Spinal Tumors Found in the Athlete

Megan E. Anderson, MD[a,b,c,*]

KEYWORDS

• Spine • Tumor • Adolescent • Aneurysmal bone cyst • Osteoid osteoma • Osteoblastoma • Giant cell tumor • Hemangioma

KEY POINTS

- Spine tumors in the adolescent athlete population are uncommon.
- A careful history and physical examination can offer clues about a spine tumor.
- Plain x-rays and magnetic resonance imaging are often the most helpful imaging modalities.
- A high index of suspicion is necessary to identify these lesions.

Spine tumors are infrequently encountered in the adolescent athlete population. However, when they are not identified in a timely manner, the consequences can be significant: spinal deformity, neurologic deficits, longstanding pain, and more. It is thus important for all clinicians caring for athletes to keep neoplasia in their differential when they are evaluating an athlete with a spine complaint.

In this article, clues in presenting symptoms and appropriate imaging are discussed. Specific tumor types that are most commonly encountered in this population and their treatment will also be included. This is not intended as an exhaustive review of spine tumors in general but truly focused to the adolescent athlete.

PRESENTATION

Most athletes with a spine tumor present similarly to those with overuse syndromes or traumatic injuries: with pain. Pain that persists beyond the normal timeframe for an injury or overuse problem or pain that is of a much more severe intensity should prompt further investigation. Pain associated with signs of nerve root compression,

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[a] Children's Hospital Boston, Department of Orthopaedic Surgery, Hunnewell 2, 300 Longwood Avenue, Boston, MA 02115, USA; [b] Beth Israel Deaconess Medical Center, Boston, MA, USA; [c] Harvard Medical School, Boston, MA, USA
* Children's Hospital Boston, Department of Orthopaedic Surgery, Hunnewell 2, 300 Longwood Avenue, Boston, MA 02115.
E-mail address: megan.anderson@childrens.harvard.edu

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myelopathy, or spinal deformity should trigger a more urgent evaluation. Pain that is worse at rest and when lying down at night can be a worrisome feature as well.

Athletes may also present with a tumor as an incidental finding when they are being evaluated after trauma or overuse. Many of these lesions are benign, but consultation with a clinical spine tumor specialist or radiologist should be the default so that the appropriate workup and biopsy, if necessary, can be performed.

Physical examination should be directed to the area of concern (eg, upper extremities for cervical spine), checking for radicular nerve root or cord compression findings. The athlete should be evaluated for spinal deformity as well. An acute curve toward the side of pain may be a spastic scoliosis caused by inflammation from a tumor such as an osteoid osteoma. An acute kyphosis may indicate vertebral body collapse secondary to involvement of the vertebral body with tumor or Langerhans cell histiocytosis. Any of these findings warrant further evaluation with imaging studies.

Section Summary

Keep spine tumor in the differential for an athlete with back pain

- Back pain that persists longer than normal
- Pain that is more severe than normal
- Spinal deformity with pain
- Nerve root compression and/or myelopathy.

IMAGING

Plain radiographs are rarely diagnostic in the evaluation of a patient with a spine tumor. They may indicate clues, however, that should prompt further evaluation. Spinal deformity would be evident on full spine x-rays. The absence of the bony landmark of the pedicle, the "winking owl sign," may indicate that a pedicle is involved with tumor. Either of these findings would then necessitate further 3-dimensional imaging studies.

Magnetic resonance imaging (MRI) is extremely helpful in evaluating a patient with a spine tumor. The normal anatomy of the neighboring cord, cauda equina, or exiting nerve roots is demonstrated, along with their relation and proximity to the tumor. Soft tissue tumors, both intra- and extradural, are best delineated with this modality. Bone tumors are also nicely assessed with MRI where internal characteristics of certain tumors can be identified (these will be discussed with specific tumor types below). Computed tomography (CT) is better at evaluating the intraosseous extent and thus fracture risk associated with a spine tumor with bony involvement. CT can also identify internal osteoid, bone, or cartilage matrix formation within a tumor.[1]

Bone scan is really only useful when multiple lesions are suspected or if the clinician cannot easily localize the site of origin of an athlete with concerning spine pain. Otherwise, bone scan typically does not add to what may be gleaned from MRI and CT. It is, however, part of the staging process for a malignant primary tumor of bone.

Section Summary

- MRI is the basis for imaging most spine tumors
- CT is helpful for bone tumors and to assess fracture risk
- Bone scan can be useful to pinpoint the area of concern.