

ANIRIDIA AND WILMS'S TUMOUR (NEPHROBLASTOMA)*†

BY

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EVIDENCE is accumulating to link certain congenital malformations with the later development of cancer. The best known link is that between mongolism and leukaemia, but other congenital abnormalities, such as ataxia-telangiectasia, agammaglobulinaemia, and Aldrich's syndrome, may also predispose to neoplasia. Recently an association between aniridia and Wilms's tumour has been reported and we wish to describe another example of this association.

Case Report

A 3-year-old girl was admitted to hospital in August, 1967, with an 8-week history of recurrent attacks of vomiting, listlessness, pallor, and enlargement of the abdomen.

She had been born at full-term following an uneventful pregnancy, and at birth it was noticed that her eyes were abnormal. Clinical examination showed that both eyes had aniridia. Eye movements were of a coarse searching character, but no abnormality of the lids or structures external to the globes was seen.

Examination under anaesthesia showed the corneae to be normal (diameter 10 mm. each eye). The ocular tension was 4.5 mm. Hg (Schiotz) with the 5.5 gm. weight in each eye. Gonioscopy showed that only a small rim of iris tissue was present. The lenses appeared smaller than normal. Fundus examination showed a temporal crescent at both discs. There was a small hypermetropic refractive error in both eyes.

There were two healthy sibs aged 18 months and 6 months. There was no family history of any form of eye anomaly.

On admission the aniridia was confirmed (Fig. 1, opposite), and a large mass diagnosed clinically as Wilms's tumour (Fig. 2, opposite) was palpable on the right side of the abdomen. An intravenous pyelogram showed a large mass in the right kidney distorting the normal calyceal pattern and there was also evidence of a smaller mass in the left kidney.

Pre-operative blood transfusion was necessary, a course of actinomycin-D was started, and at operation (Mr. J. Grieve) a large renal tumour was found on the right side. The inferior vena cava was blocked by local spread of the tumour. The left kidney was palpated at operation but no abnormality was found. A right nephrectomy was undertaken and the vena cava cleared by a Fogarty catheter. Microscopy confirmed that the tumour was a nephroblastoma.

After the operation she was at first reasonably well but her clinical condition slowly deteriorated and despite intensive therapy she developed broncho-pneumonia and died.

Post-mortem Examination (Dr. Mehroo Forbes).—This confirmed the broncho-pneumonia, and in the left kidney a mass 3.5 cm. in diameter was discovered which on microscopy was also shown to be a nephroblastoma. No metastases were found in any other organ.

* Received for publication January 10, 1968.

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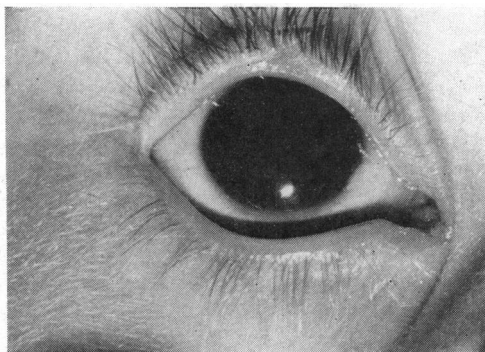


FIG. 1.—Right eye, showing absence of iris.

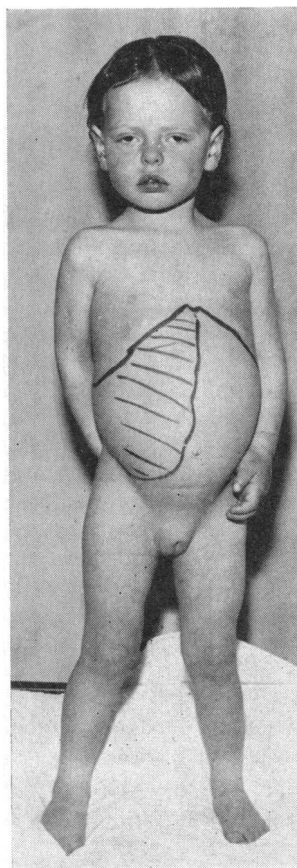


FIG. 2.—Large right-sided Wilms's tumour.

Discussion

Once the relationship between leukaemia and mongolism was established (Krivit and Good, 1957), epidemiologists searched for further examples of the association between cancer and congenital anomalies.

Miller, Fraumeni, and Manning (1964), reviewed 440 children with Wilms's tumour and found that certain congenital malformations were present more frequently than expected. The commonest anomalies found were aniridia, hemi-hypertrophy, pigmented naevi, abnormal kidneys, and cryptorchidism. Some of these malformations are common and the association with Wilms's tumour in these instances may well be a chance one, but others such as aniridia are so rare that the relationship does seem significant.

Aniridia has been estimated to have an incidence at birth of 1 : 56,000 (Shaw, Falls, and Neel, 1960) and yet Miller's series of 440 cases of Wilms's tumour produced six children with aniridia, giving a frequency of 1 : 73. This association is thus much commoner than expected and although this does not imply a causal link between the two conditions it is evident that a study of one of these diseases may provide a clue to the aetiology of the other.

Congenital aniridia is usually due to an autosomal dominant gene with almost complete penetrance and 65 per cent. of affected children have an aniridic parent (Shaw and others,

1960). However, none of the children with both aniridia and Wilms's tumour has been found to have a family history of aniridia, and it has been suggested that the eye defect in these children is due either to a random mutation or to an unknown environmental agent (Miller, 1966). It is possible that some factor acting early in pregnancy may affect the mesoderm in both the developing eye and kidney with the production of aniridia and the later development of a Wilms's tumour from a foetal "rest" of cells. In our case we have no evidence of any such factor but studies of a larger series may produce this evidence.

Including the present case twelve children with both aniridia and Wilms's tumour have now been recorded, all presenting between 1 and 3 years of age (Di George, 1964; Fontana, Ferrara, and Perciaaccante, 1965; Miller, 1966). Although four of these children also had other genito-urinary malformations, ours is the first reported case in which the tumour was bilateral. It is possible, however, that the tumour in the left kidney was a metastasis.

It is thus important for children with aniridia to be closely followed up to permit the detection at the earliest moment of Wilms's tumour, particularly when the eye anomaly occurs for the first time in a family and the child has other genito-urinary abnormalities. These children should have an intravenous pyelogram in the first year of life in an effort to detect the tumour while it is still curable, and further studies of this unusual association should be undertaken.

Summary

A case of bilateral Wilms's tumour in a child with aniridia is reported.

The association between aniridia and Wilms's tumour has now been recorded in twelve children. Aniridia is usually inherited as a dominant yet none of these children has had a family history of aniridia. It is possible that both aniridia and Wilms's tumour have a common aetiology. All non-familial aniridic children should be investigated for the presence of a Wilms's tumour in the first year of life.

We are indebted to Dr. S. G. F. Wilson, Mr. J. Grieve, and Prof. J. L. Henderson for their advice and criticism in the preparation of this report.

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