

Incidence of peri-tubal and ovarian adhesions following laparoscopic ovarian drilling (LOD) observed opportunistically at subsequent caesarean sections

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Abstract

The frequently performed procedure of laparoscopic ovarian drilling (LOD) is not without possible adverse effects on fertility. There is little uniformity in the technique or assessment of outcome or complications. The study aims to make gynaecologists aware of the frequency of one such complications even when and where the treatment goal of pregnancy has been achieved. This leaves one wondering what the contribution of LOD could be where pregnancy has not followed despite evidence of ovulation possibly by causing interference with tubal function and ovarian entrapment. The degree of adhesions calls for restraint and due care when handling and unleashing energy on the ovaries during a mundane routine procedure often performed by trainees.

Objective: To assess the extent to which the LOD could result in the formation of peri-tubal and ovarian (adnexal) adhesions, as seen opportunistically at subsequent caesarean sections. This is therefore only in instances where the procedure has been successful in resulting in a pregnancy.

Key words: laparoscopic ovarian drilling (LOD), peri-tubal and ovarian adhesions

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Laparoscopic ovarian diathermy is a second line but frequently performed procedure for polycystic ovarian disease to induce ovulation. As the disease affects about 20% of total female population in the reproductive age, the procedure too is being resorted to in large numbers. The advantages of being safer with minimal risk of ovarian hyper-stimulation and multiple pregnancy and being more cost effective than gonadotrophin therapy makes it an attractive choice the world over and more so in Sri Lanka. Gonadotrophins are not available

through state hospitals making LOD the only choice when first line therapy fails to bring about ovulation. Any inadvertent negative impact on the reproductive system therefore needs to be recognized to avoid widespread harm.

LOD is reported to be associated with peri-tubal and ovarian (adnexal) adhesions in some series^{1,2,4,5,9}. This is being investigated for possible contribution to reduced fertility rates even when ovulation is

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re-established following LOD. It was felt unethical to subject women to second look laparoscopies just to ascertain this suspicion (Micro laparoscopes were unavailable in the setting).

However, a golden opportunity arises to inspect the tubes and ovaries in women who conceived following LOD procedure with or without additional medications (Gonadotrophins). Ovaries are expected to be inspected and findings documented at caesarean sections opportunistically in any case, hence the study is completely non interventional and not requiring special consent. Should any woman were to develop complete tubal block following LOD, such cases will not be detected as would an ectopic pregnancy with a partial block (would hence not go on for a caesarean delivery). The study was to see retrospectively the degree of scarring left by LOD without resorting to a specially performed second look procedure. The study was not intended to look into pregnancy rates following LOD as only successes would be screened. It could not comment on the clinical significance of these adhesions, again as those with complete blockage would not be included.

Method

A multi -centre study of 86 women who had previously undergone LOD and another 86 women who had no such treatment subsequently undergoing LSCS at TH Peradeniya and Suwasewana Pvt hospitals Kandy were subjected to close inspection of their tubes and ovaries. LOD could have been performed in any hospital by any surgeon (consultant or his trainees). At times the LOD had been performed in the private sector but the caesarean in the state institution or vice-versa so long as there was documentation of the procedures. Vast majority of cases (67) had the LOD performed at the same hospitals as the subsequent caesarean section. Similar scrutiny of adnexa was done on controls. The study spanned 7 years 2011 to 2017 inclusive. Patients with a record or history suggestive of endometriosis or PID were excluded as the adhesions could have resulted from such disease and not the ovarian drilling procedure per se. This was compared with the incidence of such adhesions of 86 women who had no LOD or any other abdomino-pelvic surgery being performed on them. Only the first caesarean sections were included to prevent adhesions from previous section from affecting the results, effectively excluding patients where more than one pregnancy had resulted following LOD.

Laparoscopic ovarian electro-cautery had been performed previously using a three-puncture technique the exact method and number of punctures were not always known at the time of the caesarean section.

The procedures followed at the LOD where notes existed were fairly consistent in technique. A 10-mm laparoscope had been inserted by the main sub-umbilical route but the palmer's sub costal route was opted for if umbilical hernia or other factors were present. This port of entry difference was not felt likely to have any impact on ovarian adhesion formation and not studied as a variable. Grasping forceps had been introduced through one of the two lower abdominal 5-mm punctures to grasp the utero-ovarian ligament to prevent bowel contact. A third port has been used to introduce the diathermy needle to pierce the ovarian capsule. Energy of 40-60 w for 4-6 sec for 4-8 punctures had been used, with the number of ovarian punctures made during LOD decided by the operators, individualizing seemingly based on the size of the ovary. There were many patients without detailed or proper records of the exact details of the LOD procedure performed on them. The relationship of extent of adhesions to variables like the depth, power and type of diathermy used and the number of punctures could not be investigated due to poor record keeping.

The mean time interval following LOD to the LSCS was 14 months indicating early successes when LOD had worked (including varying durations of pregnancy).

Adhesions seen at LSCS were classed as mild, moderate or severe based on the degree it could potentially interfere with the tubal function on either side – the worse side being taken into account if they were bilateral. A tube pasted to the ovary densely requiring sharp division was considered moderate without occluding it. A fully blocked tube on either side was considered to be severe. This was ascertained only by attempting to pass a fine boogie as a tubal patency test was impossible to be performed at an LSCS. A filmy adhesion without any kinking of the tube was rated as being mild.

Results

50 of 86 the patients who had been subjected to LOD 34, 14 and 2 had mild, moderate and severe adhesions respectively amounting to 58%.

There were 3 cases of mild adhesions in the control 86 women not exposed to LOD at their first caesarean section (3.5%).

The difference between proportions between the 2 groups were highly significant $p < 0.0001$. Those subjected to LOD had a significantly higher resultant rate of adnexal adhesions.

Conclusions

There seems to be a considerable risk (58%) of developing peri-tubal adhesions following LOD where the only recognized pathology was PCO at LOD. The series would not include possible instances of women who would have bilateral severe tubal occlusion as they would not go on to conceive yet there were 2 cases where complete looking occlusion was seen unilaterally. LOD therefore could result in a more difficult scenario of tubal dysfunction if used liberally in every non responding case of letrozole or clomiphene. It is logical to assume the possibility of women to have not conceived due to resulting tubal occlusion by LOD though ovulation was established. There are studies which indicate that adhesions though present, as not compromising the fertility rates⁸. This study was not designed to look at the fertility rates following LOD as it was retrospective in those who conceived and even completed pregnancy, any resultant ectopic or failed pregnancies not being included. The number of punctures and variations in technique like irrigation are reported to make little difference to adhesion formation. The practice of performing the procedure unilaterally⁷ with reported similar success rates by some may protect at least one tube should the worst would happen (bilateral blockage). It may be sensible to resort to early tubal function tests when no conception follows ovulation induced by LOD.

The newer technique of transvaginal hydrolaparoscopy (THL) guided ovarian drilling¹² is reported to be superior in terms of ovarian adhesion formation but higher in complication and failure rates than the conventional method.

LOD seems justifiable for lack of a financially viable alternative for clomiphene / letrozole resistant PCOS. The adhesions, though encountered frequently did not seem to affect pregnancy as it was evidenced frequently in pregnancies that followed. Trans vaginal hydrolaparoscopic technique may be worthy of

consideration but the higher complication rates may offset the less interfering problem of few extra adhesions.

Author declarations

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References

1. Portuondo JA, Melchor JC, Neyro JL, Alegre A. Periovarian adhesions following ovarian wedge resection or laparoscopic biopsy. *Endoscopy*. 1984; 16(4): 143-5 [DOI][PubMed].
2. Gurgan T, Kisnisci H, Yarali H, Develioglu O, Zeyneloglu H, Aksu T. Evaluation of adhesion formation after laparoscopic treatment of polycystic ovarian disease. *Fertil Steril*. 1991; 56(6): 1176-8.
3. Dabirashrafi H, Mohamad K, Behjatnia Y, Moghadami-Tabrizi N. Adhesion formation after ovarian electrocauterization on patients with polycystic ovarian syndrome. *Fertil Steril*. 1991; 55(6): 1200-1.
4. Naether OG, Fischer R. Adhesion formation after laparoscopic electrocoagulation of the ovarian surface in polycystic ovary patients. *Fertil Steril*. 1993; 60(1): 95-8.
5. Greenblatt EM, Casper RF. Adhesion formation after laparoscopic ovarian cautery for polycystic ovarian syndrome: lack of correlation with pregnancy rate. *Fertil Steril*. 1993; 60(5): 766-70.
6. Liguori G, Tolino A, Moccia G, Scognamiglio G, Nappi C. Laparoscopic ovarian treatment in infertile

- patients with polycystic ovarian syndrome (PCOS): endocrine changes and clinical outcome. *Gynecol Endocrinol.* 1996; 10(4): 257-64.
7. Saravelos H, Li TC. Post-operative adhesions after laparoscopic electrosurgical treatment for polycystic ovarian syndrome with the application of Interceed to one ovary: a prospective randomized controlled study. *Hum Reprod.* 1996; 11(5): 992-7.
 8. Taskin O, Sadik S, Onoglu A, Gokdeniz R, Yilmaz I, Burak F, et al. Adhesion formation after microlaparoscopic and laparoscopic ovarian coagulation for polycystic ovary disease. *J Am Assoc Gynecol Laparosc.* 1999; 6(2): 159-63.
 9. Mercurio F, Mercurio A, Di Spiezio Sardo A, Barba GV, Pellicano M, Nappi C. Evaluation of ovarian adhesion formation after laparoscopic ovarian drilling by second-look minilaparoscopy. *Fertil Steril.* 2008; 89(5): 1229-33 [DOI].
 10. Roy KK, Baruah J, Moda N, Kumar S. Evaluation of unilateral versus bilateral ovarian drilling in clomiphene citrate resistant cases of polycystic ovarian syndrome. *Arch Gynecol Obstet.* 2009; 280(4): 573-8 [DOI].
 11. Pierluigi Giampaolino I, Ilaria Morra Post-operative ovarian adhesion formation after ovarian drilling: a randomized study comparing conventional laparoscopy and transvaginal hydrolaparoscopy *Arch Gynecol Obstet.* 2016; 294(4): 791-6.
 12. Helmy ME, Saleh SA, El-Khouly NI, Soliman AE, Abou-Shady HM. Transvaginal needle versus laparoscopic ovarian drilling in drug-resistant polycystic ovary syndrome: a randomized, controlled study. *Menoufia Med J* 2019; 32: 436-40.