

Coexistent Myopia and Hypermetropia

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Abstract: It is unusual for myopia and hypermetropia to coexist in the same eye, but is indeed possible if index form of one does so with the axial form of the other. We report such a situation in a 57 year old male patient who was diagnosed of having simultaneous anterior and posterior lenticonus in both his eyes in absence of any other systemic associations.

Keywords: Lenticonus, oil droplet, Alport's syndrome

A 57 year old man came to us with complaints of inability to see since childhood. He also mentioned of inability to see distant objects since his school days and that he had seen eye specialists before who had informed him that his vision would not improve. On examination, he had best corrected visual acuity of 2/60 on his RE and 3/60 on his LE. IOP was 12 and 14 mmHg on NCT. Refraction revealed that he required a correction of -21.75DSph with -5.50DCx5⁰ on his RE and -22.75DSph with -4.25DCx55⁰ on his LE. A scan however revealed axial length to be 21.87 mm on RE and 22.41 mm on his LE, implying that the eyes were axially hypermetropic. Slit lamp examination showed both anterior and posterior lenticonus on BE. A typical oil droplet reflex was seen in both the eyes. Fundus picture BE was absolutely normal.

The patient was asked in details about any renal or auditory problems, which was non contributory. He was however referred to an otolaryngologist and nephrologists for comprehensive evaluation, but no significant anomalies were detected.

As the patient did not have any significant cataractous changes in any eye, and it was logically presumed that the eyes were already amblyopic due to the complicated refractive situation, surgery was not considered in this patient.

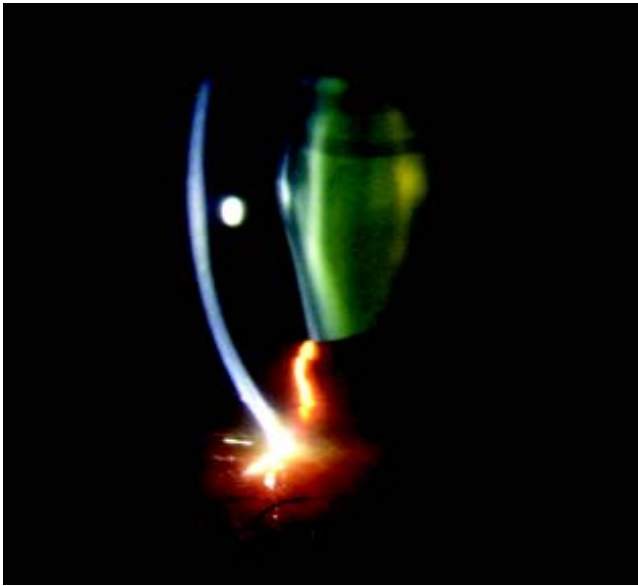
Discussion

Anterior and posterior lenticonus are two separate clinical entities with different etio-pathologic origins.

Anterior lenticonus is relatively rare and usually bilateral. It is seen as a part of Alport's syndrome, which occurs due to mutations that affect the gene COL4A3 that encodes the alpha 5 chain of type 4 collagen^(1, 2). Type 4 collagen is found in the glomerular basement membrane, the cochlea and the anterior lens capsule. The result is progressive renal failure, sensory-neural deafness and anterior lenticonus. Histopathologic examination of the anterior lens capsule shows thinning and the presence of vertical dehiscences at the inner part of the central anterior lens capsule. However, it should be noted that anterior lenticonus is not seen in childhood. Initially there is increase in thickness of the lens. As the anterior lens capsule undergoes changes during accommodation, and as the apex is thinner than the periphery, lenticonus gradually develops later in life⁽²⁾. Besides Alport's syndrome, lenticonus may also be seen in Marfan's syndrome, EDS, Waardenburg and Weel-Marchesani syndrome⁽³⁾. Interestingly enough, this patient did not have any clinical or investigative feature by which we could fit him into any of these syndrome complexes.

Posterior lenticonus on the other hand is clinically more common, unilateral and sporadic. It is usually not associated with any systemic condition. Bilateral involvement is unusual and suggests an autosomal dominant inheritance⁽⁴⁾. Being congenital, it manifests early in childhood and the average age of diagnosis is between 3 and 7 years. Amblyopia is the most common visual

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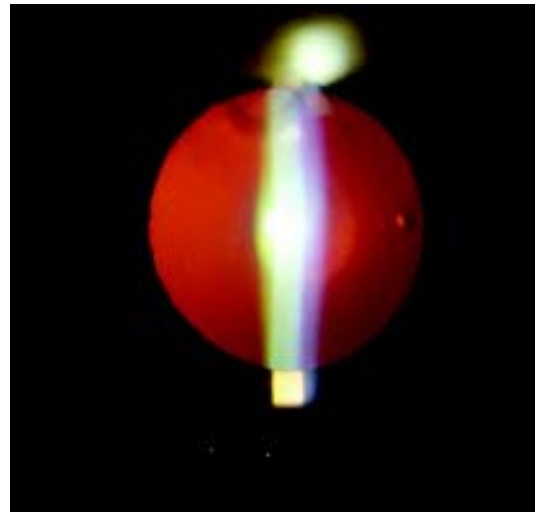


presentation. The reason could be stimulus deprivation by the oil droplet, anisometropia due to index myopia or a combination of both.

The pathogenesis of posterior lenticonus is unclear. Traction on the posterior lens capsule by remnants of the hyaloid artery system and/or disturbances in the tunica vasculosa lentis have been suggested. Other hypotheses include an overgrowth of posterior lens fibers that produce a phakoma of the lens. Although many theories have been proposed, none of them have been proved conclusively.

In bilateral cases a genetically determined congenital weakness of the posterior lens capsule has been postulated⁽⁴⁾.

Hence to conclude, posterior lenticonus is *usually* unilateral, congenital and an ocular condition. Anterior lenticonus on the other hand is bilateral, acquired and a part of a larger systemic picture. Rarely, simultaneous presence of these



two conditions have been reported, but as a part of a specific syndrome complex⁽⁵⁾. Non-syndromic bilateral anterior and posterior lenticonus is an extreme clinical rarity, and looked in this way, this particular case perhaps breaks all the rules.

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