CASE REPORTS

Primary unruptured ovarian pregnancy with intrauterine device

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Summary

A case of intrafollicular and unruptured ovarian pregnancy associated with intrauterine device which meets the rigid criteria of Spiegelberg (1878) is presented. Clinically, unruptured cases can be confused with ovarian cysts. Intrauterine devices are highly effective for protection against uterine gestation and to a lesser degree against tubal gestation, but they have no effect in preventing ovarian gestation.

Case report

A 28-year-old white female was admitted to the hospital with the chief complaint of lower abdominal pain for 4 days' duration and of having fainted at home three times. She was gravida 2, para 1, abortus 1, and had had an intrauterine device (regular size, Margulies Spiral or 'Gynekoil') for 5 years. Her last menstrual period had begun 3 weeks before admission and had continued with a light intermittent flow. Previous periods had been normal. The patient also complained of some vague chest and shoulder pain with nausea. Her temperature and blood pressure were within normal limits. Her pulse, however, was 104/min. Abdominal examination showed slight generalized tenderness with no rebound and no mass. Pelvic examination revealed slight fullness of the left adnexal area with a normal uterus and correctly placed intrauterine device. Culdocentesis was performed twice at 24-hr intervals and was negative both times. Routine urinalysis was normal. Pregnancy test (OGS method*) on urine, repeated three times at 48-hr intervals, proved positive each time. Results of routine admission tests (SMA 12) (glucose; BUN; uric acid; calcium; alkaline phosphatase; SGOT; LDH; total protein; albumin; total bilirubin; cholesterol; phosphorus) including amylase were within normal limits. Haemoglobin

was 13.5 g/100 ml; haematocrit, 41%; WBC 9,400/mm³ with normal differentiation. Routine chest X-ray was negative, and plain abdominal X-ray was normal showing IUD to be in place.

She was pain-free on the second day of admission and remained so during the hospital course. Repeat haemoglobin and haematocrit on the following days showed no significant changes and remained stable. Pelvic examination on the day before discharge revealed normal findings with no masses. Because of improvement she insisted upon going home, and was subsequently discharged, clinically improved after 8 days in hospital. The final diagnosis was a suspected early intrauterine pregnancy with IUD failure, based on the positive pregnancy test and a questionable ovarian cyst which had subsided. She was advised to return whenever the previous symptoms reappeared and also for a weekly pelvic examination and pregnancy test.

Twenty-four days later she was readmitted with a sudden onset of severe cramping pain in the left lower quadrant of the abdomen which became worse when moving. There was no vaginal bleeding and she did not appear in a state of collapse. Blood pressure was 130/75 mmHg with regular pulse at 84/min and temperature of 98°F. Pelvic examination revealed a tender, 8-cm cystic mass in the left adnexal area. The uterus appeared to be slightly enlarged but freely movable. Routine SMA 12 tests were normal. Haemoglobin was 12.9 g/100 ml and haematocrit was 40%. WBC was 8,200/mm³ with normal differentiation. Routine urinalysis was normal. The urine pregnancy test (OGS method) was positive. X-rays of chest and flat plate of abdomen were negative; IVP showed a pelvic soft-tissue mass. The clinical appearance was of ectopic gestation or ruptured ovarian cyst.

Laparotomy revealed the left ovary to be large and cystic, freely attached to the utero-ovarian ligament and separated from the left tube by mesosalpinx. No site of haemorrhage was seen. The cystic

* Ortho Gravindex Qualitative Slide Test based on agglutination of latex coated with HCG by rabbit serum anti-HCG and neutralization of anti-HCG with an HCG present in positive urine.

FIG. 1. Left ovary showing partial replacement by gestational sac, with corpus luteum of pregnancy seen on the right (arrow).

FIG. 2. Embryonic sac with degenerated embryo and gestational sac (arrow).

ovarian mass was freed from its pelvic adhesions and a left oophorectomy was carried out. The uterus, right adnexa and left tube were unremarkable.

The ovarian mass measured $7 \times 6 \times 4.5$ cm; most of the external surface was smooth with a few areas of fibrous adhesions; no site of rupture was seen. The sections revealed a haemorrhagic cystic mass representing the gestational sac, in one part of which a large corpus luteum of pregnancy was seen (Fig. 1). In the proximate centre of the gestational sac there was one embryonic sac, 3 cm in the largest dimension, with a thin, translucent membrane and a 1-mm degenerated embryo (Fig. 2). Microscopically, the gestational sac was implanted in the ovarian tissue, surrounded by corpus luteum of pregnancy and oedematous cortex of ovary. The wall of the gestational sac was haemorrhagic, consisting of placental membranes and immature chorionic villi with trophoblastic giant cells, which infiltrated an active corpus luteum, indicating an intrafollicular-type ovarian pregnancy (Fig. 3). There was no evidence of endometriosis of the ovary.

The patient was discharged after 8 days. Three pregnancy tests carried out at weekly intervals became negative after 2 weeks.

FIG. 3. Microscopic section of ovary showing chorionic villi with trophoblastic giant cells infiltrating the corpus luteum of pregnancy (arrow) H & E, $\times 70$.

Discussion

Ovarian pregnancy is a rare form of ectopic pregnancy and should be diagnosed according to the criteria established by Spiegelberg (1878): (1) the tube of the affected side must be normal; (2) the gestational sac must occupy the normal position in the ovary; (3) the sac must be connected to the uterus by the ovarian ligament; (4) unquestionable ovarian tissue must be demonstrable in the wall of the sac. Reported incidence of this is estimated by Hertig (see Gérin-LaJoie, 1951) as 0.7–1.7% of all ectopic gestations and one in 25,000–40,000 pregnancies. Isbell and Bacon (1947) have claimed that the known incidence of ovarian pregnancy would be increased if every haemorrhagic ovarian lesion such as chocolate cyst, haemorrhagic corpus luteum, etc., were subjected to microscopic examination. Also, Campbell *et al.* (1974) recommended that a check for occult ovarian pregnancy be made in cases of acute hemoperitoneum, especially if an IUD were present. Various aetiological mechanisms have been proposed by Boronow *et al.* (1965): obstructive ovulation, e.g. pelvic inflammatory disease; ineffective tubal function; favourable surface phenomena, e.g. endometriosis; parthenogenesis; chance. The clinical manifestations are commonly confused with tubal pregnancy and ruptured ovarian cyst. The unruptured cases are diagnosed extremely rarely and are mistaken for ovarian cyst.

It has been claimed by Tietze (1968) and studies

by Lehfeldt, Tietze, and Gorstein (1970) have shown that ectopic gestation occurs almost 10 times more frequently in pregnancies with an IUD in place than all other pregnancies. There is no evidence that IUDs cause ectopic gestation in general or ovarian pregnancy in particular. The fact is that women using IUDs become pregnant far more frequently than the fertile control group similarly exposed to conception (Craig, 1975). While non-IUD users are pregnant only once a year, similar groups with IUDs are fertilized at least four times in the same year (Lehfeldt *et al.*, 1970). As a rule, the oftener the fertilization, the greater the chance of ectopic gestation.

Tietze (1968) claimed that the incidence of ovarian pregnancy in ectopic pregnancies was 1 : 7 in those using intrauterine devices as compared with 1 : 150 in those without intrauterine devices. This incidence accorded with reports by Pugh, Vogt and Gibson (1973). The exact mechanism of action of an IUD is not well known. A study by Lehfeldt *et al.* (1970) showed that the IUD reduces uterine implantation by about 99.5%, tubal implantation by 95% and the incidence of ovarian pregnancy not at all. Their hypothesis is that at the site of the IUD, the endometrium produces some chemical agent which is highly effective in preventing implantation in the uterus, with a lesser degree of effectiveness in the tube and no effect in the ovary. In relation to this hypothesis, Morris and van Wagenen (1973) claim there is

evidence that IUDs or a high dose of oestrogens taken post-coitally decrease endometrial carbonic anhydrase, and subsequently prevent uterine implantation.

Conclusion

Ovarian ectopic gestation is relatively rare and usually difficult to recognize before laparotomy. It is almost always ruptured at the time of exploration. The increasing reported incidence of ovarian pregnancy has a close relationship to the increased usage of IUDs and also to the greater awareness of physicians to this type of ectopic pregnancy. Specifically, more haemorrhagic ovaries are being subjected to wedge resection or total removal and careful sectioning for detection of ovarian pregnancy.

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Septic abortion due to invasive *Salmonella agona*

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SEPTIC abortion is rarely associated with organisms other than clostridia, staphylococci, streptococci and anaerobes which are introduced into the uterus. Septic abortion occurring as a complication of an invading blood-borne pathogen is extremely uncommon. The present patient is interesting in that *Salmonella agona*, which until 1970 was an unusual serotype (Leading Article, 1971), was the cause of a septic abortion due to intrauterine infection consequent on a septicaemic illness.

Case report

The patient, a previously healthy 28-year-old primigravid housewife, who was 14 weeks pregnant,

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was admitted to hospital with a 2-day history of malaise, fever and lower abdominal pain followed 24 hr later by rigors and vaginal bleeding containing products of conception. On admission, she was flushed and sweating with a pyrexia of 39.4°C, a tachycardia of 100 and a blood pressure of 120/70 mmHg. The abdomen was distended and there was guarding and tenderness in both iliac fossae. Vaginal examination revealed fresh blood appearing from a soft, one-finger dilated cervix and bimanual examination elicited marked tenderness of the uterus and the lateral fornices. A diagnosis of incomplete septic abortion was made and the patient received ampicillin 500 mg i.m. followed by amoxycillin 500 mg/8 hr thereafter. The vaginal bleeding continued and another vaginal examination revealed a further-dilated cervix with placental remnants protruding.