

Chronic Compartment Syndrome in a Nonathletic Elderly Man

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Leg pain is a common outpatient complaint. Although chronic compartment syndrome is one of the causes of leg pain, it has not been described in the elderly. First described by Mavor¹ in 1956, chronic compartment syndrome is a condition that primarily affects young and active individuals. The typical patient presenting with this disorder is in his or her early twenties.¹⁻⁵ Ninety percent of reported cases have occurred in active athletes^{2,3} secondary to overuse syndromes while training for endurance sports. The nonathletic patients reported have had concomitant leg problems, such as knee surgery or ruptured Baker's cysts.² The following case report describes an elderly patient with chronic compartment syndrome associated with mild edema of the leg.

CASE REPORT

The patient was a 69-year-old male retired coal miner. He was first seen in the University of Utah Family Practice Center complaining of pain of three to four years' duration in his lower left leg. The pain was described as an "ache" present in the anterior and lateral parts of his leg below the knee. It was precipitated by walking or square dancing, and often occurred following cessation of the activity rather than at the start. After rest the ache would last a few minutes to several hours before abating. The patient had seen five different physicians for this problem and had been placed on a variety of nonsteroidal anti-inflammatory medications without improvement. The patient reported that the pain was slowly increasing in severity over time.

The patient had a history of chronic lung disease that had been documented by pulmonary function tests, which indicated moderately severe obstructive changes, and a

resting partial pressure of oxygen of 6.7 kPa (50 mmHg) on room air. A chest x-ray film showed hyperinflation of the lungs and prominent pulmonary arteries secondary to pulmonary hypertension. He had a 20 pack-year history of smoking but had not smoked in 30 years. He was currently not receiving any pulmonary medications. The patient had no history of other known predisposing causes of chronic compartment syndrome, such as previous deep venous thrombosis, fracture or trauma of the leg, Baker's cyst, or swelling of the knee.

On physical examination the patient's left leg was unremarkable except for mild edema (1+), which was not present in the right leg. Some hair loss was noted on the lateral side of both legs, but the distal pulses were all normal. Muscle strength was full, the deep tendon reflexes were normal, and there was no sensory loss or local tenderness present in the left leg. X-ray films of the left tibia and fibula were normal, as was a venogram of the left leg.

The remainder of the physical examination was within normal limits. There was no jugular venous distention, the lungs were clear to auscultation, the heart had normal first and second sounds, and there was no gallup and no murmur. No tenderness, masses, or organ enlargement was found on abdominal examination. Complete blood count and blood chemistry tests were within normal limits.

The patient was empirically placed on hydrochlorothiazide, 50 mg daily, to see whether removal of the edema would relieve his symptoms. He did have relief from his pain temporarily, but both the edema and pain returned. For one and one-half years after his initial visit, he returned several times complaining of recurrence of his symptoms. The hydrochlorothiazide was increased to 50 mg twice a day, and potassium supplementation was added. Soon thereafter, the diuretic was changed to furosemide, 40 mg one to two times per day, and eventually the patient was placed on digoxin, 0.25 mg daily. Each change temporarily removed the edema and relieved his symptoms.

Because the patient's symptoms repeatedly suggested pressure in the leg that responded only transiently to diuretics, chronic compartment syndrome was eventually considered despite the patient's age and activity level. He

Submitted, revised, February 8, 1988.

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was referred to an orthopedic surgeon, who performed pressure measurements of the left leg using the modified wick catheter technique.^{2,6,7} Elevated pressures of 2.4 pKa (18 mmHg) were found in his anterior and lateral compartments (normal < 2.0 pKa, 15 mmHg). Lateral and anterior fasciotomies were performed to relieve the elevated pressures. The patient had a routine postoperative recovery and was then symptom free. The digoxin was stopped following surgery, and within six months all diuretics were discontinued. The patient continued to have trace edema in his left lower leg, but he has remained asymptomatic. In two years of follow-up he has had no recurrence of his pain despite normal activities, including square dancing.

DISCUSSION

The pain of chronic compartment syndrome is most often described as a tightness or an ache²⁻⁴ and will follow activity for a length of time varying from a few minutes to a day.⁸ It is bilateral approximately 90 percent of the time, usually affecting the same compartments in both legs.^{2,4} Also, the pain generally progresses in severity over time.² Detmer et al,² describing 100 of their own operative patients, reported that the mean time between the onset of symptoms and diagnosis was 22 months, and that the patients saw an average of 2.4 physicians before a diagnosis was made.

On physical examination a patient with chronic compartment syndrome typically has no objective findings. There is no local tenderness or swelling, the distal pulses are normal, there are no neurologic deficits, and there is full range of motion of the leg.^{1,4,5} Findings on x-ray examination of the leg are also normal. The diagnosis is made by the patient's history along with the finding of elevated compartment pressures in the affected areas.^{2,6,7,9} Although no noninvasive tests exist to assist in making the diagnosis, in the hands of an experienced orthopedic or general surgeon, compartment pressure measurements are a simple outpatient procedure. Treatment consists of surgical fasciotomy.^{2,10,11}

This patient fit the diagnostic criteria for chronic compartment syndrome. His symptoms, although unilateral, were suggestive of the diagnosis, he had elevated compartment pressures, and routine fasciotomy completely relieved him of his symptoms. In the absence of overuse or a history of other known predisposing causes, the cause remains in question.

Leg pain in middle-aged and older patients is a common complaint. This case report documents chronic compart-

ment syndrome as a cause of leg pain in an elderly individual. The usual length of time between the beginning of symptoms and the diagnosis of chronic compartment syndrome as well as the number of physicians typically seen are indicative of a lack of awareness by physicians of the syndrome. Although these are measurements of delay in making the diagnosis, the lack of awareness suggests that other patients are not being diagnosed. The true prevalence of chronic compartment syndrome is unknown, however.

In evaluating leg pain of unknown etiology, chronic compartment syndrome should be included in the differential diagnosis because it is readily treatable. A history of intermittent tightness following activity is the primary clue in taking the history, particularly if the area of tightness is well demarcated. Confirmation of the diagnosis is made by referral for compartment pressure measurements.

Although the family practice authors were unaware of the diagnosis in this setting prior to caring for this patient, this knowledge has subsequently helped in diagnosing chronic compartment syndrome in two patients with leg pain, in a middle-aged individual and in an older individual.

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