Synchondrosis fracture in a pediatric patient

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We present the case of a 6-year-old boy with a fracture of the anterior arch of the atlas vertebra, treated with transoral closed reduction and external immobilization.

Case report

A 6-year-old boy arrived at the emergency department three days after falling 5½ metres (19 feet) from a balcony. Bystanders said that the child appeared to have landed on his forehead. The child complained of neck pain and held his head stiffly.

On examination, his C-spine movements were decreased and he held his head tilted to the left. The rest of the physical exam, including a neurological examination, was unremarkable. Extensive soft tissue swelling anteriorly and a widened atlanto-dental interval was seen on plain radiographs. Computed tomography revealed fractures through the synchondroses of the anterior arch of C1. The central portion of the C1 vertebra was displaced anteriorly by 6 mm on the left side and 1 mm on the right (Fig. 1, left scan).

The patient was immobilized with a halo vest, and CT repeated under general anesthesia. With the boy in the CT scanner, reduction was achieved with digital compression applied transorally by the staff surgeon (Fig. 1, middle).

A follow-up CT scan demonstrated closure of the synchondrosis and maintenance of the reduction (Fig. 1, right). The child quickly returned to normal activities, with no further symptoms. Three years later his radiographs are normal, with no evidence of stenosis or C1 arch hypoplasia.

Discussion

Excessive hyperextension has been cited as a possible mechanism of injury in anterior arch disruptions, as occurred in this case.[1] In children, the signs of atlas fractures may be subtle. Suspicious clinical or radiographic signs should prompt further investigation with CT or MRI.

Fractures of the atlas in children must be distinguished from normal variants such as congenital arch malformations.[2] Only 3 reports[3–5] in the literature describe cases of disruption of the synchondrosis of the anterior arch of C1, with no consensus as to the recommended treatment: 2 patients were treated with a rigid collar,[3,4] and the third underwent 3 weeks of cervical traction before 2 months of cervicothoracic bracing.[5] Ours is the first report of transoral reduction.

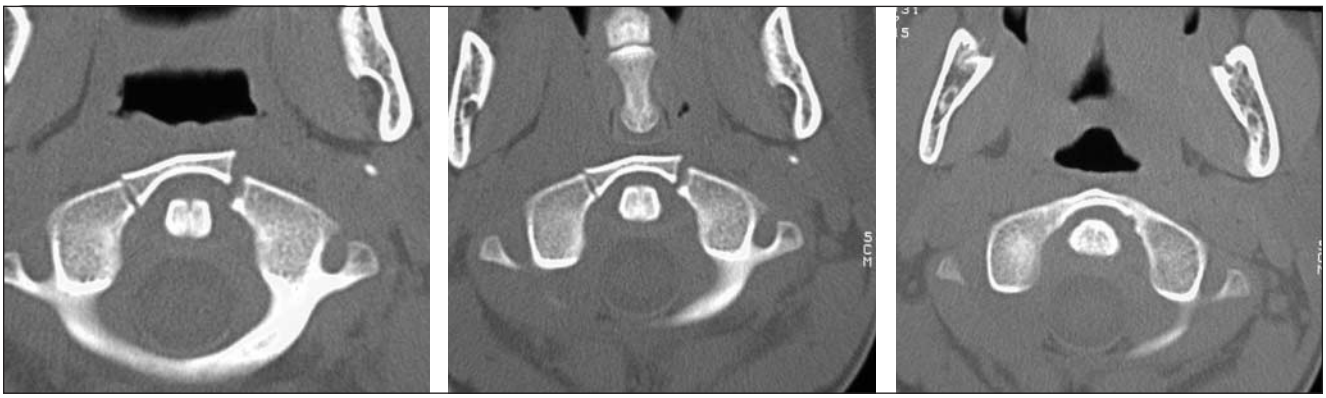

FIG. 1. Computed tomographic images of synchondrosis disruption and displacement of the C1 vertebra at presentation (left), during transoral reduction (centre) and at follow-up (right, showing the healed anterior arch).

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Fractures of the atlas vertebra are rare in children. A history of trauma combined with the classical signs of neck pain, head tilt, diminished cervical range of motion and cervical muscle stiffness should alert the clinician to the possibility of an atlas fracture. Initial radiographs may be equivocal; further images should be made with CT and MRI if clinical suspicion is high. Imaging may also be used to verify post-immobilization reduction of the fracture. For stable fractures, excellent functional results may be obtained with immobilization by external fixation.

Competing interests: None declared.

References

1. Swartz JD, Puleo S. Fractures of the C1 vertebra: report of two cases documented with computed tomography. *J Comput Tomogr* 1983;7:311-4.
2. Gehweiler JA, Daffner RH, Roberts L. Malformations of the atlas vertebra simulating the Jefferson fracture. *AJR Am J Rœntgenol* 1983;140(6):1083-6.
3. Bayar MA, Erdem Y, Ozturk K, Buharali Z. Isolated anterior arch fracture of the atlas: child case report. *Spine* 2002;27(2):E47-9.
4. Judd DB, Liem LK, Petermann G. Pediatric atlas fracture: a case of fracture through a synchondrosis and review of the literature. *Neurosurgery* 2000;46(4):991-4.
5. Mikawa Y, Wantabe R, Yamano Y, Ishii K. Fracture through a syncondrosis of the anterior arch of the atlas. *J Bone Joint Surg Br* 1987;69(3):483.

Melanoma erysipeloides

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A 63-year-old man went to his family physician with an axillary mass that had grown over the preceding year. An incisional biopsy showed a poorly differentiated tumour that stained positive for S-100 protein and negative for CD45, HMB and cytokeratin. The diagnosis was metastatic melanoma from an unknown primary.

When the patient was seen in the melanoma clinic 2 weeks later, the mass had grown somewhat and developed some reddening and local tenderness close to the biopsy site. On physical examination, the patient was afebrile and had a 15-cm left axillary mass with erythema extending around the biopsy site. The mass was firm and mobile; no other lymphadenopathy was found in the neck, right axilla or groin. No primary melanoma lesion was discovered. A complete staging work-up was arranged, and the patient booked for an axillary dissection.

Ten days later, the patient arrived at the emergency department with markedly increased pain and erythema to the left axillary mass. The mass size had increased to 21 cm, and the erythema spread to completely cover the mass (Fig. 1, left). All vital signs and laboratory values were normal. An urgent wide local excision with a left axillary-node dissection was performed (Fig. 1, right). A fine-needle aspiration biopsy found no evidence of infection within the mass. Removal of the tumour required sacrifice of the pectoralis major and thoracodorsal vessels.

The final pathologic diagnosis was metastatic melanoma involving the axillary lymph nodes with secondary dermal lymphangiomatosis in the overlying skin (Fig. 2). Immunostain results for S-100, vimentin, HMB-45 and melan-A were all positive. There was no identifiable invasion of the dermal lymphatics in the inflamed skin.

The patient was discharged from the hospital 7 days after surgery and referred for radiotherapy of the axillary bed. Last seen in follow-up at 15 months, he is still alive, with no recurrent disease.

Interestingly, an MRI done 3 months after diagnosis showed a nodular 1-cm mass in his left posterior frontal gyrus, with some perifocal edema. It was hyperintense on T_2-weighted images; it looked like a possible metastasis. After resection, pathology revealed this lesion to be nothing more than reactive gliosis, with no evidence of malignancy. Follow-up scan results have likewise all been negative.

Discussion

Inflammatory carcinoma is a well-known, although uncommon, cutaneous manifestation of metastatic malignancy. Its classical presentation involves an erythematous, indurated and tender area of skin overlying dermal lymphatic involvement by metastatic tumour.[1] It is most commonly associated with carcinoma of

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