CASE SERIES

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# Management of abdominal ectopic pregnancy: case series

# Manejo del embarazo ectópico abdominal: serie de casos

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**ABSTRACT**

Background: Abdominal ectopic pregnancy accounts for 1-1.4% of ectopic pregnancies and is associated with a high maternal mortality rate mainly due to massive hemorrhage. Objective: To describe the experience in the management of abdominal ectopic pregnancy at the Instituto Nacional Materno Perinatal, Lima, Peru. Materials and methods: Descriptive and retrospective study. The study population was patients with a diagnosis of abdominal ectopic pregnancy during the period 2021-2023. Data was obtained from the review of medical records. Statistical analysis was processed in the SPSS 24 software. Results: Seven cases of abdominal ectopic pregnancy were recorded. The mean age was 31.3 years; 57.1% of the cases had no risk factors. The mean gestational age was 9 weeks. The majority presented abdominal pain as the only symptom (71.4%). Preoperative diagnosis occurred in 42.9% of the cases. Hemoperitoneum was present in 57.1%. The most frequent site of implantation was the broad ligament (42.9%). Treatment was surgical in all cases. One case presented hemoperitoneum as a postoperative complication due to bleeding of the placental bed. Conclusions: Surgery continues to be the treatment of abdominal ectopic pregnancy. There is controversy regarding the removal of the placenta in advanced gestational ages.

Key words: Pregnancy, abdominal, Pregnancy, ectopic, Methotrexate, Laparotomy

**RESUMEN**

Antecedentes. El embarazo ectópico abdominal representa entre 1% y 1,4% de los embarazos ectópicos y se asocia con una alta tasa de mortalidad materna debido principalmente a una hemorragia masiva. Objetivo. Describir la experiencia en el manejo del embarazo ectópico abdominal en el Instituto Nacional Materno Perinatal, Lima, Perú. Materiales y métodos. Estudio descriptivo y retrospectivo. La población de estudio fueron las pacientes con diagnóstico de embarazo ectópico abdominal, durante el periodo 2021-2023. Los datos se obtuvieron de la revisión de las historias clínicas. El análisis estadístico se procesó en el programa SPSS 24. Resultados. Se registraron 7 casos de embarazo ectópico abdominal. La edad promedio fue de 31,3 años. El 57,1% de los casos no tenía factores de riesgo. La edad gestacional promedio fue de 9 semanas. La mayoría presentó dolor abdominal como único síntoma (71,4%). El diagnóstico preoperatorio ocurrió en 42,9% de los casos. El 57,1% presentó hemoperitoneo. El sitio de implantación más frecuente fue el ligamento ancho (42,9%). El tratamiento fue quirúrgico en 100%. Un caso presentó hemoperitoneo como complicación postoperatoria, por el sangrado del lecho placentario. Conclusiones. La cirugía continúa siendo el tratamiento del embarazo ectópico abdominal. Existe controversia respecto a la extracción de la placenta en edades gestacionales avanzadas.

Palabras claves: Embarazo abdominal, Embarazo ectópico, Metotrexato, Laparotomía

## Introduction

Abdominal ectopic pregnancy is a rare form of ectopic pregnancy where implantation of the gestational sac occurs in the peritoneal cavity, outside the uterine cavity or fallopian tubes. The incidence is 1/10,000 births and accounts for 1%-1.4% of all ectopic pregnancies[1-3]. It is related to a high maternal mortality rate (7-8 times higher than other ectopic pregnancies and 90 times higher than intrauterine pregnancy) due to the invasion of the trophoblast into the main organs of the abdominal cavity and the maternal vessels, causing bleeding or rupture of the affected area. This is the reason for its early diagnosis[1,2,4].

Most abdominal ectopic pregnancies are secondary, due to reimplantation of the gestational sac from a tubal abortion[3]. According to the literature, several sites of implantation have been reported, such as the

omentum, the uterus surface, the peritoneum of the pelvic cavity, the diaphragm, the broad ligament, the abdominal organs (intestine, liver and spleen) and the great blood vessels[1,2,5,6]. Many publications relate the risk factors for tubal ectopic pregnancy to those for abdominal pregnancy, but they remain unknown[2]. The clinical picture is variable and depends on the site of implantation of the ectopic pregnancy and the gestational age, with abdominal pain being the most common symptomatology[1,3]. Between 20% and 40% of cases are diagnosed before surgery[1].

The management of abdominal ectopic pregnancy will depend on the hemodynamic status and gestational age of the patient[7]. The most common treatment is surgical and consists of removal of the fetus with the placenta at early gestational ages. At advanced gestational ages there is a dilemma whether to remove the placenta or leave it in situ, since there is a high risk of massive hemorrhage. There are publications and/or case series on the conservative management of advanced abdominal ectopic pregnancies under strict control[3]. Fetal mortality in this type of pregnancy can reach more than 50%, and around 20% is associated with congenital malformations[3].

The purpose of the present study is to describe the experience in the management of abdominal ectopic pregnancy at the Instituto Nacional Materno Perinatal.

## Materials and methods

An observational, retrospective and descriptive study was conducted during the period 2021-2023. The study population consisted of abdominal ectopic pregnancies treated at the Instituto Nacional Materno Perinatal, Lima, Peru. Diagnosis was based on patient signs and symptoms, serum levels of the beta fraction of human chorionic gonadotropin (β-hCG) hormone, transvaginal ultrasound and pathological study. Patients were explained the risks and advantages of the treatment performed and signed an informed consent. Patients with a diagnosis of abdominal ectopic pregnancy with available clinical history were included. Patients treated in another hospital or with incomplete information in their clinical history were excluded.

The study variables were patient age, marital status, education level, risk factors, parity, gestational age, clinical picture, initial β-hCG, preoperative diagnosis, hemoperitoneum, implantation site, type of treatment, surgical treatment, surgical approach, intraoperative complications and postoperative complications.

The documentary observation technique was applied to the medical records and a registration form was used. The data were entered in the SPSS version 24 spreadsheet, considering all the variables and indicators. The descriptive and analytical analysis was performed with the support of this statistical package. For quantitative variables, measures of central tendency and dispersion were determined, and for qualitative variables, frequencies and percentages were determined. Data were presented in tables and graphs.

The research was approved by the Research Methodological and Statistical Evaluation Committee, as well as by the Research Ethics Committee of the Instituto Nacional Materno Perinatal, on March 27, 2024, with file number 24-2242-1. No risk was added to the patients in the study because it was a descriptive and retrospective study.

## Results

There were 480 ectopic pregnancies recorded during the study period. Seven cases met the inclusion criteria for abdominal ectopic pregnancies and represented 1.46% of the total ectopic pregnancies.

Most of the patients were younger than 36 years (71.4%), with an average age of 31.3 years (range 19-38 years). Most of the cases were cohabitants (71.4%), with high school education (85.7%) and nulliparous (57.1%). Of the cases, 57.1% had no risk factors; only 14.3% had a history of uterine curettage or cesarean section or tubal surgery for ectopic pregnancy (Tables 1 and 2).

Regarding the clinical picture, the majority presented abdominal pain as the only symptom (71.4%) and 28.6% presented abdominal pain associated with vaginal bleeding. The average gestational age was 9 weeks (range 6-14 weeks), 71.4% older than 8 weeks. Quantitative mea-

Table 1. Characteristics of abdominal ectopic pregnancies managed at the Instituto Nacional Materno Perinatal.

| | Average | +/- S.D. | Range | Mínimum | Máximum | Median |
|---|---|---|---|---|---|---|
| Age | 31.3 years | 7.2 | 19 | 19 | 38 | 33 |
| Gestational age | 9 weeks | 2.8 | 8 | 6 | 14 | 9 |
| Initial β-hCG | 47,414 mU/mL | 85,637.8 | 175,089 | 711 | 175,800 | 6,572.5 |
| **Marital status** | | | | **N** | | **%** |
| Single | | | | 2 | | 28.6 |
| Cohabitant | | | | 5 | | 71.4 |
| Married | | | | 0 | | 0 |
| **Parity** | | | | **N** | | **%** |
| Nulliparous | | | | 4 | | 57.1 |
| Primipara | | | | 2 | | 28.6 |
| Multiparous | | | | 1 | | 14.3 |
| **Education level** | | | | **N** | | **%** |
| Primary | | | | 1 | | 14.3 |
| Secondary | | | | 6 | | 85.7 |
| Superior | | | | 0 | | 0 |
| **Risk factors** | | | | **N** | | **%** |
| Previous tubal surgery for ectopic pregnancy | | | | 1 | | 14.3 |
| Uterine curettage price | | | | 1 | | 14.3 |
| Previous cesarean section | | | | 1 | | 14.3 |
| Assisted reproduction techniques | | | | 0 | | 0 |
| None | | | | 4 | | 57.1 |
| **Clinical picture** | | | | **N** | | **%** |
| Vaginal bleeding | | | | 0 | | 0 |
| Abdominal pain | | | | 5 | | 71.4 |
| Abdominal pain + vaginal bleeding | | | | 2 | | 28.6 |

*Abbreviations: SD, standard deviation; β-hCG, beta-human chorionic gonadotropin hormone.*

Table 2. Summary of the surgical characteristics of abdominal ectopic pregnancies.

| Case | Age (years) | Gestational age (weeks) | Initial β-hCG (mUI/mL) | Preoperative diagnosis | Hemoperitoneum | Implantation site | Surgical approach | Type of surgery | Intraoperative complication | Postoperative complication |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 32 | 9 | _ | Yes | No | Left broad ligament | Laparotomy | Removal of the ectopic | No | Hemoperitoneu |
| 2 | 38 | 14 | 7,385 | Yes | No | Douglas cul-de-sac | Laparotomy | Removal of the ectopic | No | None |
| 3 | 38 | 9 | 175,800 | No | No | Right broad ligament | Laparotomy | Ectopic removal + RSG | No | None |
| 4 | 35 | 8 | 711 | No | Yes | Right parietocolic peritoneum | Laparotomy | Ectopic removal + RSG | No | None |
| 5 | 33 | 6 | _ | No | Yes | Right broad ligament | Laparotomy | Ectopic removal + right adnexectomy | No | None |
| 6 | 19 | 6 | 5,760 | No | Yes | Serosal surface of the posterior aspect of the uterus | Laparotomy | Removal of the ectopic | No | None |
| 7 | 24 | 11 | _ | Yes | Yes | Omentum | Laparotomy | Removal of the ectopic | No | None |

*Abbreviations: β-hCG, beta-human chorionic gonadotropin hormone; RSG, right salpingectomy.*

surement of initial β-hCG was performed in only 4 cases and average levels were 47,414 mU/mL (range 711-175,800 mU/mL) (Tables 1 and 2).

The diagnosis of abdominal ectopic pregnancy before surgery was 42.9%. Hemoperitoneum was present in 57.1% of the cases. The broad ligament was the most frequent site of implantation (42.9%). Treatment of abdominal ectopic pregnancy was surgical (100%) and consisted of removal of the ectopic pregnancy. In 42.9% of cases, removal of the ectopic pregnancy was associated with excision of the tube or adnexa due to its involvement. The surgical approach

was laparotomy (100%). There were no intraoperative complications. One case presented postoperative hemoperitoneum caused by bleeding of the placental bed that was controlled with hemostatic stitches. All cases evolved favorably until hospital discharge (Table 2).

## Discussion

Abdominal ectopic pregnancy represents between 1% and 1.4% of all ectopic pregnancies, with maternal mortality rate 8 times higher compared to tubal ectopic pregnancies. Timely diagnosis and treatment are important to avoid fatal complications[1-3,6,8-10]. Maternal mortality rate ranges from 0.5% to 20% and increases with advancing gestational age[11]. Its incidence varies between 1/10,000 and 1/30,000 pregnancies[4-6,9,12]. In the present study, abdominal ectopic pregnancy accounted for 1.46%.

Its etiology is still unknown. Several theories have been suggested, such as the displacement of the ovum through the fluid of the peritoneal cavity and its fertilization in the cul-de-sac of Douglas due to the accumulated presence of spermatozoa. And a possible migration of the embryo via the lymphatic route from the uterine cavity to the pelvic cavity[5,12].

According to the literature, most abdominal ectopic pregnancies are mainly secondary to an aborted or ruptured tubal ectopic pregnancy, with subsequent implantation somewhere in the abdominal cavity[1,2,6,11,13]. On the other hand, primary abdominal ectopic pregnancy is rare, where implantation occurs directly in the abdominal cavity and is possibly due to the use of assisted reproductive techniques[1,2,4-6,11]. Studdiford criteria (1942) have been proposed to diagnose a primary abdominal ectopic pregnancy, which include: the fallopian tube and ovaries are intact, there is no utero-peritoneal fistula formation, the pregnancy exists only in the abdominal cavity and there is no evidence of tubal ectopic pregnancy[1,3,7]. In the present study 42.9% of the abdominal pregnancies were possibly secondary to a ruptured tubal ectopic pregnancy, because the pathology results reported uterine tube involvement.

The risk factors for abdominal ectopic pregnancy are still unknown. They are associated with endometriosis, uterine tubal lesion, pelvic inflammatory disease, intrauterine device, previous ectopic pregnancy, smoking, use of assisted reproduction techniques[1-3,5]. In the present study, most cases had no risk factors (57.1%). Poole et al[12] found that 8% of the cases of abdominal ectopic pregnancies had an intrauterine device.

The clinical picture is variable and nonspecific. The majority present abdominal pain and vaginal bleeding[1]. At advanced gestational ages (over 20 weeks of gestation), abdominal pain may be due to fetal movements or to the existence of positional abnormalities of the placenta and fetus, and present a high risk of maternal-fetal complications (postpartum hemorrhage, coagulation disorder, pulmonary embolism, maternal death)[1,6,11]. In the present study, the majority of cases had abdominal pain (71.4%), similar to most publications[1,7]. In addition, hemoperitoneum was reported in 57.1% of cases.

Thanks to advances in the use of ultrasound, abdominal ectopic pregnancy can be diagnosed at early gestational ages in 50% of cases[1,3,5,11-14]. According to the literature, cases of abdominal ectopic pregnancies diagnosed at advanced gestational ages (greater than 20 weeks of gestation), even at term, have been reported, with a high risk of postpartum hemorrhage[1]. The use of MRI in advanced abdominal ectopic pregnancy to assess placental involvement of adjacent organs is being reported in the literature[1,3]. In the present study, cases were detected at early gestational ages, the average being 9 weeks, similar to most studies[1,7,12]. According to the literature, between 20%-40% of cases are diagnosed before surgery[6,11]. Cases of abdominal ectopic pregnancy at term have been diagnosed mainly during surgery[3]. In the present study, most cases were diagnosed during surgery (57.1%), similar to that reported by most studies. Shaw et al. in 2007 informed that all cases were diagnosed intraoperatively[7].

According to the literature, several implantation sites of abdominal ectopic pregnancy have been published. Shaw et al[7] reported that the most common implantation site was the cul-de-sac of Douglas (55%), followed by the mesosalpinx (27%). Poole et al.[12] found them in the pouches or spaces around the uterus (24.3%) and the serosal surface of the uterus and tubes (23.9%). In the present study, the most frequent site of implantation was the broad ligament (42.9%).

Currently there are no standard treatments for abdominal ectopic pregnancy, the most common being surgical[1,6]. There are few publications and most of them are reports or case series due to their rarity. Management will depend mainly on the gestational age and hemodynamic status of the patient[11]. In early gestational ages, treatment consists mainly of surgical removal of the fetus and placenta[12,14]. Successful cases have been reported using laparoscopic surgery, which depends on the site of implantation not involving mainly a vascular area[7]. There have been cases with conservative management, such as the use of local injection of a cytotoxic in the gestational sac, systemic therapy with methotrexate and the use of uterine artery embolization[1,3,6,11,12,14]. These conservative treatments will require strict controls over a long period[1]. In the present study, treatment was surgical, the approach being laparotomy, similar to that found in most studies[7,12].

The controversy is in advanced gestational ages in relation to the management of the placenta once the fetus is removed[3]. When complete resection of the placenta is not possible, it is left in situ and a strict follow-up is performed for possible maternal complications (pelvic abscess, hemorrhages, intestinal obstruction, fistulas, inflammatory and necrotic processes)[3,7,11,12,14]. Placental removal must be individualized according to the site of insertion[7,11,14]. Placental resorption may take up to 6 weeks[11]. Some measures to accelerate placental involution in situ have been published, such as embolization and the use of methotrexate, but they are controversial[3,5,11,13]. Several authors disapprove the use of methotrexate because of necrotic tissue accumulation and an increased risk of infection[11,13]. In the present study, there were no cases of advanced abdominal ectopic pregnancies.

Cases have been reported with expectant management under strict surveillance, in asymptomatic advanced abdominal pregnancy, hoping to achieve fetal viability between 32 and 34 weeks. These cases present a high risk of maternal mortality due to the massive hemorrhage that may occur (12%)[3,6]. This type of management is questioned, it may improve the chances of fetal survival, but there is a growth of the placenta that may invade vital organs[6]. It has been indicated that there is a high risk of perinatal mortality, between 40-95%, and an incidence of fetal malformations, between 25-40%[4,6,8,11,14]. The probability of having a live birth in an abdominal ectopic pregnancy is between 10% and 20%, according to the literature[8,14].

The limitations of this study include the small sample size because it is a rare pathology, and its retrospective design. Prospective studies with a higher level of evidence are required to better understand the management of abdominal ectopic pregnancy.

In conclusion, abdominal ectopic pregnancy is a rare pathology, associated with a high maternal mortality rate if not diagnosed early. Its diagnosis remains a challenge despite advances in ultrasonography and, sometimes, it is diagnosed during surgery. Currently there is no definite treatment, and there are several management options, with surgery being the most common. In advanced ectopic pregnancy there is still controversy regarding the resection of the placenta due to the high risk of massive hemorrhage. In recent years, cases of abdominal pregnancies that go to term have been reported, with a high risk of maternal complications.

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