to the release of vasoactive peptides from trigeminal sensory perivascular fibres.\textsuperscript{18} F SCHON MJH HARRISON Department of Neurology The Middlesex Hospital London, UK

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Accepted 25 June 1986

Oclusion of the basilar artery in a 7 year old boy

Sir: Occlusion of the basilar artery is uncommon in childhood; a review of the literature disclosed only 29 cases documented in children up to 16 years old;\textsuperscript{1-11} there was a clear male dominance.\textsuperscript{6} The most frequent cause for occlusion of the basilar artery in adults is arteriosclerosis,\textsuperscript{12} while in children the reported cases have been associated with congenital malformations,\textsuperscript{2,3} embolism,\textsuperscript{4,5} arteritis,\textsuperscript{6} cervical injuries,\textsuperscript{7,11} and idiopathic causes.\textsuperscript{1,4,7-10} We describe a 7 year old boy with occlusion of the basilar artery verified by angiography and a locked-in state who had had previous craniovascular injury.

A 7 year old boy was admitted to our service because of sudden headache, vomiting and lethargy. Two weeks earlier he had sustained injuries to the head and cervical region, while being violently shaken against a tree trunk by an older child, resulting in malaise and drowsiness lasting a few hours but without loss of consciousness. Ten days before admission he had unsteady gait and cerebellar signs in the right limbs lasting a few minutes, accompanied by headache and vomiting. On admission his temperature was 38°C, blood pressure 120/70 mmHg and pulse rate 116/minute. He had decerebrate rigidity, oculocephalic deviation toward the left and spastic tetraparesis with bilateral Babinski sign. The pupils were symmetrical with normal reactions. The corneal reflexes were present. He was able to blink voluntarily, reacting to verbal commands by moving the eyes up and down. There was involuntary downward jerking of the eyes with slow upward drift (ocular bobbing), and sucking mouth movements without uttering words and his facial expression at times mimicked crying, either spontaneously or after stimuli. The child was admitted to the intensive care unit. The remainder of the physical examination, cardiology studies, lumbar puncture and laboratory analyses including clotting tests, antinuclear factors and syphilis tests all were normal, as were chest films and cranial and spine films. The EEG revealed a slowed basic rhythm of low voltage and occasional bursts of bilateral delta waves in the frontal and occipital areas. A CT scan showed areas of decreased density at the level of the left middle cerebellar peduncle, left lateral half of the pons and left cerebellar hemisphere. Angiography showed normal vertebral arteries and a well-filling supernumerary branch originating in the right subclavian artery. A complete proximal occlusion of the basilar artery was observed (fig). Left carotid arteriography revealed partial and irregular filling of the distal portion of the basilar artery through the left posterior communicating artery.

Treatment was begun with heparin sodium i.v. and because of worsening in ventilation, tracheostomy was performed and a volumetric respirator connected. Three weeks later the patient still opened and closed his eyes, responded to visual stimuli, breathed spontaneously and could perform voluntary proximal movements with the upper limbs, but did not speak or respond to commands and no contact could be established. Four weeks after admission the patient died because of massive haemorrhage as a complication of the tracheostomy. No post-mortem examination could be performed.

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{fig.png}
\caption{Complete occlusion of the basilar artery at its proximal third (arrow). Left vertebral artery is normal.}
\end{figure}
Although occlusion of the basilar artery has been well studied and documented in adult patients, particularly after the work of Kubik and Adams, it is very uncommon in childhood. It is characterised by sudden alterations to the state of consciousness with motor and neuro-ophthalmological anomalies in the majority of cases. In one third of all patients there are prodromal episodes with transient or reversible neurological disturbances. Occlusion of the basilar artery may give rise to the locked-in syndrome caused by ventral pontine ischaemia, although other sites of origin also have been described. Pontine lesions were confirmed in our patient by ocular bobbing and CT scan images of decreased density at the pons.

The diagnosis of occlusion of the basilar artery must be established through angiography. The examination of the four branches is advisable to rule out congenital vascular anomalies, laminar flow and spasm of the vertebral or basilar arteries. The prognosis for occlusion of the basilar artery generally is poor with a mortality rate reaching 85% in adults and nearly 25% in children, while there may be serious sequelae in survivors. Our patient death was not directly attributable to the occlusion of the basilar artery.

Mild cervical injuries have repeatedly been held responsible for different types of lesions in the vertebral arteries, such as tearing of the intima, thrombosis, aneurysms and dissections, which in turn may be the cause of severe neurological disturbances. In such cases the occlusion of the basilar artery may be produced by the thrombosis extending from the damaged vertebral arteries or through embolisms originating at the site of the thrombosis. The location of the arterial injury is not restricted to the occlitoatlantoaxial level but includes the course through the transverse foramina, with sudden lateral rotating movements either with or without forced extension of the neck being the most frequent cause for this type of lesion.

Our patient had no signs of arteritis, cardiac embolism, congenital malformation or cervical lesions and therefore craniocervical injury appeared to be the most probable cause for the occlusion in spite of the normal angiographic findings for both vertebral arteries.

When occlusion of the basilar artery is suspected in a child, the appropriate angiographic studies should be performed in selected patients to confirm the diagnosis with a complete study to determine its possible aetiological factors. A previous cervical injury must always be looked for.

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Accepted 25 May 1986
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