

## MASTER CLASS

## Presacral Neurectomy



BY CHARLES E. MILLER, M.D.,

April 1, 2007, p. 25). Moreover, we presented an excellent technique in surgical extirpation of endometriosis (OB.GYN. NEWS, April 1, 2007, p. 38).

Despite a thorough evaluation and medical and surgical treatment, midline pelvic

In previous Master Class articles, we have explored the diagnosis and work-up of chronic pelvic pain (OB.GYN. NEWS, Feb. 1, 2007, p. 28; April 1, 2007, p. 25). Moreover, we presented an excellent technique in surgical extirpation of endometriosis (OB.GYN. NEWS, April 1, 2007, p. 38).

When midline pelvic pain, dysmenorrhea, and/or dyspareunia are not alleviated with treatment, ancillary surgical procedures should be considered. Unfortunately, the most commonly performed procedure—transection of the uterosacral nerves—has proved to be ineffective over time.

On the other hand, if performed by a skilled surgeon who understands the anatomy below the bifurcation of the aor-

ta at the level of the sacral promontory, presacral neurectomy has proved quite effective long term.

I once performed this technique via laparotomy, but for nearly 20 years now I have used a purely laparoscopic technique. With the same indications, I have noted similar results to those explained here by Dr. Ceana Nezhat, the invited author of this Master Class article.

Dr. Ceana Nezhat is in private practice in Atlanta and is one of three brothers who are extraordinary gynecologic laparoscopic surgeons. Dr. Camran Nezhat, of Stanford (Calif.) University, has been an innovator in the laparoscopic treatment of endometriosis for a quarter of a century. Dr. Farr

Nezhat, who is a gynecologist at Mount Sinai School of Medicine, New York, has been a leader in the use of laparoscopy to perform gynecologic oncology procedures. Dr. Ceana Nezhat is known not only for his laparoscopic treatment of endometriosis, but also for pelvic floor reconstruction. He is a prolific author and an international lecturer, and it is with great admiration that we bring you Dr. Ceana Nezhat, discussing the laparoscopic approach to presacral neurectomy. ■

DR. MILLER, a reproductive endocrinologist in private practice in Arlington Heights, Ill., and Naperville, Ill., is the medical editor of this column.



BY CEANA NEZHAT, M.D.

## An Ancillary Treatment for Midline Pelvic Pain

Dysmenorrhea that is severe enough to limit social activities afflicts more than 18 million women in the United States, and about 20%-25% of patients with central dysmenorrhea fail to respond to medical management.

Presacral neurectomy—the resection of the hypogastric

nervous plexus that innervates the uterus—is a safe and effective alternative for these women.

It can be done alone or concomitantly with any surgical treatment of coexisting endometriosis or other pelvic pathology.

Presacral neurectomy is not a simple procedure, however, and should not be attempted without appropriate training and preparation, or without careful patient selection.

The procedure does not alleviate adnexal pain or pelvic pain that is more lateral, and is indicated when medical management has failed.

Nonetheless, when patients are carefully selected, and when the procedure is performed by a skilled surgeon who follows the principles and technique described more than 80 years ago by Dr. M.G. Cotte, it can be effectively carried out with good long-term outcomes for the majority of patients who have disabling midline dysmenorrhea and deep central, chronic pelvic pain.

More and more, the procedure is being done laparoscopically with a lower rate of postoperative morbidity. Indeed, advances in minimally invasive surgery have renewed interest in the procedure after a period starting in the 1960s in which the introduction of nonsteroidal anti-inflammatory drugs and various regimens of hormonal suppression caused interest to wane.

Moreover, despite the fact that the data on presacral neurectomy historically have covered women with dysmenorrhea, nonetheless within modern medicine dyspareunia has become an additional indication for the procedure.

## Cotte's Technique

Dr. M. Jaboulay first described the severance of sacral sympathetic afferent fibers for serious dysmenorrhea (using a posterior extraperitoneal approach) in 1899, and a variety of other procedures for nerve interruption subsequently evolved.

It took until 1937, however, for a description of presacral neurectomy to emerge.

Dr. M.G. Cotte is credited with performing the first presacral neurectomy in 1924, and 13 years later he report-

ed 98% success after transection of the superior hypogastric plexus in 1,500 patients.

Dr. Cotte emphasized that the only nerve tissue that should be resected is that within what he called the interiliac triangle (now known as the "Triangle of Cotte"), and that resection of all nerve elements in the triangle is essential in order to maximize effectiveness and minimize complications.

This triangle is extremely important. Unfortunately, because of the perilous location of the sensitive plexus, there have been modifications made in the procedure throughout the years.

Results have thus been variable, and some groups have reported recurrence rates of pelvic pain after presacral neurectomy that are significantly higher than the rates achieved by Cotte and the rates that we—and others—are now achieving.

It is difficult to analyze these results and ascertain exactly what the problems were and why the procedures failed.

However, because those surgeons who follow Cotte's principles and technique are indeed achieving good long-term results, I suspect that patient selection in the other studies wasn't optimal, or that the procedure was performed in a manner different from that originally described by Cotte.

## The Anatomy

The presacral nerve is actually almost always a plexus of nerves known as the superior hypogastric plexus. It is a direct extension of the aortic plexus below the aortic bifurcation.

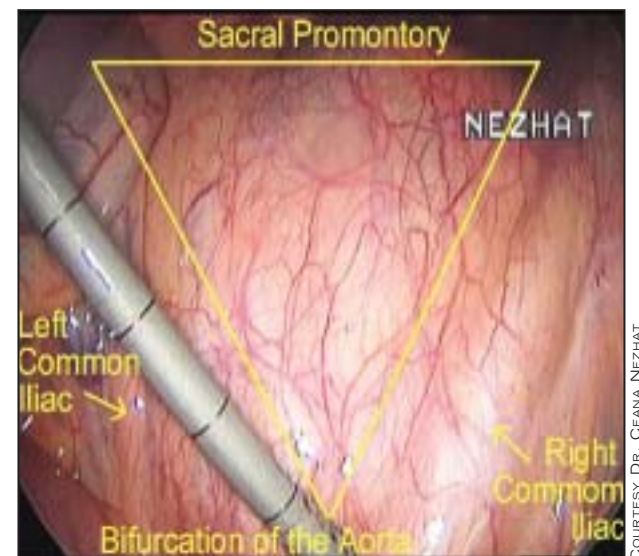
The plexus spreads out behind the peritoneum in the loose areolar tissue lying over the fourth and fifth lumbar vertebrae.

Between the vertebrae and the presacral nerve lies the middle sacral artery. On the right of the presacral nerve lie the right ureter and the common iliac vein and artery. On the left lie the sigmoid colon, inferior mesenteric vessels, left iliac vessels, and the left ureter.

Within the Triangle of Cotte, then, the common iliac artery and ureter are on the right, and the common iliac vein is on the left. The inferior mesenteric, superior hemorrhoidal, and midsacral arteries are in the center of the prelumbar space.

The triangle is defined caudally by the sacral promontory and laterally by the common iliac arteries. The superior edge of the triangle is delineated by the aortic bifurcation.

Centrally and to the left, the multiple nerve fibers representing the presacral nerve—sometimes in bundles—run caudally from the aortic plexus above and through the interiliac triangle to form the superior hypogastric



Within the Triangle of Cotte, the common iliac artery is on the right; the common iliac vein is on the left.

plexus. These fibers are buried in loose areolar tissue. They display no particular patterns and vary among individuals.

In fact, surgeons must be prepared to encounter variable anatomical findings, in addition to being prepared for potential bleeding problems that can result from the sensitive proximity to the aortic bifurcation, vena cava, and iliac vessels.

## The Procedure

In our Cotte-based procedure, an operating laparoscope is inserted through a 10-mm cannula placed through an umbilical incision.

Two or three suprapubic 5-mm cannulas are inserted at about 5-cm midsuprapubic and at 7 cm to the left and right side for the introduction of a bipolar electrode, suction irrigator, and grasping forceps, respectively.

I place the patient in the steep Trendelenburg's position, tilt her slightly to the left, and hold the sigmoid colon away from the presacral area.

After the Triangle of Cotte is identified, the peritoneum overlying the sacral promontory is elevated with a grasping forceps. I use grasping forceps to elevate the peritoneum overlying the promontory and make a small opening. I have used the CO<sub>2</sub> laser or scissors in the past. Currently, I use harmonic shears.

The suction irrigator is inserted through this opening, and the peritoneum is elevated. The peritoneum is incised horizontally and vertically, and the opening is extended cephalad to the aortic bifurcation. Any bleeding from the peritoneal vessels can be controlled with the bipolar

*Continued on following page*

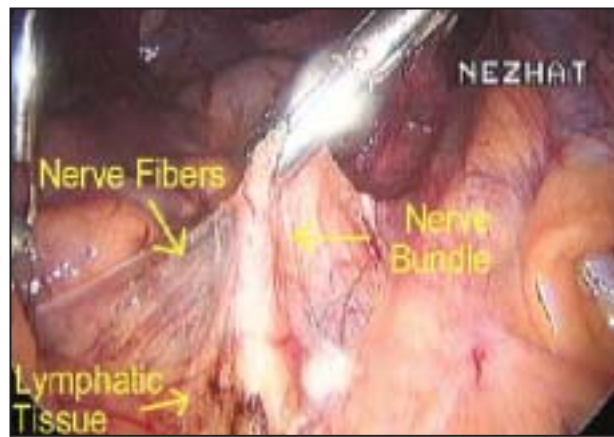
Continued from previous page

electrocoagulator. If harmonic shears are used, this is rarely necessary.

After removing retroperitoneal lymphatic and fatty tissue, we reach the hypogastric plexus and can identify the presacral tissue.

The nerve plexus is grasped with an atraumatic forceps, and using blunt and sharp dissection, I skeletonize, desiccate, and excise the nerve fibers.

All the nerve fibers that lie within the boundaries of the interiliac triangle must be removed, including any fibers entering the area from under the common iliac artery and over the left common iliac vein.



The presacral tissue is identified, and the nerve plexus is grasped with an atraumatic forceps.



All the nerve fibers that lie within the boundaries of the interiliac triangle have been removed.

I then irrigate the retroperitoneal space and coagulate bleeding points, if any. Sutures are not required to approximate the posterior peritoneum. The area heals completely on follow-up, and is covered by the peritoneum.

I send excised tissue for histologic examination to verify removal of nerve elements and ganglion.

### The Outcomes

In 1992, we described a laparoscopic method of presacral neurectomy, based on Cotte's principles and technique, as part of a report on 52 patients with disabling midline dysmenorrhea and varying severity of endometriosis, all of whom had been unresponsive to medical treatment.

Of the 52 patients who were followed for more than a year, 48 (92%) reported relief of dysmenorrhea, and 27 (52%) reported complete pain relief (BJOG 1992;99:659-63).

In 1998, we reported even longer-term outcomes (up to 72 months) in 176 women with central pelvic pain who underwent laparoscopic presacral neurectomy and treatment of endometriosis. Pain was reduced substantially in 74% of the women, and just as notably, the degree of pain improvement was not directly related to the stage of endometriosis.

A reduction in pain of more than 50% was reported in 69.8% of women with stage I endometriosis (using the revised classification of the American Fertility Society), 77.3% of those with stage II, 71.4% of those with stage III, and 84.6% of those with stage IV endometriosis (Obstet. Gynecol. 1998;91:701-4).

We were discouraged from offering patients treatment in a blinded manner because a randomized trial conducted not long before this had been stopped in an early stage by a monitoring committee when the efficacy of presacral neurectomy became clear.

In this prematurely halted study, Dr. B. Tjaden, Dr. John A. Rock, and associates at Johns Hopkins University found that of 17 patients undergoing the procedure (all had moderate to severe dysmenorrhea and stage III-IV endometriosis), only two had recurrence of pain and the remainder remained pain free at 42 months of follow-up.

Of the nine patients who underwent resection of endometriosis but not presacral neurectomy, none had relief of midline pain (Obstet. Gynecol. 1990;76:89-91).

Although Dr. Rock and his team found that relief of dyspareunia was variable in both groups, we and others have had success in treating this manifestation of pelvic pain.

In our study published in 1998, a reduction in dyspareunia by more than 50% was seen in 32 of 60 patients followed for 24 months or longer.

More recently, Dr. F. Zullo and associates published the 2-year success of laparoscopic presacral neurectomy, reporting significant reduction in the frequency and severity not only of chronic pelvic pain and dysmenorrhea but of dyspareunia as well (J. Am. Assoc. Gynecol. Laparosc. 2004;11:23-8).

Laparoscopic uterosacral nerve ablation is an easier procedure to perform than laparoscopic presacral neurectomy, but it has been proved to provide only temporary re-



Presacral space on second look: The area heals completely on follow-up.

lief and not the longer-term pain reduction that presacral neurectomy can achieve in most cases. I liken it to trimming a weed in your yard versus pulling the weed out by the roots.

### The Complications

The most common and urgent intraoperative complication is bleeding, and we must be prepared, in the event of injury, to actively identify the anatomy and determine the feasibility of the repair laparoscopically, or to immediately convert to laparotomy.

We have not had any major complications, but the slight risk of vascular injury and the possible need to convert to laparotomy is something that patients should be informed of.

Long-term complications with presacral neurectomy are uncommon. Urinary urgency, poor bladder emptying, and constipation have been reported occasionally, as has vaginal dryness during sexual arousal.

We have not had any major complications such as vascular injury, gastrointestinal injury, or genitourinary injury in any of our presacral neurectomy procedures. Nor did any of these cases require conversion to laparotomy or transfusion.

Our initial (1992) study revealed no major intraoperative or immediate postoperative complications.

However, of the 52 women followed after 1 year, seven women reported either constipation (three patients), urinary urgency (one), vaginal dryness (one), or "painless labor" (two). These are all among the issues that we routinely cover in our patient counseling.

In conclusion, procedural failure, of course, is an important long-term complication, but the most common reasons for failure—poor patient selection and incomplete neurectomy because of neurologic variability or failure to remove all nerve tissue within the interiliac triangle—can, in most cases, be avoided with proper training and preparation. ■

## No Link Found Between IBS and Elective Gynecologic Surgery

BY PATRICE WENDLING  
Chicago Bureau

MILWAUKEE — Irritable bowel syndrome did not result from elective gynecologic surgery in a large prospective binational study of 255 women.

There was no significant difference in the development of irritable bowel syndrome (IBS) at 3 and 12 months' follow-up among 132 women who underwent elective gynecologic surgery for disorders not related to pain and 123 age-matched controls who went for consultation at a gynecology clinic but did not undergo surgery. None of the women had IBS at baseline.

However, significantly more surgical patients than controls developed persistent abdominal pain (14% vs. 2%, respectively), Dr. Ami D. Sperber reported at an inter-

national symposium sponsored by the International Foundation for Functional Gastrointestinal Disorders.

The development of persistent pain was predicted by psychosocial factors, but not by sociodemographic or clinical variables, according to an analysis that included surgery type (hysterectomy, tubal ligation, cystectomy); laparotomy versus laparoscopy; surgery duration; amount of postoperative analgesia; and surgical complications.

"One might think—and this is still speculative—that the development of persistent pain could be associated more with central registration and amplification of the afferent signal via cognitive and emotional input, rather than with the degree of the actual peripheral injury per se," said Dr. Sperber, associate professor of medicine, Soroka Medical Center, Ben

Gurion University of the Negev, Beer-Sheba, Israel.

Women who anticipated difficulty in recovering from surgery were more than five times as likely (odds ratio [OR] 5.2) to develop persistent abdominal pain, according to results from psychosocial evaluations that included the Implicit Models of Illness Questionnaire, Client Satisfaction (CSQ) scale, and Sense of Coherence (SOC) scale.

Persistent pain also was more likely to occur among women with a strong personal need for control (OR 1.2), those who perceived their disease as being more severe or constant (OR 1.9), and those who had lower coping skills (OR 1.09), reported Dr. Sperber and coinvestigator Dr. Douglas Drossman, professor of medicine and psychiatry and codirector of the Center for Functional GI & Motility Disorders, Uni-

versity of North Carolina at Chapel Hill.

Although the findings are still preliminary, they could be used to identify women with a similar profile and to conduct interventions before surgery that would improve coping skills or reduce catastrophizing, Dr. Sperber said in an interview.

Prior studies show that patients with IBS undergo more gynecologic operations, particularly hysterectomy, than women in the general population. But it's unknown whether women with IBS undergo more surgery or whether gynecologic surgery can cause IBS or new bowel symptoms such as constipation.

Constipation was increased among the women in the study, but did not differ significantly between groups, said Dr. Sperber at the meeting, which was cosponsored by the University of Wisconsin. ■