Cyclic sciatica due to endometriosis is a rare but well-described clinical and pathological entity. Symptomatic deposits of endometrial tissue that involve the sciatic nerve, both within and external to the pelvis, may be identified radiographically and surgically. The diagnosis may be suggested by the association of symptoms with menses in a patient with endometriosis and by magnetic resonance (MR) imaging. Pathological confirmation is needed to establish the diagnosis with certainty. Tissue is obtained by laparoscopy for intrapelvic lesions or by open exploration for lesions involving the sciatic nerve distal to the sciatic notch.

We report on five patients who experienced cyclic neuropathic lower-extremity symptoms caused by endometriosis. The clinical presentations, imaging studies, therapeutic interventions, and outcomes are described in this report.

Illustrative Cases

We identified five patients with biopsy-proven endometriosis that caused catamenial neuropathy or radiculopathy.

Case 1

This 45-year-old woman presented with a 5-year history of progressive pain, weakness, and numbness in her left leg. Her low-back and left-leg pain progressed and radiated in an L-5 distribution, with associated numbness followed by weakness, and, ultimately, moderately severe foot drop. In retrospect, the patient recalled having experienced severe menstrual cramps for many years and noted that exacerbation of her initial low-back and left-buttock pain was associated with her menses. Eventually, the patient’s pain became continuous and disabling.

Examination. Magnetic resonance images of the lumbar spine showed some mild degenerative changes, but no neural compression. Ultimately, computerized tomography (CT) and MR imaging studies of the pelvis were obtained (Fig. 1); these studies showed an ill-defined soft-tissue mass in the sciatic notch region that appeared to involve the piriform muscle.

Operation and Pathological Findings. Surgical exploration of the mass revealed encasement of the sciatic nerve within firm inflammatory tissue (Fig. 2). A biopsy and external neurolysis were performed. The patient’s pain was partially relieved postoperatively, with no initial change in her weakness or numbness. Pathological examination provided a diagnosis of endometriosis (Fig. 3).

Additional Treatment. The patient was treated with a 6-month course of leuprolide acetate (Lupron) injections, resulting in complete resolution of her pain and progressive improvement in strength and sensory functions in the sciatic nerve distribution. When the leuprolide acetate therapy was discontinued, however, the patient’s neuro-
pathic pain recurred. A hysterectomy and bilateral oophorectomy were performed and the patient has remained free of pain throughout 52 months of follow up. Her foot drop and sensory loss have continued to improve, but have not recovered fully.

Case 2

This 36-year-old woman presented with a 4-week history of weakness in her left leg. She had developed intense pain in the left thigh over a 24-hour period. The pain resolved over a 5-day period and she was left with moderate weakness of hip flexion, knee extension, and thigh adduction. There was no history of recent trauma, but she reported a history of dysmenorrhea since adolescence. In addition to the weakness, there was sensory loss in the left femoral and saphenous nerve distributions. The femoral nerve was tender at the inguinal ligament, and reversed straight-leg raising reproduced her leg pain.

Examination. Magnetic resonance imaging of the lumbar sacral spine was unremarkable. Magnetic resonance imaging of the pelvis demonstrated a 1.5-cm cystic lesion of the posterior lower uterine segment that contained old blood, which was consistent with a solitary intramural endometrioma.

Laparoscopy and Postoperative Course. Diagnostic laparoscopy identified an endometrial tissue mass in the left pelvic sidewall. This was treated by laser ablation. The patient's symptoms were somewhat worse during the first 2 postoperative days. Her pain, weakness, and sensory loss subsequently resolved completely within a 46-month follow-up period.

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Catamenial neuropathy

Case 3

This 37-year-old woman presented with a 5-year history of dysmenorrhea and progressive pain in her right buttock, posterior thigh, calf, and sole of the foot, with some associated numbness in the dorsum of the foot and the great toe. Her symptoms increased just before and during her menses.

Examination. Magnetic resonance imaging, myelography, and CT scanning of the lumbar spine revealed minimal degenerative changes as well as multiple, incidental sacral nerve root sleeve (Tarlov) cysts. An electromyographic study showed chronic and acute degenerative changes in the sciatic nerve distribution, suggesting a lesion proximal to the knee, but distal to the dorsal root ganglia.

A right foot drop developed and the patient’s pain and sensory symptoms became constant.

Laparoscopy and Additional Treatment. Laparoscopy confirmed the diagnosis of endometriosis, and multiple endometrial tissue deposits in the pelvis were eliminated by fulguration. The patient enjoyed good pain relief for 3 months, but her motor and sensory deficits persisted. When the pain recurred she was treated with a 6-month course of leuprolide acetate followed by oral contraceptives, with good pain relief but no change in the foot drop. The pain returned despite continued hormone therapy. A second laparoscopy performed 21 months after the first one identified multiple deposits of endometrial tissue, which were ablated by the laser. The pain was dramatically improved postoperatively and leuprolide acetate therapy was resumed.

Case 4

This 31-year-old woman presented with approximately 10 years of dysmenorrhea, pelvic pain, and infertility. Endometriosis had been diagnosed by laparoscopy and confirmed pathologically. She then developed pain and paresthesias in the left lower extremity that radiated from her pelvis and buttock. Her symptoms typically began 2 weeks before menses and resolved shortly after menses. The pain was tolerable while she was taking oral contraceptives, but increased when she discontinued their use.

Examination. Neurological examination produced normal findings. Magnetic resonance imaging studies of the lumbar spine and lumbar plexus were unremarkable.

Laparoscopy and Postoperative Course. Repeated laparoscopy identified endometrial tissue deposits in both the left and right cul-de-sac. The left-sided lesions were ablated with the laser and the patient’s symptoms were significantly relieved. She has had no progression of symptoms in 29 months of follow-up review.

Case 5

This 30-year-old woman presented with a 17-year history of endometriosis. Initially her pelvic and low-back pain increased during her menses, but at 24 years of age it progressed to become constant. The pain radiated down her right anterior thigh to the knee.

Laparoscopy and Postoperative Course. Laparoscopic examination identified endometrial tissue deposits involving the uterosacral ligaments bilaterally. The patient experienced dramatic pain relief following laser ablation of these tissue deposits. She suffered a recurrence of pain 5 years later and had mild right quadriceps muscle weakness as well as sensory loss in a right L-4 distribution. Her right knee and ankle reflexes were depressed. Magnetic resonance imaging of the lumbosacral spine revealed prominent enhancement of the L4–S1 nerve roots bilaterally, consistent with endometriosis. A lumbar puncture was not diagnostic.

Additional Treatment. The patient was treated with a 6-month course of leuprolide acetate, resulting in significant improvement in her symptoms. A follow-up MR image obtained 4 months into her treatment course showed resolution of the intraradicular enhancement. She then began a course of medroxyprogesterone acetate (Depo Provera) for continued hormone suppression, with good pain control. Several months later, her pain recurred. Laparoscopy identified and treated endometrial tissue deposits in the right cul-de-sac, uterosacral ligaments, and bladder. Her symptoms worsened transiently during the postoperative period and then resolved completely. She was maintained on medroxyprogesterone acetate and has remained free of symptoms.

Discussion

Endometriosis is defined as the presence of functioning ectopic endometrial glands and stroma outside the uterus.9 Typical sites include the ovaries, uterosacral ligaments, pelvic peritoneum, appendix, sigmoid colon, and, rarely, the vagina, vulva, umbilicus, lung, nasal mucosa, brain, laparotomy scars, and so forth. The incidence of endometriosis is highest during the third and fourth decades and is seen most commonly in women who marry later in life, have fewer children, and experience infertility. It can also be seen in young adolescents with pelvic pain and in girls with uterine anomalies such as outflow obstruction. The most common clinical presentations include dysmenorrhea and infertility. The ectopic endometrial tissue may cause intrapelvic bleeding, peritumoral adhesions, and so-called chocolate cysts or endometriomas. Although these lesions may be asymptomatic, they may also cause dyspareunia, dysuria, or dyschezia. Definitive diagnosis of endometriosis can only be made by surgery (usually by laparoscopy). Despite recent advances in the resolution of MR imaging, CT scanning, and ultrasound techniques, there is no radiological study that can reliably diagnose these lesions.

Cyclic sciatica caused by biopsy-proven endometriosis was first described by Denton and Sherrill.4 The diagnosis initially given in this case was lumbar radiculopathy due to a herniated disc, but the patient did not respond to the usual conservative measures. Exploration of the proximal sciatic nerve at the sciatic notch revealed a hemorrhagic tumor that was resected along with the involved portion of the nerve. Pathological examination proved the tumor to be an endometrial tissue deposit involving the sciatic nerve. Since then the disorder has been identified in multiple case reports,1–8,10,12–14 which include surgical findings and imaging characteristics. Head, et al.,7 described the
surgical “pocket sign,” in which an evagination of peritoneum is seen extending toward the greater sciatic notch. In their case, at the distal end of this peritoneal sac, several small dark nodules of endometrial tissue were found adherent to the sciatic nerve.

The mechanism of nerve injury in cases of endometriosis is presumed to be cyclic inflammation caused by hemorrhage within endometrial tissue. The lesions have a variety of appearances, including the classic bluish-black “powder-burn” lesion; white, red, or clear vesicular implants; white or yellow papular lesions; flame hemorrhagic lesions; nodular implants; or healed fibrotic lesions. Diagnosis by laparoscopy requires that the surgeon be experienced using the technique. Presumably, when the lesions heal and become fibrotic around or within nerve fascicles, the symptoms lose their cyclic quality and become constant. When the characteristic history of cyclic sciatic pain is elicited, the diagnosis should be clear. However, the patient often does not volunteer this history, particularly after the symptoms have become constant. Then the differential diagnosis is quite broad and includes, most commonly, lumbar disc disease; spondylotic nerve root compression, hip-joint arthritis; neoplastic disease of the spine, pelvis, nerve roots, or peripheral nerve; ischemic or entrapment neuropathies, perineural or synovial cysts; arachnoiditis; and a variety of infections.

In this series of five patients, nonspecific treatment of symptoms, such as physical therapy and a course of anti-inflammatory or analgesic medication, was not helpful. Patients responded well to hormone therapy, which interrupts the cycle of stimulation and bleeding (Table 1). However, many of these agents cannot be used continuously, and each of these patients ultimately required surgical procedures, hormone therapy alone may be effective. Early recognition and treatment of this disorder is important to minimize the severity of nerve damage caused by the recurrent cycles of hemorrhage and fibrosis that are characteristic of endometriosis.

### TABLE 1

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Age at Onset†</th>
<th>Symptom Distribution</th>
<th>Hormonal Response</th>
<th>Surgical Response</th>
<th>Operative Procedure</th>
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<tr>
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<tr>
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<td>13</td>
<td>L4–S1 roots</td>
<td>+</td>
<td>+</td>
<td>laparoscopy</td>
</tr>
</tbody>
</table>

* NA = not applicable; SN = sciatic nerve; TAH/BSO = total abdominal hysterectomy and bilateral salpingo-oophorectomy; + = positive.
† Patient’s age in years at onset of symptoms.

We suspect that catamenial neuropathies and radiculopathies due to endometriosis may be more common than most clinicians appreciate. Indeed, we have evaluated and treated an additional four patients who had clinical presentations that appeared to indicate catamenial neuropathy, but we did not include them in this report because of the lack of pathological confirmation. The catamenial nature of the symptoms may be transient, and the patient often does not spontaneously volunteer this aspect of her history. Noninvasive imaging studies in these patients may be consistent with the diagnosis of endometriosis, but these studies are not specific and this particular diagnosis is usually not included in the differential diagnosis. Although each of these patients ultimately required surgical procedures, hormone therapy alone may be effective. Early recognition and treatment of this disorder is important to minimize the severity of nerve damage caused by the recurrent cycles of hemorrhage and fibrosis that are characteristic of endometriosis.

### References


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