

ABSTRACT: To study causes of obturator neuropathy and to correlate them with outcome, we retrospectively studied patients seen at the Mayo Clinic electromyography (EMG) laboratory from 1975 through 1999 with a diagnosis of obturator neuropathy. Twenty-two patients with obturator neuropathy were identified. The clinical outcome of patients with acute obturator neuropathy treated conservatively was good regardless of etiology or severity.

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OBTURATOR NEUROPATHY: CAUSES AND OUTCOME

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Injury to the obturator nerve is rare, largely because the nerve lies protected deep within the pelvis and medial thigh. Consequently, no large series describing the clinical course of obturator neuropathy has been reported. There have been several isolated case reports of obturator neuropathy due to compressive causes and entrapment.^{2,6,8,9} Reports have also described obturator nerve injury occurring during total hip replacement, after abdominal or pelvic procedures, and following inappropriate positioning or positioning in the lithotomy position.^{1,3–5,7,10–12} Pelvic tumor invading the obturator nerve has also been reported as a cause.⁹ Our objective was to report the experience at our institution with this rare mononeuropathy and to correlate associated causes with the clinical outcome.

METHODS

We identified all patients seen in the electromyography (EMG) laboratory who were suspected of having an obturator neuropathy over the period 1975 through 1999. All subjects were followed through their Mayo Clinic medical records on the basis of clinical data abstracted from the medical record.

Abbreviations: EMG, electromyography; MUP, motor unit potential
Key words: groin pain; muscle weakness; obturator neuropathy; thigh pain

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The EMG laboratory diagnosis of obturator neuropathy was based on unequivocal neurogenic findings (fibrillation potentials or high-amplitude, long-duration complex motor unit potentials [MUPs]) limited to muscles innervated by the obturator nerve. The following characteristics were abstracted from the medical record: patient demographics; neurologic symptoms and signs; surgical procedures; EMG findings; therapeutic intervention; and residual symptoms or deficits.

RESULTS

Thirty-eight patients with a clinically suspected obturator neuropathy or with EMG-documented obturator neuropathy were identified from 1975 through 1999. In 15 of these 38 patients, an alternate localization of the neuropathologic process (radiculopathy, plexopathy, or femoral neuropathy) was established by EMG. One patient was excluded because of incomplete electrophysiologic testing. The remaining 22 patients had an EMG-proven obturator neuropathy. There were 13 women and 9 men, with an average age of 56 years (range 32–84).

The most frequent patient-reported symptom was medial thigh or groin pain, which occurred in 16. In only six patients was weakness of the muscles supplied by the obturator nerve detected before EMG. Similarly, only six patients reported a sensory loss before EMG. In 17 cases, neuropathy occurred immediately after a well-defined event (surgical procedures in 14, trauma in 3). Four chronic neuropa-

Table 1. Associated risk factors in obturator neuropathy.

Risk factor	No. of patients
Total hip arthroplasty	7
Pelvic surgery	4
Pelvic trauma	3
Femoral artery procedure	2
Metastatic disease to the obturator canal	2
Bilateral total-knee arthroplasty with prolonged tourniquet use	1
Diabetes	1
Myositis ossificans	1
Unknown	1
Total	22

thies were identified (2 from metastatic disease, 1 from myositis ossificans, and 1 in association with diabetes). The cause in one case was unknown (Table 1).

Fourteen of the 22 cases were associated with invasive procedures. Seven patients had total hip arthroplasty, and neuropathic symptoms developed postoperatively. Four patients had pelvic surgery. Two patients had femoral artery procedures, including femoral aneurysm repair and femoral angiogram. One patient had bilateral total knee arthroplasties with a prolonged tourniquet time. The tourniquet was placed over the proximal thigh, and its exact relationship to the obturator neuropathy was unknown.

Three patients had trauma along the course of the obturator nerve. Two had pelvic and acetabular fractures due to motor vehicle accidents. Another

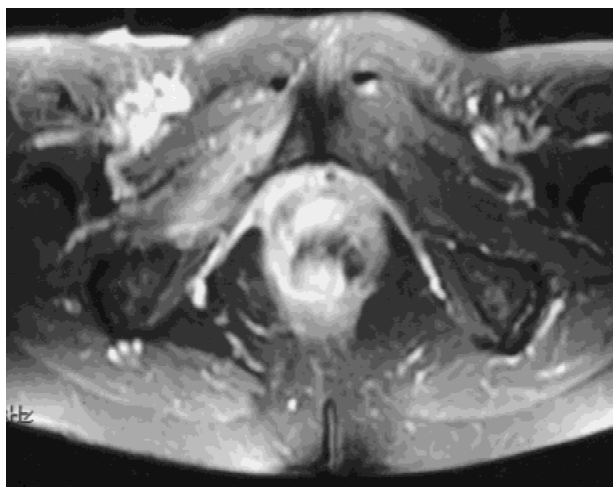


FIGURE 1. Pelvic magnetic resonance imaging demonstrating increased signal within the right obturator canal consistent with metastatic transitional cell cancer of the bladder.

patient experienced symptoms in the postpartum period; the medical record did not note whether the delivery was assisted with forceps or other procedures or whether the patient was placed in the lithotomy position.

Two patients with obturator neuropathy had metastatic disease to the pelvis. One of these had an adenocarcinoma of the prostate and another had transitional cell cancer of the bladder. Both tumors metastasized to the obturator canal (Fig. 1).

There were three miscellaneous causes of obturator neuropathy. One patient had a remote history of myositis. She experienced recurrent symptoms, and imaging revealed recurrence of the myositis ossificans within the obturator canal. Another patient had a diabetic neuropathy without involvement of proximal muscles other than those innervated by the obturator nerve. The cause of the obturator neuropathy was not found in the remaining patient.

Follow-up was available for 19 of the 22 patients, ranging from 4 to 42 months. Among the patients with acute onset, 15 were available for follow-up, and 14 of these had improvement or resolution of their symptoms, compared with 0 of 4 patients who had chronic obturator neuropathy ($P = 0.001$). The two patients with metastatic malignancy died from their disease without alleviation of their pain or deficits. In the remaining two (with myositis ossificans and diabetes) the symptoms persisted.

On EMG, four patients had lesions deemed to be complete on the basis of diffuse fibrillation potentials and no voluntary activation of MUPs in muscles innervated by the obturator nerve. Only one of these four patients underwent surgical exploration of the obturator canal with improvement. The remaining three patients improved without exploration despite the complete nature of the lesion.

DISCUSSION

Obturator neuropathy is an uncommon mononeuropathy of the lower extremity that usually occurs acutely after a well-defined event. In our series, it occurred most often as a perioperative complication or associated with pelvic trauma. Diagnosing an isolated obturator neuropathy on the basis of history and examination can be difficult. Pain was more characteristic of obturator neuropathy in our patients than paresthesias in the medial thigh or groin. The pain can be difficult to distinguish from that associated with a recent procedure or trauma.

EMG testing permits definitive localization of the lesion and assessment of the severity of the lesion. In our laboratory, 15 of 38 patients (39%) who had

been referred for suspected obturator neuropathy were found to have a different disorder.

Among patients with acute onset of obturator neuropathy, the majority had a good recovery with conservative management, even those with a complete lesion. Our findings agree with previously published outcomes of peripheral nerve lesions after hip surgery. In a review of 14 cases of peripheral nerve lesions (7 sciatic, 3 femoral, 3 mixed, and 1 obturator) after total hip arthroplasty, follow-up at 1 year showed generally good results.¹³

Outcome in our patients was determined largely by the temporal profile of the lesion. Among patients with acute onset of the neuropathy, 14 of 15 improved, whereas none of those with chronic neuropathy improved spontaneously. Those with acute onset improved whether they were treated conservatively or with surgical exploration. From this series, it appears that acute obturator neuropathy has a benign prognosis and should largely be treated conservatively. The outcome in chronic obturator neuropathy is poorer and depends on the causative systemic disease.

REFERENCES

1. Bischoff C, Schonle PW. Obturator nerve injuries during intra-abdominal surgery. *Clin Neurol Neurosurg* 1991;93:73-76.
2. Bradshaw C, McCrory P, Bell S, Brunkner P. Obturator nerve entrapment. A cause of groin pain in athletes. *Am J Sports Med* 1997;25:402-408.
3. Crews DA, Dohlman LE. Obturator neuropathy after multiple genitourinary procedures. *Urology* 1987;29:504-505.
4. Dimachkie MM, Ohanian S, Groves MD, Vriesendorp FJ. Peripheral nerve injury after brief lithotomy for transurethral collagen injection. *Urology* 2000;56:669.
5. Fishman JR, Moran ME, Carey RW. Obturator neuropathy after laparoscopic pelvic lymphadenectomy. *Urology* 1993;42:198-200.
6. Kleiner JB, Thorne RP. Obturator neuropathy caused by an aneurysm of the hypogastric artery. A case report. *J Bone Joint Surg [Am]* 1989;71:1408-1409.
7. Pellegrino MJ, Johnson EW. Bilateral obturator nerve injuries during urologic surgery. *Arch Phys Med Rehabil* 1988;69:46-47.
8. Redwine DB, Sharpe DR. Endometriosis of the obturator nerve. A case report. *J Reprod Med* 1990;35:434-435.
9. Rogers LR, Borkowski GP, Albers JW, Levin KH, Barohn RJ, Mitumoto H. Obturator mononeuropathy caused by pelvic cancer: six cases. *Neurology* 1993;43:1489-1492.
10. Siliski JM, Scott RD. Obturator-nerve palsy resulting from intrapelvic extrusion of cement during total hip replacement. Report of four cases. *J Bone Joint Surg [Am]* 1985;67:1225-1228.
11. Vasilev SA. Obturator nerve injury: a review of management options. *Gynecol Oncol* 1994;53:152-155.
12. Warner MA, Warner DO, Harper CM, Schroeder DR, Maxson PM. Lower extremity neuropathies associated with lithotomy positions. *Anesthesiology* 2000;93:938-942.
13. Weber ER, Daube JR, Coventry MB. Peripheral neuropathies associated with total hip arthroplasty. *J Bone Joint Surg [Am]* 1976;58:66-69.