

# OPERATIVE LAPAROSCOPY FOR INDUCTION OF OVULATION IN POLYCYSTIC OVARIAN DISEASE

By

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## SUMMARY

We have preferred clomiphene therapy as the primary treatment modality for induction of ovulation in infertile subjects with PCOD. None of these subjects had a prior diagnostic laparoscopy before initiation of CC regimen. CC non-responders have been subjected to operative laparoscopy, and either follicular puncture-coagulation at multiple sites or in addition ovarian wedge resection was performed through laparoscopy. Among the 35 subjects operated 57.14% had puncture of follicular cysts and 42.86% had in addition ovarian wedge biopsy.

Of the 25 subjects who could be regularly followed and who had been operated 3 months ago, 11 subjects had achieved a conception, giving a pregnancy rate of 44%. These conceptions were achieved following continuation of CC therapy post-operatively in 54.55%, gonadotropin in 27.27% and spontaneously in 18.18%. The surgical technic described is quite safe in experienced hands, and is well accepted by the patients. It is observed that the endoscopic surgery negates all the disadvantages of the 'classical' wedge resection through laparotomy incision, and moreover obviates the need for elaborate and repeated monitoring of the treatment cycles employing the costly gonadotropins.

Considering all the benefits of operative laparoscopy, we strongly recommend this procedure in all the PCOD subjects who are CC-resistant, and feel that endoscopic follicular puncture should be given a fair trial before deciding on gonadotropin therapy for PCOD subjects.

Administration of clomiphene citrate (CC) is the established and important modality of treatment for subjects with polycystic ovarian disease (PCOD) who desire conception (Goldzier and Elmind-Hirsch, 1988). Rajan and Rajan (1986)

have reported a pregnancy rate ranging from 46.34% to 83.33% in subjects with hypothalamic anovulation treated with CC. Majority of these subjects had PCOD. Clomiphene-resistant patients mandate an alternate therapeutic approach which could be either administration of gonadotropins or performance of ovarian wedge resection (OWR). It has been reported that the

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results of gonadotropin therapy in PCOD are comparable to the results following OWR. Hence one may argue as to which of these modes of therapy should be used first. The choice should be based on the expertise of the physician in the use of surgical or medical treatment, and the preference of the patient. The patients should be informed of the alternatives, the possible complications including adhesions, and the time and expense involved in the two therapies.

Recently, laparoscopic wedge resection (Campo *et al*, 1983) and follicular punctures at multiple sites by laparoscopic electrocautery (Gionness 1984) have been recommended as an alternative to the 'classical' wedge resection. Comparable results in terms of ovulation and conception rates have been reported with no risk of peri-ovarian adhesions as proved at the second-look ovarian visualization (Portuondo *et al*, 1984). In this communication we intend to detail our experience with laparoscopic ovarian surgery in anovulatory PCOD subjects who failed to respond to CC.

#### *Materials and Methods*

Since April, 1981, we have been employing operative laparoscopy as a therapeutic measure for various fertility disorders which include endometriosis, ectopic gestation, pelvic inflammatory disease and PCOD (Rajan and Ambika, 1985); and recent data reveals that 30% of diagnostic laparoscopies have been extended to operative laparoscopy procedures (Rajan, 1988).

A diagnostic laparoscopy is not routinely recommended prior to induction of ovulation in subjects with anovulatory infertility, and the same principle is applicable to subjects with PCOD (Rajan, 1988). However, failure to achieve conception even after 3 to 6 cycles of successful induction

of ovulation is considered a strong indication for diagnostic laparoscopy to unearth any pelvic factor holding back the fertility. Equally important indication for laparoscopy in PCOD subjects in our service is to perform ovarian wedge resection or follicular puncture-coagulation in clomiphene-resistant group.

*Technique of wedge resection/multiple follicular puncture:* Laparoscopy is performed under general anaesthesia and using CO<sub>2</sub> for pneumoperitoneum. Single puncture telescope with the operating channel, is passed through the sub-umbilical incision, and a second puncture is made at the suprapubic region to allow the grasper forceps. Bladder is emptied at the beginning of the procedure and a self-retaining Leech-Wilkinson canula is placed in the cervical canal to facilitate free anteversion of the uterus.

After thorough inspection of the pelvic organs and the peritoneal folds the tubal patency is studied. When all other causes are excluded, and when convinced that the ovaries are enlarged, polycystic and show no ovulatory changes a decision is made to perform wedge resection and/or multiple follicular puncture. The ovarian ligament is grasped firmly with the help of the grasper forceps passed through the suprapubic puncture. By rotating the ovarian ligament the ovary is lifted away from the other pelvic organs and intestines, and brought to a safe elevated position for surgical coagulation. Monopolar cutting-coagulation scissors are passed through the operative channel of the telescope, and after steadying the ovary by the grasper forceps the ovary is cut and coagulated simultaneously on the most prominent surface. During this process the multiple follicles could be seen to break exuding clear follicular fluid, particularly when the blades of the scissors are plunged deep into the ovarian substance. By rotating the ovarian ligament in different directions

the entire ovarian surface could be inspected and all the follicles could be punctured and coagulated. When wedge resection is aimed, the cut edge of the ovarian tissue is held by the grasper forceps and the under-surface of the ovarian flap is cut towards the depth of the ovarian tissue till a good amount of ovarian tissue is mobilised and removed for biopsy. Since cutting and coagulation are simultaneously practised ovarian bleeding could be easily avoided. Moreover, following the wedge resection the ovarian raw surface is further coagulated, and hemostasis ensured. The operated ovary is rinsed with a jet of ringer-lactate solution and this allows removal of debris and clot and identification of any raw area which may still be bleeding. If some bleeding is located the same is arrested by further coagulation of the raw areas. The same procedure is repeated on the opposite side. After thorough rinsing of the peritoneal cavity with ringer-lactate solution the fluid is aspirated by monopolar coagulation-suction canula. Any further fulguration is completed by this canula. Slight oozing is also sometimes arrested by retaining the pneumoperitoneum for few hours. Before the surgery is completed 300 ml of ringer-lactate solution containing 100 mgs of hydrocortisone is placed inside the peritoneal cavity. This should prevent the tendency for periovarian adhesions. The patient is usually discharged on the next day, with advice to report within the first 3 days of the next menstruation.

The post-operative management preferred included either an expectant follow-up with a BBT monitoring of ovulation, or to continue with the CC regimen and sonography monitoring. Regular coitus on alternate days or preferably daily was advocated, and timing of coitus with ovulation was discouraged. Those on gonadotropins were

continued on the same regimen after surgery.

### Results

There were 35 subjects who had undergone ovarian wedge resection/multiple follicular puncture-coagulation. These subjects had been recruited for operative laparoscopy on the basis that they had remained refractory to CC therapy or to gonadotropins.

Among them 20 subjects (57.14%) had undergone puncturing of cysts at numerous places by electrocautery, and the remaining 15 subjects (42.86%) had undergone wedge resection in addition to follicular puncture.

Excluding the 8 subjects who had been operated recently, among the 27 subjects who had regular post-operative follow-up, 10 subjects had post-operative CC regimen (37.04%), 3 had gonadotropins (11.11%), and the rest 14 (51.86%) were expectantly followed.

Among the 25 subjects in whom the results of treatment could be precisely evaluated 11 subjects became pregnant within 1 to 6 months following the surgery (44%). Pregnancy was achieved following CC regimen in 6 subjects (54.55%), following gonadotropins in 3 subjects (27.27%) and spontaneously in 2 subjects (18.18%).

Analysis of pregnancy outcome revealed 2 first trimester abortions due to blighted ovum (18.18%), and triplets in one subject (9.09%). All the other subjects had normal pregnancies (72.72%). The subject with triplets had a near term delivery of 3 male babies, and all of them are alive and healthy.

There were no surgical complications encountered in the series of operative laparoscopies performed for various indications,

including the 35 subjects operated for PCOD. None of the 35 subjects undergoing ovarian surgery for PCOD revealed any pelvic factor at diagnostic laparoscopy, and this further supports the view that a routine diagnostic laparoscopy is of no benefit to the patient with anovulatory infertility.

#### *Discussion*

Wedge resection of the ovary had enjoyed immense popularity one time, particularly before the advent of CC for induction of ovulation in infertile subjects with PCOD. The effectiveness of wedge resection was first thought to result from removal of the fibrous ovarian capsule, which presumably interfered with extrusion of the ovum. The exact mechanism by which OWR induces ovulation remains undefined. A local effect (intraovarian), rather than a central effect seems likely. The actual removal of ovarian tissue appears to elicit a sustained reduction in intra-ovarian and peripheral testosterone concentrations. Abolition of the intra-ovarian androgen removes the major obstacle to follicular maturation and ovulation. Other changes include decrease in estrogens and urinary 17-ketosteroids. The heightened response of the pituitary to GnRH may be actually reduced postoperatively, but basal levels of LH and FSH remain unaltered. Reduction in the ovarian folliculostatin concentration may be another mechanism to explain the improved FSH concentration.

The results of gonadotropin therapy in PCOD are comparable to that of OWR. The surgical procedure is less expensive, does not need repeated treatment cycles involving expensive and exhaustive monitoring, and more than all these, does not cause ovarian hyperstimulation and superovulation. Thus, for CC-resistant subjects OWR appears to be an acceptable alternative. However, the main drawback is the need

for laparotomy and the potentiality for post-operative pelvic adhesions.

If ovarian biopsy and multiple follicular puncture-coagulation effected through laparoscopy could achieve good ovarian response, the need for laparotomy with possible pelvic adhesions could be avoided without sacrificing the benefits of the procedure.

In this study we have described how wedge resection or multiple follicular puncture-coagulation is performed through laparoscope in 35 subjects who had been refractory to CC or some even to gonadotropins. We observe that the response to CC or gonadotropins is improved following laparoscopic procedure, and 44% of these subjects had achieved a conception. Conception occurred following continued administration of CC in 54.55%, gonadotropins in 27.27%, and spontaneously in 18.18% of the total conceptions. These conceptions have been recorded within 1 to 6 months of laparoscopy. We also observe that the endoscopic surgery does not add to any complications, and if performed in the manner described should be absolutely safe. In addition it also adds to exclusion of other causes for infertility, even though none of the 35 subjects had recorded any pelvic pathology. We also observe that the patients tolerate the surgery well, and post-operative management does not differ from that of diagnostic laparoscopy. The patient could be discharged the next day. She could resume her coital activity in the very next cycle itself and aim for conception at the earliest.

#### *Conclusion*

While CC treatment is attended with a very high ovulation and conception rate in PCOD subjects, CC-resistant subjects are preferably treated by multiple follicular puncture-coagulation / wedge resection.

through laparoscopy. Following surgery, 44% conceive either spontaneously or by continuation of the medical treatment. We feel this is a better alternative to preferring gonadotropin therapy or classical wedge resection in the CC-nonresponders. Gonadotropin non-responders are also best treated by employing the same surgical procedure. The safety and convenience of operative laparoscopy are further emphasised.

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