CASE REPORTS

Loin Pain Hematuria Syndrome: Pain Relief With Intrathecal Morphine

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● **Loin pain hematuria syndrome (LPHS) is characterized by hematuria and incapacitating loin pain. The pain experienced with LPHS is, in general, extremely difficult to treat. Many surgical and pharmacologic therapies have been directed at LPHS pain without success. This report documents successful pain control in a patient with LPHS using long-term intrathecal morphine delivered via an implantable pump. Intrathecal narcotic therapy may provide pain relief for the chronic pain of LPHS.**

INDEX WORDS: Loin pain hematuria syndrome; intrathecal narcotics.

LOIN PAIN hematuria syndrome (LPHS) is a rare disorder characterized by microscopic or macroscopic hematuria and severe, intractable loin pain.[1] Patients often become dependent on narcotics to function in the face of chronic pain. No medical therapy is consistently effective in relieving the pain of this syndrome. Similarly, no surgical therapy is uniformly successful, although renal autotransplantation is the most effective reported surgical intervention.[2,3] This case report describes successful treatment of the debilitating pain of LPHS by continuous intrathecal administration of narcotic delivered via an implantable pump.

CASE REPORT

The patient is a 38-year-old woman with a 10-year history of severe right-sided loin pain. A hysterectomy was performed for pain relief 8 years previously, but the pain worsened. Three years ago, the patient underwent sympathectomy, which did not relieve the pain. Evaluation at that time included normal intravenous pyelography, normal renal angiogram, and cystoscopic evidence of hemorrhagic cystitis, with blood clots seen predominantly coming from the right side. In addition, the patient had recurrent urinary tract infections. Despite successful treatment of the infections and cystitis, she continued to have profuse hematuria severe enough to require periodic transfusion as well as debilitating pain. In an effort to palliate the pain, right nephrectomy was performed 3 years previously. Shortly thereafter the patient developed similar, severe left-sided loin pain. Left renal biopsy revealed arteriolar nephrosclerosis but no glomerular abnormalities. The biopsy also was positive (2+) for the C3 fragment of complement, and had trace levels of immunoglobulin M (IgM), but no IgA. Serum IgA and antinuclear antibody were normal, and a hematologic evaluation revealed no bleeding diathesis. At the time of evaluation the patient was receiving 800 mg intravenous meperidine daily without relief of pain.

The patient was obese (123 kg). Examination revealed blood pressure of 122/86 mm Hg, heart rate of 92 beats/min, and respiratory rate of 20 breaths/min. The lungs were clear to auscultation, cardiac examination was normal, and the abdomen was not tender. The patient had tenderness to palpation in the left costovertebral angle. Urine was grossly bloody and the sediment contained only red blood cells.

After evaluation by a multidisciplinary pain service, including a psychological assessment, the patient underwent a trial of epidural narcotics. An epidural catheter was positioned in the L3-4 interspace, through which 10 mg of morphine and 20 mL of 1.5% lidocaine were injected. The patient experienced acute local sensory loss after injection of the lidocaine, but no acute improvement in pain. After 18 hours of continuous epidural infusion of morphine (0.8 mL/hr), however, the patient was completely pain free. One month later, in an outpatient procedure under local anesthesia, a programmable Medtronic pump (Minneapolis, MN) and catheter system were implanted. The catheter was placed in the lumbar intrathecal space and the pump was placed in a left abdominal pocket. The procedure was complicated by headache, which was treated with oral caffeine, and pruritus, which was treated with diphenhydramine. Both symptoms resolved within 1 week. The initial intrathecal morphine infusion was programmed at 2 mg/d. One week later, the patient felt that her pain was half that preoperatively. The infusion rate was gradually increased to 4 mg/d morphine. At that infusion rate, the patient's pain was eliminated and her functional status dramatically improved. She was able to perform household tasks and travel for the first time in 8 years. Furthermore, she lost 35 kg in weight and has a full-time job

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for the first time in 7 years. The patient has remained comfortable on the same dose of morphine for more than 10 months.

DISCUSSION

The etiology of LPHS is poorly understood. Characteristic pathologic features of kidneys in affected patients (without systemic hypertension) include atherosclerotic changes in renal arterioles, which may be severe enough to cause small infarction.[4,5] In addition, these vessels contain deposits of the third component of complement (C3).[6] These changes, however, are nonspecific, and renal function is normal.

Many patients with LPHS have associated coagulation disorders, including deficiency of factor XII,[7] increased platelet factor 3,[4] elevated fibrinopeptide A levels,[8] decreased heparin-thrombin clotting time, decreased platelet lifespan and circulating platelet aggregates, elevated plasma serotonin levels,[9] and elevated D-dimers.[10] Despite these findings, other organs are unaffected by the coagulopathies and, in most cases, transfusions are not required.

Because the pathologic lesions are inconsistent and nonspecific, the diagnosis is one of exclusion. The syndrome occurs more often in women than in men. Women taking oral contraceptives may improve symptomatically when the drugs are discontinued or when they become pregnant.[4]

Unfortunately, the pathologic lesions do not explain the pain. For example, similar arteriolar changes in IgA nephritis[11] or severe hemolytic uremic syndrome usually are not associated with severe pain. Since a precise anatomic source of pain cannot be targeted, a variety of symptomatic treatment modalities have been attempted, all with disappointing results. Furthermore, since the syndrome is rare, meaningful prospective trials have not been possible; only case reports and small series serve as guides to pain therapy. Because of the association of LPHS with coagulation disorders, antiplatelet agents, antifibrinolytics, and anticoagulants[5] have been administered but have not ameliorated pain. Sulphinpyrazone was reported to be effective in relieving the pain of two patients, but a small trial with the drug showed no benefit.[4] Biofeedback,[2] transcutaneous electrical nerve stimulation, which produces analgesia by modulating peripheral nerve input to the central nervous system, and acupuncture[11] have not proved successful.

Regional nerve blocks, including intercostal and celiac plexus blocks, yield only temporary pain relief at best.[2] In one patient, a dorsal column stimulator did not provide pain relief.[2]

A variety of surgical therapies have been applied to the treatment of the pain of LPHS, including sympathectomy, appendectomy, ureteral exploration and reimplantation, kidney pedicle denervation,[12] hysterectomy and bilateral oophorectomy,[4] and nephrectomy.[13] Since the disease often becomes bilateral, nephrectomy is not recommended.[3] Renal denervation with a releasing renal capsule incision successfully treated pain in one report.[14] The greatest surgical success, however, has been reported with renal autotransplantation.[2] A survey of the literature suggests that 12 of 16 patients who underwent this procedure had long-term pain relief; however, no controlled trials have been conducted and the true denominator of treated patients is not known.[12,15]

Unfortunately, the most typical pattern of pain management in LPHS is opioid administration. Although the chronic oral administration of opioids in these patients may allow them greater function, pain relief is generally incomplete. Intraspinal administration of opioids has been used successfully in other types of chronic, debilitating pain, particularly cancer pain.[16] An intrathecal catheter is tunneled subcutaneously and connected to a programmable pump. Once dosage is titrated properly, approximately four refills per year are required. Ease of programmability is an advantage with this system: the pump can be programmed externally using radiofrequency across the abdominal wall. This route of administration provides constant drug levels and, therefore, constant levels of pain relief.

Intraspinal opioids are delivered in small amounts in close proximity to their site of action in the spinal cord. For morphine, the intrathecal dose is 1/100th the intravenous dose (1/300th the oral dose). With intraspinal delivery, the intensity of analgesia is greater than that resulting from administration via other sites because the drug is concentrated at spinal opioid receptor sites.[17] Significant long-term complications of intraspinal opioids have not been reported, since the absolute amount of drug administered is a small

fraction of that delivered by traditional routes.[18] The cost of the pump and surgical placement is less than $20,000, and refills cost $400. (The patient reported here requires three refills per year.)

In the case presented here, surgical sympathectomy, hysterectomy and bilateral oophorectomy, and nephrectomy, as well as high-dose oral and intravenous narcotics were all unsuccessful in the patient's pain management. The improvement in the patient's perception of her pain after intraspinal morphine was accompanied by a sustained, correspondingly dramatic improvement in her daily level of function. In summary, the pain associated with LPHS presents a difficult therapeutic problem. This case suggests that selected LPHS patients may benefit from continuous administration of intraspinal morphine.

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