DIAGNOSTIC CHALLENGE

Answer

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The patient has an abnormal lateral cervical spine radiograph (see Figure on p. 33) with a lucency in the posterior elements (neural arches) of C1 (atlas). This finding is suspicious for a posterior neural arch fracture, which results from compression of posterior elements between the occiput and spinous processes of C2 (axis) during forced neck extension. The lack of pre-vertebral soft-tissue swelling would make a high cervical spine injury unlikely, but not impossible, especially early on.

A hangman's fracture denotes bilateral fractures of the pedicles of C2. This type of spinal column injury results from extreme hyperextension of the cervicocranial junction, like that which occurs with hangings. The lucency in this patient's radiograph is not in the region of the pedicles.

Both neural arch and pedicle fractures are potentially unstable. Therefore, in the setting of blunt head and neck trauma with midline cervical tenderness and an abnormal radiograph, further imaging is required.

A CT scan of the cervical spine (Fig. 1, this page) revealed a gap between the posterior neural arches of C1, but not a fracture. The radiological interpretation was nonunion, and the patient was said to have spina bifida occulta.

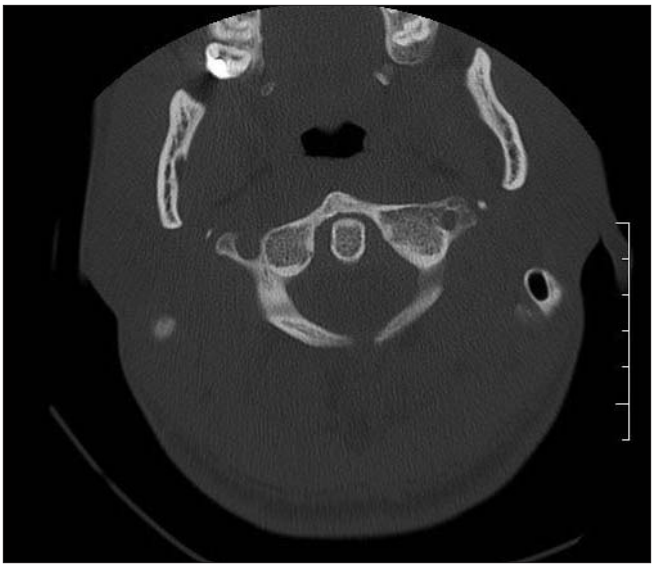

Fig. 1. CT scan of the cervical spine at the level of C1 demonstrating non-union of the posterior elements.

Failure of fusion of the posterior vertebral arches is one of a spectrum of congenital disorders under the broad heading of spinal dysraphism, more commonly referred to as spina bifida occulta. The major features are non-fused spinous processes and lamina with an intact dural sac.[1]

The exact incidence of this congenital malformation is unknown because it is for the most part asymptomatic. However, it does occur more often in the lumbosacral junction compared with the cervical spine. Occasionally, a dimple in the skin or tuft of hair overlies the lesion. In one series of patients presenting to an ED for a variety of symptoms in whom spinal imaging was obtained, spina bifida occulta of the lumbosacral spine was diagnosed in 22%.[2]

Spina bifida occulta is of no clinical significance and it does not predispose the patient to spinal column fractures or cord injuries. In a patient with this previously undiagnosed condition, however, the radiographic findings can mimic bony destruction[3] and, as in the current case, a fracture.

All emergency physicians have been in the difficult position of trying to determine if a radiologic abnormality is acute or chronic. When a finding fits with the clinical scenario and comparative films are unavailable, the conventional wisdom is to assume that it is acute and proceed on to further investigation. Even though there was really no fracture of C1, the emergency physician in this case appropriately followed this philosophy.

Competing interests: None declared.

Key words: spina bifida; cervical spine pedicle

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