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A PROSPECTIVE STUDY ON THE EFFICACY OF THE LAPAROSCOPIC UTEROSACRAL NERVE ABLATION (LUNA) IN THE TREATMENT OF CHRONIC PELVIC PAIN

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ABSTRACT

BACKGROUND: CPP is defined as constant or intermittent cyclic or acyclic pain that persist for 6 months or more and includes dysmenorrhea and intermenstrual pain.The Lee-Frankenhauser sensory nerve plexuses and parasympathetic ganglia in the uterosacral ligaments carry pain from the uterus ,cervix and other pelvic structures. Interruption of these nerve trunks by Laparoscopic Uterosacral Nerve Ablation (LUNA) may alleviate pain.

AIMS & OBJECTIVE: To assess the effectiveness of the laparoscopic uterosacral nerve ablation (LUNA) in case of a woman with chronic pelvic pain in whom diagnostic laparoscopy reveals either no pathology or mild endometriosis (American fertility society score < 5) (principal objective).

MATERIALS & METHODS: A prospective observational study conducted in the Department of Obstetrics and Gynaecology, Calcutta National Medical College, Kolkata, over 30 women out of 127 who have presented with CPP of >6 months duration during the period MARCH 2018 to AUGUST 2019.The subjects were selected according to inclusion and exclusion criteria of this study. Patients were assessed by Specific history characteristics, pre-operative ultrasound examination and findings. In all women, diagonostic laparoscopy and LUNA was performed under general anesthesia.

RESULTS: The incidence of CPP in present study was found 12.11%. The majority (66.7%) of the patients with CPP were in sexually active age group ranges between 26 – 35 years, 46.7% of patients were nulliparous and 86% were married. The most frequent finding on laparoscopy was endometriosis (36.7%) in various pelvic sites. Overall success rate of LUNA after 3 months, 6 months and 12 months followup -80%,76.7% and 70% respectively.

CONCLUSION: Laparoscopy is the gold standard investigation for evaluation of patients with CPP as it enables not only confirmation of clinical or sonographic findings but also detects causes of pain in many. LUNA can be a alternative option in well selected patients for control of CPP with mild endometriosis, dysmenorrhoea, dyspareunia and chronic PID.

INTRODUCTION

Chronic Pelvic Pain (CPP) is best defined as intermittent or constant pain of at least 6 months duration, localised to the pelvis or lower abdomen below the line joining the two anterior superior iliac spines, not occurring exclusively with menstruation or intercourse and not associated with pregnancy. Howard (2003) had proposed a working definition of CPP as noncyclic pain of 6 or more months' duration that localizes to the anatomic pelvis, anterior abdominal wall at or below the umbilicus, the lumbosacral back, or the buttocks, and is of sufficient severity as to cause functional disability or lead to medical care.

Chronic Pelvic Pain is a common complaint met in day to day gynaecological practice particularly amongst women in their reproductive years. CPP is unrelated to parity, race or mental status. It continues to be a very expensive and debilitating problem. Living with any chronic pain carries a heavy economic and social price. Various forms of CPP affect 12-15% of women of reproductive age group. CPP is the indication for 12% of all hysterectomies and more than 40% of gynaecologic diagnostic laparoscopies.

A study from U.K. had reported that CPP has prevalence rate 3.8% in women age 15 to 73years. Aetiology of CPP is often obscure. Patients with CPP are frequently anxious and depressed. Their marital, social and occupational lives are often disrupted. CPP remains an inclusive general diagnosis that encompasses many more specific causes from endometriosis to nerve entrapment syndrome. These women have a high prevalence of emotional disturbances ranging from feeling of lassitude, depression and chronic anxiety to loss of interest in social and physical pursuits. Though detailed history taking and clinical examination gives considerable information's, it is not conclusive in many patients.

Hence, there comes the necessity for imaging pelvic organs by Trans abdominal or Transvaginal ultrasonography.Though there are recent advances in technology of USG like superior resolution, 3-D imaging, Doppler method etc, still in many cases of CPP ultrasonographic evaluation is not adequate and informative. Therefore, we need the direct visualisation of pelvic organs by laparoscopy for detection of pathology causing CPP. It is the only method capable of diagnosing peritoneal endometriosis and pelvic adhesion. Non randomised retrospective and prospective studies have suggested that diagnostic laparoscopy provides a positive psychological effect on the treatment of CPP. CPP may be the only complaint of the patient or it may be associated with other complaints such as infertility or menstrual abnormality. There is usually more than one component or factor responsible for chronic pelvic pain. Hence the assessment of a patient with CPP must be directed to identify all the contributory factors rather than aiming for a single pathology.

Descartes originally suggested that pain was a simple signal from peripheral pain neurons to the brain (the somatic theory). Eventually it became clear that pain is much more complex. The gate theory proposes that peripheral nociceptive signals can be modulated by neurotransmitters like serotonin and endorphins that can be linked with mood

states. The pain may be evoked by depressive states as opposed to direct tissue irritation. Thus, interacting psychological and physical factors are likely to be present and attempt to separate one from the other is generally unrewarding. The lateral pelvis transmits pain via nervi erigentes arising from S2-4. The presacral nerve divides into the hypogastric nerve that form the inferior hypogastric plexus, and this plexus divide into vesical, middle rectal and uterovaginal (Frankenhauser's) plexuses. Frankenhauser's plexus lies lateral to the uterosacral ligaments and medial to the uterine arteries and receives pain sensations only from the corpus and vagina. Interruption of these nerve trunks by uterosacral nerve ablation may alleviate pain. Interruption of these nerve pathways has been used to alleviate pain by open abdominal or vaginal approach in the past, but now this procedure can be performed less invasively via laparoscopic approach and is often referred to as laparoscopic uterosacral nerve ablation or LUNA in short.

Originally laparoscopic surgical experts were suggested that because of the divergence of the sensory nerve fibres and their ganglia as they leave the uterus, the uterosacral ligaments should be vaporised as close to the cervix as possible. However, recent anatomical studies have demonstrated that the greatest number of fibre bundles are at some distance from the site of attachment of the uterosacral ligament to the cervix. Hence there is controversy about the optimal site for LUNA. Anatomical studies also suggest that the nerve fibres are dense at a depth of 3-15mm , thus the completeness of transection of the uterosacral ligament can also be expected to have an implication for the effectiveness of LUNA.

Information on prevalent variations in the techniques regarding optimal site and depth of LUNA is currently unavailable. Thus a survey to examine the indications and different surgical techniques of LUNA is needed to establish practice patterns.

METHOD

The study was conducted in the Department of Obstetrics & Gynaecology of Calcutta National Medical College & Hospital, Kolkata during the period of March 2018 to August 2019. This study comprises of 30 (Thirty) women who had undergone thorough clinical, sonographic and laparoscopic evaluations.

Sampling done based on the following Inclusion and Exclusion criteria:

INCLUSION CRITERIA

- Pelvic pain of longer than 6-month duration.
- Pain located within the true pelvis or between and below the anterior iliac-crest
- Associated with functional disability.
- Lack of response to medical treatment.
- Diagnostic laparoscopy planned.

EXCLUSION CRITERIA

- Previous LUNA.
- Mild, moderate and severe endometriosis (American Fertility Society score >5).
- Previous surgery for endometriosis.
- Previous surgery for pelvic inflammatory disease.
- Previous hysterectomy.
- Adnexal pathology.

After proper selection of cases, a detailed history followed by general, systemic and pelvic examination, investigations including Trans abdominal USG or TVS and diagnostic laparoscopy of the patient was done and noted as per the protocol. The patients having more pain or serious or have come from distant places or divisions were admitted and complete workout was done in a stepwise manner. The patients having less pain and not willing for immediate admission were advised the investigations required including USG (abdominal or TVS) and admitted at a later date for diagnostic laparoscopy.

TECHNIQUE OF LAPAROSCOPY

A. INSTRUMENTS AND ACCESSORIES

The laparoscope and its accessories viz. Veress needle, trocar and cannula, Gas insufflators, Light source with fibre optic light, Camera, Instruments needed for endometrial biopsy and dye test, when indicated.

B. PROCEDURE OF LAPAROSCOPY

PRE-OPERATIVE PREPARATION

The patients were admitted electively the day before laparoscopy. Diagnostic laparoscopy was usually done in the post- ovulatory secretory phase if associated with infertility or D & C is planned for investigation of endometrial TB/ other granuloma/ infertility. Antiseptic shaving was done in the abdomen and perineum. The patients took nothing per month for atleast 8 hours prior to the operation. Informed consent was obtained. The patient and her relatives were explained about the nature of the procedure and the associated complications of operation and anaesthesia.

TECHNIQUE

A standard three-puncture technique is suggested. The procedure is performed by placing the uterosacral ligaments on stretch by anteverting the uterus with the uterine manipulator. A CO_2 laser (40 to 60 W) or another cutting instrument is employed to transect the ligaments at the points of their insertion into the cervix using a vertical motion from medial to lateral.

Following the recommendation of Fujii, the tissue located approximately 1 to 3 cm along the uterosacral ligament should be treated to a depth of 1.5 cm. This segment of the uterosacral ligament is close to the uterine vessels and ureter. The suction– irrigator serves as a backstop to make the uterosacral ligament more prominent and protect the ureter. A relaxing incision may be made along the outer side of the ligament to retract the ureter laterally before the ligament is transected. The blood vessels run along the medial aspect of the uterosacral ligament, and bleeding in this area must be controlled carefully because of the proximity of the ureter and rectum. Some gynecologists also vaporize a path along the base of the cervix between the uterosacral ligaments (Interceed (Gynecare) may be placed over the transected area).

If the uterosacral ligaments are difficult to identify, uterosacral transection is not recommended. When the uterosacral ligament is cut, a blood vessel inside it tends to bleed. To ascertain if this has occurred, uterine traction should be released and pneumoperitoneum should be decreased.

The direction of the ureter should be identified from the pelvic brim to the bladder because ureteral injury is a serious complication associated with this procedure. There is usually a distance of 2 to 3 cm between the ureter and the uterosacral ligaments; however, this varies.

If the ureter is close to the uterosacral ligaments, as mentioned above, a relaxing incision should be made as described.

The ureter is retracted laterally before the ligament is transected. If uterosacral transection is unsuccessful, it is presumed that interruption of the nerve fibers was incomplete or the nerves regenerated. Lichten reported that repeating the procedure did not relieve dysmenorrhea, implying that the course of the nerve fibers in these individuals may not be normal. Several patients with failed uterosacral transection have obtained relief from a

subsequent presacral neurectomy.

COMPLICATIONS

Complications of the LUNA procedure include loss of uterine support, adhesions, and ureteral transections.With loss of uterine support may leads to uterine prolapsed in women whose occupation and lifestyle are associated with heavy physical labor or exercises, although the etiology of uterine prolapse is complex, and no conclusions as to cause and effect can be made.

STATISTICAL ANALYSIS:

The results of all the tests were analysed and the sensitivity and predictive values of each modality (clinical / USG/laparoscopy) in diagnosis of CPP were calculated in % and compared with the international and national data available.

RESULTS

The actual number of OPD patients were high but this was due to their multiple visits. Out of these 127 patients, only 30 have undergone LUNA. This was because of the various inclusion criteria as well as patient compliance. Here the incidence of CPP of both gynaecologic and non- gynaecologic origin is 12.11%. Majority (46%) of patients with CPP were in the age group between 31 – 35 years which means CPP found commonly in sexually active women and most of the patients presenting in GOPD with CPP were married (87%), which again shows that CPP is much more common in sexually active women. 47% of patients with CPP in our study were nulliparous followed by primiparous patients (27%). 26% patients were multipara. So, most of the patients were either nullipara or primipara. Distribution of cases according to history of associated infertility among married women with CPP (n = 26). 65% of married women with CPP have no associated history of infertility. Total number of infertile patients was 26, of whom 15% have primary infertility and 20% have secondary infertility. It signifies relatively high association of infertility both primary and secondary with CPP in our study.

43% of women with CPP presented within 1 year and another 27% presented in GOPD within next 6 months. So, 70% of patients with CPP presented within one year and six months, which suggests that patients are increasingly seeking medical advice for CPP as they have become more conscious and also because they get free-treatment in hospital. Acyclical lower abdominal pain, dysmenorrhoea and dyspareunia either alone or together were present in more than 67% of the patients with CPP. Hence, it is clear that CPP goes hand in hand with acyclical lower abdominal pain, dysmenorrhoea and dyspareunia. It is clear that pelvic tenderness is the common findings by per vaginal examination in CPP. 86.7% of patients with CPP no abnormality can be detected by ultrasonography and only 6.7% endometriosis and 6.7% chronic PID can be detected by sonography .63% of patients with CPP have one or more positive findings, the commonest being endometriosis in various pelvic sites (37%) suggesting increased incidence of endometriosis in our society due to delay in age of marriage and first conception. The actual incidence of adhesions was much higher as some cases of endometriosis, chronic PID. Laparoscopy is the gold standard for the diagnosis of endometriosis. Common intraoperative complication of LUNA in this study is oozing which was managed by cauterization with the help diathermy successfully. Out of 30 patients only 3 patients(10%) complicated with oozing during operation and only 2 patients (6.7%) complain of fever in post operative periods which was managed by conservatively within 2-3days.

All patients were followed up after 3, 6, and 12 months after the ablation. Follow-up visits included: history taking, clinical examination . The effectiveness of the procedure was estimated using a 10-cm visual analog scale (VAS), anchored at one end as no pain at all, and at the other as the worst imaginable pain. Also, the VAS ratings were obtained at 3, 6, and 12 months for each of the types of pain: noncyclical pain (pain at any other time other than during periods or during intercourse), primary (spasmodic) dysmenorrhea, secondary (congestive) dysmenorrhea, and dyspareunia (pain during intercourse).The success rate was defined as the percentage of women who reported no, minimal, or tolerable pain during the period of follow-up and this PAS was calculated as percentage to simplify the results (*excellent =10–9, **good =6–8 PAS , ***tolerable =3– 5, ****minimal =0–2 PAS).The patients' satisfaction was estimated by asking the patients a direct question (did the procedure improve your health status?, regarding the need for additional treatments, resource usage, days off work, and complications of surgery), and the patients' answers determine the degree of satisfaction (if it is excellent [4], good [3], average [2], or no improvement [1]). Also, the option if the pain was "worse than before" was evaluated and was only restricted to complications of the procedure that worsen the patients' condition. All patients were followed up for long-term complication and the need for additional treatment (medical or surgical), which was considered as treatment failure. The efficacy was at 3, 6 and 12 months of follow-up and it was 80%, 76.7%, and 70% and p-value was 0.754,0.368 and 0.558 respectively.

The Sensistivity, Specificity, PPV, NPV of USG findings in respect to laparoscopic findings was measured and we got the p value which is 0.231 whis is not significant. Therefore Chr PID sensitivity (50%), specificity(100%) ,positive predictive value (100%), diagonostic accuracy 93.3 and in case of endometriosis sensitivity (18.18), specificity(100%), positive predictive value (100%), of laproscopic findings.The above calculation is done assuming laparoscopy as gold standard.

Out of 30 patients 26 patients are married.Among the married total no of infertility was 9 (primary and secondary infertility).Among the 9 infertile women 2 women became pregnant which is 22.22%.

Table 1: Distribution of patients with CPP according to duration of pain in months

Duration of CPP (in months)	Number of cases	Percentage (%)
6 – 12	13	43.3
13 – 18	8	26.7
19 – 24	4	13.3
25 – 30	2	6.7
31 – 36	3	10.0
> 36	0	0
Total	30	100

Table 2: Clinical presentation in women with CPP

Clinical Presentation	Number of cases	Percentage(%)
Only Acyclical lower abdominal pain	7	23.3
Only Dysmenorrhoea	8	26.7
Only Dyspareunia	1	3.3
Acyclical lower abdominal pain & Dyspareunia	3	10.0
Acyclical lower abdominal pain & Dyscazia	1	3.3
Acyclical lower abdominal pain & Dyspareunia & Dyscazia	1	3.3

Dysmenorrhoea & Dyspareunia	3	10.0
Dysmenorrhoea & Dyspareunia	1	3.3
Dysmenorrhoea & Dyspareunia & Dyscazia	5	16.7
Total	30	100.0

Table 3: Ultrasonographic findings or diagnoses in women with CPP

Ultrasonographic finding or diagnosis	Number of cases	Percentage (%)
No abnormality detected	26	86.7
Endometriosis	2	6.7
Chronic pelvic pain	2	6.7

Table 4: Laparoscopic findings or diagnoses in women with CPP

Laparoscopic finding or diagnosis	Number of cases	Percentage (%)
No abnormality detected	11	37
Endometriosis	11	37
Chronic PID	7	23
Polycystic changes	1	3

Table 5: The success rate according to the PAS after treatment at 3, 6, 12 month follow-up following LUNA…(n-30)

	After 3 Months		After 6 Months		After 12 Months		p Value		
Outcome	Frequency	Percent	Frequency	Percent	Frequency	Percent	3 Mth vs. 6 Mth	3 Mth vs. 12 Mth	6 Mth vs. 12 Mth
No pain	6	20.0	5	16.7	3	10.0	0.738	0.273	0.445
Minimal pain	7	23.3	8	26.7	7	23.3	0.765	1.000	0.785
Tolerable pain	11	36.7	10	33.3	11	36.7	0.787	1.000	0.787
Pain as before	6	20.0	7	23.3	9	30.0	0.754	0.368	0.558
Total Success	24	80.0	23	76.7	21	70.0	0.754	0.368	0.558
Total	30	100.0	30	100.0	30	100.0			

Table 6: Calculation of Sensitivity, Specificity, Positive and Negative Predictive values of USG findings in respect to laparoscopic findings.

		USG Findings			Total		
		Chr PID	Endometriosis	NAD		**p Value**	**Significance**
Laparoscopic findings	Chr PID	2(100)	0(0)	4(15.38)	6(20)	0.231	Not Significant
	Endometriosis	0(0)	2(100)	9(34.62)	11(36.67)		
	PID	0(0)	0(0)	1(3.85)	1(3.33)		
	Polycystic change	0(0)	0(0)	1(3.85)	1(3.33)		
	NAD	0(0)	0(0)	11(42.31)	11(36.67)		
Total		2(100)	2(100)	26(100)	30(100)		

DISCUSSION

CPP is a common complaint amongst women in their reproductive years. Clinical and sonographic evaluations are of paramount importance in assessing the causal factors. Nevertheless, laparoscopy as a diagnostic tool is more informative as it can assess as yet hidden pathologies like peritoneal factors in addition to those arising from uterus, tubes and ovaries. In this study an attempt has been made to assess women with CPP by clinical, sonographic and laparoscopic methods and Laparoscopic Uterosacral Nerve Ablation was done according to their inclusion and exclusion criteria.

During the 18 months study, CPP was detected in 12.11% of patients which tallies with the incidence detected by various authors. However only 30 patients had undergone sonography and diagnostic laparoscopy. A great number of patients with non- gynaecological causes for CPP were excluded, but few of them with dual suspicion kept in the study. Some of the patients were unwilling for any surgical intervention and were excluded from study.

Majority (62%) of patients with CPP were in the age group of 26 – 30 years and 31 – 35 years suggesting that CPP is a disease of young sexually active women. The average age of patients with CPP in our study was 30.04 years which is Similar to Zubor P et al [1]. Majority (78%) of patients with CPP were married which again proves that it is a disease of sexually active women in their reproductive years [2].

It is evident that 46.7% of patients with CPP were nulliparous followed by primiparous patients (26.7%). In present study parity was somewhat towards lower side as the patients of CPP with associated primary or secondary infertility consented more readily for diagnostic laparoscopy for their fertility problems rather than CPP.

In our study 43.6% of married women with CPP have associated infertility, either primary or secondary. This may be due to the reason that patients with associated infertility consented more readily for diagnostic laparoscopy [3].

Menstrual abnormalities have been found to be associated with CPP, among which menorrhagia was the commonest (27.08%) followed by hypomenorrhoea (10.42%) particularly in those cases associated with pelvic tuberculosis. 62% of patients with CPP in our study presented within one and half years since onset of pain. This indicates that patients are increasingly seeking medical advice for CPP. This picture also reflects the availability of free treatment in hospital, which is also responsible for early presentation. In a study by Zubor P et al. (2005) the average pain duration was 11.5 months (6 – 28) which correlates with our study[52].

Dysmenorrhoea and dyspareunia either alone or together were present in 92% of the patients with CPP, which is comparable with other studies. Dyscazia was present particularly in those patients having endometriosis involving rectovaginal septum [4]. Most common causes of CPP diagnosed clinically were endometriosis and chronic PID being 28% each and together constituting 56% of total cases. 50% of patients with CPP have either adnexal mass/ ovarian cyst (26%) or endometriosis / endometrioma (24%) detected sonographically. Except the above two conditions, adenomyosis and uterine myoma were the other conditions detected better by sonography than any other investigative procedure[4]. 17 patients out of 50 (34%) came out to be suffering from endometriosis in various pelvic sites. Only

post- operative adhesions without any other pathology were found in 12% cases. If all causes of adhesions are taken together in consideration, then adhesions were the commonest (50%) laparoscopic finding which was responsible for CPP in our study and which tallies with the findings of Gizewski et al. (1992)[5], Marana et al. (1993)[3], Bojahr et al. (1995)[6] and Gowri V et al. (2001)[7]. 10% of patients detected to have normal pelvis. It is evident that 50% of patients with CPP underwent adhesiolysis followed by ovarian cystectomy (36%) and ablation of endometriotic deposits (28%). There was considerable overlapping of therapeutic procedures. A study by Steege JF et al. (1991)[8] states that both pain during daily activities and dyspareunia are likely to improve after lysis of adhesions.

It is found that sensitivity and positive predictive value of sonographic findings in respect to laparoscopic findings were 50% and 100% respectively in present study. According to a study by Ozaksit G et al. (1995)[9] The predictive value of normal findings at ultrasound was 60% and Laparoscopy revealed abnormality in 100% of patients with abnormal ultrasound findings.

Chr PID sensitivity (50%), specificity(100%), positive predictive value (100%), diagonostic accuracy 93.3 and in case of endometriosis sensitivity (18.18), specificity(100%), positive predictive value (100%) and p-value is 0.231. In a study by Kamilya G et al. (2005), they applied Kappa statistics and there was fairly good agreement between the number of normal and abnormal cases by laparoscopy vs USG examination (Kappa = 0.71). USG. Thus the strongest agreement is between laparoscopy and USG, and the weakest between clinical examination and laparoscopy. Laparoscopy is most sensitive in detecting an abnormality.

No serious complications were encountered in the patients included in the present study. Due to pneumoperitoneum mild chest pain, abdominal pain occurred in a few cases. All the patients after the LUNA was discharged within 2-4 days almost all the patients were return to their normal activity within 12-16 post-operative days.

In this study after luna all the patients was followed up 3, 6 and 12 months according to the judgement of pain with help of VISUAL ANALOGUE SCALE (VAS). Total success rate after 3 ,6 and 12 months follow up 80%,76.7% and 70%.and p-value 0.754,0.368 and 0.558 respectively. Jung et al.[10] found that of his 12-month follow-up study of LUNA for treating primary deep dyspareunia, the satisfactory rates at 3 and 12 months were 66.7% and 50%, respectively. However, in our opinion, deep dyspareunia is very complicated in its pathogenesis, which includes both physical and psychiatric/psychologic aspects; hence, a verified system comprising of clarified definitions and criteria in the assessment of satisfaction or improvement is mandatory, and will be very difficult to be practiced in our community and with our patients with the lack of group evaluators, including social personnel who are qualified for appraising a sexologic and psychiatric /psychologic questionnaire to give more informed insight, and so these results need to be evaluated carefully in a large, randomized trial before it will be generalized.

In this study out of 26 married women 9 women were infertile. Out of 9 infertile women 2 women became pregnant which was 22.2% probably due to adhesiolysis which was done during LUNA.

CONCLUSION

Thorough history taking and clinical examination are of paramount importance in evaluation of patients with CPP. Ultrasonography either transabdominal or transvaginal should always be the first line of investigation to supplement clinical findings as it is non- invasive and having high detection rate in adnexal pathology. Laparoscopy is the gold standard investigation for evaluation of patients with CPP as it enables not only confirmation of clinical or sonographic findings but also detects causes of pain in many. Clinical or sonographic diagnoses do not always tally with laparoscopic diagnosis, but they direct the Gynaecologist about the pathology to look for during laparoscopy. Normal pelvis detected by laparoscopy indicates for psychosomatic evaluation of the patient or it suggests verification whether any non- gynaecological cause of CPP has been missed. Work–up for associated infertility and therapeutic procedures like adhesiolysis, cystectomy or ablation of endometriotic deposits can be done simultaneously which is an added advantage of laparoscopy. As laparoscopy is an invasive procedure and requires general anaesthesia, it is not free of complications, but if done by a skilled person in a proper set-up, the complications are minimum.

In case of CPP which is not responding to medical therapy LUNA is the best option. In LUNA intra-operative, post-operative complications are less. Patient can be returned their normal activity within two weeks of post-operative day. The cost and surgical morbidity of laparoscopy can be justified as it can add a much to the other investigative procedures in the evaluation of patients with CPP and further treatment for achieving the desired goal of pain relief. Therefore, it can be said that all three methods, i.e. clinical, sonography and laparoscopy are not exclusive. On the contrary, they are complementary to each other and should be used in combination judiciously to increase the detection rate. Finally, it can be concluded that clinical evaluation of CPP when combined with sonography is highly predictive, but needs confirmation, best provided by laparoscopy which is the gold- standard amongst the three methods. Aiming for accurate diagnosis and effective management from the first presentation may help to reduce the disruption of the woman's life and may avoid an endless succession of referrals, investigations and operations.

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