

Case report

# Laparoscopy and methylene blue intrauterine injection immediately after undiagnosed conception: effect on pregnancy and neonatal outcome

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## Abstract

A 39-year-old woman with infertility and chronic pelvic pain underwent a diagnostic laparoscopy with dye-test performed approximately 7 days after conception. No effects were reported on pregnancy and neonatal outcome.

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## 1. Introduction

Diagnostic laparoscopy is usually performed to evaluate the tubal factor of infertility and to study the gynecologic pelvic pain. During laparoscopy a dye-test with methylene blue is carried out, injecting the liquid through the cervical canal inside the uterus, in order to visualize the tubal filling and its patency. We describe a case in which an early intrauterine pregnancy was present at the time of intrauterine injection of dye. The pregnancy continued till the end and a healthy baby was born.

## 2. Case report

A 39-year-old patient was admitted to our department with a diagnosis of chronic pelvic pain and secondary infertility. The pain was particularly evident during the 10 days preceding the menstrual flow. A laparoscopy was performed in the luteal phase of the cycle in order to diagnose the presence of endometriosis, to analyze the tubal factor of infertility, at the same time collecting peritoneal fluid to determine CA-125, interleukin (IL)-1, IL-6 and tumour necrosis factor (TNF)- $\alpha$  for research purposes.

Ultrasonographic monitoring was planned during the same menstrual cycle of the surgery (starting on day 7) in

order to determine the ovulation time and to be sure that the scheduled procedure was performed in the mid-luteal phase. Ovulation was ultrasonographically demonstrated by the follicular rupture and the endometrial transformation.

The patient signed an informed consent in which she was advised about the risks of the procedure and to abstain from intercourse in the cycle of laparoscopy. Two days before surgery the pregnancy test was negative.

At the endoscopic examination the internal genital organs were normal, except for the presence of a 2 cm anterior, intramural myoma and an adhesion between the uterus and the anterior pelvic wall. Adhesiolysis was performed and the dye-test showed a bilateral, prompt release of methylene blue through the fallopian tubes. No evidence of endometriotic lesions was found.

Two weeks later a pregnancy test was positive and a transvaginal sonography showed a 5 weeks intrauterine gestational sac. The patient admitted she had sexual intercourse approximately 7 days before laparoscopy, during the period of the ultrasonographic demonstration of a preovulatory follicle. She was informed that the major risk would have been a miscarriage due to the mechanical trauma of the intrauterine procedure. The injection of the dye was supposed to be without risk for the fetus [1], even though in the literature one case was reported with an inadvertent tubal dye injection at 6 week of gestation [2]. The possibility of a neonatal Heinz-body hemolytic anemia was also analyzed but the termination of pregnancy was not considered, since there has been a low number of cases reported in the literature [3]. Pregnancy proceeded to term without

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complications and a cesarean section was performed at 38 weeks for acute fetal distress during labor. The newborn was a male, weighing 3200 g, with Apgar score of 8–10 at 1 and 5 min. At the present time the infant is 15-month-old and no pathology or anemia has been found.

### 3. Discussion

Laparoscopy is usually performed in order to evaluate infertility in the follicular phase of the cycle, to avoid the risk of an invasive, intrauterine procedure in presence of a viable pregnancy. This patient was enrolled in a research project, concerning the study of substances potentially involved in a non-surgical diagnosis of endometriosis. In this case laparoscopy was scheduled during the luteal phase, while in a second group of patients the endoscopic procedure was planned during follicular phase: we collected peritoneal fluid of both groups to determine CA-125, IL-1, IL-6 and TNF- $\alpha$ . We correlated such values with serum levels, observing differences during the menstrual cycle.

Laparoscopy was carried out approximately 1 week after ovulation, but the patient had sexual intercourse in the ovulatory period of the evaluation cycle.

We were able to estimate the time of conception because an ultrasonographic monitoring was planned during the same menstrual cycle of the surgery in order to determine the ovulation time and to be sure that the scheduled procedure was performed approximately one week after ovulation. Patient had sexual intercourse on day 13 of the cycle, when a preovulatory follicle was ultrasonographically evident.

Moreover the ultrasonographic scan performed two weeks after the procedure revealed a 3 mm gestational sac, well correlated with the 5-week gestational age [4].

To our knowledge this is the first report of an invasive, intrauterine dye injection in early pregnancy (approximately 7 days after conception). In another case reported in the literature similar findings were described, but laparoscopy was performed in a later period of pregnancy (4 weeks after conception) [2].

Studies show that human implantation occurs 5–6 days after conception. According to this case-report, after the first hours of embryo implantation, a strong adhesion was established between the deciduo-corial tissue and the embryo. Neither the mechanical trauma induced by the tip of the rigid cannula inserted into the uterine cavity, nor the liquid pressure of the methylene blue on the gestational sac impaired the existing embryo-decidual attachment.

Depending on this experience the intrauterine injection of methylene blue in early pregnancy does not seem to affect the pregnancy and neonatal outcome.

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