

PLACE OF OVARIAN RESECTION

by

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Normal ovulation in women depends on balanced activity of hypothalamo-pituitary-ovarian axis; anovulation may occur along with clinical oligomenorrhoea.

The underlying pathology of such syndrome may be due to (a) Ovarian dysfunction. (b) Pluriglandular imbalance involving. (i) Adrenal, (ii) Pituitary, (iii) Other endocrine glands, (iv) Stress, emotional disorders and general diseases.

In the last two decades the conditions of the ovaries in this syndrome has attracted attention of many authors.

Since the epoch-making observation of Stein and Leventhal (1935) the evaluation of anovulation syndrome has received a lot of attention. According to Leventhal (1969) there is no dilemma in diagnosis and treatment of Stein Leventhal Syndrome which is characterised by secondary oligomenorrhoea, infertility, obesity with or without hirsutism and associated with clinically demonstrable enlarged ovaries, comprising of multiple follicular cysts. This author emphasised that these cases cannot be cured by hormone and ovarian resection is required to restore normal biphasic cycle.

The etiology of this syndrome still re-

mains obscure. Stein and Leventhal (1935) observed that bilateral ovarian enlargement was probably due to abnormal stimulation of the ovaries by pituitary hormones. Ingersoll *et al* (1959) demonstrated an excess urinary excretion of L.H. in clinically diagnosed cases of Stein-Leventhal Syndrome. According to Bailey (1959) however, deficiency of F.S.H. lead to anovulation.

There may be some relation between the ovary and the adrenals contributing to anovulation. Administration of cortisone may restore ovulation in a group of cases where mild adrenal hyperplasia is associated with signs and symptoms allied to Stein-Leventhal Syndrome.

Currently the use of clomiphene, HPG, HMG, HCG in therapeutic induction of ovulation in cases of oligomenorrhoea syndrome has lead to considerable advancement in our therapeutic approach. (Gamzell 1966).

In view of these recent advances of therapeutic correction of oligomenorrhoea and anovulation, the place of surgical procedures for restoration of ovulation requires proper review. In this paper the problem of oligomenorrhoea with anovulation and its treatment has been critically analysed and the place of ovarian resection evaluated.

Material and Methods

The clinical features and managements

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of 12 cases, with complaints of oligomenorrhoea, anovulation, infertility, obesity with or without hirsutism are being discussed to evaluate the role of ovarian resection in restoring ovulation and symptomatic improvements. The investigations were, (i) Recording of basal body temperature, (ii) Estimation of 17-ketosteroids, (iii) Vaginal cytology, (iv) Gynaecography, (v) Examination under anaesthesia, (vi) Culdoscopy. Laparotomy was done in eight cases.

A histological analysis of 368 ovaries have also been performed to examine the types of multiple cystic ovaries with or without hyperthecosis.

Case 1

Mrs. V. A., 30 years, married for 3 years, para 0 + 0 was admitted with complaints of oligomenorrhoea, hirsutism, obesity and infertility.

On examination—obesity ++, weight — 156 lbs. hirsutism—moderate needs shaving daily.

Special Investigations. (i) B.B.T.—monophasic. (ii) 17-ketosteroids—7 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography uterus normal size. Both ovaries enlarged. (v) Examination under anaesthesia—uterus, normal in size. Both ovaries enlarged. (vi) Endometrial biopsy—low proliferative. (vii) Culdoscopy—not done.

Laparotomy—Uterus, normal in size. Both ovaries enlarged, cystic resection of both ovaries was done.

Ovarian histopathology—Typical Stein Leventhal.

Case 2

Mrs. S. D., 26 years, married for 12 years, para 0 + 0 complains of oligomenorrhoea, with spells of amenorrhoea, hirsutism—moderate, obesity and infertility.

On examination—obesity ++, weight 154 lbs. hirsutism—moderate.

Special Investigation, (i) B.B.T.—Monophasic. (ii) 17-ketosteroids—10 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus, normal in size.

Both ovaries enlarged. (v) Examination under anaesthesia—uterus normal in size. Both ovaries enlarged. (vi) Endometrial biopsy—low proliferative. (vii) Culdoscopy—not done.

Laparotomy—Uterus, normal in size. Both ovaries enlarged. Resection of both ovaries done.

Ovarian histopathology—Typical Stein Leventhal.

Case 3

Mrs. S. M., 35 years, married for 18 years, para 0 + 0 complained of oligomenorrhoea, infertility.

On examination—weight 130 lbs.

Special Investigation. (i) B.B.T. biphasic. (ii) 17-ketosteroids—10 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus normal in size. Both ovaries normal size. (v) Examination under anaesthesia—uterus normal in size. Left ovary enlarged. (vi) Endometrial biopsy—secretory pattern. (vii) Culdoscopy—Left ovary enlarged, cystic, no corpus luteum.

Laparotomy—Uterus, normal in size. Left ovary, cystic. Resection done.

Ovarian histopathology—cysts present, no corpus luteum.

Case 4

Mrs. M. B.—27 years, married for 6 years, para 0 + 0 complained of oligomenorrhoea with phases of amenorrhoea, obesity, infertility.

On Examination—weight—140 lbs.

Special Investigation. (i) B.B.T.—monophasic. (ii) 17-ketosteroid—8 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus, normal in size. Ovaries, normal sized. (v) Examination under anaesthesia. Uterus, normal in size. Ovaries, not palpable. (vi) Endometrial biopsy.—Scanty, nonsecretory. (vii) Culdoscopy—uterus N.S. ovaries normal size with multiple cysts.

Laparotomy—Uterus, normal in size. Ovaries cystic. Resection done.

Ovarian histopathology—cysts present, no corpus luteum.

Case 5

Mrs. G., 28 years, married for 5 years, para, 0 + 0 complained of oligomenorrhoea,

hirsutism, obesity, infertility.

On Examination—weight 130 lbs, hirsutism—mild, virilism +.

Special Investigation. (i) B.B.T.—monophasic. (ii) 17-ketosteroid—9 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography.—Uterus normal in size. Both ovaries enlarged. (v) Examination under anaesthesia. Uterus, normal in size, both ovaries enlarged. (vi) Endometrial biopsy—nonsecretory. (vii) Culdoscopy—not done.

Laparotomy—Uterus, normal in size. Both ovaries enlarged, cystic. Resection done.

Ovarian histopathology—Typical Stein Leventhal.

Case 6

Mrs. S. R.—26 years, married for 5 years, para 0 + 0 complained of oligomenorrhoea, hirsutism, virilism, obesity, infertility.

On Examination—weight 140 lbs, hirsutism ++, needs shaving daily, virilism ++.

Special Investigation—(i) B.B.T.—monophasic. (ii) 17-ketosteroid—15 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus normal in size. Both ovaries enlarged. (v) Examination under anaesthesia—Uterus, normal in size. Both ovaries enlarged. (vi) Endometrial Biopsy—nonsecretory. Culdoscopy—not done.

Laparotomy—uterus small, both ovaries enlarged and cystic. Resection done.

Ovarian histopathology—Typical Stein Leventhal.

Case 7

Mrs. S. C.—28 years, married for 5 yrs. para 0 + 0 complained of oligomenorrhoea, obesity hirsutism, infertility.

On Examination—obesity ++, weight 150 lbs, hirsutism—mild.

Special Investigations—(i) B.B.T.—Monophasic. (ii) 17-ketosteroids—9 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus normal in size. Both ovaries enlarged. (v) Examination under anaesthesia.—Uterus smaller than normal, both ovaries enlarged. (vi) Endometrial biopsy—Non—Secretory. (vii) Culdoscopy—Not done.

Laparotomy—uterus smaller than normal, both ovaries enlarged and cystic, resection done.

Ovarian Histopathology—Typical Stein Leventhal.

Case 8

Miss C.—20 years unmarried. Complained of oligomenorrhoea, with dysmenorrhoea, hirsutism needed shaving daily.

On Examination obesity—nil, weight 108 lbs, hirsutism—moderate, virilism ++.

Special Investigation—(i) B.B.T.—monophasic. (ii) 17-ketosteroid—15 mgm. (iii) Vaginal Cytology—hypoovarian. (iv) Gynaecography—uterus normal size both ovaries enlarged. (v) Examination under anaesthesia—uterus, normal in size. Both ovaries enlarged. (vi) Endometrial biopsy—Non-Secretary. (vii) Culdoscopy — Not done.

Laparotomy—uterus small, both ovaries enlarged and cystic, resection done.

Ovarian histopathology—Typical Stein Leventhal.

Case 9

Mrs. A. A., 34 years married for 14 years, para 0 + 0 complained of oligomenorrhoea, obesity and infertility.

On Examination—weight 140 lbs.

Special Investigation—(i) B.B.T.—monophasic. (ii) 17-ketosteroid—20 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus normal in size. Both ovaries enlarged. (v) Examination under anaesthesia—uterus smaller than normal, ovaries enlarged. (vi) Endometrial Biopsy—Nonsecretory endometrium. (vii) Culdoscopy—not done. (viii) Treated with cortisone.

Case 10

Miss S. 24 years unmarried complained of persistent oligomenorrhoea, hirsutism.

On Examination—weight 120 lbs. hirsutism ++.

Special Investigation. (i) B.B.T.—monophasic. (ii) 17-ketosteroids—20 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus normal in size. Both ovaries enlarged. (v) Examination under anaesthesia—uterus normal in size. Both ovaries enlarged. (vi) Endometrial biopsy—nonsecretory pattern. (vii) Cul-

doscopy—both ovaries enlarged, studded with cysts, no corpus luteum. (viii) Treated with Cortisone.

Case 11

Miss L. 28 years unmarried complained of persistent oligomenorrhoea, hirsutism—requires shaving daily.

On Examination—weight—120 lbs. hirsutism ++.

Special Investigation—(i) B.B.T.—Monophasic. (ii) 17-ketosteroids—15 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus normal in size. Both ovaries enlarged. (v) Examination under anaesthesia—uterus normal in size. Both ovaries enlarged. (vi) Endometrial biopsy—nonsecretory.

Culdoscopy—not done.

Treated with Cortisone.

Case 12

Mrs. K. 32 years, married, 7 years, para 0 + 0 complained of oligomenorrhoea with phases of amenorrhoea, infertility.

On Examination—Weight 115 lbs.

Special Investigations—(i) B.B.T.—Monophasic. (ii) 17-ketosteroid—18 mgm. (iii) Vaginal cytology—hypoovarian. (iv) Gynaecography—uterus normal in size—ovaries, not enlarged. (v) Examination under anaesthesia—uterus normal sized, ovaries not palpable. (vi) Endometrial biopsy—nonsecretory endometrium. (vii) Culdoscopy—ovaries normal sized with cysts, no corpus luteum. (viii) Treated with Clomid.

Results of Treatment

Table I presents the results of treatment of 12 cases, 8 by resection, 3 by cortisone therapy and 1 by clomiphene.

B.B.T. was restored to biphasic pattern in 6 cases after resection of the ovaries. Resumption of normal menstrual cycles failed to occur in 2 cases, one of the two developed phases of prolonged amenorrhoea, after the operation.

Three cases with evidence of adrenal hyperplasia and slightly raised 17-ketosteroids were treated with cortisone. All

TABLE I

No. of Cases	Follow up result
1.	Normal cycles resumed, conceived—delivered by caesarean section. Hirsutism—slightly improved.
2.	Cycles restored. conceived, delivered at term.
3.	Cycles restored, not conceived.
4.	Developed secondary amenorrhoea.
5.	Cycles restored, not conceived.
6.	Cycles restored, not conceived—no improvement of hirsutism or virilization.
7.	Cycles restored, not conceived.
8.	Cycles not restored after resection.
9.	Conceived after cortisone therapy.
10.	Cycles restored after cortisone therapy.
11.	Cycles restored after cortisone therapy.
12.	Conceived after clomiphene therapy.

the cases returned to normal cycles with biphasic B.B.T.

Symptomatic improvement as regards hirsutism was observed in 2 cases. Hair became less tough and sparse after ovarian resection and cortisone.

Conception took place within 4 months to 1 year in 4 cases of which 2 had resection, 1 had cortisone and the remaining 1 had clomiphene therapy (50 mgm x 5 days for 2 cycles).

Significance of Follicular Cysts

A histopathological study of 368 ovaries showed (Table II), presence of multiple follicular cysts in 48 cases. Out of these 48 cases showing multiple cysts, 20 were associated with corpus luteum, 23 sections showed cysts without corpus luteum and in only 5 cases there were demonstrable theca cell hyperplasia as found in cases with clinical oligomenorrhoea and anovulation (fig. 3, 4 & 5).

TABLE II

Types of Cases	Total Cases	Follicular Cyst	Follicular Cyst with Corpus luteum	Theca cell hyperplasia
Normal control	200	Nil	Nil	Nil
Uterine fibromyoma	60	20	12	2
Endometriosis	45	10	3	2
Functional uterine bleeding	39	13	4	1
Carcinoma Cervix	18	5	1	Nil
Carcinoma Corpus	6	Nil	Nil	Nil
Total	368	48	20	5

Discussion

It is known that follicles undergo cystic changes and such conditions may be single or multiple. Single cysts are often associated with Shrooder's disease where anovulation is also an important feature. Multiple cysts may be seen in association with fibromyoma, endometriosis, retroversion. Uterus with no endocrinological significance. Many of these cases may be associated with corpus luteum.

The term polycystic ovary vis-a-vis multiple cystic ovary requires clarification. Polycystic ovaries are associated with symptoms of oligomenorrhoea and anovulation resulting in infertility. Associated with it there may be occasional hirsutism together with obesity.

Out of 48 cases with multiple cysts only 5 could be grouped as polycystic disease of ovary with symptoms.

In selecting cases for ovarian resection in oligomenorrhoea syndrome the following criteria were followed:

(i) Patient should have monophasic cycle. (ii) Bi-phasic cycle failed to occur after hormone or cortisone therapy. (iii) Enlarged ovaries demonstrated by gynaecography and culdoscopy.

Goldzieher *et al* (1963) in a survey of world literature comprising 187 references found amenorrhoea in half of total

1097 cases reviewed. According to Goldziehere the following symptomatology is associated with polycystic ovaries.

Amenorrhoea 57%; infertility 74%; dysmenorrhoea 25%; functional bleeding 29%; obesity 41%. hirsutism 69%, virilization 21%.

Menon (1968) reported a series of 39 cases with polycystic ovaries with menorrhagia as the principal complaint. Acharia *et al*, (1967) published the results of 106 ovarian resections in selected cases. One hundred cases of her series had oligomenorrhoea with polymenorrhoea and 7 had metropathic episodes. In a comparative study Acharia has shown a collected series where most of the patients subjected to wedge resection for polycystic ovaries had phases of amenorrhoea or irregular cycle. Leventhal (1969) commented that classically in S.L. syndrome clinical manifestations are oligomenorrhoea or amenorrhoea preceded by a phases of profuse and irregular bleeding. In our series oligomenorrhoea with phases of amenorrhoea was observed in all the 12 cases.

Enlargement of the ovaries, unilateral or bilateral, was stressed by Stein and Leventhal in association with oligomenorrhoea and anovulation syndrome. Ingersall (1969) also stressed that demons-

tration of enlarged ovaries is a prerequisite in oligomenorrhoea syndrome before undertaking surgery. Goldzieher (1963), on the other hand, commented that results of ovarian resection in polycystic ovarian diseases does not depend on enlargement of the ovaries. Acharia *et al*, (1967) in her series of resection found bilateral enlargement of the ovaries in 70 and bilateral enlargement of ovaries 38 cases. In our series, 8 had bilateral enlargement and 1 had unilateral enlargement of the ovaries. In the remaining 4 cases the ovaries were polycystic normal sized.

Changes in 17-Ketosteroid excretion has been reviewed by different observers. Goldzieher (1962) thought a raised 17-Ketosteroid value was of not much significance. Ingersoll (1959) impressed on cortisone load test before undertaking surgery. Menon while comparing results of his 39 cases commented that adrenal component in addition to ovarian factors are to be reviewed before surgery. In 2 of his cases showing persistent high 17-Ketosteroid level after surgery and later responding to cortisone therapy is very significant that cortisone suppression test is informative before surgery. In the present series one case of unilateral enlarged polycystic ovary shown by gynaecography and culdoscopy and 2 cases of normal sized polycystic ovaries responded to cortisone therapy with restoration of B.B.T. 1 and normal cycle and conception in 1 case.

The recent advances in induction of ovulation in cases of oligomenorrhoea infertility syndrome, clomiphene and HFG, HMG and HCG sequence, has been highlighted. Marshall (1970) recommends the prior evaluation of cases before ovulation induction therapy in cases of oligomenorrhoea. The mechanism of clomiphene and EMG initiating ovulation is by stimu-

lation of the hypothalamus and pituitary, whereas gonadotrophin therapy is essentially replacement therapy acting directly on the oocyte. The rationale of using clomiphene and gonadotrophin have been stressed by Marshall only in proved cases of oligo ovulation or anovulation caused by ovarian hypofunction. In only one of our cases clomiphene was tried, fortunately with good results.

Stein-Leventhal (1935) originally found a cure of their syndrome after wedge-resection of polycystic ovaries. Epstein and Collaboratores (1961) claimed restoration of ovulation in 74% cases after wedge-resection in oligomenorrhoea syndrome. Menon (1968) in his series had a success rate of 91.6% in dysfunctional bleeding cases.

Summary

The conclusive evidence is that success after wedge resection depends on proper selection of cases among anovular oligomenorrhoea syndrome.

Criteria for selection should be the following:

1. Patients should have oligo-ovulation or anovulation evidenced by monophasic cycle.
2. Failure of resumption of normal cycles after hormone or cortisone therapy.
3. Clinically demonstrable enlargement of ovaries, bilateral or unilateral, confirmed by gynaecography and or culdoscopy is very important in selection of proper cases. Six out of 8 cases treated by resection were successful and our failure in 2 cases had normal sized ovaries showing polycystic changes.

Resection upto the medulla is not justified as it potentially disturbs ovarian blood supply leading to ovarian dysfunction of hypofunction.

4. Search for causes of adrenal hyperplasia along with oligomenorrhoea

syndrome should be carefully done before planning resection.

5. Cases for clomiphene therapy should be selected carefully. This will prevent performance of unnecessary resection resulting in secondary amenorrhoea.

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See Figs. on Art Paper I-II