Commentary: Inner retinal excavation in torpedo maculopathy and proposed type 3 lesions in optical coherence tomography

In the current issue of Indian Journal of Ophthalmology, Jain *et al*.[1] present an interesting multimodal imaging analysis of various torpedo-shaped lesions of the fundus in three cases. Torpedo maculopathy (TM) is a rare, usually asymptomatic condition characterized by a hypopigmented horizontally oval, torpedo-shaped lesion just temporal to the fovea.[2]

In 2015, Wong *et al*.[3] classified TM into two types according to the optical coherence tomography (OCT) features. In both of these types, the inner retina is normal and there is increased signal transmission into the choroid. Type 1 TM shows attenuation of the interdigitation zone (IZ) and ellipsoid zone (EZ). Thinning of the outer nuclear layer (ONL) may be present. However, outer retinal cavitation is absent in type 1.[3] Type 2 TM is characterized by definite loss of EZ and IZ and thinning of ONL and outer retinal cavitation which may or may not be associated with inner choroidal excavation.[3] In type 2 lesions, the inner surface of the retina is usually at the level of the nearby retina and not depressed, as illustrated in the classification by Wong *et al*.[3] In some of these cases, the retina may even be slightly elevated.[4] However, it is increasingly being recognized that lesions morphologically typical of TM can be excavated also.[2,5,6]

We happened to examine a 27-year-old male patient who had a TM lesion in the left eye [Fig. 1a]. He was asymptomatic in the left eye and best-corrected visual acuity was 6/6. The lesion had a pigmented area at the tail. On swept-source OCT (DRI-OCT Triton, Topcon, Tokyo, Japan), there was an excavation of the inner surface of the retina corresponding to the area with pigmentation [Fig. 1b]. Along the whole lesion, there was increased transmission of the signal. The outer retina including the IZ, EZ, and the external limiting membrane was disturbed, and the ONL and outer plexiform layer (OPL) were thinner at the depigmented nasal part of the lesion [Fig. 1b]. At the area of retinal excavation, the retina was thin and retinal layers external to inner nuclear layer were not appreciated. Inner retinal layers had mild disorganization/thinning. A nonconforming focal choroidal excavation [Fig. 1b, arrowhead] was noted along with an outer retinal defect overlying it. The choroid was very thin at the location of choroidal excavation.

Typically, TM has been considered to be a flat lesion. In a large series of 13 patients, each case had a flat lesion.[7] However, the pigmentation at the tail-side of TM may be depressed or excavated. In 2014, Trevino *et al*.[2] presented two cases of TM (called as "paramacular coloboma") which showed excavation of inner retinal surface and the retinal pigment epithelium (RPE), disorganization of RPE, retinal thinning,

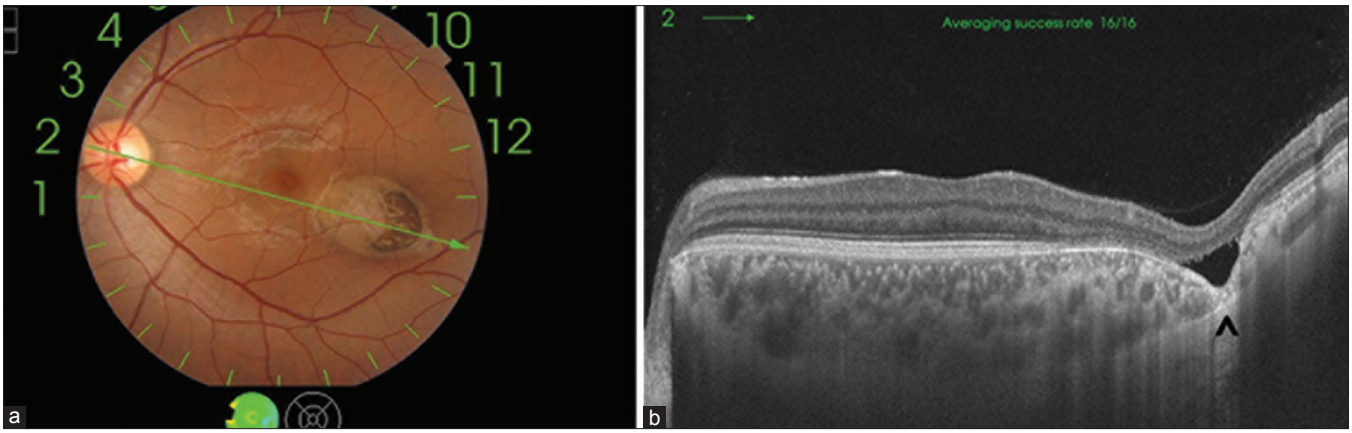

Figure 1: (a) The fundus photograph showing a torpedo-shaped lesion with a pigmented tail. (b) The optical coherence tomography revealing excavation of the inner retina, degeneration of the outer retina, thinning of the retina, choroidal excavation (nonconforming), and subretinal cleft (arrow head)

and superficial intraretinal hyporeflective spaces without any subretinal cleft. However, the Case 2 in this report[2] had peripheral pigmentation with an excavated macular lesion, giving the differential diagnosis of congenital toxoplasmosis or other congenital infections.[8] In 2016, Papastefanou *et al*.[5] reported two cases which showed "fundus excavation, attenuation of nuclear layers, disruption of the outer plexiform layer, and loss of photoreceptors and a subretinal cleft." In 2017, Hamm *et al*.[6] reported a 60-year-old female with unilateral torpedo lesion with a hyperpigmented tail. The OCT showed excavation of retina, RPE, and choroid; disorganization of outer retina and RPE; and hyporeflective cavity between the retina and choroidal excavation. Our case also showed both retinal and choroidal excavation with a subretinal cleft. The excavated TM with a subretinal cleft may present a variant of type 2 TM, with the addition of the fact that the inner retinal surface is also depressed.

However, the cases with excavated TM, retinal thinning, inner retinal hyperreflective spaces, and no subretinal cleft[2] do not strictly fall under either type 1 or type 2 lesions. We propose that these OCT features be classified as type 3 TM, provided the fundoscopic appearance is of typical TM (hypopigmented with or without pigmented tail, horizontally oval-shaped, located temporal to fovea). However, other differentials of excavated macular lesions should be ruled out before terming a lesion as type 3 TM. These conditions include, but are not limited to congenital infections, coloboma, Leber's congenital amaurosis, and posterior staphyloma.

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 initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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