

Laparoscopic Presacral Neurectomy

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Presacral neurectomy (PSN) has been successfully used to treat women experiencing midline premenstrual and menstrual dysmenorrhea along with midline pelvic pain for almost 100 years.¹⁻¹⁶

Recent developments in minimally-invasive surgical technique have allowed the gynecologic surgeon to perform laparoscopic presacral neurectomy (LPSN) as an isolated procedure or in conjunction with other conservative procedures for the treatment of pelvic pain and dysmenorrhea.

INTRODUCTION

A 24 year old white female, gravida 0, para 0, presents to the gynecologist with worsening RLQ and midline premenstrual and menstrual dysmenorrhea, in addition to deep thrust dyspareunia which is worse on the right side than the left. The premenstrual component begins 5 to 7 days before the onset of menses and continually worsens until menstruation begins. The menstrual dysmenorrhea lasts for approximately 48 hours and then subsides. The patient has been treated with progestogen-dominant oral contraceptive pills (OCP's) in addition to prostaglandin synthetase inhibitors (PSI's) and narcotics without relief of symptoms. Pelvic exam reveals right adnexal thickening and tenderness and is otherwise normal. Options are dis-

cussed with the patient, including possible LPSN at the time of video laparoscopy. The findings at subsequent surgery are dark-hemorrhagic and white-fibrotic lesions strongly suggesting endometriosis, just above, and on top of the ureter and behind the right tube and ovary. The uterus is noted to be minimally enlarged and to have a somewhat boggy appearance. The suspected endometriosis is excised using a carbon dioxide laser and LPSN is performed during the same procedure. Eighteen months after this procedure, the patient remains symptom free.

The effectiveness of PSN has been described by a number of different authors since the first attempt to interrupt the nerve supply to the pelvis was reported by Jaboulay¹⁷ in 1899. Review of the early literature^{2,3,7} generally

demonstrates significant relief of pain in 75% to 80% of patients treated with PSN. Black¹ in 1964 summarized literature case reports for PSN (79% overall success rate) in addition to tabulating data obtained from a survey of physicians (75% reported success rate) in which 472 of 800 responded.

In 1955 Doyle¹⁸ described a procedure for treatment of dysmenorrhea through paracervical uterine denervation by transection of the cervical plexus. More recently Lichten and Bombard¹⁹ described a laparoscopic approach to Doyle's procedure - laparoscopic uterosacral nerve ablation (LUNA). Unfortunately, most series^{19,20} reveal long term pain relief with LUNA to be at or less than 50%.

The first 25 cases of LPSN were reported by Perez¹³ in 1990. Subsequently, a number of authors^{12,14,22} have reported successful relief of midline pelvic pain and dysmenorrhea with this procedure. The success rates for long term pain relief reported for LPSN are similar to those for PSN. Most authors agree that failures are due to improper patient selection or incomplete resection of the nerve plexus.

INDICATIONS FOR PRESACRAL NEURECTOMY

In recent years, medical therapy has reduced the need for surgical intervention to treat pelvic pain. Specific causes of pelvic pain such as infection and irritable bowel syndrome should be appro-

priately diagnosed and treated prior to consideration of surgical therapy. If other etiologies have been excluded and the patient is to be treated for dysmenorrhea, medical therapy with OCP's and/or PSI's should be instituted before surgery is considered unless the medical therapy is contraindicated. Use of the PSI's is most effective when the medication is begun prior to onset of symptoms and is effective in treating dysmenorrhea for many women. Danocrine²³ was previously a mainstay in treatment of pain and dysmenorrhea associated with endometriosis, but has well-known side effects and a high recurrence of symptoms within one year after stopping the medication.²⁴ Gonadotropin releasing hormone (GnRH) analogues were introduced in 1982 for treatment of endometriosis²⁵ and its associated symptoms, but likewise have similar drawbacks of undesired side effects and relatively short duration of action.²⁶

There is a consensus that patients must demonstrate insufficient relief from medical therapy prior to being considered for surgical treatment. One exception to this may be pain associated with infertility when known or suspected endometriosis is present. In this situation medical therapy would simply delay the likelihood of conception and not significantly improve the fecundity rate.²⁷ Before proceeding to surgery for treatment of pelvic pain, a thorough history should include questions about the possibility of childhood

physical and sexual abuse. Walker²⁸ demonstrated a correlation between these forms of abuse and pelvic pain in women during adulthood.

It has also been well documented²² that only midline pelvic pain and dysmenorrhea should be treated with PSN or LPSN. Lateral pelvic pain and dysmenorrhea respond poorly to these procedures. Whenever pathology is present that is amenable to specific therapy such as lysis of adhesions and ablation of endometriosis, this should be treated whether or not PSN or LPSN is to be performed.

Intractable midline pelvic pain and dysmenorrhea not responsive to medical therapy and (when appropriate) other conservative surgical therapy may be treated with hysterectomy or PSN or LPSN. If hysterectomy is chosen, the author recommends it be performed as a laparoscopic or laparoscopically-assisted procedure to minimize the chance endometriosis or other pathology is left in situ resulting in persistent pain. There is some disagreement whether PSN and LPSN should be performed as a primary surgical procedure or whether they should be reserved for the patient who has failed not only medical therapy but also other conservative surgical therapy such as ablation of endometriosis. The author performs LPSN as a primary procedure when there is a significant midline component to the patient's pain whether obvious endometriosis is present or not. This obviates the need to later bring the patient back to the operating room for further surgery. Completing PSN laparoscopically has obvious benefits over the open procedure.

Any discussion of indications for a surgical procedure should also explore the qualifications and skills of the surgeon performing the procedure. It is universally acknowledged that the learning curve for laparoscopic procedures is longer than that for the same procedures performed by open technique. Prior to any procedure being performed laparoscopically, the surgeon should be proficient at performing it as an open procedure and be appropriately credentialed in both approaches. Because of the area in which PSN and LPSN are performed, there is a greater chance of significant complication with these procedures than with most other gynecologic cases. As a result, most credentialing committees have grouped PSN and LPSN with other more difficult procedures such as pelvic node dissection and tubal reanastomosis.

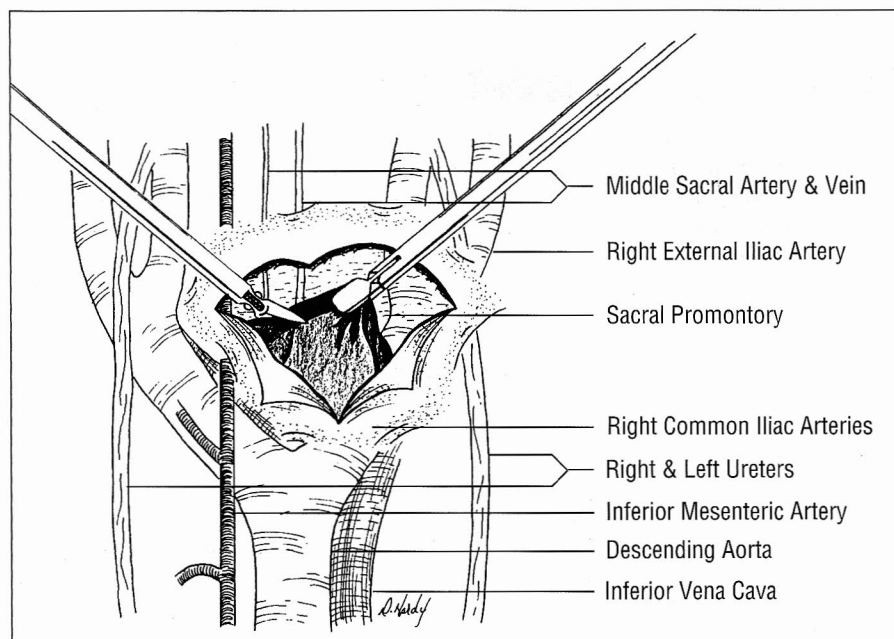


Figure 1: Anatomy of the interiliac trigone-dissection technique using scissors is shown.

Anatomy

A complete knowledge of the anatomy is mandatory prior to attempting surgery in any location. Equally important is the realization that the location of specific structures varies from individual to individual.

The superior hypogastric plexus or so-called presacral nerve may occasionally be a single nerve but is more commonly a group of several fibers connected with anastomosing elements. Because all of the nerve fibers are usually not found at the same depth in the presacral fatty and connective tissue, it is necessary to remove all of this tissue from the surgical site.

The presacral nerve is found in a triangular area known as the interiliac trigone. The lower boundary of the trigone is the sacral promontory, and the lateral boundaries are formed by the common iliac arteries joining at the bifurcation of the aorta (Figure 1). The lateral limit of the dissection on the right is the ureter as it crosses the common iliac artery just before, or as, it bifurcates. There is usually a similar anatomic relationship on the left side, but the ureter on this side is most often lateral to the limit of dissection. The lateral limit of the dissection on the left side is usually the inferior mesenteric artery and the base of the sigmoid colon (Figures 2a and 2b). During the dissection, the superior rectal (hemorrhoidal) vessels are seen as continuations into the pelvis of the inferior mesenteric vessels. While performing PSN or LPSN, care must be taken to avoid damage to the left common iliac vein since it runs more medially than the corresponding artery and actually forms part of the floor of the trigone. The middle sacral artery and vein are usually seen running caudad down the middle of the trigone attached to the periosteum. Inadvertent interruption of these vessels can result in significant blood loss as can carrying the dissection too far caudad where a delicate venous plexus is found.

Procedure

Preoperative bowel prep is helpful to reduce obstruction of the visual field by dilated loops of bowel. LPSN is performed under general anesthesia with the patient in low lithotomy position. A four-puncture technique is preferred with a laparoscope inserted through the umbilical incision and assisting instruments passed through three 5mm suprapubic incisions (one in the midline and two just lateral to the rectus muscles, taking care

to avoid injury to the superficial and deep vessels of the abdominal wall.

The LPSN is begun after any other procedures necessary to treat pelvic disease are completed. The incision in the peritoneum and subsequent dissection is carried out with whatever instrumentation the surgeon is most comfortable. Significant vascularity is present in the presacral tissue necessitating the use of some modality for hemostasis. Most frequently the author utilizes a combination of the carbon dioxide laser, monopolar scissors, and bipolar cautery. The peritoneum overlying the sacral promontory is elevated at the points of the lateral limits of dissection

as described under Anatomy (Figures 2a and 2b). The landmarks on the right are easily identified, but this is not true on the left. Care must be taken during dissection to reduce the chance of damage to the inferior mesenteric and superior rectal vessels in addition to the sigmoid colon itself. In the author's experience, the left ureter was seen inside the limits of dissection on one occasion out of 40 cases. When the limits of dissection are difficult to identify, a "T" incision should be made, beginning in the middle of the transverse incision in the peritoneum and continuing the incision cephalad to the bifurcation of the descending aorta. Connective and fatty

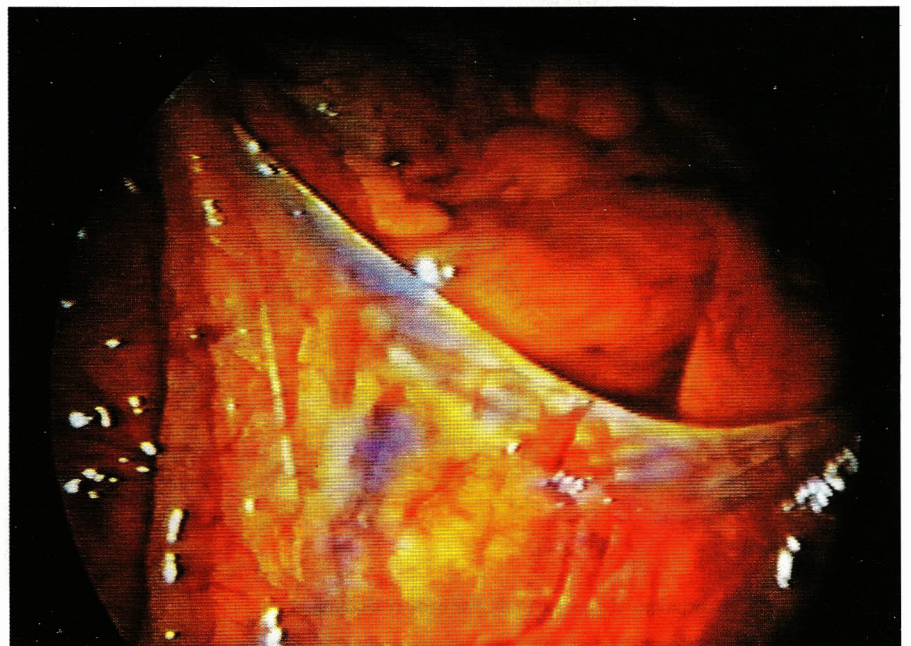


Figure 2a. Peritoneum is tented up prior to incising. Left inferior mesenteric and middle sacral vessels are seen.

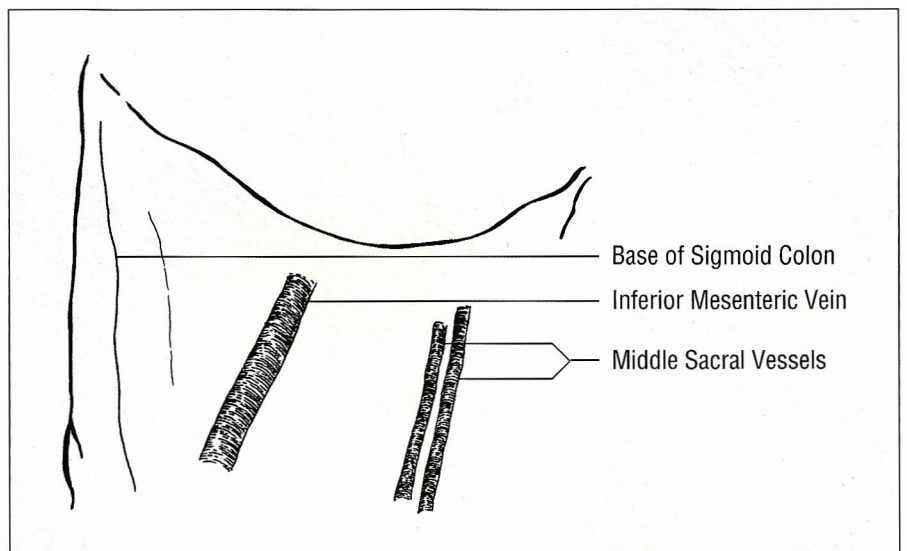


Figure 2b. Illustration of Figure 2a.

tissue which contains the nerve plexus is dissected and isolated in small longitudinal bunches, cauterized (Figures 3a and 3b) and excised in 1-2cm segments, and sent to pathology to confirm removal of nerve segments. The sacral promontory has the appearance of a "baby's bottom" at the completion of the procedure with the middle sacral vein running down the middle (Figures 4a and 4b). The peritoneum overlying the surgical site is usually left open.

Most patients are discharged within several hours after completion of the procedure and return to all but the most strenuous activities within one week.

Complications

LPSN has the same inherent potential complications present when performing any laparoscopic procedure. Complications unique to LPSN are related to possible effects of cutting the presacral nerve itself and to the anatomical site where the procedure is performed. Knowledge of the relevant anatomy and its variances, meticulous dissection technique and a comprehensive knowledge of the effects and limitations of the energy modalities used are all necessary to minimize complications including injury to bowel, vessels and ureters. LPSN offers significant advantage over

PSN of close visual proximity which should decrease the chance of injury.

Possible effects related to cutting the presacral nerve include constipation, sexual dysfunction in the form of vaginal dryness, backache, and voiding dysfunction. Most complaints are limited to a relatively short period of time ranging from two weeks to six months. Transient constipation is the most commonly related effect. Urge incontinence, incontinence without urgency, difficulty initiating urination, continual leakage of a small amount of urine requiring a sanitary pad and loss of a feeling of a full bladder have all been

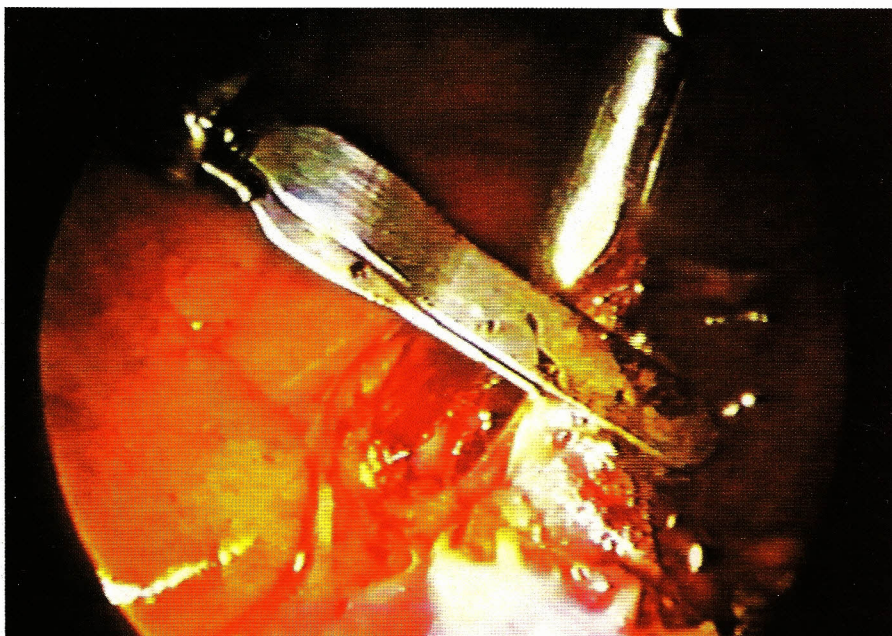


Figure 3a. Dissection technique shown use of bipolar cautery instrument.

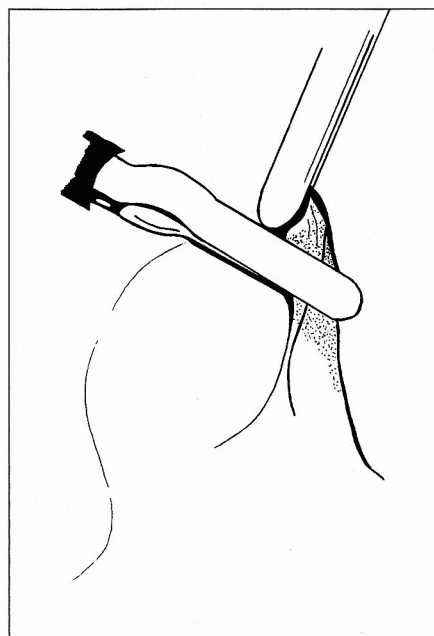


Figure 3b. Illustration of Figure 3a

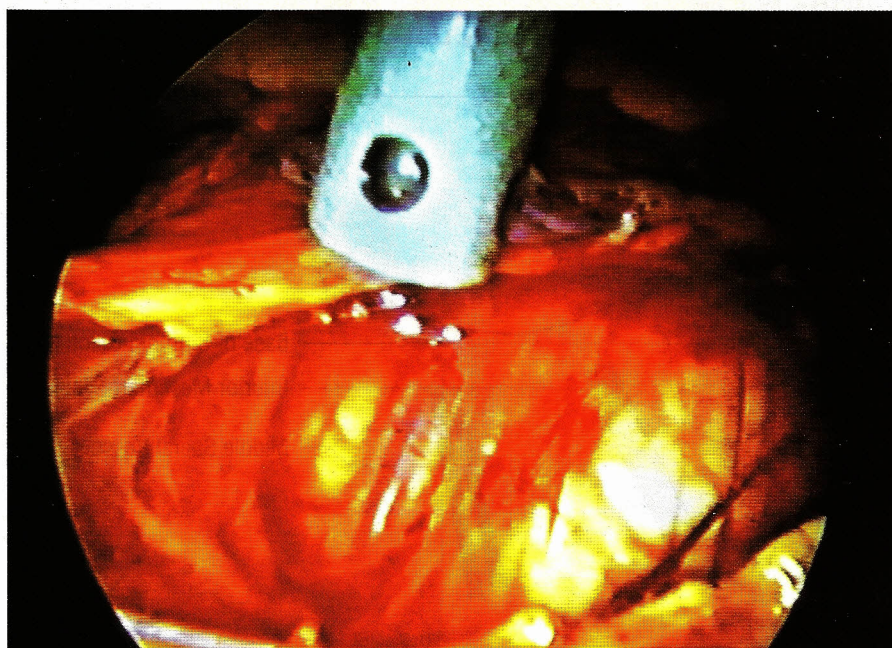


Figure 4a. View of sacral promontory after completion of procedure.

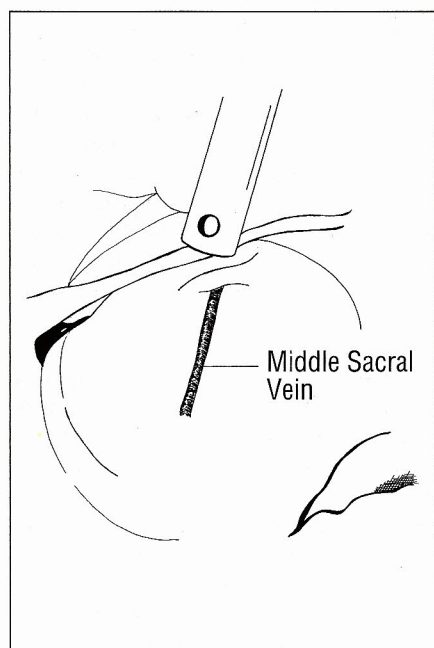


Figure 4b. Illustration of Figure 4a.

reported, again usually as transient phenomenon.

CONCLUSION

Because of the small number of prospective studies and the limited data using systematic long-term follow-up, further research is needed to obtain conclusive evidence of efficacy. In spite of these shortcomings in the literature, most authors agree LPSN offers long-term relief for women with midline pelvic pain and dysmenorrhea. In order to obtain good results, there must be proper patient selection, in addition to complete removal of the presacral nerve plexus. It cannot be over stressed that LPSN should be performed only by advanced laparoscopists who have shown proficiency at performing the procedure using open technique and who have the ability to recognize and treat potential complications. **STI**

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