non-perfusion in the choroid as demonstrated on ICG. The lack of early marking on IVP and the sustained hypofluorescence of the lesions on ICG (which is highly protein bound and therefore stays in the circulatory system), suggest that the lesions may represent areas of relative choroidal ischaemia.

Previous authors have postulated that focal depigmented choriotelial areas in sarcoidosis may correspond to subpigment epithelial granuloma similar to Dalen-Fuch’s nodules (typically found in sympathetic ophthalmia). It has been suggested that these lesions may compress the choroidal vasculature rather than invade it. However, ocular postmortem examination of patients with fundal sarcoidosis has revealed non-caseating granuloma consisting mainly of epithelioid cells within the choroid, lymphocytic vascular cuffing was closely associated with these lesions. This may indicate a possible mechanism for the apparent vascular insufficiency of the choroid in the angiographic findings in our patient.

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Ossification in choroidal melanoma

EDITOR.—The correct diagnosis of uveal melanoma has improved in recent years following the introduction of superior methods of fundus examination, combined with modern ancillary tests such as fluorescein angiography and ultrasonography (echography). A percentage of misdiagnosis, however, is to be expected, even in preselected patients undergoing a rigorous screening schedule as in the example of the Collaborative Ocular Melanoma Study (COMS) where a misdiagnosis rate of 0.48% has been reported.1 The diagnostic criteria of uveal melanoma with standardised echography are: (i) solid, dome-shaped or collarstud mass lesion; (ii) low to medium reflectivity; (iii) regular internal structure; and (iv) a variable degree of internal vascularity.2 Other features include choroidal excavation, associated exudative retinal detachment, extraocular/orbital spread, and, less commonly, vitreous haemorrhage.3

Calcification/ossification ‘within’ choroidal melanoma mass has not been previously reported, either echographically or histologically. We present such a case.

CASE REPORT
An 85-year-old white man presented with a 3-year history of painless, gradual loss of vision in the left eye. There was no history of eye disease apart from myopia. Systemic inquiry indicated that he was hypertensive receiving diuretic therapy. On examination, the vision was 6/12 partly in the right eye and hand movements in the left with a large inferior scotoma. There was a left afferent pupillary defect. The anterior segments and intraocular pressures were normal. Fundus examination on the left showed pigmented cells in the vitreous, a dark, raised, collarstud mass in the superonasal quadrant, and associated retinal detachment involving the macula. Apart from mild atrophic macular changes the right fundus was normal.

B-scan ultrasonography confirmed the collarstud nature of the lesion (Fig 1). The tumour measured 13 mm x 10 mm at base, and 9 mm in height. Vascularity was noted during kinetic examination. An unusual feature was the presence of a highly reflective plaque, located within the tumour at the ‘neck’ of the collarstud, where the tumour had breached Bruch’s membrane. The plaque caused significant acoustic shadowing, indicating that it was calcified. No extrascleral spread was detected. Standardised A-scan showed the characteristic features of melanoma, except at the area of calcification where a single, high reflective, thick spike was located within the tumour echoes (Fig 2). Marked vascularity was seen appearing as fast short vertical oscillation of the tumour echoes. Systemic examination, haematological and biochemical screen, chest radiography, and liver ultrasonography were all normal. The eye was enucleated. Pathological examination showed a heavily pigmented mushroom-shaped mass, 10 mm in base diameter and 7 mm in height. The tumour was predominantly of ‘spindle B’ type with a small amount of epithelioid cells. In the region of the perforated Bruch’s membrane there was an area of fibrosis containing bone, which showed calcification and the presence of osteocytes (Fig 3). This was surrounded by the tumour mass. Apart from Bruch’s membrane at the site of perforation, there was no calcification elsewhere in the eye. The retina was stretched and thinned in parts at the summit of the tumour but was not breached by it. There was no evidence of tumour necrosis or extrascleral spread.

One year after surgery, the patient was alive and well with no evidence of orbital or distant metastasis.

COMMENT
We believe this case to be the first in the literature demonstrating a choroidal melanoma containing a large plaque of calcified bone. Byrne and Green7 reported a small area of calcification on echography on a melanoma surface, and underlying an area of localised retinal detachment, but not within the melanoma mass itself. Calcification in choroidal melanoma has also been reported

Figure 1  Echographic B-scan showing a mushroom-shaped melanoma. The calcified area is seen, appearing as a highly reflective plaque (arrows) and giving rise to a linear shadowing effect.

Figure 2  Standardised A-scan. The tumour is represented by the echo spikes between the two closed arrows, a single high amplitude echo representing the calcified plaque is seen within the tumour mass (open arrows).

Figure 3  Histological section showing the area of calcification (C) including osteocytes in fibrous tissue overlying a node of spindle cell melanoma (M) that has ruptured through Bruch’s membrane, which itself is also showing calcification (arrows). Overlying retina (R) is intact. (Magnification ×84, haematoxylin and eosin.)
post-brachytherapy by Kellner et al.4 but it is rare, being seen in three out of 1300 patients in that series. The authors postulated that the location was in the residual necrotic tumour mass. A literature search failed to provide similar echographic cases of calcification/ossification 'within' tumours.

Calcification can be classified into (a) dystrophic type – calcium deposition in degenerative, desed, or dying tissue – for example, in long standing traumatic cataracts, retinal detachment, phthisis bulbi, band keratopathy, and in retinoblastoma; (b) metastatic type – calcium is deposited in undamaged tissue – for example, hyperparathyroidism, vitamin D intoxication; (c) metaplastic type – retinal pigment epithelium (RPE) may undergo metaplastic change or act as an inducer and cause calcium deposits and bone formation inside the eye – for example, osseous choristoma.5

Of interest in our case is the intense vascularity of the tumour as seen on B-scan and standardised A-scan and also the lack of tumour necrosis, which would have been implicated as a cause of calcification. The origin of calcification is therefore uncertain. It may have arisen from RPE or Bruch’s membrane at the site of tumour penetration. This is suggested by the presence of calcification in Bruch’s membrane and fibrosis immediately adjacent to the area of calcified bone. Alternatively, it may have developed in remnants of disorganised retina before the tumour had penetrated Bruch’s membrane. Malignant transformation in a long standing naevoidus with overlying calcification is also a remote possibility. In conclusion, large calcification/ossification ‘within’ the interior of choroidal melanoma is a rare phenomenon. Echography is a sensitive method in its detection. The presence of such calcification should not exclude the diagnosis of choroidal melanoma provided its other characteristic acoustic features are identified.

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Liesegang rings associated with a cystic lesion of the eyelid

EDITOR.—Liesegang rings are laminted precipitation structures well recognised in the field of chemistry, occurring as a consequence of the rhythmic accumulation of sub and supersaturation of insoluble products in a colloidal matrix, which precipitate by diffusion1 resulting in characteristic precipitation rings. They are recognised only rarely in vivo, arising in association with cystic or inflammatory processes. Clinically reported cases have been described most frequently in the kidney and can be mistaken for parasitic infestations.2 3 Other single case reports include a mucocele of the paranasal sinus,4 benign breast cyst fluid,5 and peritoneal endometriotic implants.6 Only three cases have been reported previously in ocular structures6 indicating the rarity of this lesion around the eye.

CASE REPORT

A 70-year-old man presented with a swelling on the left lower eyelid of about 3–4 months’ duration. A lateral canthal lesion, clinically suspicious for a cystic basal cell carcinoma, was removed under local anaesthetic. A skin ellipse 1.1×0.4 cm to a depth of 0.4 cm was received in the laboratory. A central slightly elevated tan-coloured non-ulcerating 0.4×0.3 cm nodule was evident on its surface. Histological examination revealed a benign multicystic cyst in the dermis lined by one or two layers of flat to cuboidal epithelial cells showing some apocrine features consistent with a sudoriferous cyst associated with a Moll’s gland. The overlying epidermis was unremarkable. Adjacent to this was a dilated cystic space lined by epithelium in which there were numerous round to oval separate eosinophilic structures ranging in size from 40 to 200 μm (Fig 1).

These were acellular, laminated with radial striations, non-birefringent with polarised light and negative with Perl’s, periodic acid Schiff, Congo red, and Von Kossa stains. The appearance was that of Liesegang rings (Fig 2).

COMMENT

The largest reported series of Liesegang rings2 comprised 29 cases, the majority being in the kidney. In all, 10 were initially misdiagnosed as parasitic, the most common being the giant kidney worm Dicothymia renale in four of the 12 renal cases. Sneige et al.3 described two further renal cases, initially thought to be parasitic, and pointed out the differences in appearance from parasites.

Of the three ocular cases reported,2 two occurred in the conjunctiva: one was in a woman aged 42 years who presented with a sore eye; the other in a male whose age and

Figure 1 Low power view showing edge of multicystic sudoriferous cyst (left, arrowhead) and adjacent cystic space containing multiple oval bodies (right, arrow). Haematoxylin and eosin, ×10.

Figure 2 High power detail showing laminated structure with cross striations. Haematoxylin and eosin, ×200.