godinho – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

João Gonçalves – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

**Guarantor of Submission**

The corresponding author is the guarantor of submission.

**Source of Support**

None

**Consent Statement**

Written informed consent was obtained from the patient for publication of this study.

**Conflict of Interest**

Authors declare no conflict of interest.

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