

# Follow Up of Women after Laparoscopy Versus Laparotomy in Emergency Gynecological Problems

## Follow Up of Women after Laparoscopy Versus Laparotomy in Emergency Gynecological Problems

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### **Abstract**

**Background:** Lifesaving is not the only aim of surgery for acute abdomen but preservation of infertility is the main goal of each gynecological or pelvic surgery in reproductive age female. Infertility may result from these surgeries because of adhesions, tubal damage or blockage and its effects on ovarian reserve. The benefits of laparoscopy in the last years were recognized because of short recovery and hospital stay with minimal scars. Follow up studies of laparoscopy or laparotomy were for short period or few months. So the aims of this study are to recognize the differences between laparotomy and laparoscopy and their effect on ovarian reserve and infertility and to clarify the benefit of laparoscopy versus ultrasound in diagnosis of acute abdomen due to gynecological problems.

**Patients and Methods:** A longitudinal prospective study was done at teaching center and approved by scientific committee of the college of medicine. Two hundred seventeen patients had acute abdomen during study period and only (98) patients were excluded from the study according to its exclusion criteria. The remaining (119) patients were enrolled in the study. (57) patients were enrolled in laparoscopic group or group (1) and (62) patients in laparotomy group or group (2). Full history, general, abdominal, pelvic examinations and basic investigations were done to all patients. Vaginal and abdominal ultrasound (2D) examinations were done to each patient before operation and after 1,3 months and 1 year during the period of follow up. Chest x-ray, abdominal x-ray, MRI and CT scan were done to the patients on need. After stabilization of patient, surgery was done to her. Follow up of patients was for to 5 years to monitor below main outcomes measures.

**Main outcomes measures:** Operation time, recovery period, usage of injectable analgesia, drop in hemoglobin level, W.B.C count changes, antral follicles count (AFC) changes and ovarian volume changes.

**Results:** different pathological problems were found in relation to gynecological acute abdomen in reproductive age women, such as different ovarian cyst, ectopic pregnancy, appendicitis, intestinal obstruction and acute cholecystitis. No significant changes were found in parameters of ovarian reserve in both surgeries.

**Conclusions:** multiple pathologies can cause acute abdomen due to gynecological problems in relation to pelvis at reproductive age and different factors would affect the outcomes of laparoscopy and laparotomy groups.

**Keywords:** acute abdomen, laparoscopy, laparotomy.

### **Introduction**

Women of all ages look to their gynecologist to diagnose, treat or triage any problem that arise within the pelvis. A pain or mass in the pelvis may arise primarily from the reproductive organs

but it may arise from the urinary tract, the gastrointestinal tract, the retroperitoneal space, or the bony pelvis. Double lesions are not uncommon. So the gynecologist surgeon should be aware about preoperative diagnosis and to manage unfamiliar diseases intra-operatively. Acute abdomen is one of

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surgical complaints of patients attending out-patient or emergency unit of the hospital which is sudden, severe pain of unclear etiology that less than 24 hours induration. All the abdomen, pelvis and retroperitoneal organs can be the cause of this pain due to inflammation, perforation, obstruction, infarction or rupture but it might cause by acute medical problems, so urgent and specific diagnosis is required and some causes may need surgical treatment. (1,2)

The differential diagnosis of acute abdomen includes but not are limited to:-

Acute appendicitis, acute peptic ulcer, acute cholecystitis, acute pancreatitis, acute intestinal ischemia, diabetic ketoacidosis, acute diverticulitis, acute peritonitis, acute ureteric colic, bowel volvulus, acute pyelonephritis, adrenal arises, abdominal aortic aneurysm, hemo-peritoneum, ruptured spleen and kidney stone. (1)

Gynecological problems that cause acute abdomen are:- ectopic pregnancy, adnexal torsion, hemorrhagic functional ovarian cyst, pelvic inflammatory diseases and tubo-ovarian abscess. (3)

Obstetrical conditions that cause acute abdomen:-

1. Physiological effect of pregnancy such as: round ligament pain and sever uterine torsion.
2. Pathological conditions related to pregnancy either related to uterus such as abortion, leiomyoma uterus, placental abruption, chorioamnionitis and uterine rupture.

3. Pathological conditions unrelated to pregnancy such as fatty liver of pregnancy.

Evaluation of female patient presenting with acute abdomen must always consider surgical and gynecological disorders in a pregnant or non-pregnant state. Laparoscopy has a major impact on surgical approach in gynecology. (3)

Most cases of acute abdomen can now be approached laparoscopically, certain conditions however still require the traditional laparotomy. Preservation of reproductive capability has a major impact on the well-being of women. (3)

Laparoscopy is a revolution in surgery in late 19th and 20th century. Its origin related to Talmud of Babylon. Although the term endoscopein is attributed to Avicenna (980-1037 AD). The procedure was first practiced by Arab Albulasim (912-1013 AD). He was Bozzine who gave birth to modern endoscopes in 1805, when he developed the first "light cable".(4)

After many years of development, it was named by Jacobeus as Laparoscopy at 1914. During this long journey of development and modification many things should be realized first:- its early steps of examination by laparoscopy start from vagina, urethra, pelvis and nostrils. (4) So it should take a large space in the management of gynecological operations with professional training of gynecologist. The second thing : it faced many skepticisms and criticism especially from those who not well trained. So many studies were conducted to

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diagnose the advantage, complications, difficulties in this new surgery which in the coming years, surgery will take on new dimension with changing term of laparoscopy in pelvic surgery to minimally invasive surgery. (4)The aims of the study are: to recognize the differences between laparotomy and laparoscopy and their effect on ovarian reserve and fertility and to clarify the benefit of laparoscopy versus ultrasound in diagnosis of acute abdomen due to gynecological problems.

### **Patients and Methods**

A prospective longitudinal study was conducted in the period between November 2007 to October 2013 at obstetrics and gynecology department in Tikrit Teaching Hospital. It was approved by Ethics committee in the college of medicine. Informed consent was taken from each patient. Each female in reproductive age and below 40 years who had acute abdomen was enrolled in the study. The pain period was between 6 hours to 72 hours.

All patients had full history, full clinical general, abdominal and vaginal examinations. Routine investigations such as complete blood picture, blood sugar, liver function tests, renal function tests, clotting system tests and chest x-ray were done to them. Abdominal and pelvic x-ray were done as needed.

All patients had vaginal and abdominal ultrasound. Some patients had CT scan and MRI as needed. Exclusion criteria for both surgeries include:-

- Pregnancy.
- Malignancies.

- Contraindication to laparoscopy then we did laparotomy.
- Bilateral lesions.
- Infertility for any cause.
- Smoking.
- Any associated medical diseases.
- Previous pelvic surgery.
- Contraception use 3 month before surgery.
- Contraception use directly after surgery.

Counseling of patients was done to choose either laparotomy or laparoscopy approach and if any patient refused laparoscopy would be include in laparotomy group. Patients were classified in three groups, group (1) laparotomy group, group (2) laparoscopy group and group (3) converting group(from laparoscopy to laparotomy).

Laparoscopy was done under general anesthesia. Verses needle was used to pre-insufflate the peritoneal cavity with CO<sub>2</sub> through small transverse umbilical incision. After pneumoperitoneum ,10mm torcher and cannula were used to enter the primary port for introduction of camera and light source. Inspection of pelvic and abdominal cavity was done in each laparoscopy. The CO<sub>2</sub> pressure was between 12-15 mmHg. Secondary or ancillary ports (5m -10m) were done usually by 2cm below the umbilical and 10cm laterally to avoid epigastric artery. Supra pubic insertion of secondary port might be needed in some cases. The bladder was emptied. Any ancillary port should be under direct vision. Peritoneal wash was done to all patients without hemo-peritoneum and sent for histopathology. Ovarian cyst is either removed intact if its small or dermoid

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and chocolate cyst or by aspiration and excision of the cyst, if it's very large. Any bleeding points in both surgeries, minimal amount of electro- cautery or suturing were used. Oophorectomy or salpingo-oophorectomy were done when there is a large lesion with severe damage to the ovary or the tube and no healthy ovarian tissue can be left. Biopsy was taken from ovary in any case with suspicion of malignancy. Ectopic pregnancy is either treated with salpingectomy if it ruptured or by milking of the tube in the case of tubal abortion. Interstitial or cornual ectopic pregnancy was treated by laparotomy. (4,5)

All patients with acute gynecological problems were put in lithotomy position and sound or cannula which were used to lift the uterus and its related structures to visualize pelvic cavity. When appendectomy was decided, the position will be Trendelenburg's position with tilting the table toward the operator by 10–20°c. Suction-irrigation system was used in laparoscopy. (4,5)

Laparotomy was done by simple mini laparotomy through transverse incision even in appendectomy for cosmetic purposes in female and when another laparotomy is needed the operation (cesarean section) will be through the same incision. Drain will be used if its needed and indicated in both surgeries. Phone number of each patient was taken to follow up her after 1 month ,3 months,12 months and through 5 years .

Vaginal ultrasound (2D) at second or third day of cycle was done to measure antral follicle count (AFC) and

ovarian volume. It was measured by applying the formula for an ellipsoid ( $D1 \times D2 \times D3 \times 0.523$ ). The dimension of ovaries is calculated by measuring in three perpendicular directions. (6)

During follow up period pregnancy rate , time of ovarian cyst recurrence ,ectopic pregnancy recurrence in the same tube (if not removed ) or contralateral tube ,time of its recurrence and adhesions (when second laparotomy was done to the patient especially cesarean section) were recorded.

Primary outcomes are:-Pregnancy rate, AFC and ovarian volume after operation.

Secondary outcomes are:-Time of surgery, febrile illness, number of injectable analgesia , hospital stay, hemoglobin level differences, W.B.C.C level differences and complications.

Statistical analysis and data management:

The Statistical Package for Social Sciences (SPSS, version 18) was used for data entry and analysis. Chi ( $\chi^2$ ) square test of association was used to compare proportions of different factors among cases with the same proportions among controls. ANOVA was used to compare means of numerical variables. P value of  $\leq 0.05$  was regarded as statistically significant.

## Results

Two hundred seventeen women with acute abdomen were enrolled in the study and (97) were excluded from the study according to exclusion criteria of this study .The remaining (119) patients

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with acute abdomen due to gynecological problems were enrolled in the study in three groups(1,2 and 3).Figure (1) shows the flow chart of women distribution in the study and some of them were not complete the study because they lost to follow up .

General characteristics of the patients in three groups such as age, residence ,job, obstetrical history and body mass index (BMI) are shown in table (1).

Figure (2) shows the differences between hemoglobin before and after operations in three groups .The drop in its level was high in group(2) and (3).There was no significant differences between three groups before operations although the group (3) had the lowest Hb level because the complicated cases were included in this group and differences of postoperative Hb level were significant from preoperative level collectively .

Changes in W.B.C.C. level are shown in Figure (3) and the post-operative reduction of W.B.C.C . is more in group (1) and less change in group (3) which it included most complicated cases. This result was statistically not significant between all groups post operatively.

Other differences such as operation time, number of injectable analgesia, hospital stay between three groups are shown in table (2).All of them are lowest in group(1) than group(2) and group (3).

The definitive diagnosis of acute abdomen pathology is shown in table (3). Benign ovarian cysts especially functional type are more common cause

of acute abdominal pain due to torsion ,rupture and hemorrhage.

Operations types were done in the study according to the diagnosis in three groups as show in figure (3).

The post-operative complications (early and remote) and recurrence of ovarian cyst occurrence and ectopic pregnancy in three groups through 5 years of follow up ( the study period ) are shown in table (4) .Some patients got pregnancy or lost to follow up so table (4) shows the occurrence of complications in the follow up period .Adhesions was diagnosed when another laparotomy for cesarean section or any pathology that need operation.

Figure (4) and (5) show the antral follicular count (AFC) and ovarian volume after 1,3 and 12 months of follow up period and they show no significant changes of both for three types of operations in relation to ovarian cystectomy, ectopic pregnancy, appendectomy for ipsilateral lesions that occurred in the study groups. There is no any changes for both AFC and ovarian volume in all groups regarding adhesiolysis ,intestinal obstructions and cholecystectomy operations.

Pregnancy rate after different operations in the study through the follow up period is shown in table (5) and its high for group (1) .This result was statistically not significant.

Table(5) pregnancy rate during all follow up period of the study among three groups. Some patients became pregnant and lost to follow up after that. Table (6)shows the effectiveness of ultrasound as diagnostic modality in acute abdomen. The accuracy is very

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high but the sensitivity is very low regarding diagnosis of acute abdomen in gynecological problems.

### **Discussion**

Acute complains referable to the abdomen are common presentation in surgical emergency departments. Abdominal pain is the leading symptoms in this context. Acute abdomen is any severe abrupt onset pain less than 7 days. Some of the conditions that cause abdominal pain prove to be self-limiting and benign, whereas others are potentially life-threatening. (7)

Female evaluation presents with acute abdomen must always consider surgical and gynecological disorders in a pregnant and non-pregnant state. (3) A correct diagnosis is crucial because of the various diseases that may be responsible for the same symptoms in order to plan the appropriate procedures or to avoid unnecessary laparotomies. (8)

After full history and examination during hospitalization and active clinical observation may not reach the diagnosis of acute abdomen. The traditional management to wait and see includes repeated clinical examinations, radiological investigations and different opinions. A delay in diagnosis may increase morbidity, hospitalization, and other complications such as infertility on the other hand laparotomy may be unnecessary with its complications. (9)

Noninvasive diagnostic procedures are expensive and not always conclusive and available. Laparoscopy is the only minimally invasive technique to simultaneously allow diagnosis and sometimes

treatment. (8) Aulestia (2003) found that the precise diagnosis at laparoscopy was different from the preoperative diagnosis by ultrasound in 54.5% of patients, the diagnosis time was short, the laparoscopy offers surgery at the same time with minimal surgical time, hospital stay, complications and cosmetic scars. (10)

The accuracy of laparoscopy is very high. Because it allows exploration of the abdominal cavity and identification of concomitant disease and appendectomy may be done even if it is normal because 24.6% of patients with normal looking appendix have appendicitis in histopathological examination, Agresta (2000). (8)

Ultrasound examination in acute abdomen had high predictive value versus pelvic examination. This may be to the size of ovarian cyst. In some cases it may be small and not recognized by pelvic examinations. (11) But the accuracy of ultrasound is not conclusive as laparoscopy. So laparoscopy should be advocated if routine diagnostic procedures have failed to diagnose acute abdomen, and noninvasive diagnostic aids should be exhausted first. (7)

Laparoscopic complications often occur especially if its operative and they become very high and complex by increasing the complexity of the procedure. The complications may be due to anesthetic related due to CO<sub>2</sub> gas absorption, Trendelenburg position and increasing intra-abdominal pressure. Injuries due to Trocar related, procedures related, instruments related, patient related and positioning related also include in this context and may cause injury to the bowel, blood vessels, bladder, ureters, anterior abdominal wall hematoma and hernia, pulmonary

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atelectasis, pulmonary embolism, cardiac compression, deep venous thrombosis, nerve and musculoskeletal system problems. (5)

Febrile illness, hospital stay, injectable analgesia, hemoglobin level and W.B.C.C level before and after surgery, and complications were low in laparoscopic group in previous studies which agreed with our results. (8, 12)

While Marino (2006) concluded in their study early laparoscopy did not show a clear benefit in women with a cute non-specific abdominal pain, this may be due to the complain of population of study (non-specific). (9)

Laparoscopy may be diagnostic or mostly therapeutic and both terms laparoscopy and infertility were used in gynecology to check tubal patency and treatment of some cases of infertility such as polycystic ovaries (PCOS), adhesions and endometriosis.

New studies concentrate on the effect of therapeutic laparoscopy on ovarian reserve with its relation to the female fertility.

Ovarian reserve refers to women's current supply of eggs, and closely associated with reproductive potential and in practical matter it is a theoretical concept. It refers to the case at which an individual's ovary can be successfully stimulated with fertility drugs. The single most consistent variable effecting ovarian reserve is the women age. This because the women born with all the eggs she will ever have. It appears that the best eggs are ovulated first. (13, 14) It is related to size, number and quality of oocyte within follicles. (15)

Markers which have related to ovarian reserve includes age, sonographic variables such as ovarian volume, antral follicles count, ovarian stromal blood

flow, hormonal parameters (FSH, LH, estradiol E2, Anti-mullerian hormone (AMH), inhibin B levels and the FSH/LH ratio. (16)

One of the ovarian reserve determining factors is antral follicles count which is assessed by transvaginal ultrasound during the follicular phase. (16)

Serum antimullerian hormone (AMH) levels and antral follicles count (AFC) are noninvasive markers of ovarian reserve and reliable tests. Both AFC and total ovarian volume are age related although it may be gradual to AFC. (16-17)

Despite a relatively limited number of studies, AFC may be more effective than ovarian volume for predicting poor ovarian response after ovulation induction. (16) Account of 8-10 is considered as a predictor of a normal response. Different diameters are used to define AFC those measuring 2-6 and 7-10mm. there is no consensus regarding the size of AFs which truly represent ovarian reserve. Fourteen number of AFC is a good predictor of response and 3D ultrasound examination of it has no benefit more than the 2D ultrasound. The ovarian volume would be related to number of AFC. It remains unchanged till the premenopausal period and it is not beneficial more than AFC. It decreases with age as AFC. The Doppler study of ovaries is used also as in ovarian volume measurement but not more effective than AFC. (6)

AFC in each ovary is indicated of ovarian reserve as follows:- 2 or less very low ovarian reserve, 3-6 low ovarian reserve, 7-10 average ovarian reserve, 11-20 above average ovarian reserve. (17) Genetics is the main factor that affects ovarian reserve

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,menopause and early menopause or early ovarian aging but acquired factors can play a role in this context(18) and laparoscopy may be one of these factors.

The present results regarding group (1) and group (2) showed that laparoscopy or laparotomy would not affect significantly ovarian reserve. This may be due to meticulous technique which was used during either surgeries. Also, infertility will depend on many factors especially age of patients and the potency of the both tubes. These results agreed with Darwish (2007) as they concluded that both laparoscopy and laparotomy can achieve fertility preservation following basic microsurgical principles, with significant superiority of laparoscopic approach. High fertility is achieved in young patients if contralateral tube is healthy and adhesions is removed. (19)

Also Farzadi (2012) found that ovarian drilling by electrocoagulation did not affect ovarian reserve. Their study variables were AMH, testosterone, LH and AFC. (15)

Chang (2010) use laparoscopy for different ovarian cyst types and use AMH and ultrasound of ovarian volume to study ovarian reserve and they found it could be reduced after laparoscopic cystectomy; however it could be restored after 3 months post operation in reproductive age and these results agreed with ours. (20)But our results disagree with Zaitoun etal (2013) whom they found that usage of electrocoagulation in laparoscopic ovarian cystectomy versus laparotomy associated with significant reduction of ovarian reserve indicators by using FSH,AMH,AFC, mean ovarian diameters and Doppler ovarian blood flow . (21)

The ovarian reserve decrease in patients with endometriosis ovary treated by laparoscopy. (22)This is not due to laparoscopy itself only but it might be due to the disease itself because many mechanisms implicated in infertility caused by endometriosis. (23)

Ectopic pregnancy can be treated by laparoscopy even in dynamically unstable patients, but there is controversy in results of ovarian reserve .Some studies found that fertility after salpingectomy for ectopic pregnancy by laparoscopy was superior to that of laparotomy and it was equivalent to that after conservative treatment. (24) New studies examined the Doppler blood flow of ovaries, AFC, ovarian volume between ipsilateral ovary near the operated side and the contralateral ovary. they found that above indicators of ovarian reserve would reduce in operated side at short period of assessment.(25)These results disagree with our results. This may related to the usage of extensive cautery or harmonic diathermy that harms ovarian reserve extensively which are not use in our study.

Another operation done by laparoscopy is appendectomy which may increases the chances of tubal adhesions especially the right side but Mueller etal (1986) found that in young women with reproductive age early diagnosis and treatment of appendicitis before rupture decreases tubal infertility because little adhesions and tubal damage may produce by them. (26)

### **Conclusions**

The results of the study showed no significant reduction in ovarian reserve following different pelvic surgeries whither by laparoscopy or

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laparotomy if meticulous technique with minimal amount of electro-cautery are used in both surgeries. Laparoscopy is superior to ultrasound as a definitive diagnostic with therapeutic benefit in management of acute abdominal pain of gynecological etiology.

### Recommendations

Further larger randomized controlled studies with more extended time of follow up and more involved factors which may affect ovarian reserve and fertility during laparoscopy are needed.

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Table (1) general characteristics of patients

Characteristics	Study groups						P value
	Group( 1)		Group( 2)		Group( 3)		
	No.	percent	No.	percent	No.	percent	
<b>Mean age</b>	27.6±8.4		28.95±8.3		28.5±6.8		>0.05
<b>Residence</b>							
urban	16	36.4%	24	38.7%	7	53.8%	>0.05
Rural	28	63.6%	38	61.3%	6	46.2%	
<b>job</b>							
housewife	27	61.4%	46	74.2%	8	61.5%	>0.05
worker	11	25%	11	17.7%	4	30.8%	
student	6	13.6%	5	8.1%	1	7.7%	
<b>BMI*</b>	25.5±4.6		26.6±5.8		26.8±6.4		>0.05
<b>Obstetrical history</b>							
Gravida	2.6±1.5		2.2±1.7		3±1.2		>0.05
Para	2.3±1.03		1.8±1.5		2.5±1.3		>0.05
Abortion	0.63±0.33		0.4±0.1		0.5±0.2		<0.05
<b>Total</b>	44	100%	62	100%	13	100%	

\*BMI= body mass index

Table (2) the operation's related conditions among three groups

Operation details	Study groups						P value
	Group (1)		Group(2)		Group( 3)		
	Mean	<0.05 S	Mean	Std. Deviation	Mean	Std. Deviation	
Injectable analgesia	2.66	<0.05 S	4.15	2.28	5.31	1.32	<0.05
Time of operation(minutes)	58.86	<0.05 S	43.6	18.83	63.15	22.75	<0.05
Hospital stay(hours)	23.95	6.11	44.1	13.71	71.08	28.76	<0.05

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Table (3) the definite diagnosis among patients of the three groups

Definite diagnosis	Study groups						Total	
	Group 1		Group 2		Group 3			
	No.	%	No.	%	No.	%	No.	%
Follicular cyst	8	18.18	6	9.68	0	0	14	11.76
Corpus Leuteal cyst	2	4.55	3	4.84	0	0	5	4.2
Hemorrhagic cyst	11	25	6	9.68	0	0	17	14.29
Dermoid cyst	4	9.09	7	11.29	1	7.69	12	10.08
Benign Mucinous cyst	2	4.55	5	8.06	1	7.69	8	6.72
Benign serous cyst	2	4.55	7	11.29	0	0	9	7.56
Endometriosis	2	4.55	5	8.06	2	15.38	9	7.56
Fibroma	1	2.27	2	3.23	0	0	3	2.52
Thecoma	1	2.27	0	0.00	0	0	1	0.84
T.B of ovary	1	2.27	1	1.61	0	0	2	1.68
Tubo-ovarian abscess	0	0	1	1.61	1	7.69	2	1.68
Para ovarian cyst	1	2.27	1	1.61	0	0	2	1.68
Ovarian mass	0	0	1	1.61	0	0	1	0.84
ectopic pregnancy	4	9.09	9	14.52	3	23.08	16	13.45
Hydrosalpinx	0	0	1	1.61	0	0	1	0.84
adhesion	1	2.27	0	0	2	15.38	3	2.52
Acute cholecystitis	0	0	2	3.23	0	0	2	1.68
Intestinal obstruction	0	0	2	3.23	1	7.69	3	2.52
Appendicitis	4	9.09	3	4.84	2	15.38	9	7.56
Total	44	100	62	100	13	100	119	100

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Table (4) Early and remote complications after three types of operations

Complications		Study group			Total	P value
		Group 1	Group 2	Group 3		
Febrile illness		6	32	8	46	<0.05
Recurrence*		16**	8***	1	25	<0.05
Adhesion	mild	5	11	0	16	Not reliable
	moderate	4	2	0	6	
	sever	0	1	1	2	
Wound infection		2	13	3	18	
Hernia		1	4	1	5	
PID		0	1	0	1	
Intestinal obstruction		0	1	0	1	
Bleeding		1	0	0	1	

\*Recurrences of ovarian cyst and ectopic pregnancy

\*\*Two of them ectopic pregnancy

\*\*\*One of them ectopic pregnancy

\*\*\*\*PID=pelvic inflammatory disease

Table (5) Pregnancy rate among three groups

pregnancy	Study groups				Total
	Group 1	Group 2	Group 3		
positive	No.	24	27	5	56
	%	64.86	58.7	38.46	58.33
negative	No.	13	19	8	40
	%	35.14	41.3	61.54	41.67
Total	No.	37	46	13	96
	%	100	100	100	100

P value > 0.05

### Follow Up of Women after Laparoscopy Versus Laparotomy in Emergency Gynecological Problems

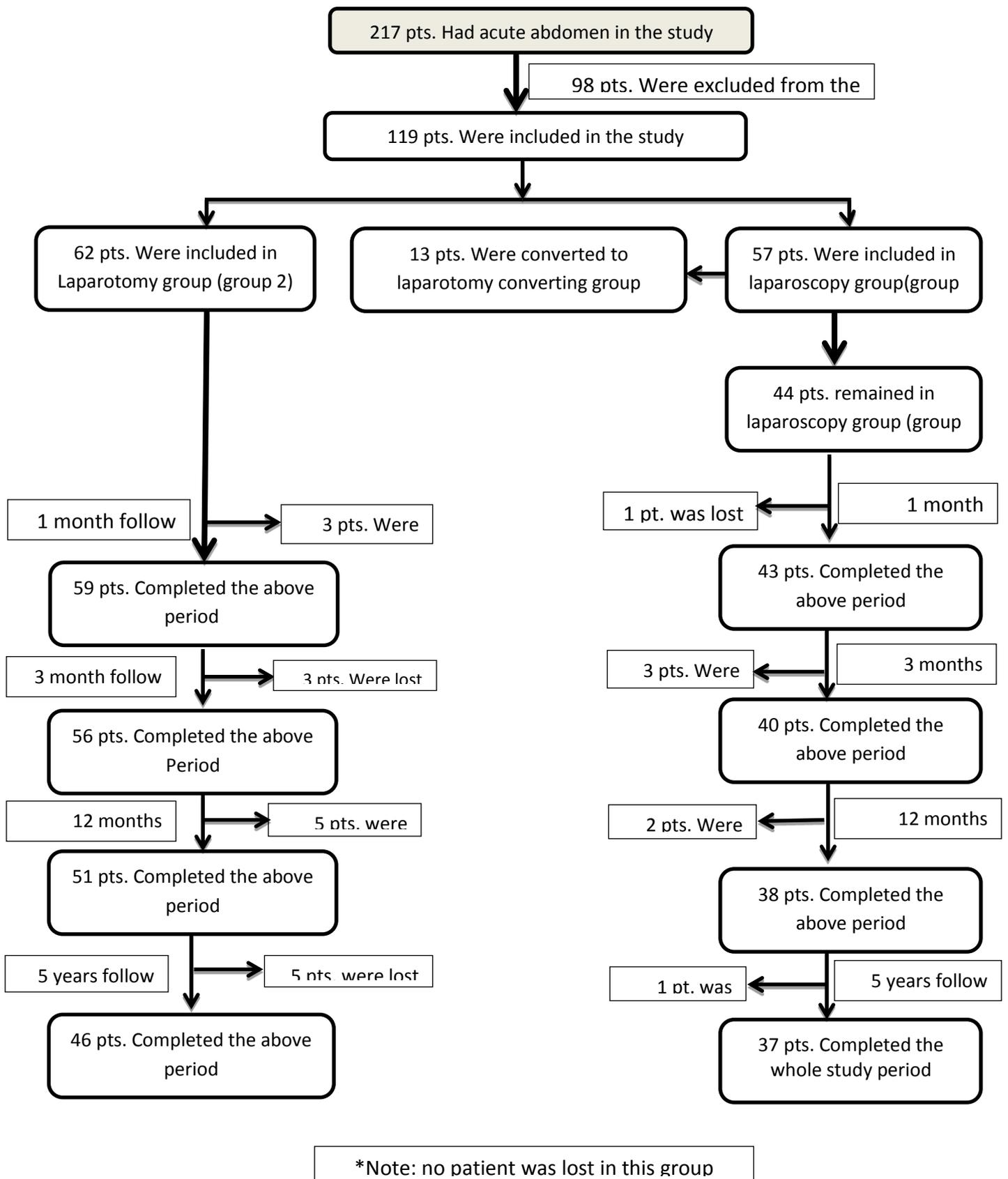
Table (6) the effectiveness of Ultrasound in diagnosis of acute abdomen in gynecological problems

Us finding	Pathology		Sensitivity	Specificity	False Positive	False negative	accuracy	PPV*	NPV**
	Positive	Negative							
Positive	34	3	31	67	33	69	34	92	7
Negative	76	6							

\*PPV=positive predictive value

\*\*NPV=negative predictive value

## Follow Up of Women after Laparoscopy Versus Laparotomy in Emergency Gynecological Problems



**Figure (1): flow chart of patients through the**

## Follow Up of Women after Laparoscopy Versus Laparotomy in Emergency Gynecological Problems

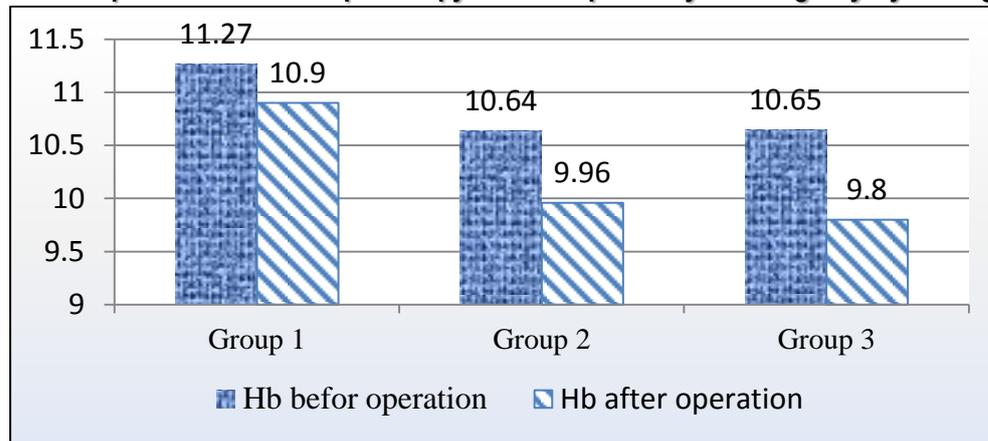


Figure (2) the differences in HB before and after operation among 3 groups

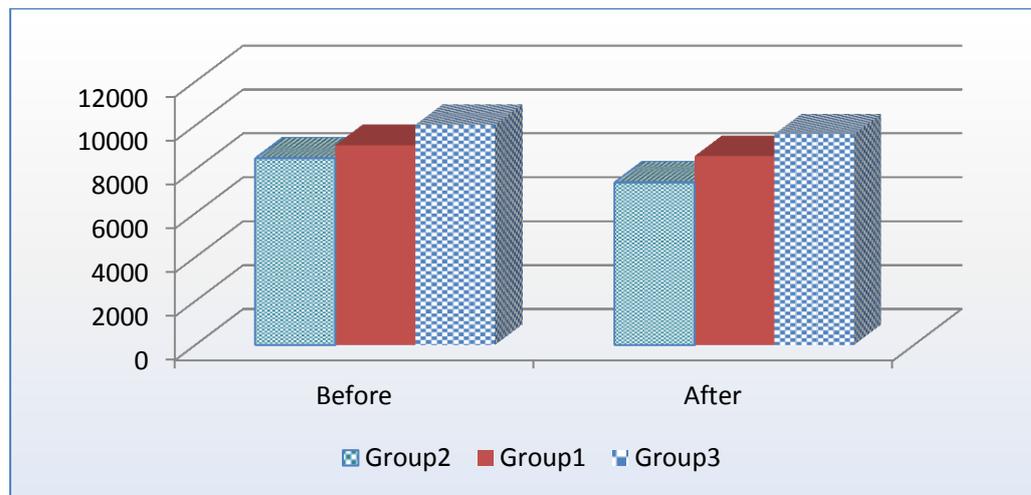
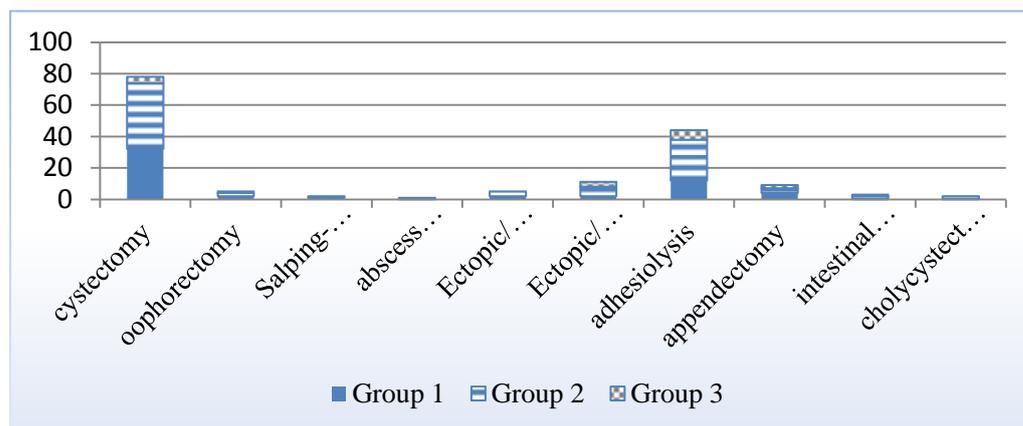


Fig.(3):pre and post-operative W.B.C.C. level in all study groups



\*Ectopic pregnancy operation either milking or salpingectomy

Fig.(3) Operations types in the study

### Follow Up of Women after Laparoscopy Versus Laparotomy in Emergency Gynecological Problems

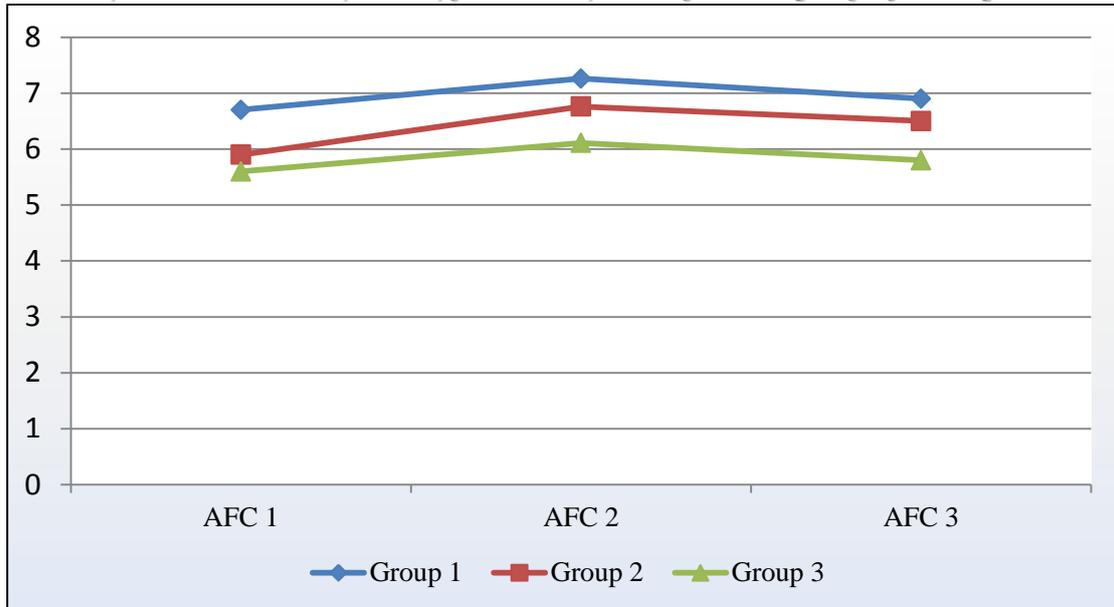


Figure (4) the AFC measurement at 1,3,12 months after postoperative follow up period

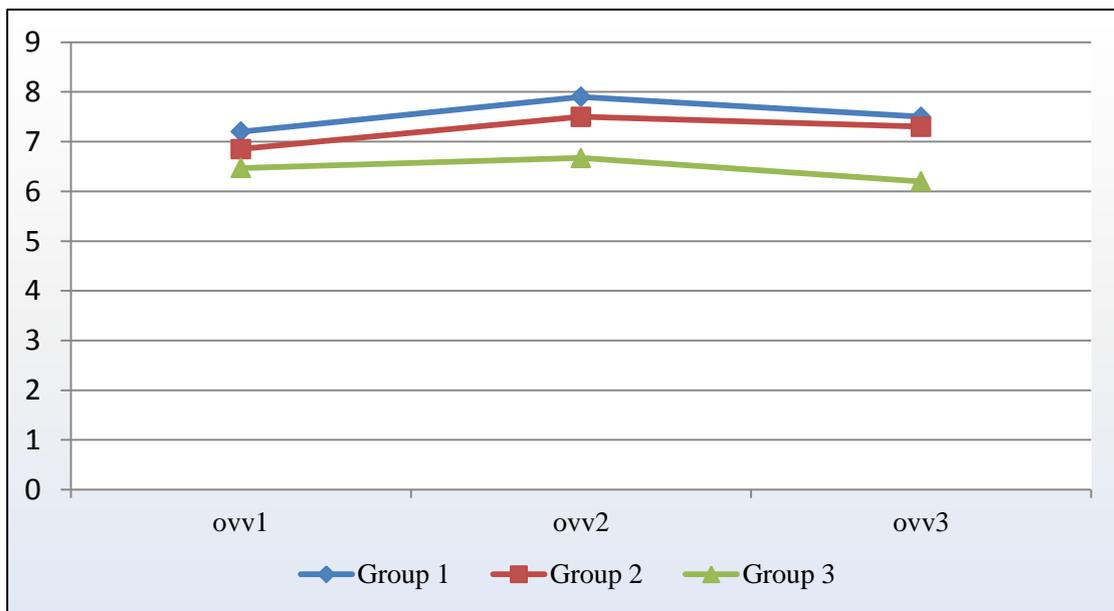


Figure (5) the ovarian volume measurement at 1,3,12 months after post-operative follow up period.