



Definition of Pathologic Myopia (PM)

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Kyoko Ohno-Matsui

Myopia is a significant public health concern worldwide [1–3]. It is estimated that by 2050, there will be 4.8 billion people with myopia which is approximately one-half (49.8%) of the world population. Of these, 938 million individuals will have high myopia which is 9.8% of the world population [4].

Although most myopic patients obtain good vision with optic correction of refractive error, the exception is pathologic myopia (PM). Eyes with PM develop different types of fundus lesions, called myopic maculopathy, which can lead to a significant reduction of central vision [5, 6]. In fact, myopic maculopathy in eyes with PM is a major cause of blindness worldwide, especially in East Asian countries [7–11].

The definitions of myopia and pathologic myopia have not been standardized, and the term “pathologic myopia” is often confused with “high myopia.” However, these two are distinctly different. “High myopia” is defined as an eye with a high degree of myopic refractive error, and “pathologic myopia” is defined as myopic eyes with the presence of pathologic lesions in the posterior fundus. Duke-Elder defined “pathologic myopia,” as “that type of myopia which is accompanied by degenerative changes occurring especially in the posterior pole of the globe” [12].

Myopia is defined as a refractive condition of the eye in which parallel rays of light entering the eye are brought to a focus in front of the retina when the ocular accommodation is relaxed [13]. This refractive status is dependent on the axial length, and a disproportionate increase of the axial length of the eye can lead to myopia, called axial myopia, or a disproportionate increase in the refractive power of the eye can also lead to myopia, called refractive myopia. The WHO Report defines myopia as “a condition in which the refractive error (spherical equivalent) is ≤ -0.50 diopter (D) in either eye” [3].

Myopia is classified into low myopia, moderate myopia, and high myopia. The cutoff values for the different degrees have not been consistent among studies. The WHO Report defined “high myopia” as “a condition in which the objective refractive error (spherical equivalent) is ≤ -5.00 D in either eye” [3]. Very recently, Flitcroft on behalf of the International Myopia Institute (IMI) proposed a set of standards to define and classify myopia [13]. Low myopia is defined as a refractive error of ≤ -0.50 and > -6.00 , and high myopia is defined as refractive error of ≤ -6.00 D [13]. The Japan Myopia Society proposed a category of “moderate myopia” between “low myopia” and “high myopia” (<http://www.myopiasociety.jp/member/guideline/index.html>). According to this society, low myopia was defined as a refractive error of ≤ -0.50 and > -3.00 D, moderate myopia is ≤ -3.00 and > -6.00 D, and high myopia is ≤ -6.00 D. Table 2.1 shows a modified summary of the classification of different degrees of myopia and PM.

As mentioned above, PM is classified as being present when myopic eyes have characteristic lesions in the posterior fundus. The changes are the presence of myopic macu-

Table 2.1 Summary of definitions of various types of myopia

Term	Definition
Myopia	A condition in which the spherical equivalent refractive error of an eye is ≤ -0.50 D when ocular accommodation is relaxed
Low myopia	A condition in which the spherical equivalent refractive error of an eye is ≤ -0.50 D and > -3.00 D when ocular accommodation is relaxed
Moderate myopia	A condition in which the spherical equivalent refractive error of an eye is ≤ -3.000 D and > -6.00 D when ocular accommodation is relaxed
High myopia	A condition in which the spherical equivalent refractive error of an eye is ≤ -6.000 D when ocular accommodation is relaxed
Pathologic myopia	Myopia that accompanies characteristic myopic fundus changes (the presence of myopic maculopathy equal to or more serious than diffuse choroidal atrophy or the presence of posterior staphyloma)

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K. Ohno-Matsui (✉)

Department of Ophthalmology and Visual Science, Tokyo Medical and Dental University, Bunkyo-Ku, Tokyo, Japan
e-mail: k.ohno.oph@tmd.ac.jp

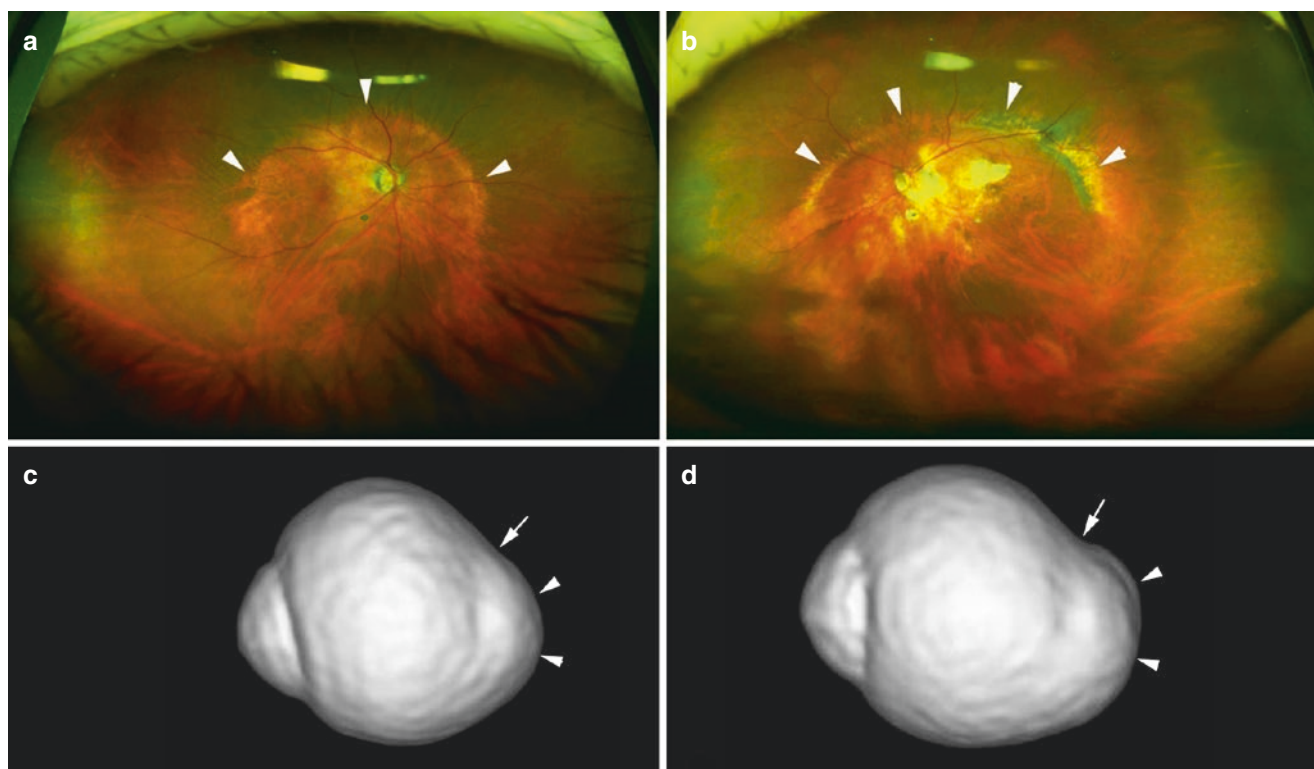


Fig. 2.1 Three-dimensional magnetic resonance images (3D MRI) of an eye with unilateral high myopia. (Modified and cited with permission from Ref. [15]). The axial length was 24 mm in the right eye and 28 mm in the left. Ultra-widefield fundus images show the upper edge of the

staphylomas (**a** and **b** outlined by arrowheads). In 3D MRI images viewed nasally, a posterior protrusion (arrowheads) due to a staphyloma is seen in both eyes (**c** and **d**), although the degree is milder in the right eye (**c**). The upper edge is observed as a notch (**c** and **d** arrows)

lopathy equal to or more serious than diffuse choroidal atrophy (equal to Category 2 in the META-PM classification [5]) and/or the presence of a posterior staphyloma [14]. The cutoff values of the myopic refractive error and axial length should not be set for the definition of pathologic myopia because a posterior staphyloma has been reported to occur in eyes with normal axial length (Fig. 2.1) [15] and even in eyes with axial lengths <26.5 mm [16]. This suggested that PM occurs independently of the axial length of the eye.

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