MATERIALS AND METHODS

Materials
Seven enucleated human eyes were selected for histopathologic and immunohistochemical evaluation. Five of them had been removed for choroidal melanoma including one with CME. The remaining two had been enucleated for endophthalmitis predominantly involving their anterior segments; one exhibited massive CME.

Methods
After fixation in 10% formaldehyde, the eyes were sectioned in the horizontal meridian through the macular region and 5 microns thickness sections were stained with HES. Immunohistochemical studies were performed on adjacent sections by the streptavidin biotin method, using a 1/200 polyclonal anti-GFAP antibody (DAKO Rabbit Anti-Cow Glial Fibrillary acidic protein) in order to visualize and study astrocytic and Müller cell glia.

CASE BY CASE ANALYSIS

Case #1 (A426): 70 year old woman with a small equatorial malignant melanoma associated with a limited RD which, in no case, affected the macula (Fig.12).
- Macula: No structural alterations were seen in HES stained sections. In GFAP stained sections there is discrete staining of Müller cells endfeet and of a few astrocytes. Astrocytes, in the form of scarce small cells appear quiescent, and fusiform with scanty cytoplasm. They surround small blood vessels and are in contact with the ILM between the Müller cells endfeet.
- Non detached extra macular retina: No architectural modifications are seen with HES, but GFAP stained sections exhibit Müller cells gliosis, localized to the nerve fiber layer and ILM (Fig.13).
- Detached extra macular retina: In HES stained sections discrete pigment granules adhering to the external portions of photoreceptors testify to a recent RD. GFAP staining reveals impressive transretinal Müller cells gliosis, extending from the ILM to the ELM, with staining of some perivascular astrocytes (Fig14).

Case #2 (C298): 32 year old woman with a retromacular malignant melanoma and localized serous detachment of the submacular retina (Fig. 15).
- Detached macula: HES stained sections show alterations of photoreceptors outer segments with RPE clumping. The retina is not oedematous. GFAP stained sections exhibit transretinal Müller cell gliosis without notable astrocytic gliosis (Fig. 16).
- Non detached extra macular retina: HES stained sections show no architectural modifications. In GFAP stained sections the gliosis is limited to Müller cell endfeet.

Case #3 (C399): 59 year old woman with a huge malignant melanoma occupying all the posterior pole including the peripapillary area. There is retinal vessel distortion and equatorial serous retinal detachment. The para papillary retina has been invaded by tumor and has undergone cystoid degeneration (Fig.17 ). HES stained sections of the detached macula demonstrate loss of foveolar photoreceptor cells. There is no associated edema (Fig. 18). GFAP stained sections reveal prominent transretinal Müller cell gliosis extended from the ILM to the ELM associated with perivascular astrocytic gliosis predominantly in the internal layers (Figs 19 and 20). Higher magnifications show massive Müller cell gliotic fibrils filling all interneuronal spaces
Case #4 (B713): 86 year old man with large nasal equatorial malignant melanoma and angle closure glaucoma. Anterior portion of eye showing angle closure associated with a partially necrotic choroidal melanoma. Extra macular retinal vessels exhibit a congestive pattern, testifying of hemodynamic disturbance. The macula is detached; discrete alterations are seen in the detached photoreceptors; we can notice preservation of all retinal layers (Fig. 21); GFAP stains of the detached paramacular retina show the presence of both astrocytic and massive Müller cell gliosis as well as hyperplasia and hypertrophy of perivascular astrocytes adjacent to the ILM (Fig. 22).

Case #5 (A493): 53 year old woman with peripapillary and submacular malignant melanoma with focal peripapillary retinal elevation and without peripheral RD (Fig 23). The optic papilla and central retinal vasculature have been distorted by the melanoma; the adherent overlying portion of the macular retina has undergone cystoid degeneration (Figs 23&24). GFAP stained sections of the adjacent portion of the macula exhibit discrete alterations in the photoreceptor layer, without RD. There is perivascular astrocytic proliferation in the ganglion cell and inner plexiform layers, without any change in GFAP stains of the Müller cells. The outer nuclear layer exhibits oedematous changes (Fig.25).

Case #6 (A988): 58 year old man with a corneal abscess and endophthalmitis following keratoplasty performed 2 years after corneal and conjunctival burn by hydrochloric acid. HES stained sections exhibit acute inflammatory cells and fibrin in the pre-foveal vitreous extending along the ILM. The subjacent oedematous retina and its parafoveal vessels are inflamed; the fovea is focally elevated by transudate (Fig.26). Discreet GFAP staining of perivascular astrocytes is noted in the ILM and parafoveal ganglion cell layer. There is a near absence of Müller cell staining (Fig 27).

Case #7 (D1109): 85 year old man with endophthalmitis following keratoplasty. The detached macula is distorted by vitreous traction and inflammatory cell infiltrate. A discrete edema is localized to the fovea in the external layers (Fig.28). GFAP stained sections of the parafoveal area show inner retinal gliosis and perivascular astrocytic proliferation that extends along the internal retinal layers (Fig. 29). Transretinal Müller cell gliosis is readily visualised in the parafoveal zone.