HANGMAN'S FRACTURE IN AN INFANT

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A case is reported of fracture of the pedicles of the axis vertebra in an infant. Non-operative management in a Minerva cast resulted in union and full recovery without complications.

The mobility and flexibility of the cervical spine in infants help to protect against injury (Bailey 1952; Sullivan, Bruwer and Harris 1958; Cattell and Filtzer 1965). Fractures and fracture-dislocations in this age group are uncommon, and until the synchondrosis between the odontoid peg and the body of the axis closes at or about six years of age, a shear fracture through the cartilaginous plate is the most common injury. Fracture through the pedicles of the axis (the so-called hangman's fracture) in an infant has been reported only twice in the English literature (Weiss and Kaufman 1973; Gauffin and Goodman 1975). We now report a further case in which non-operative management was successful.

CASE REPORT

An 18-month-old infant presented with painful torticollis of two weeks' duration, a diagnosis of tonsillitis having been made by the family doctor. A radiograph of the cervical spine was taken to exclude cervical abscess and was reported to be normal (Fig. 1). The child was allowed to go home but 20 days later had shown no improvement. A further radiograph, taken in flexion, confirmed the diagnosis of bilateral pedicle fractures of the axis (Fig. 2).

The child was then admitted to hospital. There was no clear history of previous trauma and on examination the infant was otherwise normal with no evidence of either head injury or abnormal neurology. The fracture was reduced by extension, and held in a well-padded Minerva cast. One month later radiographs showed immature healing and a further month in a cast was advised. After this a soft collar was rapidly discarded. There were no skin complications as a result of two

Fig. 1

Fig. 2

Figure 1 – Lateral view of the cervical spine at first presentation. The fracture through the pedicles of the axis can be seen to allow slight forward displacement of C2 on C3. Figure 2 – Twenty days later, a radiograph with the neck in flexion shows the displacement to be more marked, with an increase in angulation and forward subluxation.

Fig. 3

Fig. 4

One year after the injury, flexion and extension radiographs show sound union of the fractures, and no instability.

months in the Minerva cast, and at follow-up, one year after the injury, there was a full range of painless cervical movement (Figs 3 and 4).

DISCUSSION

The pathomechanics of hangman's fracture in the adult are complex (Effendi et al. 1981; Francis et al. 1981) and result in a spectrum of injuries and degrees of vertebral displacement. No precise explanation can be put forward for the infantile injury; both previously reported cases sustained considerable trauma in motor-vehicle accidents. There was no clear history of antecedent trauma in the present case, and no reason to suspect physical abuse.

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The radiography of the infant cervical spine has many diagnostic pitfalls (Bailey 1952). In particular, the dens-arch synchondrosis may, in oblique views, be mistaken for a fracture (Swischuk, Hayden, and Sarwar 1979; Matthews, Vetter, and Tolo 1982). Persistent, painful torticollis in an infant or child demands a diagnosis, and this was lacking in the early management of our patient. Occult injury to the synchondrosis between dens and body is possible in such cases; in our opinion this may well be related to the aetiology of the enigmatic os odontoideum.

Hangman's fracture accounts for 5% of adult cervical spine injuries (Pinczewski, Taylor and Ryan 1983), and non-operative management is now well-established. The successful outcome in our case, even after delay in effective immobilisation, attests to this approach. One of the previously reported cases was treated by internal fixation and the other by skull traction. In our experience careful plaster technique and attentive parents can prevent skin damage to infants in a Minerva cast. Operation to restore stability and help avoid cord embarrassment has no practical value in either infants or adults.

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