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Persistent detachment of the fovea after non-buckling repair of rhegmatogenous retinal detachment

Persistent detachment of the fovea is increasingly recognised as a cause of delayed visual recovery after repair of rhegmatogenous retinal detachment (RRD).^{1–6} Often subfoveal fluid cannot be seen on biomicroscopy or indirect ophthalmoscopy. It has only been the recent introduction of optical coherence tomography (OCT) into clinical practice that has allowed a more detailed study of this fluid. Persistent subfoveal fluid has primarily been reported after scleral buckling (SB) surgery,⁷ though it has been documented after pneumatic retinopexy^{8–9} and pars plana vitrectomy (PPV).¹⁰ The persistent fluid can be very subtle and difficult to detect on fundus examination. We report three cases of delayed visual recovery caused by persistent neurosensory macular detachment after non-scleral buckling procedures. Despite a normal appearing fundus, OCT confirmed the presence of persistent subretinal fluid.

Case report

A 58 year old myopic woman was referred for the treatment of a macula-off retinal detachment in the left eye. Her symptoms had begun 6 weeks earlier. Examination of the right eye was within normal limits. Best corrected visual acuity (BCVA) in the left eye was 20/400. Slit lamp examination (SLE) was

Figure 1 Top: Fundus photograph and OCT (nasal to temporal scan) from the patient in case 1 taken 1 month after the pneumatic retinopexy. The OCT shows the presence of persistent subretinal fluid. Middle: Fundus photograph and OCT (nasal to temporal scan) from the patient in case 2. The OCT shows the presence of persistent subretinal fluid. Note the presence of a fine epiretinal membrane along the temporal macula, but this was not thought to be contributing to the persistence of the subretinal fluid. Bottom: OCT (nasal to temporal scan) from the patient in case 3 confirming the presence of persistent subretinal fluid.

unremarkable. Dilated fundus examination revealed a horseshoe retinal tear at 1 o'clock with macula-off temporal retinal detachment. Cryotherapy and pneumatic retinopexy with C₃F₈ gas were performed the same day without complication. One week after the procedure the BCVA had improved to 20/100. By one month, the BCVA improved to 20/60. Though the retina appeared attached on ophthalmoscopic examination, OCT showed a trace amount of persistent subretinal fluid (fig 1, top). Over the course of the next 3 months the OCT finding of subretinal fluid resolved completely and the BCVA improved to 20/40.

A 54 year old woman was referred for treatment of a macula-off RRD. She had noted a visual acuity decrease in her left eye for the previous 3–4 days. Ophthalmic history was significant for lipid keratopathy secondary to herpetic keratitis, resulting in a baseline BCVA of 20/50 left eye. On examination, the visual acuity in the left eye was hand motions. Dilated fundus examination showed a horseshoe tear at the 2 o'clock position with an associated macula-off RRD. Cryotherapy and pneumatic retinopexy with C₃F₈ gas were performed the same day without complication. One week later the visual acuity improved to 20/70. Additional laser photocoagulation was performed around the tear, as there was only a light cryotherapy scar. Although the fundus view was not clear because of corneal opacification, the retina appeared attached on ophthalmoscopy. OCT imaging, however, revealed a neurosensory detachment with persistent subretinal fluid under the fovea (fig 1, middle). Complete reabsorption of the fluid occurred by 18 months and final BCVA improved to 20/50.

A 65 year old man was referred for treatment of a macula splitting retinal detachment in the left eye. The BCVA in the left eye was 20/20. SLE revealed an intact posterior capsule with a posterior chamber intraocular lens, which was implanted 2.5 years previously. Dilated fundus examination of the left eye revealed a macula splitting detachment caused by a retinal tear at the 2 o'clock position. PPV with fluid-gas exchange (12% C₃F₈) and endolaser was performed. In addition, small retinal breaks at the 11 30, 12 30, 1 30, and 3 00 o'clock positions were treated with transscleral cryotherapy. Postoperatively, after the gas had reabsorbed, the retina appeared attached, but OCT showed multiple, focal detachments involving the central macula (fig 1, bottom). These fluid loculations resolved after 11 months and the patient's final BCVA was 20/15.

Comment

It is not known with certainty why shallow areas of subretinal fluid can persist after retinal detachment repair. Fluorescein and indocyanine green angiography studies have failed to show leakage in the areas of persistent subretinal fluid.^{1–2} One study suggested that the presence of posterior vitreous detachment (PVD) may have a role, since only three out of 10 eyes with PVD had persistent retinal detachment compared to four out of five eyes without PVD.³ Another explanation could be the focal impairment of the retinal pigment epithelium pump affecting its ability to reabsorb the subretinal fluid.⁷ The subretinal fluid itself may also provide an impediment to reabsorption because of the protein rich and highly viscous nature of the fluid in chronic retinal detachment. In previous reports these detachments resolved spontaneously within 4–26 months,^{2–4 8–9} which is similar to our cases.

We observed two types of persistent detachment after RRD surgery based on OCT characteristics. The first is a diffuse shallow retinal detachment, and the second is a circumscribed focal detachment. These two types can co-exist in the same patient, and may represent a spectrum of severity as diffuse detachment might convert to focal detachments as the fluid reabsorbs. On OCT, focal detachments appear to resemble small pigment epithelial detachments, since the outer surface of the detached retina, which faces the subretinal fluid, has an outer edge of higher than normal reflectivity. In all our cases, however, there was a second, normally positioned highly reflective layer underneath the subretinal fluid that corresponded to the actual retinal pigment epithelial layer. The high reflectivity of the neurosensory detachment seen on OCT could be an image artefact resulting from the summation of reflectance of the outer retina that is now being scanned more perpendicularly than normal. Another explanation could be that the outer segments of the photoreceptors are disrupted and have a higher reflectivity compared with their normal parallel arrangement. High resolution OCT might help resolve this discrepancy.

Subclinical areas of retinal detachment may persist after RD surgery, including vitrectomy and pneumatic retinopexy. Clinicians should consider imaging patients with OCT if this phenomenon is suspected, particularly if the visual recovery does not correspond to the biomicroscopic and ophthalmoscopic examination.

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Metastatic pleural mesothelioma initially masquerading as chalazion

Metastases confined to the eyelid are rare. They usually derive from breast, skin, gastrointestinal, and urogenital tracts.¹ Malignant pleural mesothelioma is an uncommon malignancy presenting a steady rise in its incidence over the past 25 years.² It usually gives local metastases, although distant metastases are also reported.²

To our knowledge, an eyelid metastasis from pleural mesothelioma has never been reported. We describe a patient with pleural mesothelioma who developed a solitary eyelid metastasis. The lesion initially manifested as a recurrent chalazion. Histological confirmation has been obtained antemortem. Histopathology was consistent with the primary tumour.

Case report

A 57 year old man presented with unilateral painful swelling of the left upper eyelid

Figure 1 Diffuse thickening of the left upper eyelid corresponding to the metastatic lesion. The multifocal pattern of the infiltration is apparent. There was some loss of eyelashes. The lesion had a deep reddish, non-nodular appearance.

followed by high fever and weight loss. During the previous 6 weeks, he had been treated with local and systemic antibiotics for recurrent chalazia without any improvement. His medical history included pleural malignant mesothelioma for which he had undergone surgery combined with chemotherapy. Eighteen months elapsed between the diagnosis of mesothelioma and the presentation of the eyelid lesion. During that time he remained asymptomatic without any local recurrences or metastases to any of the common sites at the regular follow up.

On examination, a diffuse thickening of the eyelid with ill defined margins was noted (fig 1). The lesion seemed multifocal. The overlying skin was not movable but there were no surface irregularities or hyperkeratoses. The eyelid was too sensitive to invert. Examination of the right eye was unremarkable. There was no double vision. Visual acuity was 20/20. Slit lamp and fundus examination, and intraocular pressures were

normal. The tumour did not extend into the orbital cavity, as seen on the magnetic resonance image.

A biopsy was taken from the eyelid. Examination of the specimen showed a malignant epithelioid neoplasm with histological and immunohistochemical features similar to those of the primary pleural tumour, and consistent with malignant mesothelioma (fig 2). The patient was referred to the oncology department. Metastatic investigation revealed no other metastatic sites. Chemotherapy was initiated but without any response. The patient died 3 months later of lung metastasis.

Comment

Malignant mesothelioma is an aggressive tumour with a dismal prognosis.² This is consistent with the short lifespan of our patient after the detection of the eyelid lesion. There have been few reports of orbital metastasis of malignant mesothelioma but we are unaware of any previous report of an eyelid metastasis.³

Misdiagnosis of eyelid metastases is not uncommon. In a clinicopathological study of 31 patients with metastatic disease to the eyelid, metastasis was suspected in only 32% of the cases.¹ Chalazia can simulate other lesions. In a series of 1060 cases with the clinical diagnosis of chalazion, 6.4% were clinically misdiagnosed.⁴ In an otherwise healthy man the persistent eyelid infiltration of the present case, besides chalazion, would also recall a sebaceous carcinoma. The associated loss of lashes makes it suspicious of such a tumour. In the reported case pathological evaluation of the recurrent, atypical “chalazion” proved critical. Thus, any recurrent chalazion should be evaluated histopathologically. Accumulation of tumour cells in a multifocal pattern is indicative of a “field effect” at the level of the eyelid.⁵

Figure 2 (A, B) Histopathological examination demonstrates a population of large, epithelioid cells with severe pleomorphism, atypia, and abundant cytoplasm, infiltrating striated muscle (A) and skin adnexae (B). A hair follicle, sweat glands, and part of a sebaceous gland can be seen on the left of (B) (haematoxylin and eosin; original magnification $\times 400$). (C, D) Immunoreactivity of neoplastic cells for both vimentin (A) and pankeratin AE1/AE3 (B) (amplified avidin-biotin method with Ventana's “NexES” automatic immunostainer; original magnification $\times 400$). The cells were negative to antibodies against calretinin, CD141 (thrombomodulin), TTF1, cytokeratin 5/6, CEA (polyclonal) BerEP4, HMB 45, MART1, EMA, and CD30 (Ki 1).