RESULTS

RESULTS

This study was carried on 35 infertile females with clomiphene resistant PCOS selected from the outpatient clinic of Benha University Hospital. Patient characteristics at selection are shown in table (1).

The mean age of the women was [24.8 ± 2.9] years and the duration of infertility was [5.4 ± 2.9] years. All patients had irregular menstruation either amenorrheic (28.6%) or oligomenorrheic (71.4%). Some patients show hirshutism (68.5%), galactorrhea (57.1%) and obesity (88.6%) "BMI ≥ 25 Kg/m^2". All patient had ultrasonographic signs of polycystic ovaries, and were previously treated with clomiphene citrate up to 200 mg/day for 5 days detected by failure of ovulation. Lastly, the majority of PCO cases were presenting with primary infertility (82.9%). Two patients were lost to follow up.

On comparing the ultrasound characters of Rt and Lt ovaries two weeks before laparoscopic drilling, no statistically significant difference was found between both ovaries this is shown in table (2).

On comparing the ultrasound characters of Rt and Lt ovaries one week after laparoscopic drilling, no statistically significant difference was found between both ovaries. This is shown in table (3).

On comparing the ultrasound characters of Rt and Lt ovaries three weeks after laparoscopic drilling. No statistically significant difference was found between both ovaries. This is shown in table (4).

Measurement of the ovarian volume in the Rt ovary revealed that the mean pre-operative volume was [11.98 ± 1.02] cm^3 while one week after surgery it was [14.39 ± 1.22] cm^3. The mean ovarian volume three weeks after surgery [6.98 ± 0.62] was significantly smaller than that before surgery ($P < 0.05$) this is shown in table (5b) as in Fig. (1,2 &3).

Measurement of the stromal volume in the Rt ovary revealed that the mean pre-operative volume was [6.61 ± 1] cm^3. While one week after surgery it was [10.40 ± 1.39] cm^3. The mean stromal volume three weeks after surgery [4.88 ± 0.67] cm^3 was significantly smaller than that before surgery ($P < 0.05$). This is show in (Table 6b).

Counting of the dominent follicles in the Rt ovary revealed that the mean preoperative dominent follicles was [0.86 ± 0.69] follicle. While 1 week after surgery it was [1.34 ± 0.73] follicle. The mean dominent follicles three weeks after surgery [1.57 ± 0.85] follicle, was significantly more than that before surgery ($P < 0.05$). This is shown in (Table 7b).

Measurement of the ovarian volume in the Lt ovary revealed that the mean pre-operative volume was [12.44 ± 1.01] cm^3, while one week after it was [14.63 ± 1.23] cm^3. The mean ovarian volume three weeks after surgery [7.21 ± 0.79] cm^3 was significantly smaller than that before surgery ($P < 0.05$). This is shown in (Table 8b).

Measurement of the stromal volume in the Lt ovary, revealed that the mean pre-operative volume was [6.69 ± 0.98] cm^3, while one week after surgery it was [11.23 ± 1.40] cm^3. The mean stromal volume 3

weeks after surgery [5.05 ± 0.71] cm^3, was significantly smaller than that before surgery ($P < 0.05$) (Table 9b).

Counting of the dominant follicles in the Lt ovary revealed that the **mean pre-operative dominant follicle was [0.94 ± 0.83] follicle.** While one week after surgery it was [1.31 ± 0.76] follicle. The mean dominant follicle three weeks after surgery [1.68 ± 0.93] follicle, was significantly more than that before surgery ($P < 0.05$). This is shown in (Table 10b).

Endometrial thickness shown progressive increase in thickness from [0.79 ± 0.05] cm preoperative to [0.94 ± 0.03] cm one week after surgery. While the mean endometrial thickness three weeks after surgery [1.12 ± 0.08] cm was significantly thicker than that before surgery ($P<0.05$). This is shown in (Table 11b).

Before the surgery there was no ovulation recorded throughout the period of monitored cycles while after the surgery, ovulation was recorded in 21 patient out of 33 patient (63.6%) "Two patient was lost during follow up". This is shown in (Table 12a).

Table (12b) showed the onset of ovulation after laparoscopic drilling. Ovulation was encountered in 9 patients (42.9%), 7 patients (33.3%), 4 patients (19%) and one patient (4.8%) in 1^{st}, 2^{nd}, 3^{rd} and 4^{th} months respectively. In the 5^{th}& 6^{th} months no ovulation was recorded. From that table we can concluded that 95.2% of ovulation occurred in the first 3 months after laparoscopic drilling.

The total number of patient that got pregnant during the follow up period was 7 patient (21.2%), one had twin pregnancy and one aborted during the first trimester. This is shown in table (13).

Comparison of clinical and sonographic characteristics among responder and nonresponders to laparoscopic ovarian cauterization are shown in table (14). It was found that the age & duration of infertility could be used to predict treatment outcome. While BMI could not be used to predict treatment outcome. Regarding sonographic criteria; failure of an ovulatory response was noticed to be significantly related to increased ovarian volume and stromal volume and to reduction in number of dominant follicles ($P < 0.05$).

So, the outcome is more likely to be successful if the age is between 20-25 years, duration of infertility is less than 3.6 years, the preoperative ovarian volume < 10.5 cm^3, stromal volume < 5.5 cm^3 and the number of dominant follicles are one or more.

Table (1): Patient characteristics at selection.

Characters	Before laparoscopic drilling
Age in year	
Mean	24.8
SD	± 2.9
Duration of infertility in year	
Mean	5.4
SD	± 2.9
BMI (kg /m^2)	
Mean	30.8
SD	± 5.5
*** Hirshutism "No"**	24/35 (68.5%)
*** Galactorrhea "No"**	20/35 (57.1%)
Menstrual irregularity	
Ammenorrhic (No.)	10/34 (28.6%)
Oligommenorhic (No.)	25/35 (71.4%)
Parity:	
Nulliparous (No.)	29/35 (82.9%)
Multiparous (No.)	6/35 (17.1%)

Table (2): Comparison of ultrasound character of the right and left ovaries 2 weeks before laparoscopic drilling.

Characters	Rt ovary		Lt ovary		T-test	P-value
	Mean	SD	Mean	SD		
Volume of the ovary Cm^3	11.98	1.02	12.44	1.01	1.83	> 0.05
Volume of the stroma Cm^3	6.61	1.0	6.68	0.98	0.34	> 0.05
Number of dominant follicles	0.86	0.69	0.94	0.83	0.47	>0.05

P-value > 0.05 = Non significant difference

Table (3): Comparison of ultrasound character of the Rt and Lt ovaries one week after laparoscopic drilling.

Characters	Rt ovary		Lt ovary		T-test	P-value
	Mean	SD	Mean	SD		
Volume of the ovary Cm^3	14.39	1.22	14.63	1.23	0.84	> 0.05
Volume of the stroma Cm^3	10.40	1.39	11.23	1.40	2.47	> 0.05
Number of dominant follicles	1.34	0.73	1.31	0.76	0.16	> 0.05

P-value > 0.05 = Non significant difference.

Table (4): Comparison of ultrasound characters of the Rt & Lt ovaries 3 weeks after laparoscopic drilling.

Characters	Rt ovary		Lt ovary		T-test	P-value
	Mean	. SD	Mean	SD		
Volume of the ovary Cm^3	6.98	0.62	7.21	0.79	1.32	> 0.05
Volume of the stroma Cm^3	4.88	0.67	5.06	0.71	0.99	> 0.05
Number of dominant follicles	1.57	0.85	1.68	0.93	0.54	> 0.05

P-value > 0.05 = Non significant difference.

Table (5): Comparison of the ovarian volume of the Rt ovary 2 weeks before, one week and 3 weeks after laparoscopic drilling.

(a) One-way analysis of the 3 readings

Ovarian volume	SS	DF	MS	FF	P
Between readings	998.99*	2*	499.49*	516.63*	0.00*
Within readings	98.61*	102*	0.97		
Total	1097.60	104	500.46		

* Highly significant

SS = Sum square

DF = Degree of freedom

MS = Mean square

F = Freedom

P = F-value

(b) Least significant difference between 3 readings

Ovarian volume	2 weeks before	One weeks after	3 weeks after
	Mean = 11.98	Mean = 14.39	Mean = 6.98
2 weeks before drilling		0.00000*	0.00*
1 week after drilling	0.00000*		0.00*
3 weeks after drilling	0.000000*	0.000000*	

* Highly significant

Table (6): Comparison of the volume of the stroma of the Rt ovary 2 weeks before, one week and 3 weeks after drilling.

(a) One –way analysis of the 3 readings

Stromal volume	SS	DF	MS	F	P
Between readings	531.21*	2*	265.61*	230.04*	0.00*
Within readings	117.76	102*	1.15		
Total	648.97	104	266.66		

* Highly significant

SS = Sum square

DF = Degree of freedom

MS = Mean square

F = Freedom

P = P-value

(b) Least significant difference between 3 readings

Stromal volume	2 weeks before	One weeks after	3 weeks after
	Mean = 6.61	Mean = 10.40	Mean = 4.88
2 weeks before drilling		0.000000*	0.000000*
1 week after drilling	0.000000*		0.000000*
3 weeks after drilling	0.000000*	0.000000*	

* Highly significant

Table (7): Comparison of No. of the dominant follicles on the Rt ovary two weeks before, one week and three weeks after drilling.

(a) One –way analysis of the three readings

Dominant follicles	SS	DF	MS	F	P
Between readings	9.31	2*	4.66*	8.09*	0.005*
Within readings	58.74	102*	0.58		
Total	68.05	104	5.24		

* Highly significant

SS = Sum square

DF = Degree of freedom

MS = Mean square

F = Freedom

P = P-value

(b) Least significant difference between 3 readings

Dominant follicles	2 weeks before	One weeks after	3 weeks after
	Mean = 0.86	Mean = 1.34	Mean = 1.57
2 weeks before drilling		0.008647*	0.000151*
1 week after drilling	0.008647*		0.210552
3 weeks after drilling	0.000151*	0.210552	

* Highly significant

Table (8): Comparison of the ovarian volume on the Lt ovary 2 weeks before, one week and 3 weeks after drilling.

(a) One –way analysis of the 3 readings

Ovarian volume	SS	DF	MS	F	P
Between readings	1017.48	2	508.74	482.41	0.00
Within readings	107.57	102	1.05		
Total	1125.05	104	509.79		

* Highly significant

SS = Sum square

DF = Degree of freedom

MS = Mean square

F = Freedom

P = P-value

(b) Least significant difference between 3 readings

Ovarian volume	2 weeks before	One weeks after	3 weeks after
	Mean = 12.44	Mean = 14.64	Mean = 7.21
2 weeks before drilling		0.000000*	0.00*
1 week after drilling	0.000000*		0.00*
3 weeks after drilling	0.000000*	0.000000*	

* Highly significant

Table (9): Comparison of the stromal volume on the Lt ovary two weeks before, one week and three weeks after drilling.

(a) One –way analysis of the 3 readings

Stromal volume	SS	DF	MS	F	P
Between readings	748.87*	2*	374.43*	331.78+	0.00+
Within readings	115.11*	102*	1.13*		
Total	863.98	104	375.56		

* Highly significant

SS = Sum square

DF = Degree of freedom

MS = Mean square

F = Freedom

P = P-value

(b) Least significant difference between 3 readings

Stromal volume	2 weeks before	One weeks after	3 weeks after
	Mean = 6.69	Mean = 11.23	Mean = 5.05
2 weeks before drilling		0.00*	0.000000*
1 week after drilling	0.000000*		0.000000*
3 weeks after drilling	0.000000*	0.00*	

* Highly significant

Table (10): Comparison of the number of dominant follicles on the Lt ovary two weeks before, one week and three weeks after drilling.

(a) One –way analysis of the dominant readings

Dominant follicles	SS	DF	MS	F	P
Between readings	9.66*	2*	4.82*	6.75*	0.001*
Within readings	72.97	102	0.72		
Total	82.62	104	5.54		

* Highly significant

SS = Sum square

DF = Degree of freedom

MS = Mean square

F = Freedom

P = P-value

(b) Least significant difference between 3 readings

Dominant follicles	2 weeks before	One weeks after	3 weeks after
	Mean = 0.94	Mean = 1.31	Mean = 1.68
2 weeks before drilling		0.007	0.004*
1 week after drilling	0.07		0.01
3 weeks after drilling	0.004*	0.07	

* Highly significant

Table (11): Comparison of the endometrical thickness two weeks before, one week and three weeks after drilling.

(a) One –way analysis of the 3 readings

End thickness	SS	DF	MS	F	P
Within readings	1.81	2	0.91	280.13	0.00*
Between readings	0.33	102	0.03		
Total	2.14	104	0.94		

* Highly significant

SS = Sum square

DF = Degree of freedom

MS = Mean square

F = Freedom

P = P-value

(b) Least significant difference between 3 readings

Endometrial thickness	**2 weeks before**	**One weeks after**	**3 weeks after**
	Mean = 0.79	**Mean = 0.94**	**Mean = 1.12**
2 weeks before drilling		0.000000*	0.000000*
1 week after drilling	0.000000*		0.000000*
3 weeks after drilling	0.000000*	0.000000*	

* Highly significant

Table (12a): Comparison of ovulation before and after Lap drilling.

	Before drilling	After drilling
No. of patient	35	33
Ovulation	0	21
Ovulation percentage	0%	(63.6%)

Table (12b): Onset of ovulation after laparoscopic drilling.

Months after laparoscopic drilling	Ovulation (n = 21 cases)
1st month after laparoscopic drilling	9 (42.9%)
2nd month after laparoscopic drilling	7 (33.3%)
3rd month after laparoscopic drilling	4 (19%)
4th month after laparoscopic drilling	1 (4.8%)
5th month after laparoscopic drilling	-
6th month after laparoscopic drilling	-

Table (13): Comparison of pregnancy before and after Lap drilling

	Before drilling	After drilling
Pregnancy	0	7 cases (21.2%)
Multiple pregnancy	0	1 Case
Abortion	0	1 case
Singleton pregnancy	0	5 cases

Table (14): Comparison of clinical and sonographic admission characteristics among responders and nonresponders to laparoscopic ovarian drilling.

	Responder (n = 21)	Non-responder (n = 12)	t-test	P-value
A- Clinical characters:				
Age (year)				
Mean	22.3	30.2	6.1	< 0.05
SD	± 1.7	± 3.7		
Duration of infertility (year)				
Mean	3.6	7.8	4.4	< 0.05
SD	± 1.7	± 3.8		
BMI (kg/m^2)				
Mean	29.1	31.6	1.35	> 0.05
SD	± 4.2	± 5.1		
B- Sonographic characters:				
Ovarian volume (cm^3)				
Mean	10.9	13.8	14.8	< 0.05
SD	± 0.59	± 0.39		
Stromal volume				
Mean	5.9	8.9	15.9	< 0.05
SD	± 0.55	± 0.53		
Dominant follicles (No.)				
Mean	1.14	0.5	2.35	< 0.05
SD	± 0.79	± 0.67		

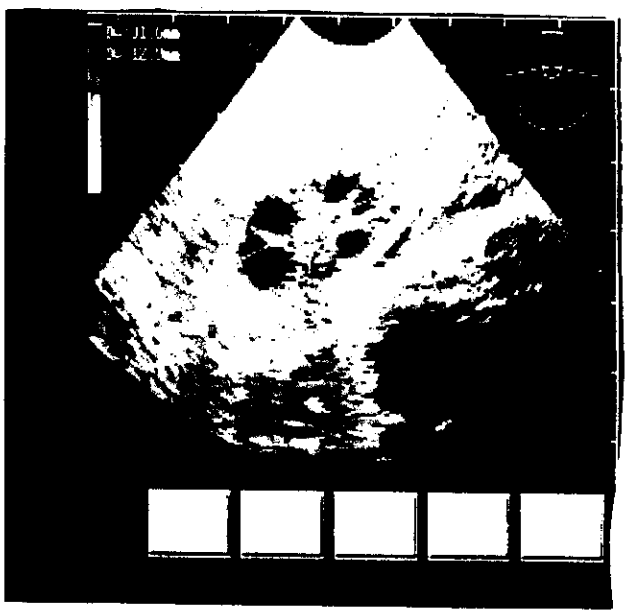

Fig. (1): Ovary two weeks before laparoscopic ovarian cauterization.

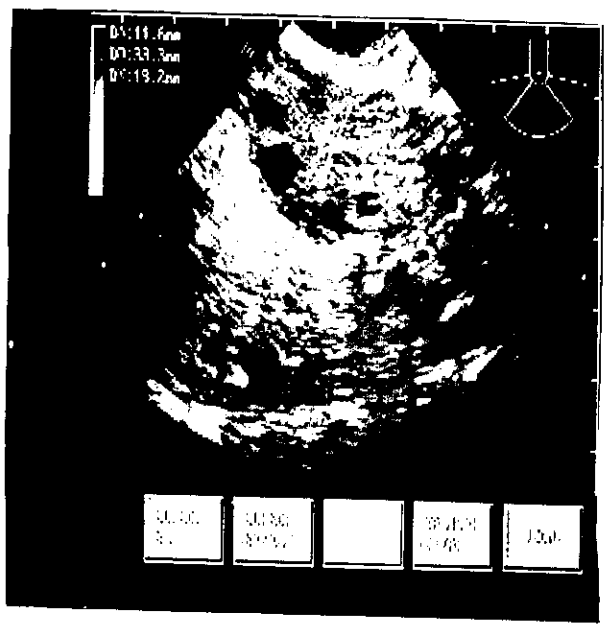

Fig. (2): Ovary one week after laparoscopic ovarian cauterization (temporary swelling of the ovary one week after the procedure).

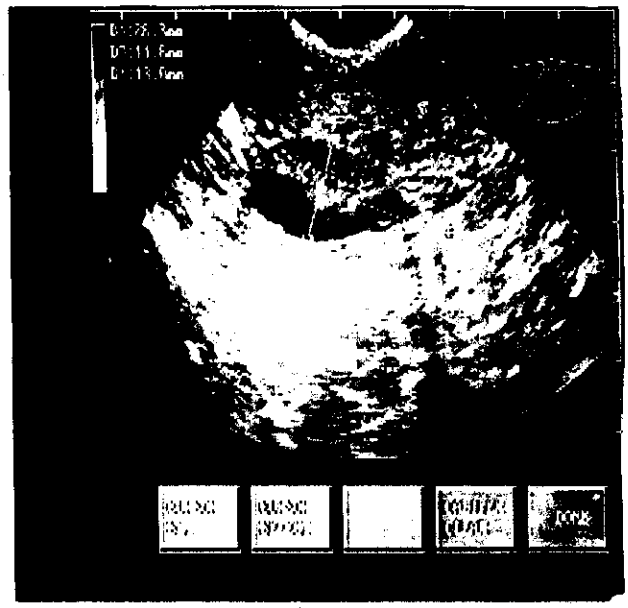

Fig. (3): Ovary three weeks after laparoscopic ovarian cauterization (ovary was significantly smaller than that before surgery).