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Case Report Open Access

A Typical Cause for Neuropathic Pain in a Person with a Chronic Traumatic Spinal Cord Injury

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Abstract

Context: A 44-year old man with a history of a chronic T12 AIS C spinal cord injury (SCI) presented with a six month history of left chest wall neuropathic pain and upper extremity paresthesias.

Findings: Assessment demonstrated a mixed picture of upper extremity and chest wall paresthesias associated with severe neuropathic pain well above the level of his original injury. MRI of cervical spine and thorax revealed the presence of cervical canal stenosis and a soft tissue tumor at the level of the ninth left intercostal space. Surgical resection of the tumor revealed an encapsulating nerve sheath tumor diagnosed by pathology as a rare peripheral benign schwannoma or neurilemoma.

Conclusion: This unreported cause of neuropathic pain in a person with a chronic spinal cord injury is discussed within the context of the importance of thorough history and physical exam when evaluating individuals with previous spinal cord injury presenting with new neuropathic pain.

Case Presentation

A 44-year old man with a 24 year history of T12 American Spinal Cord Injury Association (ASIA) C traumatic spinal cord injury, presented to his Family Physician with pain in the left lower chest and parasthesias of the upper extremities. He functioned independently with incomplete paraplegia and could propel his own manual wheelchair. A chest x-ray was reported as normal and an abdominal ultrasound revealed a benign right kidney cyst. A two week trial of gabapentin provided no relief. A switch to pre-gabalin resulted in cognitive blunting and was discontinued. He was referred to a Physiatrist for pain management and investigation.

The patient reported a six-month history of neuropathic pain along the left T9 dermatome and upper extremity parasthesias. During a typical day he may have total relief, but may also experience severe chest wall discomfort, a grade 10/10 on a visual analog scale (VAS). It was worse at night and had interrupted sleep. His mood was not affected, but pain levels above grade 8/10 on the VAS impacted upon activities of daily living. He described a burning and tingling sensation, characterized by intermittent itch, paroxysmal electrical shocks, and pins-and-needles that progressively became as sharp as a knife. He was adamant the pain originated from above the level of his original SCI. It radiated from the left chest to left shoulder, sometimes to the upper back and always situated above the umbilicus. It was aggravated with sneeze or cough, and partially relieved by applying pressure or by rubbing the affected area. He was also affected by intermittent neck pain and aching of the upper extremities with numbness in the fingers when sleeping. He denied weight loss. He had stable neurological status from the pre-existing SCI as evidenced by unchanged bowel and bladder function.

Physical exam did not reveal evidence of skin irritation or blistering suggestive of an infective process. Attempts to reproduce the chest pain were negative and deep palpation along the ribs, paraspinal muscles and lateral recesses did not reproduce his symptoms. Strength, sensation and stretch reflexes were normal in the upper extremities. He was able to independently transfer from a wheelchair to plinth with only moderate truncal instability. Extended neurological exam found minimal voluntary anal contraction, no pinprick sensation around the anus, and no deep anal pressure sensation.

Magnetic resonance imaging (Figure 1) and sagittal CT (Figure 2) of the thoracic spine demonstrated a 3.7x2.4x3.6 cm ovoid well-defined mass between the ninth and tenth ribs that followed the course of the neurovascular bundle, suggesting a peripheral nerve sheath tumor. Additionally, CT cervical spine identified mild to moderate central canal stenosis and moderate to severe bilateral foramina stenosis at the C5-6 level.

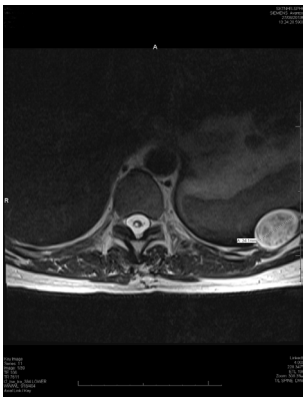

Figure 1: Magnetic resonance imaging.

Thoracic Surgery performed en bloc resection of the chest wall and tumor (Figure 3). Histopathology confirmed Antoni A & B areas with S100 positive spindled, wavy cells typical of a schwannoma with no invasion into the pleura (Figures 4 and 5). Follow-up with neurosurgery advised physiotherapy for upper extremity symptoms

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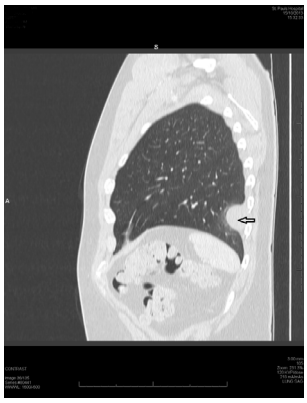

Figure 2: Sagittal CT Lung.

Figure 3: Resected schwannoma with superior and inferior rib segments (2 cm).

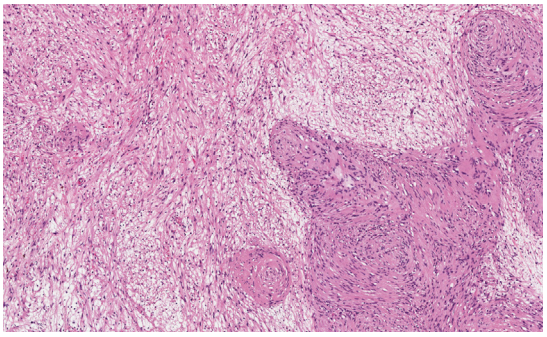

Figure 4: Schwannoma H&E stain.

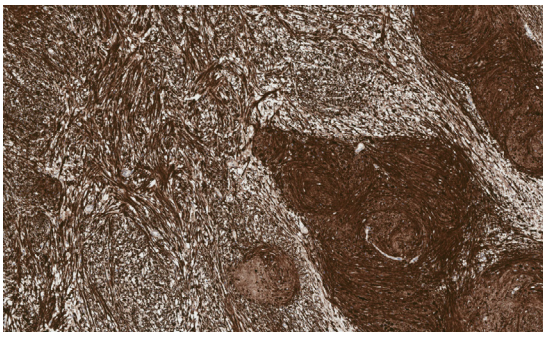

Figure 5: Schwannoma S100 stain.

related to the cervical stenosis. At the six month follow-up, the patient reported musculoskeletal residual pain of the left shoulder and thorax distal to the original area of pain. These symptoms may be attributed to surgical positioning. Surgical resection of the mass and encapsulated intercostal nerve resulted in numbness along the left T9 dermatome, but complete resolution of the original presenting pain.

Box 1. Different diagnosis of neuropathic pain in traumatic SCI
Compressive myelopathy with spinal stenosis
Radiculopathy (cervical, thoracic, lumbosacral)
Syringomyelia
Brachial neuritis or other plexopathy
Entrapment neuropathies
Nutritional deficiency related neuropathies
Post herpetic neuralgia
Iatrogenic neuralgias(post thoracotomy pain)
Posttraumatic neuralgias
Post radiation plexopathy
Trigeminal Neuralgia
Complex regional pain syndrome
Multiple sclerosis
Alcoholic polyneuropathy
Complex regional pain syndrome
Nerve/spinal cord compression by tumor infiltration

Discussion

New neuropathic pain (Box 1) in a person with a chronic SCI should be thoroughly assessed and should not be attributed to the original SCI until proven otherwise. In this situation, there was a 6-month history of new chest wall neuropathic pain in a dermatomal pattern, complicated by upper extremity paresthesias in a person with a SCI of 20 years' duration. The cervical stenosis was investigated and proved to contribute minimally to the clinical presentation of neuropathic pain.

Peripheral nerve sheath tumors usually present in adults and most occur as incidental findings in patients who are asymptomatic [1]. Although reports of paraspinal nerve sheath tumors can be found in the literature, a search using key words "schwannoma", "neurilemoma", "spinal cord injury" and "neuropathic pain" or "pain" did not reveal any English case reports or documented diagnoses of a person with chronic SCI and peripheral nerve sheath tumor resulting in neuropathic pain. More than 95% of peripheral nerve sheath tumors are benign, and may account for 20% of all mediastinal tumors [1]. They grow slowly and have various involvement with the nerve they encapsulate [2]. They are well encapsulated, firm, and generally easily resectable [1]. Significant pain may indicate a malignant tumor and treatment is surgical, allowing for pathology and diagnosis [2]. In the asymptomatic person, only observation is necessary as there is little risk the lesion will become malignant [3].

In this case, pathology defined a neurilemoma (a benign schwannoma), which is the least common of all benign peripheral nerve sheath tumors [3]. Presentation typically occurs in the third decade [2] though individuals may be affected between 20 and 50 years, with equal rates in women and men [3]. The tumor is made of Schwann cells which form the myelin sheath protecting peripheral nerves [2] and is usually round [3]. Characteristically, the lesion will exhibit point tenderness and shooting pain when palpated, however continuous pain or pain without provocation suggests malignancy [2]. It is also thought that peripheral lesions are less restricted, unlike more proximal neurilemoma which may be more painful and associated with neurologic deficiency due to their bony constriction near the spinal roots [3]. For symptom relief, excision is recommended and is usually performed without damaging the associated nerve [3]. In this case unfortunately, the intercostal nerve could not be spared and the man described numbness in the distribution of left T9 dermatome after surgery.

Key Points

People with spinal cord injuries can present with new complications that affect their neurologic status.

Not all neuropathic pain is related to an individual's existing spinal cord injury.

The etiology of new neuropathic pain in a person with a chronic spinal cord injury should be investigated.

Neurilemoma rarely cause pain or neurological deficit but must be ruled out in dermatomal distributed neuropathic pain.

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