Sir,

Clear cell thyroid carcinoma metastatic to choroid: clinicopathological study of a case

Metastatic thyroid carcinoma usually involves the orbit and rarely the intraocular structures. We report an unusual case of a young man who presented with a choroidal mass and secondary retinal detachment. There was a previous history of surgery for a thyroid swelling. Systemic evaluation was normal at the time of presentation to us.

Case report

A 37-year-old male was referred to us in November 1994 by a local ophthalmologist with a diagnosis of retinal detachment, secondary to a tumour in the right eye. Examination of the left eye was unremarkable. His past history revealed surgery for a painless swelling of the thyroid gland 4 years previously, the histopathology report of which could not be retrieved.

On examination, his best-corrected visual acuity in the right eye was perception of light with accurate projection in four quadrants. On fundus examination there was a total bullous retinal detachment with a large elevated yellow subretinal mass in the inferior half of the retina. B-scan ultrasonography revealed a subretinal mass lesion in the inferonasal quadrant with a maximum height of 15.6 mm. A clinical diagnosis of an exudative retinal detachment secondary to malignant melanoma of the choroid or metastatic tumour to the choroid was considered. Laboratory investigations, which included estimation of haemoglobin, total and differential white cell counts, erythrocyte sedimentation rate, postprandial blood sugar, blood urea and creatinine, were normal. The patient was examined by an internist and no primary or metastatic tumour was detected. Ultrasonography of the abdomen and the chest radiograph were normal.

After discussion with the patient about the strong possibility of an intraocular malignancy and the various treatment options, the eye was enucleated with the patient's consent.

Histopathological study of the globe revealed a tumour arising from the choroid. The tumour was composed of cells with clear cytoplasm and small nuclei. On Periodic Acid Schiff (PAS) staining, PAS-positive material was found within the tumour cells. Following diastase digestion, PAS-positive material was digested, indicating the presence of glycogen (Fig. 1). Differential diagnoses of metastatic renal cell carcinoma, clear cell malignant melanoma and metastatic thyroid carcinoma with clear cell changes were considered. Immunohistochemistry was done using the Avidin Biotin Complex (ABC) method with a panel of antibodies against S-100, HMB-45 and thyroglobulin (Dako, Denmark). Immunohistochemical study showed negative staining for S-100 and HMB-45, thereby excluding a melanoma; however, it was positive for thryroglobulin, indicating a metastatic thyroid carcinoma (Fig. 2).

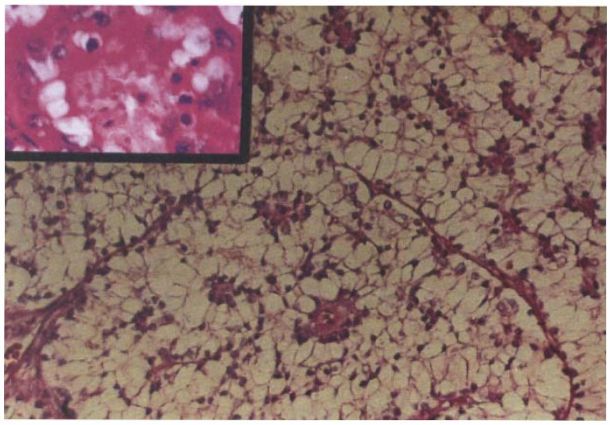

Fig. 1. *Photomicrograph showing a tumour arising from the choroid and composed of clear cells (H&E; 100). Inset: PAS-positive material (arrows) within the tumour cells (PAS stain, 200).*

The patient was subsequently lost to follow-up. After writing several letters to the patient, we were informed by the family that the patient had died in November 1998. The exact cause of death was not available to us.

Comment

The clinical diagnosis of a metastatic tumour to the choroid can sometimes be challenging because in about 25% of cases with uveal metastasis there is no history of a primary tumour. In men, metastatic cancer in the uveal tract occurs, in the majority of cases, due to a primary tumour in the lung, gastrointestinal system, kidney and rarely thyroid gland. In women, the common tumour to metastasise to the uveal tract is breast cancer, followed by lung, gastrointestinal tract and thyroid gland malignancies.[1]

Carcinoma of the thyroid metastatic to the eye is relatively rare. A review of the literature showed 15 such cases.[4] Eleven of them were to the orbit, 1 to the choroid,[2] 1 to the iris[3] and in the remainder the site was not specified.[4] The age of the reported patients ranged from 49 to 66 years. Among thyroid carcinomas follicular carcinoma of the thyroid usually metastasises to the orbit

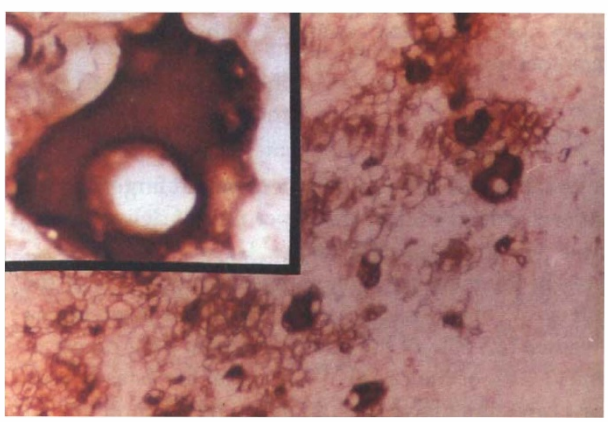

Fig. 2. *Tumour cells showing positive staining with antibody to thyroglobulin (DAB, 200). Inset: A large malignant cell with the cytoplasm staining brick red, indicating positivity (DAB, 400).*

and rarely to the choroid. Haematogenous spready by papillary thyroid cancer is rare. Medullary carcinoma of thyroid also rarely metastasises to the choroid.

Clear cell changes can occur in thyroid neoplasms of various histological types due to cytoplasmic vesicles of mitochondrial origin and due to accumulation of thyroglobulin, glycogen, lipid or mucin.[5] The neoplasm most prone to undergo clear cell changes is the Hurthle cell variant of thyroid tumour, due to a vesicular swelling of mitochondria.[5] Clear cell changes are also seen in follicular carcinoma due to vesicles of either mitochondrial or granular endoplasmic reticulum derivation,[5] papillary carcinoma due to glycogen accumulation,[6] undifferentiated carcinoma and rarely medullary carcinoma of the thyroid.

Immunohistochemical study with antibody to thyroglobulin is positive in these neoplasms. The natural history of these tumours is determined by their basic nature rather than the extent of cytoplasmic clearing in the tumour cells. Therefore clear cell carcinoma is not considered as a specific tumour type.[5,7]

Our case has certain unusual features, such as the relatively young age of the patient, the site of the metastasis and the clear cell differentiation within the tumour. Documented choroidal metastasis occurring 4 years after the primary thyroid tumour is rare. Our report also indicates that the eye could be the only and early sign of metastasis of a thyroid cancer and such patients should have regular periodic systemic and ophthalmic evaluation.

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Sir,

Unilateral retinitis pigmentosa in a woman and pigmented paravenous chorioretinal atrophy in her daughter and son

A woman presented unilateral retinitis pigmentosa, and her two children hereditary pigmented paravenous chorioretinal atrophy. All were followed up for 21 years; no progression of disease was observed.

Case reports

In 1975, a 28-year-old woman was referred to us for visual impairment in the left eye. Her family history was normal (Fig. 1). The patient's right eye visual acuity was 20/20, while the left eye showed no light perception. Ophthalmoscopy yielded normal results in the right eye, while atrophic optic disc, attenuated retinal arterioles and bone spicule pigment clumping that had spread into the peripheral retina in association with maculopathy were observed in the left eye. Results of electroretinography were normal in the right eye and were not detectable in the left eye. On fluorescein angiography, the right eye was normal while the left eye showed diffuse hyperfluorescence due to pigment epithelial atrophy together with hypofluorescence corresponding to bone spicule pigment clumping.

In 1976, her 10-year-old daughter was admitted to our Retinal Unit presenting anisometropic amblyopia in the left eye, with a 3 year history of bilateral visual impairment. On admission, visual acuity was 20/20 (-0.75) in the right eye and 20/100 (-1.00 $-4.00 \times 10°$) in the left eye. Ocular motility, anterior segment and intraocular pressure were normal; no relative afferent pupillary defect was found. Ophthalmoscopy showed typically defined, bilateral areas of chorioretinal atrophy

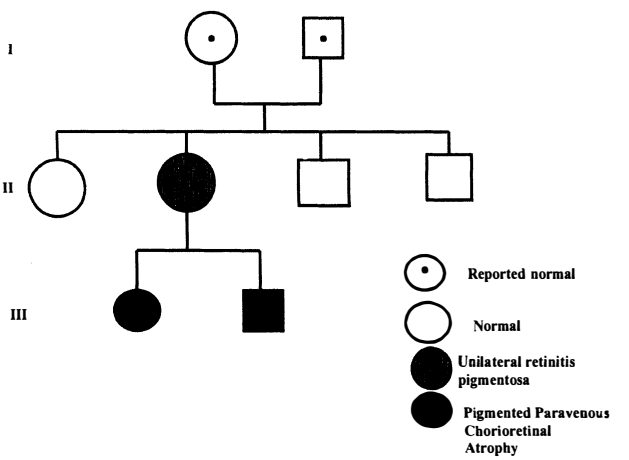

Fig. 1. *Family pedigree.*