Dancing eyes

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INTRODUCTION

Opsoclonus is a dramatic eye movement disorder in which there are involuntary, chaotic saccades occurring in multiple directions. Since it is uncommon, a lack of familiarity may lead the non-specialist to mislabel it as nystagmus. It should be distinguished from true nystagmus (which would have intervals or slow phases between the saccades) and from ocular flutter (which would be restricted to one plane).

Opsoclonus may occur as a transient disturbance in otherwise well newborns. It has been associated with a number of malignancies, most commonly neuroblastoma in childhood but also adult malignancies such as lung, breast and renal cancer (Castleberry, 1997; De Luca et al, 2002). It has also been described in encephalitis, meningitis, hydrocephalus and myoclonic encephalopathy (Shetty and Rosman, 1972). In view of the association with neuroblastoma, onset of opsoclonus after the first few weeks of life should prompt investigation for this condition. This article reports a case in which the identification of opsoclonus was delayed.

DISCUSSION

Neuroblastoma is the most common extracranial solid tumour of early childhood. It accounts for 8% of all childhood cancers, and 40% are diagnosed in children less than 1 year of age (Ries et al, 1999). It is a small round cell tumour of neural crest origin which has a variable behaviour, presentation and response to treatment. It may spontaneously regress, differentiate into benign ganglioneuromas or pursue an aggressive course with regional and distant metastatic spread that is poorly responsive to treatment.

Classification may be based on histology (amount of stroma, degree of differentiation, mitotic figures), genetics (amplification of the N-myc protooncogene, chromosome 1p deletion, ploidy) and tumour staging (1-4S International Neuroblastoma staging system) (Castleberry, 1997). Poor prognostic indicators of neuroblastoma are age greater than 2 years, spread across the midline (stage 3) or dissemination (stage 4), N-myc amplification and presence of chromosome 1p deletions (Caron et al, 1996; Brodeur et al, 1997).

Neuroblastoma develops from cells of the sympathetic nervous system. In infants it is more common in the neck and posterior mediastinum (typically tumours at these sites have better prog-

CASE REPORT

A 7-month-old girl was referred by her GP with a 6-hour history of 'jittery eyes'. During the preceding day she had been 'grizzly' and non-specifically unwell. Her mother reported that on the day of admission she had had rigors and abnormal eye movements. The child had no significant past medical history. There was a family history of epilepsy.

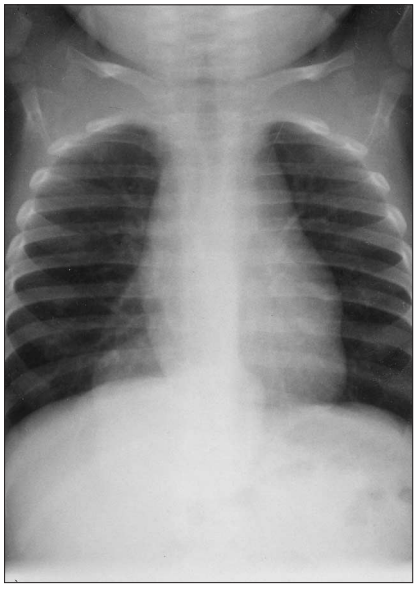
Paediatric review noted a miserable child with an inflamed right tympanic membrane and sudden eye movements up and to the right. An electroencephalogram was performed which was normal and a provisional diagnosis was made of right-sided otitis media with associated nystagmus resulting from putative labyrinthine involvement. The child was started on a course of amoxycillin and admitted. After 24 hours her condition had improved and she was discharged, pending an ophthalmology review 4 days later.

At the ophthalmology review it was noted that although the child appeared generally well, she was distressed by recurrent sudden conjugate dextro-elevatory eye movements associated with simultaneous backward jerks of the head. She was ataxic but the examination was otherwise normal. The opinion of a paediatric ophthalmologist was sought, the diagnosis of opsoclonus was made and further investigation arranged.

Chest radiography revealed bilateral paravertebral mass in the lower thoracic region (*Figure 1*). Magnetic resonance imaging confirmed this and showed anterior extension encircling the aorta and displacing the inferior vena cava (*Figure 2*). Considerable enhancement with gadolinium was noted. No involvement of liver, spleen or cranium was seen. A bone scan and marrow trephine was normal. An MIBG (metaiodobenzyl guanidine) scan showed increased uptake in the lower thoracic right paraspinal area. Tumour biopsy revealed rosettes of small round cells consistent with neuroblastoma.

The diagnosis was therefore of thoraco-abdominal neuroblastoma stage 3. This was not resectable and chemotherapy was started as per the European Infant Neuroblastoma Protocol. She made rapid improvement with radiographic reduction in tumour size and dramatic improvement in her neurological features.

Figure 1. Chest radiograph showing bilateral paravertebral mass in the lower thoracic region.



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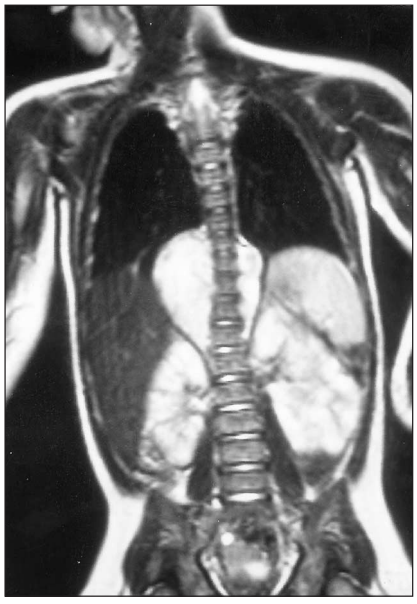
nosis than those located elsewhere) and generally remain more localized. In older children it is usually abdominal, arising either in the adrenal gland or in the sympathetic ganglia. The most common sites for metastases are bone, bone marrow, lymphatic system, liver and subcutaneous tissue.

Clinical features vary with the primary site, metastatic potential and neuroendocrine function of the tumour. Local disease may present with a mass, most commonly in the neck or abdomen. The pressure effects upon surrounding tissue may result in cord or nerve root compression. Metastatic features include bone pain, anaemia, periorbital ecchymosis, proptosis and subcutaneous nodules. Paraneoplastic manifestations include diarrhoea and hypertension in response to catecholamine and other vasoactive substance production as well as opsoclonus–myoclonus.

Opsoclonus in the context of neuroblastoma is commonly associated with myoclonus and ataxia first described by Kinsbourne in 1962 and later entitled 'dancing eyes-dancing feet syndrome'. The chaotic irregular jerking movements involving extraocular muscles and limbs simulate cerebellar nystagmus and ataxia. It is postulated that it arises from autoantibodies to a common antigen shared by the neuroblastoma and the saccadic pause neurones (Posner, 1997). These neurones are located in the pons and discharge tonically providing a constant inhibition to the saccadic burst cells except when saccades are required. Loss of pause cells could therefore result in the uncontrolled saccadic movements of opsoclonus (Hanson et al, 1986). Neuroblastomas associated with opsoclonus have a better prognosis than those without, perhaps as a result of the autoimmune factor restraining tumour growth (Altman and Baehner, 1976).

Figure 2. Magnetic resonance imaging demonstrating extent of paravertebral mass.



Treatment of neuroblastoma is multimodal, comprising of surgery, radiotherapy and chemotherapy, and is tailored according to location, staging and prognosis. Bone marrow transplant and stem cell transplantation have been shown to be effective in a subset of patients. The cure rate remains variable: up to 75–90% in infants and stages 1 and 2, but as little as 15% in older children with stage 4 disease (Castleberry, 1997).

The use of adrenocorticotrophin in the treatment of associated opsoclonus is well documented and there may be complete resolution of opsoclonus in one third of patients. However, children with opsoclonus–myoclonus and neuroblastoma frequently have long-term developmental and cognitive problems which may be minimized by early intervention (Koh et al, 1994).

The favourable prognosis for neuroblastoma in infants, even with metastatic disease, has prompted the evaluation of neonatal screening. Screening by measuring the catecholamine metabolites homovanillic acid and vanillylmandelic acid in urine is simple but is unlikely to reduce incidence or mortality of high-risk tumours. A large body of evidence suggests that screening detects disease with favourable prognosis associated with high rate of spontaneous regression or maturation into benign ganglioneuromas while disease with unfavourable prognosis remains undetected. Screening for neuroblastoma using urinary catecholamine metabolites may cause harm by treating cases that would have run a benign course (Woods et al, 2002).

CONCLUSION

Opsoclonus is a distinctive disorder of eye movements characterized by multidirectional high-amplitude saccades. Although it is infrequent, correct identification may facilitate the diagnosis and treatment of an underlying neuroblastoma or other disorder. **HM**

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