

Sclerochoroidal Calcification: Parathyroid Connection

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Abstract

Objective: Sclerochoroidal calcification is a benign condition often noted incidentally on ophthalmoscopic examination of the fundus. It may be associated with metabolic disorders such as hyperparathyroidism, Gitelman syndrome, pseudo hypoparathyroidism. Here we present a case of asymptomatic Sclerochoroidal calcification incidentally found on a routine fundoscopic examination of a patient with diabetes and primary hyperparathyroidism.

Methods: The following is a case report with a review of the literature.

Results: 62 year old Caucasian male was referred to Endocrine section from ophthalmology for work up of possible secondary causes of an incidental finding of sclerochoroidal calcification noted on routine exam for diabetic retinopathy in 2015. The lesion was present in prior fundus photos from 2011 with no significant changes, indicating stability of the lesion over the last 4 years. Ophthalmic exam noted all normal findings for pupillary reaction, extraocular motility, intra ocular pressures, visual fields and acuity of vision was 20/20 in both eyes and there was no evidence of diabetic retinopathy on dilated fundus exam. An incidental finding of an elevated round yellow lesion superior to the optic nerve head was noted on the fundus exam in the left eye behind the lesion consistent with dense intra-lesional calcification. The lesion did not demonstrate any abnormal vasculature, pigmentation, or retinal fluid. Ophthalmic ultrasonography testing revealed hyper-reflectivity with acoustic shadowing. On work up found to have primary hyperparathyroidism. Whether they are related or incidental problems together is not clear.

Conclusion: Though Sclerochoroidal calcification can be idiopathic in most cases, clinicians are advised to rule out metabolic disorders such as abnormal calcium and phosphorous metabolism.

Keywords: Sclerochoroidal calcification; Primary hyperparathyroidism; Vitamin D deficiency fundoscopic examination of a patient with diabetes and primary hyperparathyroidism.

Introduction

Sclerochoroidal Calcification (SCC) is a benign ocular condition often noted incidentally on ophthalmoscopic examination of the fundus. It is characterized by yellow-white irregular sub retinal lesions, usually in the superotemporal mid-periphery of the fundus. It can clinically simulate a number of intraocular tumors like choroidal metastasis, choroidal melanoma, choroidal osteoma and melanoma. Most cases are idiopathic (79%) and 21% of cases can be associated with hyperparathyroidism, parathyroid adenoma, Gitelman syndrome, Bartter syndrome, chronic renal disease, and metabolic imbalance after diuretic use; case reports in association with Vitamin D deficiency and Al Bright's syndrome. The idiopathic form appears to be seen mainly in older patients and hence some consider it as an age-related change. Screening for associated conditions were recommended to be carried out to exclude an underlying systemic disorder such as pseudo hypoparathyroidism.

The frequency of the various systemic associations with sclerochoroidal calcification was mostly reported in two reviews and case reports [1,2]. Here we report a case of asymptomatic Sclerochoroidal calcification incidentally found on a routine

Case Details

A 62 year old Caucasian male was referred from ophthalmology clinic to Endocrine section for work up of possible secondary causes of an incidental finding of sclerochoroidal calcification (Figure1).

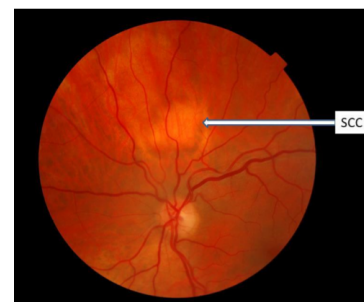
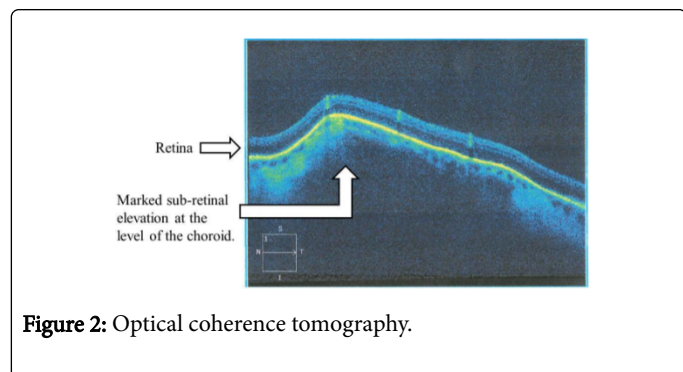


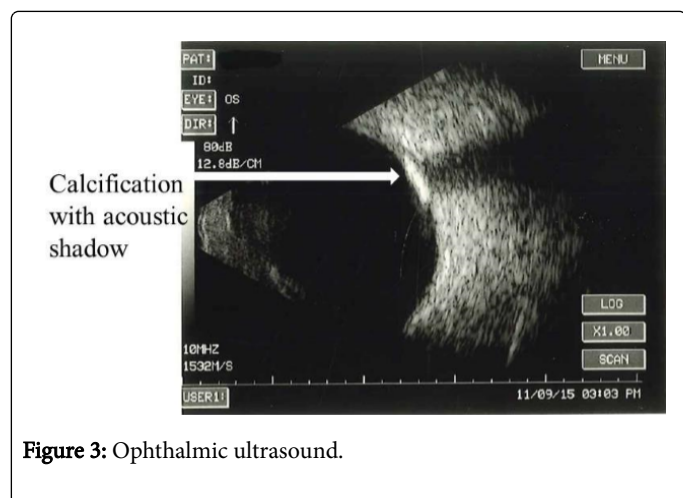
Figure1: Fundus photo showing sclerochoroidal calcification.

Per ophthalmic note, the patient was presented for a routine diabetic ocular examination. The medical history is notable for type 2 diabetes since 2006, left nephrectomy for renal cell carcinoma, CAD, COPD, hypertension, hypothyroidism since childhood, and CKD stage 3. Patient was not on calcium or Vitamin D supplements, but was on low dose HCTZ. Patient had no systemic or visual complaints. Review of the medical record did reveal elevated calcium of 10.3 mg/dL with no simultaneous PTH, 9 months prior to Endocrine clinic visit. The lesion was present in prior fundus photos from 2011. Calcium levels then were in normal range in 2011.

Clinical exam was unremarkable with no additional significant findings. Laboratory work up revealed normal calcium and phosphorus levels with PTH intact of 124.9 pg/mL (Ref Range: 29.1 to 79.9), PTH intact was 115 pg/mL one month prior to the Endocrine visit, and eGFR of 47mL/min with serum creatinine of 1.6. Additionally, 25 (OH) vitamin D levels were 26.9 ng/mL with 24 hour urine calcium of <140 mg/d. With a clinical diagnosis of Primary hyperparathyroidism, had a parathyroid scan. Parathyroid scan revealed a positive uptake in the inferior aspect of the right thyroid gland suggestive of parathyroid adenoma (Figure 2). DXA scan revealed a normal bone mineral density.

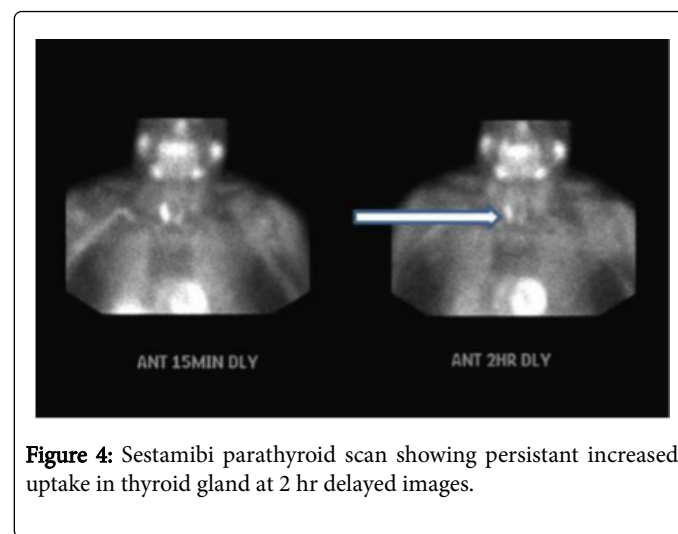


Ophthalmic exam noted all normal findings for pupillary reaction, extraocular motility, intra ocular pressures, and visual fields by confrontation test and best corrected vision was 20/20 in both eyes. There was no evidence of diabetic retinopathy on dilated fundus exam. An incidental finding of an elevated round yellow lesion superior to the optic nerve head was noted on the fundus exam in the left eye.



The lesion did not demonstrate any abnormal vasculature, pigmentation, or retinal fluid. The lesion was present in prior fundus photos from 2011 with no significant changes, indicating stability of the lesion over the last 4 years. Ophthalmic ultrasonography testing revealed hyper-reflectivity with acoustic shadowing behind the lesion consistent with dense intra-lesional calcification (Figure 3).

Spectral Domain Optical Coherence Tomography (SD-OCT) revealed marked sclerochoroidal elevation at the site of the lesion with absence of retinal fluid or neovascularization, normal pigment epithelium and neurosensory retina and intact overlying the lesion (Figure 4).



Discussion

The interesting points in the patient presented include that he had sclerochoroidal calcification at least 3 years prior to mild hypercalcemia; remained asymptomatic over 4 years; though patient had mild hyperparathyroidism biochemically, parathyroid scan did reveal parathyroid adenoma, confirming primary Hyperparathyroidism. The most common systemic condition with association to SCC seems to be hyperparathyroidism, Gitelman syndrome and pseudohypoparathyroidism

Since it is an uncommon condition, it is worth reviewing the literature. The biggest case series published include 118 patients and among them 53 subjects had metabolic work up. Among those 53, only 33 had PTH levels available. Among these 33 subjects, 9 subjects (27%) had abnormal PTH levels and the adenoma identified in 5 subjects (15%). Other associations include Gitelman's syndrome (6/53, about 11%) and Barter's syndrome [3]. The longest follow up seems to be in that series was 4 years mean follow up. In about 79% of cases, no secondary cause was found. Other conditions reported in case reports include Albright's hereditary osteodystrophy and vitamin D deficiency [4].

Characteristic findings are irregular yellow-white sub retinal lesions, mostly located around 9.00 to 3.00 clock position of the fundus. It can clinically simulate a number of intraocular tumors like choroidal metastasis, choroidal melanoma, choroidal osteoma and melanoma. Confirmation with ultrasonography or computed tomography establishes that this lesion is calcified. The lesions could be unilateral or bilateral. It is usually asymptomatic as the vision is not involved. At mean 4 years follow up, it was reported that there was no enlargement

of the lesion, decalcification, or related sub retinal fluid/hemorrhage, choroidal neovascularization, or vision loss [5]. Visual prognosis seems to be good, as the lesions are typically located away from the macula and foveal encroachment is rare [6].

Based on enhanced depth optical coherence tomography sclerochoroidal calcification was described as a scleral-based disease and could be classified based on four "mountain-like" topographic patterns. They include flat (Type 1) (n=9) at median thickness of 1.2 mm, rolling (Type 2) (n=28) at 1.4 mm thickness, rocky-rolling (Type 3) (n=21) at 2.1 mm thickness and table mountain (Type 4) (n=9) at a thickness of 1.9 mm [5,7]. Rarely sight-threatening complications that have been reported with sclerochoroidal calcification include choroidal neo-vascularization and serous detachments. The electroretinogram abnormality suggests a retinopathy involving mostly rods which may be due to the involvement of the G proteins involved in normal photoreceptor functioning. The pathogenesis of sclerochoroidal calcification is not entirely clear.

Wong and associates first described histopathologic findings of sclerochoroidal calcification in postmortem eyes of a patient with pseudo hypoparathyroidism. It was reported that the earliest calcification occurs in the sclera.

Conclusion

SCC is an incidental finding and the diagnosis is usually made by recognition of the clinical features of this lesion on ophthalmoscopy, and confirmation with ultrasonography or computed tomography to establish that this lesion is calcified. Most often SCC can be idiopathic in most cases, metabolic evaluation and clinical examination is important to exclude associated systemic conditions. It is possible that

our patient had both sclerochoroidal calcification independent of hyperparathyroidism since our patient had the eye features ahead of hypercalcemia.

Statement of Ethics

A case report at this institute does not require IRB approval as long as data is presented in an anonymous manner in which participants were not identifiable as in this case report.

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