

# Chronic pelvic pain syndromes – traditional and novel therapies: Part I surgical therapy

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## Summary

**Purpose:** To describe the role of various surgical therapies for the relief of pelvic pain. **Methods:** The latest studies involving surgical therapies for relief of pelvic pain are reviewed and the pros and cons are discussed. **Results:** Laparoscopic removal of endometriotic implants should be performed if the surgical procedure is being performed for diagnostic purposes. Laparoscopic uterine nerve ablation of endometriotic implants and presacral neurectomy may provide additional relief but require greater surgical skills and have significant risks, especially bleeding. There still is a role for complete hysterectomy usually with bilateral salpingo-oophorectomy. **Conclusions:** Recurrence rates following surgery relegate surgical procedures behind medical therapy, i.e., to be used only if medical therapy is failing. Not all pelvic pain is related to endometriosis. Some novel concepts as to common mechanisms involved in a large percentage of these pelvic pain syndromes leading to some novel highly effective medical therapies will be discussed in part II.

**Key words:** Endometriosis; Deep dyspareunia; Dysmenorrhea; Surgical therapy.

## Introduction

Pelvic pain may be spontaneous, e.g., menstrual cramps, or following certain acts, e.g., intercourse (where it is referred to as dyspareunia) or following urination (dysuria). Chronic pain is estimated to affect over five million women in the United States with estimated associated healthcare costs approximately three billion per year [1]. Approximately 40% of diagnostic pelvic laparoscopies are for chronic pain [2]. When laparoscopy finds endometriosis then the pain is assumed to be from that entity. When endometriosis is not found the patient is sometimes advised that 1) she may still have endometriosis but we may not be seeing it because it is clear or white and lost with the light source but could still be the etiologic factor, 2) what we see with endometriosis through the laparoscope may be just the “tip of an iceberg” and in this case we may not be able to see the tip, 3) endometrial implants may be in the wall of the myometrium, i.e., adenomyosis, and thus would not be seen, 4) endometriosis does not exist but instead there may be pelvic congestion syndrome [3], 5) the pain is unexplained and could be psychosomatic for various reasons including avoidance of sexual intercourse, 6) maybe the pain is bowel related, 7) the pain could be related to pelvic floor dysfunction, 8) the pain could be bladder related, i.e., interstitial cystitis (one study suggested that interstitial cystitis was present in 85% of women complaining of chronic pelvic pain) [4].

It should be noted, however, that frequently when a laparoscopy is performed for infertility diagnosis, resection of a hydrosalpinx, or tubal ligation, endometriosis may be found and sometimes extensively in women not complaining of any pelvic pain at all [2]. Thus it is not clear that in women with chronic pelvic pain that the finding of endometriosis is necessarily the cause of the chronic pelvic pain.

Certainly it makes sense if one has inserted the laparoscope to ablate the endometriotic implants that are safely located. Sometimes one finds long lasting relief from the laparoscopic ablation of endometriotic implants. Sometimes there is no relief at all suggesting that the cause of the pain was from another source and the endometriosis was just an innocent bystander. Alternatively the possibility exists that the skill of the surgeon is insufficient to diagnose all the implants or they were not all able to be found even by skilled technicians. Temporary relief of just a few months can be explained similarly.

## *Theories of the mechanism of chronic pelvic pain from endometriosis*

When there is pain without bleeding with or without intercourse one theory to explain the pain is irritation or direct invasion of pelvic floor nerves by infiltrating endometriotic implants especially in the cul de sac and uterosacral ligaments [5]. Deep dyspareunia may also be caused by the traction of scarred inelastic uterosacral ligaments during intercourse or by the pressure on endometriotic nodules imbedded in fibrotic tissue. Sometimes the dyspareunia may be related to scar tissue immobilizing the pelvic organs during intercourse.

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Pelvic pain with intercourse when associated with menstrual bleeding may be related to the direct or indirect effects of active bleeding from endometriotic implants. Possibly the actual pain from the bleeding implants may be related to the blood attracting activated macrophages and other white blood cells which then produce growth factors and cytokines which actually cause the pain.

## Treatment options

### *Surgery*

#### *Laparoscopy*

##### *Laser ablation of endometriotic lesion*

Usually when one sees published reports on surgery, in general, it is usually the experts with the most experience reporting their data. Thus another less experienced surgeon cannot necessarily expect to achieve the same outcome. Even experienced experts may decide not to report their findings if “their success” pales compared to other reports. At one year following laser ablation, improvement of pain, but not necessarily eradication was reported in 50-95% of women treated with laparoscopic ablation of endometriosis usually with laser [6-13].

However a randomized controlled study found no difference in the proportion of women reporting improvement of pain at three months in those with laser vaporization of endometriosis vs the controls having diagnostic laparoscopy only [8]. Interestingly, however, at six months 62.5% of the women having laser ablation reported significant improvement in pain vs only 22.6% of the controls [8]. The worse the endometriosis the higher percentage of women claiming pain relief [8].

After one year 44% of the laser treated women had a recurrence of endometriosis [14]. There are no studies determining which of the various techniques for ablation of endometriosis provides better results (unipolar or bipolar electrocautery, or laser ablation using CO<sub>2</sub>, KTP neodymium, yttrium or Nd YAG lasers).

With the high recurrence rate in a short time my suggestion to women is not to purposely do a laparoscopy to remove endometriosis for pain purposes. However, if a diagnostic laparoscopy is being performed to confirm the etiology of pain it makes sense to remove the endometriotic implants at that time.

As far as whether to use excisional surgery vs ablative surgery for ovarian endometriomata a Cochrane review by Hart et al found good evidence that excisional surgery for endometriomata provided a more favorable outcome than drainage and ablation for relief of pain and recurrence of the endometrioma [15].

##### *Other surgical procedures to relieve dysmenorrhea*

Laparoscopic uterosacral nerve ablation (LUNA) is intended to disrupt the efferent nerve fibers in the uterosacral ligaments to decrease severe dysmenorrhea [16, 17]. The risk of complications following LUNA is small but there have been reports of transection of the ureter and uterine prolapse [18]. Unfortunately a large randomized controlled trial comparing the effect of conservative laparoscopy surgery with LUNA vs the control of just laparoscopic surgery alone failed to find any significant difference in recurrent dysmenorrhea percentage [19]. Thus LUNA should not be added as an additional procedure to laparoscopic ablation of endometriosis.

Presacral neurectomy involves interrupting the sympathetic intervention to the uterus at the level of the superior hypogastric plexus. In contrast to LUNA, presacral neurectomy requires much greater surgical skill and carries the significant side-effect of bleeding from the adjacent venous plexus [20]. Nevertheless, in contrast to LUNA two randomized controlled trials did show improvement in mid-line dysmenorrhea but not other aspects of pelvic pain, i.e., backaches or rectal discomfort with menses or dyspareunia [21, 22]. Thus, in view of only partial relief of pelvic pain and significant risk, this procedure should not be performed routinely when a laparoscopy is being performed for diagnosis of pelvic pain.

##### *Surgical procedures to mitigate deep dyspareunia*

Deep dyspareunia refers to painful intercourse with deep vaginal penetration as opposed to painful intercourse soon after traversing the introitus. Dyspareunia may accompany dysmenorrhea, e.g., in women with endometriosis. One study found it present in 41% of women with chronic pelvic pain [23]. However it can exist solely by itself without other pelvic pain syndromes in about 14% of women [23].

Surgical excision of deep endometriotic nodules which may include the rectovaginal septum and the wall of the bowel have been shown to have definite benefit one year from surgery as evidenced by a randomized placebo-controlled study [24]. These data are in agreement with other retrospective and prospective but not controlled studies [25, 26]. The reader should be reminded that the published reports are generally from the most skilled surgeons and complications are common even with these experts. Less skilled gynecological surgeons are more apt to have a higher complication rate and a lower efficiency rate.

### *Women with endometriosis with debilitating disease that has been resistant to other treatment modalities - surgical option*

When other surgical and medical therapies have not succeeded in adequate reduction of pelvic pain one can consider hysterectomy. It is an easier choice for women who already have children and desire no more, or women who may desire more in the future but are willing to compromise with the number they already have in exchange for relief of pain.

Simple hysterectomy can be effective especially if the main complaint is dysmenorrhea. However, without bilateral oophorectomy reduction of deep dyspareunia is not significantly diminished and there is a high recurrence rate of pelvic pain and return of endometriosis [27].

Simple hysterectomy with bilateral salpingo-oophorectomy (TAH BSO) is an easier choice for women who are of advanced reproductive age, do not want more children, and who are suffering greatly. It would still not be recommended for a younger group to try TAH BSO before conservative medical treatment because they will probably need hormonal replacement for control of severe vasomotor symptoms and they are generally too young to allow atrophic vaginal and bladder changes. Thus why risk surgical complications if the same medical therapy after surgery could provide sufficient relief prior to surgery? [28].

In women having TAH BSO for excessive uterine bleeding, symptomatic leiomyomata or cervical dysplasia or carcinoma in situ and are close to the menopause age, to remove the risk of ovarian carcinoma frequently the ovaries are removed. It is generally recommended in this group to only replace estrogen and not to add progesterone in order to possibly decrease the risk of breast cancer and heart disease.

However, in contrast, women with TAH BSO for endometriosis should be treated with an estrogen/progestin combination to lower the risk of recurrent endometriosis and at the same time help lessen vasomotor symptoms. In this case scenario the theoretical small risk of breast cancer or heart disease is overshadowed by the very real risk of recurrent symptoms from endometriosis without such therapy.

One may wonder why would simple hysterectomy with removal of other identifiable implants not be sufficient since the source for retrograde menstruation would be removed [29]. However, retrograde menstruation may not be the only way to develop endometriosis. A second theory is that some cases may be related to coelomic metaplasia. This describes a circumstance where undifferentiated cells in the peritoneal cavity differentiates into the endometrium. Recently there has been evidence that the mesenchymal stem cells from bone marrow can differentiate into the endometrium and endometriosis [30]. These stem cells can subsequently be recruited into the endometrium where they differentiate into both endometrial epithelial and stromal cells. Retrograde menstruation of these stem cells or endogenous uterine stem cells can cause endometriotic implants. Ectopic differentiation of stem cells can also cause the progression of endometriotic implants locally or at distant sites even in the absence of a uterus [30]. Coelomic metaplasia could also explain the persistence of endometriomata despite the absence of a uterus. This is the reason why estrogen/progestin therapy may be needed even after TAH BSO.

Sometimes the pain is so severe that in circumstances of recalcitrance to other therapies TAH BSO may be needed. There is evidence that endometriomas may be associated with a greater risk of clear cell or epidermoid ovarian cancer [31, 32]. Some younger women with complex cystic structures that are probably endometriomata but are sometimes not distinguishable from early ovarian cancer especially if the serum CA-125 levels are elevated may prefer to remove the ovaries as well as the uterus [33]. In these circumstances the woman may consider in vitro fertilization with either cryopreservation of the embryos if there is a male partner or cryopreservation of the oocytes so that embryos could be transferred in the future to a gestational carrier.

### *The role of laparoscopic salpingectomy*

Laparoscopic salpingectomy for hydrosalpinges is most commonly performed today for purposes of infertility since data suggest that transfer of the infectious tubal fluid to the uterine cavity can impair embryo implantation [34-36]. The majority of women with unilateral or bilateral hydrosalpinges are asymptomatic. Occasionally however, a woman presents with chronic recurrent episodes of pelvic inflammatory disease or persistent deep dyspareunia and considerable relief is provided by salpingectomy.

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