

## ECTOPIC PREGNANCY—A STUDY OF 332 CASES

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Ectopic pregnancy includes all cases of pregnancy where the ovum is not implanted in the endometrium lining the uterine cavity. It is a broader term than extrauterine pregnancy as it includes cervical and cornual pregnancy (i.e., when the ovum is implanted into the cervical mucosa or into the mucosa of the accessory horn of a malformed uterus), besides ovarian, abdominal and the much larger group of tubal pregnancy. It is a well-known fact that ectopic pregnancy is one of the greatest impostors, as, whether it presents in the acute form or in the chronic one, it may simulate almost any intra-abdominal disease, be it medical, surgical or gynaecological. The possibility of ectopic pregnancy should, therefore, be constantly borne in mind when one is confronted with a patient who is a woman of childbearing age.

### INCIDENCE

The incidence of ectopic pregnancy was usually given to be about 1 in 250 to 300 pregnancies. Schumann (1921) recorded 186 cases amongst 56,441 cases of intrauterine pregnancy and Nucci (1946) 150 cases amongst 37,783 intrauterine pregnancies. Recent figures, however, showed a definite increase in incidence of ectopic pregnancy. Anderson (1951) found that the ratio of tubal pregnancies to viable deliveries in white women was 1:200 and that it was 1:120 in nonwhite women. Beacham et al (1956) had 426 cases of ectopic pregnancy from 1951 to 1955 as compared with 58,756 deliveries in that same period, giving a ratio of 1 case to 139 deliveries.

Two hundred and ten cases of ectopic pregnancy were admitted to the Obstetrical and Gynaecological Unit of Hong Kong University from January, 1946 to June, 1953. In that same period of 7½ years there were 45,089 deliveries under the care of the same Unit, giving a ratio of 1 case to 215 deliveries (King, 1954). Between January, 1956 and December, 1959, 332 cases of ectopic pregnancy were

encountered at the same Unit; and during that same period of 4 years there were 32,670 deliveries, thus giving an incidence of 1.013 per cent or 1 in 98 deliveries. There was thus an increase in incidence of ectopic pregnancy even in Hong Kong. There were 2 deaths in this series, thus giving a mortality rate of 0.6 per cent. But as one of the 2 deaths occurred in a patient who committed suicide before treatment could be given, the corrected mortality rate was 0.3 per cent.

Of these 332 cases, 38 or 11.45 per cent had had a previous ectopic pregnancy. All of them had had a salpingectomy or salpingo-oophorectomy done. Thirty-four had the second ectopic pregnancy in the tube on the opposite side, 3 had it in the tube on the same side and one had a cervical pregnancy. Incidentally, another 3 patients had an ectopic pregnancy after postpartum sterilisation by Pomeroy's method.

### AGE AND PARITY

According to Beacham et al (1956), the age group in which ectopic pregnancy was commonest was older among white women than among Negroes. It was older still among the Chinese, 57 per cent of the patients being over 30 years of age.

There were almost 3 times as many nulliparous women in Malkasian's series (121 cases or 37.6 per cent) as in the present series (46 cases or 13.8 per cent). As pelvic infection was one of the important aetiological factors, it might well be that whilst it was relatively more commonly gonococcal in origin in the States, it was usually puerperal or postabortal in Hong Kong. A time interval of 2 years or more between marriage and ectopic pregnancy was found in 85 per cent of the nulliparous patients and one of 2 years or more between the last pregnancy and ectopic pregnancy in 75 per cent of the parous.

TABLE I SYMPTOMS

	Present series	Armstrong et al	Sandmire	Malkasian
Abdominal Pain	324 (97.6%)	96.4%	92.3%	62.7%
Amenorrhoea	318 (96 %)		58 %	
Vaginal Bleeding	261 (78.6%)	87.9%	89 %	60.6%
Vomiting or Nausea	121 (36.4%)			
Fainting	79 (23.8%)	37.8%		
Passage of Tissue Mass	37 (11.1%)			

## SYMPTOMS

The main symptoms are listed and compared with those in other series in Table I in the order of frequency.

Of the 318 cases who had a history of amenorrhoea, the duration was less than 8 weeks in 40.6 per cent and less than 12 weeks in 84.2 per cent.

Abdominal pain was by far the commonest symptom. It was felt over the upper abdomen as well as the lower abdomen in 4.5 per cent of cases and over the lower abdomen only in 93 per cent, bilateral in 84 per cent and unilateral in 9 per cent (in the latter case it was felt on the same side of the lesion in 6.9 per cent and on the opposite side in 2.1 per cent). Abdominal pain was present without vaginal bleeding in 74 cases and vaginal bleeding was present without pain in only 11. Both abdominal pain and vaginal bleeding were present together in 250 cases. Contrary to the teaching of most gynaecological textbooks, the pain had been preceded by vaginal bleed-

ing in 107 cases (42.8 per cent), noticed at the same time as the bleeding in 74 cases (29.6 per cent) and followed by vaginal bleeding in only 69 cases (27.6 per cent).

Shoulder pain was present in only 6 cases.

## PHYSICAL SIGNS

The main physical signs are listed in Table II and are self-explanatory.

Only 4 patients (1.2 per cent) had a temperature higher than 101°F. This was found to be quite useful in differentiating between ectopic pregnancy and pelvic infection.

Shifting dullness was present only occasionally if the amount of blood in the peritoneal cavity was less than 500 ml. but it was almost invariably present when the amount was 2,000 ml. or more. Marked tenderness, extreme guarding of the abdominal wall, gaseous distension and obesity were some of the misleading factors.

TABLE II PHYSICAL SIGNS

Temperature	Above 101°F.	4 ( 1.2%)
	Above 100°F.	27 ( 8.2%)
	Above 99°F.	125 (37.9%)
Systolic B. P.	Below 60 mm. Hg.	10 ( 3 %)
	Below 80 mm. Hg.	42 (12.6%)
	Below 100 mm. Hg.	96 (28.9%)
Pulse Rate	120 or more per minute	43 (12.9%)
	100 or more per minute	136 (40.9%)
Abdominal Examination	Tenderness	283 (85.2%)
	Shifting Dullness	155 (47 %)
	Abdominal Mass	54 (16.4%)
Vaginal Examination	Tenderness in Fornix	283 (85.2%)
	Mass in Fornix	199 (59.9%)
	Tender Cervix	190 (57.2%)
	Enlarged Uterus	134 (40.4%)

## INVESTIGATIONS

One hundred and eighty patients (56.6 per cent) had a haemoglobin level of less than 10 gm. as against 32.5 per cent of cases in Sandmire's series (1959). A pre-existing anaemia might well have been present in most of the patients in the present series. Leucocytosis (w.b.c. count of 10,000 per cu. mm. or more) was found in 94 cases (34.4 per cent) V.D.R.L. was done in 149 patients and found to be positive in 14 (9.4 per cent).

The male frog test was positive in only 33 per cent of cases and then mainly in those who were amenorrhoeic for 8 to 12 weeks.

A positive test would not enable one to differentiate between an ectopic pregnancy and pathological conditions associated with an intrauterine pregnancy (such as abortion, hydatidiform mole, and intestinal colic, acute pyelonephritis, appendicitis, red degeneration of fibromyoma or torsion of ovarian cyst complicating pregnancy). Hence, the male frog test was of very limited value in the differential diagnosis of ectopic pregnancy.

Dilatation and curettage were also of limited value, decidual reaction being found in about 20 per cent of cases. The same reaction might be found in cases of intrauterine pregnancy

TABLE III OPERATIVE FINDINGS

*Side of Ectopic Pregnancy*

	First Tubal Pregnancy	Repeat Tubal Pregnancy	
		Same Tube	Other Tube
Right	144	2	13 (38.2%)
Left	145	1	21 (16.8%)

*Side of Ectopic Pregnancy*

Tubal	251 (75.6%)
Ampullary	59 (including 1 case of twin isthmic pregnancy)
Isthmic	13
Fimbrial	3
Interstitial	2
Tubo-ovarian	3
Ovarian	1
Cervical	1
Primary Abdominal	1

*Conditions of Opposite Tube in Tubal Pregnancy*

"Normal"	150
Chronic Salpingitis	71
Hydrosalpinx	22
Haematosalpinx	18
Chronic Salpingo-oophoritis	13
Tubo-ovarian Cyst	6
Tubal Pregnancy	1
Tube Removed	34
Tube Partially Resected	3
Accessory Ostium	1
Not Stated	6

*Minimal Amount of Blood Loss*

Nil or Not Stated	26 ( 7.8%)
Less than 1,000 ml.	161 (48.5%)
1,000 ml. —	98 (29.5%)
2,000 ml. —	38 (11.4%)
3,000 ml. —	6 ( 1.8%)
4,000 ml. —	3 ( 0.9%)

when the ovum might be so small that no chorionic villi were present in the curetting. The examination under anaesthesia done before the dilatation and curettage, however, was often found to be of considerable value in that it revealed or confirmed, in quite a number of cases, the presence of a mass in the pelvis which could not be definitely palpated before the patient was put under anaesthesia.

Culdocentesis or colpotomy was found to be rarely necessary but was of definite value in doubtful cases. Culdoscopy has not been resorted to in this series. There is no doubt, however, that it is of value in the early diagnosis of intact ectopic pregnancy.

### OPERATIVE FINDINGS

Some of the operative findings are listed in Table III.

Although it was said that tubal pregnancy was more often right sided and that this was possibly explained by the proximity of the appendix (Jeffcoate, 1962), it occurred with the same frequency on both sides in this series. It was, however, more often left-sided among these who had a previous tubal pregnancy. This seemed to suggest that a right tubal pregnancy was more likely to be followed by another ectopic pregnancy.

The ampullary portion of the tube was by far the commonest site, and the isthmic part the next common.

It was obvious from a consideration of the condition of the opposite tube that pelvic inflammatory disease was the commonest cause of ectopic pregnancy in Hong Kong. The incidence of abnormal tubes must be higher, and probably considerably so, than that shown in the table. Some of those tubes might well be diseased or blocked internally and microscopically.

As a variable amount of blood was inevitably left behind, the amount of blood loss represented the minimal amount of blood in the peritoneal cavity. And yet 43.6 per cent of cases lost 1,000 ml. or more and 14.1 per cent 2,000 ml. or more, the record figures being 4,250 ml., 4,750 ml. and 6,750 ml.

An attempt is made to see if there is any correlation between the amount of blood loss

and blood pressure, pulse rate, haemoglobin level and site of ectopic pregnancy.

A systolic blood pressure of less than 100 mm. Hg. was usually associated with a large amount of blood loss; and the lower the blood pressure, the larger was the amount. This was to be expected. What was even more noteworthy was the fact that the systolic blood pressure was less than 80 mm. Hg. in 6 patients who had lost less than 1,000 ml. and that it was 120 mm. Hg. or higher in 5 who had lost 2,000 ml. or more.

A pulse rate of 120 per minute or more was also associated with a large amount of blood loss. And again what was noteworthy was the fact that it was 120 per minute or more in 3 patients who had lost less than 1,000 ml. and that it was less than 80 per minute in 2 who had lost 2,000 ml. or more. These, however, were not so surprising if it was remembered that the general condition of the patient, the blood pressure and the pulse rate did not depend on the amount of blood loss alone but also on the rate of blood loss and the previous haemoglobin level of the patient.

Love (1962) had recently drawn attention to the unreliability of the pulse rate and blood pressure as an indication of the degree of shock present and to the fact that the pulse rate was often normal or even slower than normal in cases of abruptio placentae. The pulse rate should accelerate when the blood pressure fell. This, however, did not take place in 3 of his cases. There were also 3 such cases in the present series. From an analysis of 41 patients with a systolic blood pressure of less than 80 mm. Hg. (one patient was admitted with no blood pressure and pulse and was therefore not included), it was shown that the average amount of blood loss in the 3 patients who had a pulse rate of less than 80 per minute was 1,990 ml. and that the average amount of blood loss in the other 38 patients who had compensatory tachycardia of varying degrees was 1,691 ml. The probability value *P* is found to be less than 0.01 and the difference is therefore significant.

There was hardly any significant correlation between the haemoglobin level and the amount of blood loss. This was not surprising as it depended even more on the previous level as well as the extent of haemodilution.

As was expected, isthmic pregnancy was associated with a large amount of blood loss.

## TREATMENT

Treatment consisted essentially of control of bleeding and replacement of blood loss. Both of them were equally important. Laparotomy would have to be done to stop internal bleeding. It was even more urgently required in an acute case in Hong Kong for 2 purposes: to stop the bleeding as well as to obtain blood for autotransfusion. As there was usually insufficient blood in the blood-bank, most of the blood used for replacement would have to come from the peritoneal cavity of the patient. The usual procedure of treatment of an acute case of ectopic pregnancy was as follows. A cut-down was performed and blood taken for cross-matching. If the blood pressure was 80 mm. Hg. or more, the patient was anaesthetised and laparotomy done as soon as blood was running into the vein. If the systolic blood pressure was less than 80 mm. Hg., an attempt was made to raise it with whatever blood-bank blood available to 80 mm. Hg. and laparotomy under general anaesthesia was then proceeded forthwith. If there was no or insufficient blood-bank blood, laparotomy was done under local anaesthesia and auto-blood transfusion started immediately. Unilateral salpingectomy was by far the commonest procedure, being performed in 220 cases (66.3 per cent).

## CONCLUSION

1. There is an increase in incidence of ectopic pregnancy in Hong Kong as well as in other places in the world. This may well be due to the effect of antibiotics in maintaining fertility in cases of pelvic infection that formerly would have become sterile due to complete tubal occlusion.

2. The diagnosis of ectopic pregnancy in the majority of cases depends on (a) the awareness of the possibility of the condition and (b) a careful consideration of the history and physical findings. The common symptoms and physical signs have been presented and briefly discussed.

3. As expected, a pulse rate of 120 per minute or over or a blood pressure of less than 100 mm. Hg. is associated with a large amount of blood loss. It is also shown in this paper that a slow pulse rate seen in conjunction with a low blood pressure is a sign of bad omen.

4. The safe and life-saving measure of autotransfusion is emphasized. No side effect has been encountered in this series. The response of the patient is found to be satisfactory, gratifying and often times most dramatic.

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