

THE OUTCOME OF PREGNANCY FOLLOWING ABDOMINAL SURGERY DURING PREGNANCY

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SUMMARY

The literature about surgery during pregnancy is rather limited. The diagnostic and clinical problems of acute surgical conditions during pregnancy rise due to two main reasons: the physiological changes which the patient undergoes, as well as the presence of an "additional patient", namely the fetus, who can be affected through a mother illness or a surgical intervention.

This paper deals only with acute surgical conditions, which stem due to gastrointestinal pathology and other internal abdominal pathology.

The frequency of surgical or gynecological problems which need of elective or emergency operation, was found to be close to the rates found in the articles surveyed - 0.07%.

Within a period of 12 years, 20 emergency operations and 13 elective ones were performed in the surgery and gynecology departments.

20 acute abdomen cases: the findings during the operation were in 7 (35%) of acute appendicitis, in 10 (50%) of necrotic ovarian cyst due to acute torsion, and in only one case (5%) of necrotic myoma. In the remaining 2 cases (10%) no real acute findings which necessitated surgical intervention were found.

The indication for operation in 13 elective cases was a pelvic mass of unknown origin and of substantial size. In one of the above mentioned cases obstructive jaundice because of cholelithiasis was found.

Of the 11 women operated in the *first* trimester of pregnancy, two aborted within two weeks after the day of the operation, while in one of the two cases, a threatened abortion developed several weeks *prior* to the operation itself.

Those who were operated while in their *second* trimester (19 women) gave birth in the proper date (38-42 weeks), and of the 3 women who were operated while in their *third* trimester,

Acute abdomen in pregnancy is very difficult to diagnose because of the difference in the clinical picture. Obstetricians and surgeons hesitate in performing surgical procedures. This hesitation is due to the presumption that the pregnancy might become complicated during surgery, and that surgery itself and the post operative situation might endanger both the pregnancy and the fetus.

Danger of abortion as a complication due to surgical intervention in a pregnant woman arises especially in cases where surgery is performed on internal sex organs or organs close to them.

The main purpose in this work is to answer the question whether surgery on these organs really endangers the pregnancy.

Most of the cases reviewed in this series, deal with surgery on sex organs such as the uterus and ovaries and the appendix which is close by.

MATERIAL AND METHODS

The cases analyzed in this work are from the surgical register books of the gynecology department and the surgical departments of the Tel Hashomer Hospital during the years 1965-1976.

The work includes 33 women admitted to that hospital during these years. The age in this

one gave an early birth during the 32nd week of pregnancy.

As to the type of labor, 26 women had spontaneous vaginal delivery, two were delivered with vacuum assistance. Only one woman required pitocin induction while two others underwent cesarean section.

In all the above pregnancies, healthy babies were born without any anomaly, with the exception of one case of hypospadias (3.3%).

As a conclusion, we can say that no higher frequency of the normal level of abortions was found (6%), as well as no higher frequency of premature deliveries.

The only finding of ovarian malignancy which was found during operation of one of the pregnant women, and the lack of post-operative complications in most cases, justifies the conclusion that in any case of existence of findings that necessitate emergency or elective intervention during pregnancy we should operate without any doubt as to the outcome of the pregnancy itself.

group was between 20 and 30 years and all underwent general anesthesia. The greater part of the cases, 24, were taken from the surgical register book of the Dept. of Gynecology and the smaller part, 9 cases, from the medical summary and surgical reports of the Surgery Departments.

RESULTS

20 out of the 33 examined cases were emergency operations (60%) and 13 were elective (40%). The type of surgery performed is shown in table 1.

Table 1. — *Type of surgery performed.*

1. Salpingoophorectomy (right or left)	12
2. Ovarian cyst removal	3
3. Oophorectomy (right or left)	3
4. Uterine myomectomy	3
5. Appendicectomy	7
6. Cholecystectomy	1
7. Explorative laparotomy *	4
Total	33

* Three out of four explorative laparotomies were performed due to an abdominal tumour; at the laparotomy single or multiple uterine myomas were found, and it was decided to do nothing. With the fourth case a single small lutein cyst was found and left.

The reasons for the acute abdomen in 20 cases operated were found to be as follows:

- 7 cases (35%) of acute appendicitis.
- 10 cases (50%) of necrotic ovary or of ovarian cyst due to torsion.
- 1 case of necrotic myoma.
- In the two remaining cases there were no findings explaining the symptoms of acute abdomen.

The reason for surgery of the 13 elective cases was a tumour of considerable size and of unknown origin:

In the 7 cases of acute appendicitis prior to surgery there was a characteristic clinical picture which was expressed by pain in the upper middle abdomen or

epigastrium which later on centralized in the lower right abdomen. In all cases the pain was accompanied by nausea, vomiting and loss of appetite. The result of the clinical examination in all the cases suggested the existence of peritonitis. In three patients temperature was found to be somewhat elevated (37.8° - 37.9°C). Three other patients were with subfebrile state (37.2° - 37.4°C), and in one patient there was normal temperature.

It should be pointed out that in 6 out of 7 patients leukocytosis was not found (the leukocyte count was less than 10,000) and in one single case where perforated necrotic appendicitis was found, the leukocyte count reached 22,100 with left deviation.

It can be said that in all 7 cases the diagnosis was made mainly by clinical examination almost without the help of laboratory findings. The histology revealed acute appendicitis in 6 cases, and one case of normal appendix with oxyuris.

Out of the 6 cases where single or multiple myoma in a pregnant uterus was found, only one case showed a picture of acute abdomen necessitating emergency explorative laparotomy (pain, expanded abdomen, tenderness, rebound, slight muscle resistance, tachycardia and cold perspiration); laboratory studies showed no pathological findings. At laparotomy a necrotizing myoma due to torsion was found. In the rest of the cases, the indication for surgery was a pelvic mass of unknown origin – while the differential diagnosis was of an ovarian cyst. The tumour was discovered accidentally by the patient herself or by the general practitioner. The pathological findings were of necrotizing myomas in one case and in two cases of benign myomas.

In 19 cases the finding at operation was of ovarian cysts with or without torsion. In 12 cases (66%) there was a picture of acute abdomen which included acute abdominal pain in the right or left lower abdomen. The pains appeared sud-

denly and were accompanied by nausea and vomiting. Clinical examination showed considerable tenderness in the lower right or left abdomen, muscle resistance and rebound. In all the cases except for one, upon gynecological examination a pelvic tumour was palpable, sensitive to palpation.

The laboratory studies showed no significant finding, other than 2 cases in which leukocyte count in the blood rose above 10,000 and the blood sedimentation rate was accelerated. In other 7 cases (34%) pelvic mass was accidentally discovered during a routine examination in pregnancy or was discovered upon examination after complaints of abdominal pains.

The pathological findings are shown in table 2.

Table 2. — *Histological diagnosis of the excised ovarian tumours.*

Path. diagnosis	No. of cases	% of cases
1. Simple cyst	6	33.3
2. Dermoid cyst	3	16.6
3. Mucinous cystadenoma	2	11.2
4. Serous cystadenoma	2	11.2
5. Necrotic ovarian cyst	2	11.2
6. Corpus luteum cyst	1	5.5
7. Mucinous cystadenocarcinoma	1	5.5
8. Paraovarian cyst	1	5.5
Total	18	100.0

The single case of cholecystectomy was performed during the 23rd week of pregnancy and the histology report showed acute cholecystitis, stones in the gallbladder and bile ducts. This case was accompanied with severe obstructive jaundice which did not pass over after 3 weeks of conservative treatment before the operation.

In the single case of mucinous cystadenocarcinoma, no capsular penetration was seen and no metastasis was found.

23 out of 33 patients were treated by hydroxyprogesterone caproate which was given by one injection of 500 mg intramuscularly post-operatively and afterwards two or three weekly injections of 500 mg.

Table 3 shows the outcome of pregnancies according to the age of pregnancy at surgery. All the pregnancies except for two, ended successfully and healthy babies were born with normal Apgar. Two cases ended in abortion, and in one of them uterine bleeding had started before the operation.

Table 3. — *Comparison between age of pregnancy at operation and outcome.*

Age of pregnancy at operation	No. of cases	Abortions	Deliveries		
			Total	Premat.	Term.
1st trimester	11	2* (18%)	9	—	9
2nd trimester	19	—	19	—	19
3rd trimester	3	—	3	1**	2
Total	33	2	31	1	30

* One abortion was 5 days after appendectomy, the second abortion 2 weeks following adnexectomy.

** 2 weeks after appendectomy.

Most of the pregnancies ended in spontaneous vaginal deliveries (table 4) and only in two, elective cesarean sections were performed.

Table 4. — *Mode of delivery of 31 cases.*

Vaginal spontaneous delivery	26
Vacuum extraction	2
Elective cesarean section	2*
Medical induction of labor	1**
Total	31

* Post myomectomy (1).
Previous cesarean section (1).

** Due to diabetes mellitus and previous stillbirth.

In all the above deliveries, healthy babies were born without any anomaly with the exception of one case of hypospadias (3.3%).

Post operative complications are shown in table 5.

Table 5. — *Post-operative complications.*

Eventration	1
Seroma in wound	1
Superficial thrombophlebitis	1
Paralitic ileus	2
Slow wound healing	1 *
Total	6

* A paralitic ileus was noted also in this case.

DISCUSSION

During a period of 12 years close to 45,000 women delivered in the Dept. of Obstetrics of the Sheba Medical Center of Tel-Hashomer. 33 cases (0.07%) in this group showed surgical or gynecological problems necessitating elective or emergency surgery during pregnancy.

Child and Douglas ⁽¹⁾ state an incidence of 0.3% and Hamlin ⁽²⁾ of 0.1%.

It is possible that one of the main reasons for the general low incidence in this work is the fact that, in a great deal of the medical records and surgery reports in cases operated in the surgery dept., the diagnosis of pregnancy was not listed together with the main diagnosis.

While examining the effect of abdominal surgery on the outcome of pregnancy according to age of pregnancy, the following surgical findings were noted:

— Two out of the 11 women operated during the first trimester of pregnancy aborted after a period of up to two weeks from the date of surgery. In one of the women a threatened abortion developed prior to the operation itself.

— All the women operated during the second trimester of pregnancy, 19 women, delivered at term (38-42 weeks).

— Only one out of the 3 women operated during the third trimester of pregnancy, had premature delivery at the 32nd week of pregnancy.

According to the literature 10%-15% of all pregnancies ended with abortions, whereas in women in the age group of 30-40 the abortion is up to 20% ⁽³⁾.

In this work, two out of the 33 women operated during pregnancy aborted, but in one case the abortion perhaps started before the surgery; so if we take into consideration 2 abortions, we can state that the abortion rate was about 6%; this rate, which is lower than the rate of spontaneous abortions stated above, is probably a result of the age of most of the women included in this study, which is under 30 years, and also due to the small number of cases. This abortion rate is close to that reported in the work of Lackmer and Tulsy ⁽⁴⁾; it should be stated also that in these works the number of cases is not large.

Abortion, as a complication due to a surgical intervention performed in pregnant women is especially frequent in operations performed on internal sex organs or organs close by.

Different explanations to the mechanism of abortions are presented in the literature: direct stimulation of the uterus during surgery ⁽⁵⁾, excision of ovarian mass together with corpus luteum of pregnancy ^(5, 6).

Amongst many surgeons there seems to be a tendency to prevent abdominal surgery before the 16th week of pregnancy due to fear of abortions as well as the great importance of the corpus luteum of pregnancy.

Booth ⁽⁷⁾ concludes that the human is included in the same group of mammals where the corpus luteum is not necessary to the existence of pregnancy. According to Booth, the most important cause of abortion following oophorectomy during early stages of pregnancy is the uterine trauma during operation.

It should be remembered that about 15% of all the pregnancies ends in abortion before the 14th week of pregnancy and when abortion occurs after surgery,

there is no connection between the surgery and the abortion (^{4,7}).

The decision to perform an operation on a pregnant woman must be based on the same criteria as on a non-pregnant one. But if there is a possibility to postpone the operation, it is advisable to do that, after the 14th week of pregnancy, mainly because of the placental function which is in its optimum state of function and nidation in the uterine wall (^{4,7}). The preventive post-operative treatment with progesterone was suggested in those cases in which an oophorectomy is performed, including the corpus luteum (⁸).

Many authors (^{1,9}) suggest to treat with progesterone post-operatively in order to prevent abortions after abdominal surgery. This in spite of the fact that it was proven that progesterone has no effect on the forecast of spontaneous abortions (⁹).

Hill *et al.* (⁸) in their work, summarize their experience with the post-operative progesterone treatment and state that there is no difference between the abortion rate of the treated group and the non-treated group.

Others (^{10,11}) are not convinced whether there is an improvement with the progesterone treatment in the prevention of abortions.

Summarizing of our findings: a low abortion rate after surgical intervention, a low rate of early deliveries, a single finding of ovarian malignancy that was

discovered in one of the pregnant women operated on and no post-operative complications in most of the women.

We can conclude that in every case of acute abdomen in pregnancy as well as in cases of tumour that might be of ovarian origin and malignant, we should not hesitate to perform surgery during pregnancy, since the outcome of the pregnancy will not be significantly changed.

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