

Bruch's Membrane Abnormalities in Dome-shaped and Mushroom-shaped Choroidal Melanomas

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Abstract

Introduction: Mushroom-shaped choroidal melanoma is known to be associated with breaks in Bruch's membrane and is more likely to develop when Bruch's membrane is diseased. The study's goal is to determine if diseases causing breaks in Bruch's membrane predispose a choroidal melanoma to develop into a mushroom-shaped melanoma. **Materials and Methods:** A retrospective review of cases of choroidal melanoma seen at our institution was carried out to determine if mushroom-shaped melanomas are more common than dome-shaped tumours in patients with macular abnormalities involving a loss of Bruch's membrane integrity. Forty-nine eyes of 48 patients were included in this retrospective study. A dome-shaped or mushroom-shaped configuration was assigned to each tumour. Macular degeneration, macular drusen, retinal pigment epithelial (RPE) stippling, macular oedema, choroidal neovascularisation (CNV), angioid streaks, disciform scars, lacquer cracks, and myopia greater than -3.00 D, were considered to constitute evidence of potential Bruch's membrane breaks and were determined in both eyes. A chi-square evaluation was used to compare the proportion of eyes with macular abnormalities in the 2 tumour configuration groups. **Results:** The tumour was dome-shaped in 40 eyes (82%) and mushroom-shaped in 9 eyes (18%). Macular abnormalities, indicative of loss of Bruch's membrane integrity, were seen in 21 (53%) of 40 eyes with dome-shaped melanomas and 5 (56%) of 9 eyes with mushroom-shaped melanomas. The proportion of eyes with macular abnormalities was not statistically different between the dome-shaped and mushroom-shaped tumours, as assessed by chi-square analysis ($P = 0.87$). **Conclusions:** Bruch's membrane disease does not influence the differentiation of choroidal melanoma into mushroom-shaped or dome-shaped tumour growth patterns.

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Key words: Bruch's membrane, Choroid, Macular degeneration, Melanoma, Retinal pigment epithelium

Introduction

Uveal melanoma is the most common primary intraocular malignancy and is diagnosed chiefly in the fifth to seventh decades of life.¹ The choroid is the most common site for its development, and choroidal melanomas grow as dome-shaped or mushroom-shaped tumours.² Also called collar button-shaped melanoma, mushroom-shaped choroidal melanoma is known to be associated with breaks in Bruch's membrane,² a feature rarely seen with any other type of ocular tumour. The mechanism of these breaks is unclear but may relate to tumour size or enzymatic degradation.³

Degradation or breaks in Bruch's membrane can accompany other ocular diseases, including macular

degeneration, previous chorioretinitis (e.g., histoplasmosis or toxoplasmosis infection), angioid streaks and pathologic myopia. We encountered a patient with a mushroom-shaped choroidal melanoma and prominent angioid streaks, leading us to wonder whether mushroom-shaped melanomas, as opposed to dome-shaped tumours, are more likely to develop when Bruch's membrane is diseased. Therefore, we conducted a retrospective review of cases of choroidal melanoma seen at our institution to determine if mushroom-shaped melanomas are more common than dome-shaped tumours in patients with macular abnormalities that signify a loss of Bruch's membrane integrity.

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Materials and Methods

The records of all 56 patients photographed at our institution from 1962 to 1999 with a clinical diagnosis of choroidal melanoma were retrospectively reviewed after obtaining Institutional Review Board approval. Eight cases were subsequently eliminated from the study; 2 patients were found to have choroidal nevi on review of the photographs and pre-treatment photographs were not available in 6 patients who had undergone enucleation elsewhere and received only follow-up care and photographs at our institution. One patient had bilateral choroidal melanomas. Thus, 49 eyes of 48 patients were included in this retrospective study. Visual acuity was converted to logMAR for analysis in 42 of 49 eyes. Visual acuity in the remaining 7 eyes was either light perception or no light perception. These eyes were therefore excluded in the average visual acuity calculations.⁴

A dome-shaped or mushroom-shaped configuration was assigned to each tumour by reviewing the records of indirect ophthalmoscopy, fundus photographs, fluorescein angiograms and, when available, the ultrasound and pathology reports. Macular abnormalities, including macular degeneration, macular drusen, retinal pigment epithelial (RPE) stippling, macular oedema, choroidal neovascularisation (CNV), angioid streaks, disciform scars, lacquer cracks and myopia greater than -3.00 D, were considered to constitute evidence of potential Bruch's membrane breaks. The presence of macular abnormalities was determined in both eyes. A chi-square evaluation was used to compare the proportion of eyes with macular abnormalities in the 2 tumour configuration groups.

Results

Of the 48 patients, 23 were male and 25 were female. The tumour was dome-shaped in 40 eyes (82%) and mushroom-shaped in 9 eyes (18%). The mean age for all patients at the time of diagnosis was 64 years (range, 31 to 86). The mean age for patients with dome-shaped tumours was 64 years and for patients with mushroom-shaped tumours was 63 years. The mean visual acuity at the time of presentation to our clinic for all eyes was 20/219 (range, 20/20 to no light perception). The mean visual acuity for eyes with dome-shaped tumours was 20/214 and that for eyes with mushroom-shaped tumours was 20/230.

Macular abnormalities, indicative of a loss of Bruch's membrane integrity, were present in 26 (53%) of the 49 eyes. These changes were seen in 21 (53%) of 40 eyes with dome-shaped melanomas and 5 (56%) of 9 eyes with mushroom-shaped melanomas. The proportion of eyes

with macular abnormalities was not statistically different between the dome-shaped and mushroom-shaped tumours, as assessed by chi-square analysis ($P = 0.87$).

Discussion

We postulated that diseased Bruch's membrane would be more prone to tumour invasion and mushroom-shaped growth, but our data do not support this hypothesis. We found no difference in the incidence of macular abnormalities in patients with mushroom-shaped versus dome-shaped melanomas. Small Bruch's membrane breaks have been documented in a large proportion of patients with uveal melanoma.⁵ The stimulus for growth of tumour through these breaks is unknown, although tumour size is thought to be a major stimulus.

This review is limited by its retrospective nature and small sample size. In addition, fluorescein angiograms had not been performed in all patients, which may have decreased the sensitivity of detecting diseases of Bruch's membrane. Nevertheless, because the percentage of eyes with macular abnormalities (and Bruch's membrane breaks) was nearly equal in patients with dome- and mushroom-shaped tumours, it is unlikely that real differences in incidence would be detected by a larger sample size. Whatever stimulates differences in the growth of dome- and mushroom-shaped tumours does not appear to be related to diseased Bruch's membrane.

Competing Interests

The authors have no proprietary interest in any aspect of this report.

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