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Bilateral Traumatic Neuroma of the Anterior Cervical Nerve Root

Case Report

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Study Design. Case report.

Objectives. A rare case of anterior cervical second root traumatic neuroma with no history of trauma is reported, and possible etiology is discussed.

Summary of Background Data. Traumatic neuroma is the reactive, nonneoplastic proliferation in the injured nerve. Several atypical locations of traumatic neuroma have been reported. To date, only 4 cervical traumatic neuroma cases with no history of trauma have been reported, and, to our knowledge, there is no case of bilateral cervical traumatic neuroma published in the literature.

Methods. A patient with a history of neck and left upper extremity pain, who had hypoesthesia in left C2 dermatome on neurologic examination is presented. A left C2–C3 hemilaminectomy and tumor extirpation were performed.

Results. A histopathologic study revealed features of a typical traumatic neuroma. The patient had no deficits on her postoperative neurologic examination, and her neck and left arm pain improved. The unusual location of this lesion and possible etiology of such a traumatic neuroma are discussed.

Conclusions. A rare case of anterior bilateral cervical second root traumatic neuroma with no history of trauma is reported. An unnoticed history of trauma may play an etiologic role in the development of these lesions.

Key words: atypical location, cervical nerve, traumatic neuroma. **Spine 2005;30:E521–E523**

Traumatic neuroma is the reactive, nonneoplastic proliferation of axons, Schwann cells, and fibroblasts at the proximal end of an injured nerve.[1] Traumatic neuroma generally develops as a reactive process of the injured peripheral nerve.[2] Traumatic neuromas typically involve peripheral nerves of the extremities, but they can occur at any side in the body where a nerve is traumatized. Several atypical locations of traumatic neuroma, such as the facial nerve and supraorbital nerve, have been reported.[3,4] To date, 4 cervical traumatic neuroma cases with no history of trauma have been reported.[2] To our knowledge, a bilaterally cervical traumatic neuroma has never been reported in the literature. We describe an interesting case of a bilateral anterior cervical nerve root traumatic neuroma with no remarkable history of apparent trauma.

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Case Report

A 49-year-old woman presented with a 1-year history of neck and left upper extremity pain. The pain worsened and did not respond to medical treatment over the prior 2 months. Physical examination revealed no significant abnormalities aside from hypoesthesia in the left C2 dermatome.

Cervical magnetic resonance imaging (MRI) revealed bilateral intradural extramedullary mass lesions at the level of the C2–C3 vertebrae, 9×14×30 mm on the right and 11×17×40 mm on the left side, extending vertebral neuroforamina bilaterally. The lesions were isointense on T1-weighed images and hyperintense on T2-weighed images, and enhanced homogeneously after contrast injection (Figure 1). The differential diagnosis was considered a schwannoma or a neurofibroma. Because of persistent neck and left upper extremity pain, a left C2–C3 hemilaminectomy and tumor extirpation were performed. Intraoperatively, a fusiform enlargement of the left anterior C2 nerve root was detected in the subarachnoid space. Neither inflammation nor adhesion to the arachnoid membrane was noted. No activity was recorded with electrical stimulation to the proximal side of the fusiform part of the anterior C2 nerve root. Accordingly, the left anterior C2 nerve root along with its fusiform dilation was removed. Because the frozen section of the operative sample was consistent with a traumatic neuroma, no further intervention was performed on the right-sided asymptomatic lesion.

The microscopic evaluation of surgical specimen revealed a mass consisting of proliferating nerve fascicles involving Schwann cells and fibroblasts in a traumatic fibrocollagenous stroma, and was interpreted as a traumatic neuroma (Figure 2). The patient had no deficits on postoperative neurologic examination, and had improved neck and left arm pain. The patient was observed clinically and with MRI for 6 months. At her 6-month follow-up, she was symptom free, and her neurologic examination revealed no deficits. The left-sided lesion did not reoccur, and there was no change in the size of the right-sided lesion on the 6-month follow-up MRI.

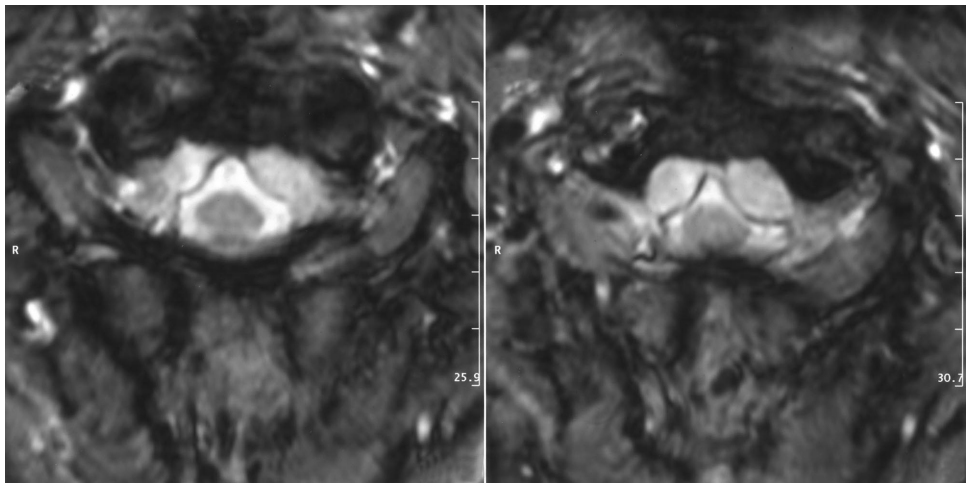

Figure 1. Bilateral intradural extramedullary masses at C2 level on T2-weighed axial MRI.

■ Discussion

The growth of axons from the proximal to distal stump of a damaged nerve is guided by proliferating schwann cells, which often results in the haphazard realignment of the injured nerve in ideal conditions. If the ends of the damaged nerve are not in close apposition or if there is no distal stump, the proximal nerve axon proliferates in a disorganized manner, resulting in a traumatic neuroma. Subsequently, axons of traumatic neuroma continue to grow and divide, and are surrounded by proliferating Schwann cells with thin myelin sheets.[1,2] Our case was consistent with these typical pathologic features of a traumatic neuroma.

Schwannomas and neurofibromas may present with sensory disturbances depending on the level or location of the involved nerve root. Other symptoms include motor disturbances, radicular pain, dysesthesias, and bladder dysfunction. Rarely, a traumatic neuroma may present with subarachnoid hemorrhage, causing sudden pain, fever, and meningismus.[5] Traumatic neuromas resulting from peripheral nerve injury usually present with the loss of function of the involved nerve but also may cause pain.[2] Like other mass occupying lesions, the traumatic neuromas of the spine may present similar to schwannomas and neuromas.

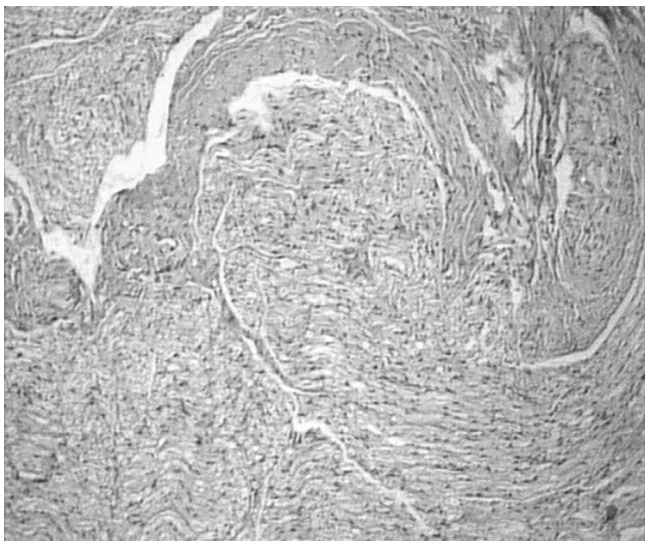

Figure 2. Proliferating nerve fascicles in a fibrocollagenous stroma (hematoxylin and eosin, original magnification ×100).

Although schwannomas and neurofibromas are classified as benign neural sheath tumors, they have the potential for malignant transformation.[1] This process is less frequent for schwannomas. Traumatic neuromas without evidence of malignant transformation are not classified as primary neoplastic tumors, and, therefore, indications for surgery are controversial.[1] The surgical removal of a neuroma is indicated when it becomes symptomatic or if there is suspicion of a recurrent tumor in a patient with a history of prior cancer-related surgery. In our case, we removed only the symptomatic left C2 anterior nerve root neuroma. Once it was determined on frozen section to be a benign neuroma, the right asymptomatic lesion was left undisturbed.

We had expected to find an intradural extramedullary tumor of the cervical nerve root, possibly a schwannoma or a neurofibroma. Confusing a traumatic neuroma with a palisading encapsulated neuroma or neurofibroma is a frequent occurrence. Neurofibromas histologically consist of an abundance of fibrous tissue and nerve fibers within the tumoral stroma. Diffuse fusiform enlargement of the involved nerve makes it impossible to distinguish between nerve tissue and the actual tumor.[1] As was seen in our case, involvement of all elements of the nerve fascicles and identification of a damaged nerve distinguish a traumatic neuroma from neurofibroma. Schwannomas histologically consist of both Antoni types A and B tissues. Antoni type A tissue consists of compact, cellular spindle-shaped cells, while Antoni type B tissue consists of loosely arranged, less compact spindle cells. These histologic features do not exist in traumatic neuromas or neurofibromas.[1]

Our patient had no subjective history of antecedent trauma that could have caused the development of a traumatic neuroma of the cervical nerve root. After reviewing the literature, the possible etiologic causes of traumatic neuroma include a minor brachial plexus injury

or a hard pull on a baby's head at birth, or a forgotten traction injury to the upper extremity in childhood.[6,7] It is often difficult to identify the history of physical traction in every case. This difficulty may support the possibility of unnoticed minor trauma occurring later in life, predisposing to the development of a traumatic neuroma.

■ Key Points

- Traumatic neuroma is the nonneoplastic proliferation of all elements of the injured nerve.
- Several atypical locations of traumatic neuroma have been reported.
- To date, cervical traumatic neuromas in the absence of trauma have been rarely reported.

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