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Editorials

Intraocular metastasis

'Seek, and ye shall find' (Matthew vii: 7)

Recent surveys have shown that intraocular, secondary deposits of carcinoma can be found in more than a third of patients with disseminated breast cancer and a slightly lower incidence is found in patients with primary lung or gut carcinomas. This high incidence is associated with symptoms, usually painless blurring of vision, and inspection characteristically shows homogeneous single or multiple placoid lesions in the posterior choroid especially in the macular region. However, intraocular metastasis, especially from breast cancer, can be symptomatically silent, with an incidence of 9% in such patients and was shown to be present in 8.5% of a postmortem series of unselected eyes from patients dying with carcinoma.1

These figures are in sharp contrast to the previously held opinion that metastatic intraocular cancer was such a rare disease that few ophthalmologists had ever seen more than a single case.2 Several explanations for this apparent increase in incidence can be postulated. More patients with disseminated disease may be living for longer, owing to increased oncological prowess. This may allow time for the emergence of intraocular tumours derived as metastases from intrapulmonary secondary deposits. Alternatively, greater use of the indirect ophthalmoscope may be revealing more deposits.

The reluctance of most general pathologists to examine eyes without explicit permission may also have led to underreporting of the incidence in the past and, in addition, the number of necropsies requested on patients known to have terminal cancer is often low.

Weiss, in this issue, hints that the incidence may be even higher than is currently supposed and advances evidence to show that, far from being a 'hostile' or unusual site for secondary deposits, in breast cancer especially, the eye may be one of the most favoured target sites for embolised fragments of carcinoma, equalling the red bone marrow and outstripping the adrenals.

This metastatic efficiency is defined as an index of incidence of deposits in relation to the blood flow to the target organ. Although the choroid is widely recognised as one of the most richly vascularised tissues in the body, the volume of blood supply to the eye has been calculated as only 0.013% of the cardiac output, in the region of 0.8 ml per minute, of which 84% supplies the choroid. Even using the most conservative estimates of incidence of intraocular metastasis (8-5%) for the tumours Weiss describes, it appears that the choroid has the highest calculated metastatic efficiency index of any site investigated.

The incidence and efficiency is not governed by the rate of delivery of embolised cancer cells in the arterial blood flow alone. Flow dynamics, especially in relation to the direct origin of the left common carotid from the aorta, were previously supposed to increase the likelihood of metastasis to the left eye, but more recent work has shown no significant difference between the two globes and 30% of patients have bilateral disease.3 The heightened efficiency of the choroid in promoting metastasis may be related to the architecture of the vessel walls or to factors such as the interactions between adhesion molecules on the surface of the cancer cells and ligand sites. Intraocular metastases from breast cancer are almost always secondary to metastatic deposits within the lung. The lower incidence of intraocular metastases derived from primary lung carcinomas when compared with those derived from secondary lung tumours may be a reflection of altered adhesive or invasive properties of breast cancer cells, which already have a proved ability to metastasise, allowing the 'seeds' to embed and germinate in the fertile 'soil' of the choroid, using Stephen Paget's (1889) analogy.

Weiss, in his paper, emphasises the need for accurate data on the incidence of intraocular metastases from other carcinomas. This will require the close cooperation of patients, oncologists, ophthalmologists, and pathologists but it is unlikely that intraocular metastasis will be regarded as a rare disease in the future, if we examine patients with cancer in the clinics, wards, and postmortem rooms as he suggests.

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