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Schistosomal Involvement of the Choroid Plexus

BY

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Although cerebral schistosomiasis has been reported from time to time, involvement of the choroid plexus is rare. In 1906 Tsunoda and Shimamura reported a case in which schistosome ova were recovered from the choroid plexus. This contribution reports *S. haematobium* involvement of the choroid plexus found at autopsy.

CASE REPORT

A.B., a 59-year-old African female was admitted to Harare Hospital (Rhodesia) on 21st May, 1970. She complained of coughing blood on three occasions during the three weeks preceding admission.

On clinical examination there was nothing to indicate systemic disease and there were no cerebral signs. Blood taken on admission gave a haemoglobin estimation of 8.0 gms. per cent. and



Fig. 1.—Part of choroid plexus nodules showing fibrous wall and bilharzial ova.

a total white cell count of 7,000 per c.mm. with nine per cent. eosinophils. The patient had a fatal haemoptysis one day after admission.

At autopsy a tumour involving the left main bronchus and part of the adjacent lung was found. The meninges and brain showed no unusual features, but the choroid plexus in the left lateral ventricle had a firm nodule of 5.0 cm. diameter.

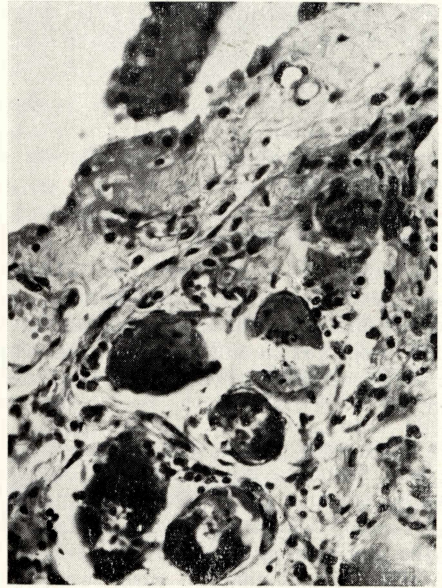


Fig. 2.—Choroid plexus showing bilharzial ova (H & E x 320).

Microscopic Examination:

The tumour of the bronchus and lung was a well differentiated squamous cell carcinoma.

A section of the choroid plexus nodule showed numerous bilharzial ova contained in a well defined fibrous capsule (Fig. 1). Giant cell systems were present in different parts of the capsule. Surprised by this finding, numerous sections of the nodule and choroid plexus were cut. The plexus showed numerous ova, some of which were calcified (Fig. 2). The most gratifying reward of this exercise was to find adult Schistosomes in the choroid plexus (Figs. 3 & 4).

The Ziehl-Neelsen stain showed the ova to be those of *S. haematobium*. (Brygoo and Randriamalala 1959).



Fig. 3.—Adult Schistosomes in the choroid plexus (H & E x 44).

DISCUSSION

There can be no doubt about the diagnosis of choroid plexus *S. haematobium* in this case, but it is unfortunate that, as the nature of the lesion was not suspected at autopsy, no sections were taken from other parts of the central nervous system.

Ova of all three species of human Schistosomes have been found in the central nervous system. Marcial-Rojas and Fiol (1963) summarised 97 cases of ectopic central nervous system lesions from the world literature (including two of their own). They found that 60 cases were due to *S. japonicum*, 26 to *S. mansoni* and 11 to *S. haematobium*. In Rhodesia, Gelfand (1950), using a digestion method, demonstrated ova of *S. haematobium* in various parts of the brain of 28 out of 50 autopsy subjects.

What has puzzled investigators of ectopic central nervous system bilharzial lesions has been the mechanism by which they are produced. It has been postulated that ova reach the central nervous system as "emboli" by the vertebral plexus of Batson. This mechanism does not adequately explain the large concentration of ova sufficient to produce a tumour mass, such as the nodule described in this case. One report quoted by Zelman (1966) showed adult flukes in the meninges with ova in the brain. Kaufman (1969) quotes the case of Budzilovich, Most and Feigin, in which the ova lay in a straight line in the

adventitia of a spinal vein, suggesting deposition *in situ*.

The fact that ova of *S. japonicum* have been seen most frequently in the central nervous system may be due to three factors:—

- (i) their relatively small size; and
- (ii) the presence of only a rudimentary, if any, spine;
- (iii) the large number of ova passed per day.

The mean sizes of Schistosome ova are compared below:—

	Size (in micra)
<i>S. haematobium</i>	143 x 60
<i>S. mansoni</i>	155 x 66
<i>S. japonicum</i>	89 x 67

Whereas *S. mansoni* may pass 300 ova per day, *S. japonicum* may pass up to 3,500 per day.

Experimenting with a model of *S. mansoni* egg made from plastic and a metal rod (Bruijning, 1963) demonstrated that the spine may have a decisive function in inhibiting the removal of the egg by the current in small blood vessels.

The case reported here is of particular interest as it clearly demonstrates that adult Schistosomes can traverse intra-cerebral vessels and there deposit their ova. As *S. haematobium* is the biggest (2.2 (2.0-2.5) x 0.025 cm.) (Belding 1963) of the three species it would be reasonable to assume that *S. mansoni* 1.4 (1.2-1.6) x 0.016 cm.) and *S. japonicum* (1.9 (1.2-2.6) x 0.03 cm.) can similarly traverse intra-cerebral vessels.



Fig. 4.—Adult Schistosomes in the choroid plexus (H & E x 125).

SUMMARY

A case of Schistosomal involvement of the choroid plexus has been presented and discussed.

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