PAPERS AND ORIGINALS

Vertebral artery occlusion and oral contraceptives

ERIK ASK-UPMARK, EDWIN R BICKERSTAFF

British Medical Journal, 1976, 1, 487-488

Summary

If vertebral artery occlusion occurs in degenerative arterial disease it is almost invariably left-sided, but in vertebral artery deficiency syndromes associated with oral contraceptives a striking preponderance of right-sided involvement has been shown. This observation adds support to the view that causes other than changes in the wall of the vessel at the site of occlusion must be sought as an explanation of the occlusion.

Introduction

Occlusion of a vertebral artery is not uncommon and may result from atherosclerosis, embolism, arteritis, trauma, compression of the vessel from neighbourhood lesions or, and as yet inexplicably, during the use of oral contraceptives.

Natural disease

When all age groups are considered atheroma remains the most common cause of occlusion, and, despite the demonstration by Hutchinson and Yates^{1,2} in pathological studies that both vessels usually show significant disease, Hulten-Gyllenstein³ has shown that clinically it is almost invariably the left vertebral artery that is apparently affected. There is probably a simple hydrodynamic explanation for the left-sided predominance, the impact of pulse wave and pulse pressure having, for anatomical reasons, a more direct effect on this vessel.

While the clinical features of complete vertebral artery occlusion are those of the well-known lateral medullary, or Wallenberg's syndrome (at one time ascribed to a thrombosis of the posterior inferior cerebellar artery), varieties of this syndrome of widely

differing degrees of severity are by no means uncommon in clinical practice. When considering the younger age groups, however, there is a striking difference between the incidence of "strokes" in the territory of the carotid vessels and that in the posterior part of the cerebral circulation, and if one limits this study to young women under the age of 35 vertebral artery occlusion becomes extremely rare. Salmon *et al*⁴ made an extensive review of the subject but were unable to find any report of occlusion of the vertebrobasilar system in young women. The reports reviewed all referred to the period before the appearance on the clinical scene of vascular occlusions related to the use of oral contraceptives. There has been a striking increase in the incidence of occlusion in the vertebrobasilar system produced in this way.⁵

Review of artery affected

It was not appreciated, however, that there was also a striking difference in which of the two vessels was commonly affected. One of us (EAU), after seeing three right-sided vertebral artery lesions and only one on the left in patients using oral contraceptives, suggested that the other (ERB) should review his material from this point of view, and though in some cases of vascular insufficiency in this territory it is difficult to decide which vertebral artery might be responsible it was possible to make a decision in 19 of the 25 cases reviewed. Fifteen of those 19 cases were right-sided.

We then reviewed a group of published cases of vertebral occlusions associated with the use of oral contraceptives. We make no claim that this represented a comprehensive review, but we found a definite preponderance of occlusions on the right side (see table).

Side of vertebral artery occlusion in women taking oral contraceptives: data taken from several studies

	Bickerstaff ⁵	Ask-Upmark ^{1,10}	Odeberg ¹¹	Hawkes ^{12,13}	Stewart Wallace ¹⁴	Salmon <i>et al</i> ⁴	Total
Right side	15	3	1	1	1	1	22
Left side	4	1					5

Comment

Twenty-five years ago Radner⁶ showed that the right vertebral artery has a take-off from the subclavian artery in what is anatomically described as a "recurrent" fashion, which would

Department of Medicine, Uppsala University, Uppsala, Sweden

ERIK ASK-UPMARK, MD, emeritus professor of medicine

Midland Centre for Neurosurgery and Neurology, Smethwick, Warley, England

EDWIN R BICKERSTAFF, MD, FRCP, consultant neurologist

reduce considerably the impact of pulse pressure waves under normal circumstances and may contribute towards protecting this vessel from the disturbances resulting from atheroma. The occurrence of symptoms related to the right artery in patients on oral contraceptives underlines the fact that influences other than simple disease of the arterial wall must be responsible.

We have always considered such occlusions to be embolic in origin when they affect the cerebral vasculature,⁷ and Enzell and Lindernalm⁸ have made one suggestion which might overcome the problem of how any embolism, other than one from the heart or great vessels in the neck, could reach the arterial side of the cerebrovascular system without a septal defect in the heart and a right-left shunt. They produced strong arteriographic support for the theory of embolism and suggested that the pulmonary vascular bed might be a source. They could not prove this, but clearly it is a possibility that needs careful study in future necropsy material.

We ourselves have no explanation to offer for the right-sided predominance in the cases studied, and record the fact mainly to

draw attention to yet another tantalising facet of the enigma of cerebral arterial occlusion occurring in women using contraceptives.

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Congenital malformation associated with intrauterine contraceptive device

HERBERT BARRIE

British Medical Journal, 1976, **1**, 488-490

Summary

Two infants with fibular aplasia and related limb-reduction defects were born to mothers who were using copper-containing intrauterine contraceptive devices. The possibility of a causal association is consistent with the known hazards of intrauterine devices and cannot be excluded on the available experimental evidence. More information is urgently needed, and searches, including radiography of placenta and pelvis, should be made for such devices in mothers who may have used them in the past and who give birth to malformed infants.

Introduction

Despite the growing list of complications from intrauterine contraceptive devices, congenital anomalies have not so far been attributed to them. This report describes two infants with unusual limb reduction malformations born to mothers who had been fitted with intrauterine devices.

Case 1

The first child of a 26-year-old mother was born at term after a normal pregnancy and labour. There was no history of exposure to drugs or x-rays during labour, but his mother had been fitted with a coil two years previously, despite which conception had occurred. At birth the baby's condition was good: the Apgar score at one minute was 7, birth weight 3180 g, length 50 cm, and head circumference 37 cm. An unusual pattern of limb reduction malformation

affecting all limbs was immediately evident, however (fig 1). The right arm appeared to end just below the elbow in two rudimentary digits. The left arm was normal as far as the hand, which had a normal thumb but only three fingers, two of which were fused. The feet were held in a valgus position and there were only four toes on each side. The left leg was shorter than the right and there was a longitudinal dimple running down the medial border of the shin, suggesting absence of the fibula. He was normal in all other respects. The placenta was normal and weighed 480 g, while the cord contained the normal three vessels.

A skeletal survey (fig 2) confirmed the absence of the left fibula and the right ulna. The right radius was short and narrow, and there were only two right metacarpals. On the left there were four metacarpals and digits but only one ossified tarsal bone. The skull, ribs, pelvis, and spine were radiologically normal.

A plain radiograph of the mother's pelvis after delivery confirmed the presence of a radio-opaque intrauterine ring, which was subsequently removed and identified as a Grafenberg ring. It was submitted for emission spectrographic analysis and was found to be composed mainly of silver but containing significant impurities of copper (0.05-0.5%) and lead (0.01-1%). It contained no barium, less than 0.1% of aluminium and silicone, and under 0.05% of boron, iron, magnesium, and sodium.

During two years of follow-up this baby's progress has been good and when he was last seen he was developmentally normal for his age, allowing for his motor handicap, although growth has occurred in the affected limbs.

Case 2

This child was the first baby of a 26-year-old mother who conceived despite a plastic intrauterine device that had been fitted abroad five months before the start of the pregnancy. To her knowledge the device had never been extruded and she was under the impression that it had stayed in situ throughout the pregnancy. A routine chest x-ray picture was taken in the 8th week and the pregnancy was normal except for a mild untreated influenzal illness in the second trimester. She was delivered at term after a normal labour. The baby weighed about 3600 g and was normal except for obvious limb reduction malformations. He was brought back to this country at the age of 3 months. On examination the right hand was smaller than the left and bore a normal thumb and three fingers. The right leg and foot