OVARIAN PREGNANCY

by

S. C. SAXENA,* M.S.

and

R. K. PATHAK,** M.D., D.G.O.

Ovarian pregnancy is a rarity. The first case was reported in the 17th century. In 1902, Thomson recorded the first instance of ovarian pregnancy in the American literature. Since then cases have been reported by many authors like Novak (1940) Hertig (1951), Baden and Heins (1952) and King (1954). Guixo and Pene (1958) reviewed the literature. From India cases have been reported by Upadhyay *et al.* (1955), Subhadra Devi (1960), Savitri and Reddy (1959), Shastrakar (1961), Dalal (1964), Shakuntala Devi, *et al* (1967-4 cases), Mokadam and Kalappa (1968—4 cases), Sunanda Bai *et al.* (1968—2 cases), Patel *et al.* (1968—2 cases), Kishore and Pushpa (1968—one case), and Roy Chowdhury (1968—one case).

75% of ovarian pregnancies terminate in the first trimester, 12.5% in second trimester, and 12.5% in the third trimester of pregnancy (Baden and Heins, 1952). Advanced ovarian pregnancies have been reported by King (1954), Upadhyay *et al* (1955), Mitford-Barberton (1963), Vaishya (1965), Haubecker (1963), Rakshit (1964), and Purushottam (1964). Cases of simultaneous intra-uterine pregnancy, twin ovarian pregnancy, and ovarian hydatidiform mole have been reported (Wittenberg and Ries, 1948). There is no authentic report of primary choriocarcinoma of ovary except that associated with a teratoma. The incidence of ovarian pregnancy as reported by various authors is given in Table I.

Rarity of the condition warrents the report of the following case.

Case Report

Smt. A. T., 30 years old, second para, was admitted in the Gynaecological wards of the Medical College Hospital, Jabalpur, on 5-5-1969 at 4 a.m., with a history of severe pain in the abdomen associated with fainting and giddiness at 3 p.m., and again at 11 p.m. on 4-5-1969. She had two full term normal deliveries, the last being 1¼ years ago. Her menstrual history was regular being 4/30-35 days. The last menstrual period was on 14-4-1969. She gave a previous history of pelvic inflammation for which she had received treatment one year back.

Pallor was present. Pulse was 110/minute, blood pressure 90/60 mm. Hg, and the temperature was 99°F.

There was tenderness in the lower abdomen, more marked in the right iliac fossa, but no rigidity or guarding of recti. Vaginal examination revealed a cervix which was firm and pointing downwards and forwards, the uterus was anteverted and normal in size. The movement of the cervix was extremely tender. In the right fornix

*Reader.

**Lecturer.

Dept. of Obst. & Gynec. Medical College, Jabalpur, M.P.

Received for publication on 20-6-1969.

TABLE I

Incidence of ovarian pregnancy

Author	Year	Incidence in relation to pregnancy	Incidence in relation to ectopic pregnancy (%)
Eckerson*	1941		0.30
Courtiss	1942		0.97
Kuzma*	1942		1.45
Nucci	1946		0.67
Isbell*	1947		0.97
Hertig	1951	1 : 25,000–40,000	0.7-1.07
Taber & Crossett*	1952		2.7
Hofman	1952		1.52
Hayes*	1953		0.22
Bossert, et. al. *	1955	1 : 36978	0.50
Borrow & Winkelstein*	1956	1 : 52833	0.17
Bercovici, Pfen & Liban	1958		4.25
Ellis	1959		4.71
Dowling, Collier & Bretschneider*	1960	1 : 59740	0.21
Savitri & Reddy	1960		1.92
Boronow	1963	1 : 9229	2.74
Purushottam	1964	1 : 75663	1 : 103
Shakuntala Devi, et. al.	1967	1 : 7878	1 : 02
Mokadam & Kalappa	1968	1 : 13125	1.1
Sunanda Bai, et. al.	1968	1 : 13328	1.9
Patel, et. al.	1968	1 : 26928	3.2
K'shore & Pushpa	1968		0.79

*Quoted by Boronow, et. al.

was felt a soft tender mass, 3″ x 3″ in size and in the left fornix an enlarged ovary was palpable. Other systems were clinically normal. Colpocentesis was done and dark coloured fluid blood came out. The diagnosis of ruptured ectopic pregnancy was made, and it was decided to perform laparotomy.

Under gas, oxygen, and ether endotracheal anaesthesia, a laparotomy was performed. On opening the abdomen, the peritoneal cavity was found full of dark coloured blood. 1½ to 2 pints of blood was aspirated. The right ovary was enlarged to the size of 4½″ x 3″ x 3″ and was soft and cystic. A small sac of the size of 1″ x ¾″ x ¾″ was protruding through the rent present on its lateral wall. Along with it blood clots were present in the enlarged cavity of the ovary. The left ovary was enlarged to the size of 2″ x 2″ x 1½″, and was cystic. Right sided ovariotomy was performed. Tubal sterilization was performed by modified Pomeroy's method. In the post-operative period she was given 350 c.cs. of compatible blood. The post-operative period was febrile, but otherwise uneventful. The patient was discharged on the 12th day.

The specimen showed an enlarged, soft, cystic ovary of the size of 4½″ x 3″ x 3″ and through a rent on its lateral wall protruded a small sac. It was connected to the uterus by the utero-ovarian ligament. The right fallopian tube was apparently normal. Microscopic examination of the specimen revealed trophoblastic tissue surrounded by corpus luteum, thus confirming the diagnosis of primary ovarian pregnancy. (Fig. 1).

Comments

According to Baden and Heins (1952), ovarian pregnancies can be classified as follows;—

I. Primary ovarian pregnancy—(a) Intra-follicular, (b) extra-follicular, which includes juxta-follicular, interstitial, cortical and superficial.

II. Combined ovarian pregnancy —where ovary forms at least a por-

tion of tissue lying adjacent to the foetal tissue, but not forming the entire wall.

In the intra-folicular type, the ovum gets fertilized in the follicle itself, whereas, in the extra-follicular type, the fertilized ovum gets implanted on the surface of ovary. A true intra-follicular type is very difficult to prove, and the majority are extra-follicular in origin.

There are different views regarding the mechanism of occurrence of ovarian pregnancy. For ovarian implantation, obstructed ovulation has been proposed as one of the causes. Other causes are, tenacious granulosa cells and discus proligerous, low intra-follicular pressure, ineffective tubal function (ciliary and/or peristaltic), favourable surface phenomenon, parthenogenesis, and chance. The escape of the egg from the follicle may be retarded by tortuous channels of exit, or, after the rupture of the follicle the ovum may be retained in the discus proligerous. The mature follicles might be superimposed, the deeper discharging its ovum into the cavity of the more superficial, bringing about the retardation which would permit fertilization (Leopold 1958).

In recent years Viet's view is accepted. He is of the view that the implantation is not necessarily within the follicle from which the growing ovum was discharged, especially now that we know that the secretion of the corpus luteum is essential for implantation. After discharge, the ovum is fertilized, and then takes roots in the follicle or corpus luteum (intra-follicular implantation), but these are soon penetrated by trophoblast which pushes into the deeper ovarian structure (juxta-follicular implantation).

Meyer asserted that cortical implantation of the egg was the most common mechanism, this being due to the presence of ectopic endometrium on the surface of the ovary. But only 2 cases associated with ovarian endometriosis were encountered by Baden and Heins (1952) among 97 cases collected by them from the literature. Animal work has shown that neither decidua nor endometrium is necessary for trophoblastic implantation or proliferation.

The site of implantation is the graafian follicle which is entered by the spermatozoon through the site of rupture or possibly by direct penetration of its wall. The ovum may be impregnated when lying on the surface of the ovary, or after its discharge from the follicle, and may excavate a bed for itself. In the cells lining the follicle the fertilized ovum finds a nidus unsupported except for its delicate follicular wall.

Pelvic inflammatory disease is incriminated in 19.7% of cases only.

The ovary contains a large blood clot in which are found amniotic membrane and chorionic villi. The clots and the products of gestation are enclosed in a complete capsule of ovarian tissue. True decidua is not formed, but patches of decidual cells are seen in the stroma of the medulla and cortex.

In 1878, Spiegelberg, as quoted by Eastman and Hellman (1961) laid down the criteria for the diagnosis of ovarian pregnancy, viz., (i) that the tube, including the fimbria-ovarica on the affected side, be intact and the former clearly separate from the ovary, (ii) that the gestation sac defi-

nitely occupies the normal position of the ovary, (iii) that the sac be connected with the uterus by the ovarian ligament, and (iv) that unquestionable ovarian tissue be demonstrated in the wall of the sac. To this, Norris, in 1909, added one more modification, that the tube must not show any microscopic evidence of pregnancy. Later, Rubin (1951) emphasised the removal of the tube in every case for study. In 1941, Stander enlarged the fourth postulate, that the ovarian tissue be found in several places at some distance from each other, and intervening between the foetal tissue and extraneous tissue.

For the diagnosis of advanced ovarian pregnancy, Rakshit (1964) modified the fourth postulate by mentioning that in these cases the ovarian tissue is compressed and may not be identified, and added one more postulate, that the blood supply of the sac is maintained only by the normal arterial channels, viz., the ovarian and terminal part of the uterine artery. These views are endorsed by Vaishya (1965).

A review of the literature suggests several clues which may strengthen the index of suspicion in favour of ovarian gestation. These patients are usually in second to fourth decade. Though it is stated that in 27% of cases the patient may be a primigravida with a period of sterility, it is not always the case. The present case was gravida 3, para 2, but had a previous history of pelvic inflammation.

Missed menstrual periods only occur in half of the cases. The present case did not give any history of amenorrhoea. Dalal's (1964) case also did not have amenorrhoea. It is likely that these cases conceived soon after ovulation and the fertilized ovum got implanted in the corpus luteum which ruptured before the next period was due. In these cases attacks of severe colicky pain in the abdomen, associated with giddiness and fainting, pallor, fast pulse, low blood pressure, rigidity of the lower abdomen, and palpable soft tender masses in the vaginal fornices are very suggestive of the diagnosis, which can be confirmed by colpocentesis. The possibility of acute appendicitis should be kept in mind. Palpable adnexal masses are sometimes mistaken for fibroids of the uterus, as happened in Subhadra Devi's case (1960).

The presence or absence of the corpus luteum in ovarian pregnancy has attracted great attention, and there are reports of an intact corpus luteum to a complete absence of this structure. In the present case, the corpus luteum was recognised histologically surrounding the trophoblastic tissue, thereby suggesting implantation in the corpus luteum. Most of the authors agree that it may be absent in the intrafollicular type of implantation. Another interesting feature is the presence of decidual cells in ovarian pregnancy. These cells may arise from ovarian stroma, luteal cells, or from the trophoblast itself.

The treatment usually practised is removal of the tube and ovary on the affected side. But, conservative surgery may be preferred, and wedge resection of the affected ovary may be done if possible. In the present case the affected ovary was removed and the patient was sterilized by par-

tial salpingectomy as she desired sterilization.

Summary

1. A case of ruptured primary ovarian pregnancy is reported.

2. The literature on the subject is reviewed. The incidence, aetiology, clinical features, diagnosis and treatment are discussed.

Acknowledgement

We acknowledge our thanks to the Prof. of Obst. & Gynecology, and Dr. V. B. Thakre, Superintendent, Medical College Hospital, Jabalpur, for their kind permission to publish this case.

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See Fig. on Art Paper III