Dome shaped macula with serous macular detachment in an elderly myopic woman: Case report and review of literature

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Abstract:
Dome-shaped macula (DSM) is a recently described entity characterized by convex protrusion of the macula within a posterior staphyloma. Serous macular detachment is the most common complication, but the condition often remains stable despite lack of intervention. Spontaneous resolution of the condition has also been reported in many cases. The condition may be observed with periodic review with optical coherence tomography (OCT). We report a 56-year-old Omani woman, a high myope without significant ocular complaints who was incidentally detected to have bilateral DSM with serous macular detachment and review the literature regarding its diagnosis, pathogenesis, and treatment options. As the patient was asymptomatic, she was followed with serial OCTs for 6 months and is stable in terms of visual acuity and subretinal fluid.

Keywords:
Dome-shaped macula, high myopia, serous macular detachment, subretinal fluid

Introduction

Dome-shaped macula (DSM) first described by Gaucher et al. in 2008 is convex protrusion of macula within a staphyloma in highly myopic eyes seen on optical coherence tomography (OCT). Diagnosis of this condition is based on typical spectral domain-OCT (SD-OCT) findings. Recently developed multimodal imaging techniques such as OCT angiography can add to its diagnosis and pathogenesis. Using swept source OCT with deeper tissue penetration into choroid and even sclera, Ellabban et al. have reported precise topography of the posterior pole in eyes with DSM describing horizontal ridge formed within the posterior staphyloma by uneven thinning of the sclera.[1] More recently, Caillaux et al. described three morphological DSM patterns according to SD-OCT features – round domes (without predominant axis), horizontally oriented oval-shaped domes, and vertically oriented oval-shaped domes.[2] Here, we report an elderly Omani woman with high myopia who was incidentally detected to have DSM with serous macular detachment and managed conservatively. This entity is often misdiagnosed with central serous chorioretinopathy (CSCR). Furthermore, we review the literature on this interesting clinical entity and describe its pathogenesis, diagnosis, and management options. We highlight the importance of conservative management.

Case Report

A 56-year-old Omani woman, a high myope, without any significant ocular complaints presented for a routine ophthalmic examination. Her best-corrected visual acuity (BCVA) in the right eye was 6/12p with −8.25 DS/−1.00 DC at 100° and in the left eye was 6/12 with −7.70
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DSM/−1.50 DC at 70°. Slit-lamp examination of anterior segment was unremarkable. Dilated fundus examination revealed bilateral posterior staphyloma, tessellated appearance, and dull foveal reflex in both eyes [Figure 1a and b]. Retinal periphery showed areas of white without pressure. SD-OCT (Spectralis, Heidelberg Engineering, Heidelberg, Germany) showed convex protrusion of the macula with serous macular detachment in both eyes [Figure 2a and b]. Central macular thickness was 452 µm and 470 µm and dome height 213 µm and 300 µm in the right and left eyes, respectively. Fundus fluorescein angiography [Figure 3a and b] showed parafoveal stippled hyperfluorescence and late parafoveal leakage. There was no choroidal neovascularization (CNV).

A diagnosis of bilateral DSM with serous macular detachment was made. Since she was asymptomatic, no intervention was advised. She was followed up with serial SD-OCTs every 3 months. At the 6-month follow-up, her visual acuity remained unchanged, and repeat OCT showed stable condition [Figure 4].

**Discussion**

DSM was first described by Gaucher et al. in 2008 as an abnormal convex, anterior protrusion of the macula on SD-OCT within the concavity of the posterior staphyloma. It is found in 5%–10% of highly myopic eyes. Although pathogenesis of this condition is still not clear, several hypotheses have been postulated such as abnormal curvature of macula,[3] mechanical and hemodynamic changes,[4] RPE dysfunction,[5] and choroidal blood flow obstruction due to thickened sclera.[3] Initially, Gaucher et al. proposed that choroidal thickening over macula and resistance of sclera to deformation are the reasons for DSM.[6] Imamura et al. proposed that localized scleral thickening in the macula is the main causative factor[3] which is supported recently by Elabban et al. who also stated scleral thinning in parafoveal area.[1] A variety of complications can occur in DSM which include serous foveal detachment (SFD), CNV, extrafoveal schisis, foveoschisis, lamellar, or full thickness macular hole.[7] SFD is the most common complication where positive correlation exists[2] between frequency and dome height and its prevalence in existing studies varies between 6% and 52%.[1-3,6,7]

DSM may be differentiated from idiopathic CSCR by the absence of punctate hyperfluorescence and vascular hyperpermeability on indocyanine green angiography with an abnormal convex profile and no choroidal thickening on SD-OCT.[6] The pathophysiology of both conditions differs. In DSM, SFD is likely to be caused by choroidal vascular changes secondary to excessive thickening of sclera and is present only inside the inward bulge within the posterior staphyloma and not widely spread in the entire choroid as in CSCR.[7] Byeon and Chu
proposed the term “scleral compression maculopathy” where compressive changes in choroid and choriocapillaris and RPE alterations are seen characteristically along the margin of the myopic staphyloma.

At present, there is no definitive treatment for SFD associated with DSM. Several options have been tried such as argon laser photocoagulation, photodynamic therapy (PDT),[8] and anti-vascular endothelial growth factor (VEGF) agents,[9] and oral spironolactone.[10] Chinskey and Johnson have reported resolution of SFD in two patients with half-fluence PDT and also reported failure of intravitreal anti-VEGF injection in resolution. Lorenzo et al. found neither anti-VEGF nor PDT effective in treating SRF in DSM. Dirani et al.[9] reported effectiveness of oral mineralocorticoid antagonist spironolactone in two cases. Tamura et al. reported spontaneous resolution of bilateral SFD in DSM after a month.[10] Most of the abovementioned studies and case reports have shown structural improvements with
reduction in central macular thickness or resolution of SFD but no functional improvement in terms of BCVA. Conservative management with observation may be a prudent option in many cases as in our patient. Our patient was asymptomatic, and follow-up at 6 months showed stable visual acuity and subretinal fluid remained stable.

**Conclusion**

DSM may be rarely complicated by serous macular detachment but often remains stable without any intervention. Hence, it is advisable to observe this condition with periodic review with SD-OCT and consider intervention only if it is progressive or complicated by the development of CNV.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initial(s) will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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