Patchy Choroidal Atrophy

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Ran Du and Shiqi Xie

Abstract

Patchy choroidal atrophy is observed as a grayish-white and sharply margined atrophy in the posterior fundus. The shape of patchy atrophy is longitudinally oval, or round, or irregular when multiple lesions merge. Patchy atrophy can derive from lacquer cracks or diffuse atrophy. It rarely affects the central fovea. Fundus autofluorescence shows uniform hypo-autofluorescence in the area of patchy atrophy. OCT images show a loss of retinal pigment epithelium, with or without a Bruch's membrane defect.

Keywords

Patchy choroidal atrophy · Bruch's membrane · Retinal pigment epithelium

Patchy choroidal atrophy (known as Category 3 in META-PM classification [1]), is a grayish-white and well-margined atrophy in the posterior fundus [2]. It can derive from lacquer cracks or develop in the area of background diffuse atrophy. Patchy atrophy is longitudinally oval when it originates from lacquer cracks, or round when it originates from diffuse atrophy, or has an irregular shape when multiple lesions are merged.

Although patchy atrophy is seen in the posterior fundus [3–6], it rarely involves the central fovea itself. This location is different from CNV-related macular atrophy, which is almost always fovea-centered. As pathologic myopia progresses, multiple small patchy lesions enlarge and merge together or fuse with parapapillary atrophy. Some lesions of patchy atrophy occur in the mid-periphery [6]. In some rare cases, a very large merged lesion may finally cover almost the entire posterior pole and shows a "bare sclera" appearance.

Patchy atrophy shows a clear hypo-autofluorescence in fundus autofluorescence images (Fig. 10.1). In fluorescein angiogram (FA), patchy atrophy shows a hypo-fluorescence due to the choroidal filling defects in the early phase, and the edges show gradual hyper-fluorescence in the late phase (Fig. 10.2). In ICG angiogram, patchy atrophy shows hypo-fluorescence in the late phase. Intrascleral and retrobulbar blood vessels can be seen through the atrophic area. In OCT images, patchy atrophy is observed as a loss of retinal pigment epithelium, with or without a Bruch's membrane defect [6]. Following the loss of retinal pigment epithelium and Bruch's membrane, the choroid and the outer retina disappear and the inner retina directly sits on the sclera (Fig. 10.3). Pigmentation is often observed especially in and along large patchy atrophies. Perforating scleral vessels are sometimes detected within the atrophic area (Fig. 10.4) [7]. In that case, scleral pits are observed at the emissary of scleral perforating vessels.

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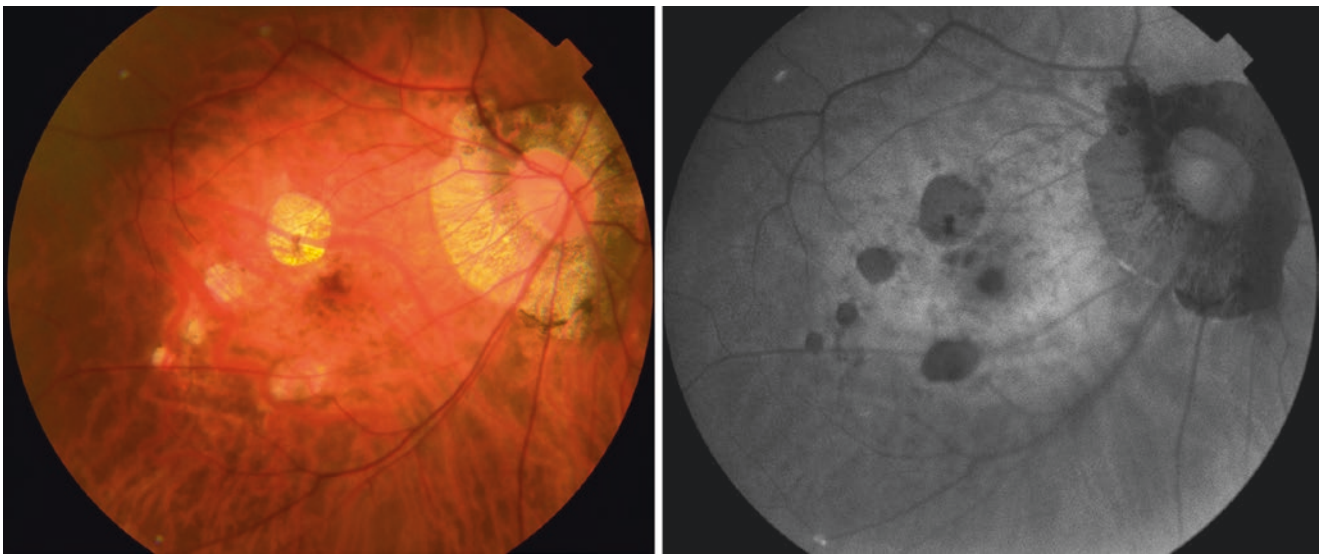

Fig. 10.1 Multiple lesions of patchy atrophy in the posterior fundus. (Left) Right fundus of a 57-year-old woman with axial length of 32.3 mm shows multiple lesions of patchy atrophy within the area of diffuse atrophy. (Right) Patchy atrophy is observed as uniform hypo-fluorescence in fundus autofluorescence image

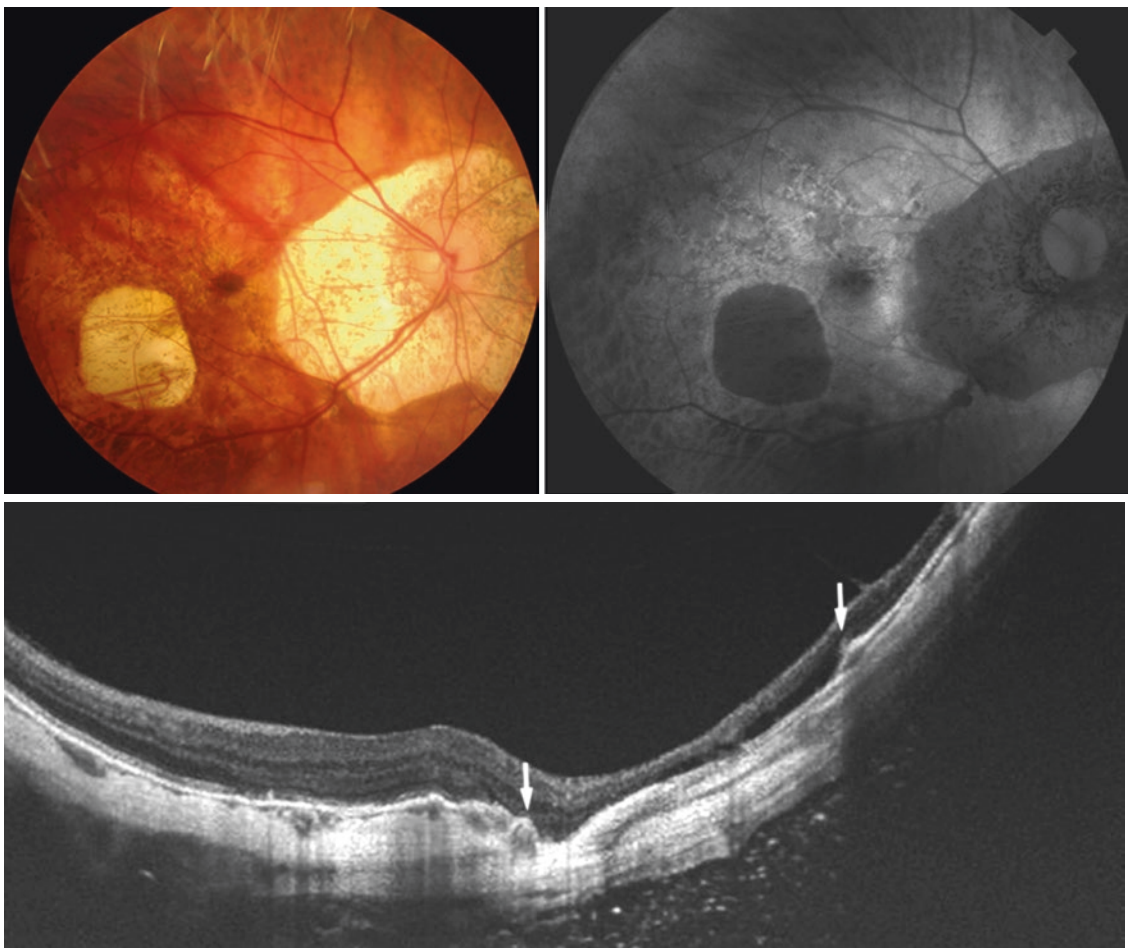

Fig. 10.2 Multimodal imaging of patchy atrophy. (Top Left) Right fundus of an 85-year-old man with axial length of 30.6 mm shows a circular patchy atrophy lower-temporal to the macula within the area of diffuse atrophy. Such circular-shaped patchy atrophy tends to develop from diffuse atrophy. (Top Right) The lesion of patchy atrophy shows uniform hypo-fluorescence in fundus autofluorescence image. (Middle) Swept-source OCT image across the patchy atrophy shows a defect of the retinal pigment epithelium (RPE) as well as Bruch's membrane. Arrows indicate the end of RPE. In the area of patchy atrophy, the outer retina and the choroid has also disappeared. Inner retina directly sits on the sclera. (Bottom) Fluorescein angiogram (FA) of the area of patchy atrophy shows hypo-fluorescence in the early phase (Left) and hyper-fluorescence along the edge of patchy atrophy in the late phase (Right)

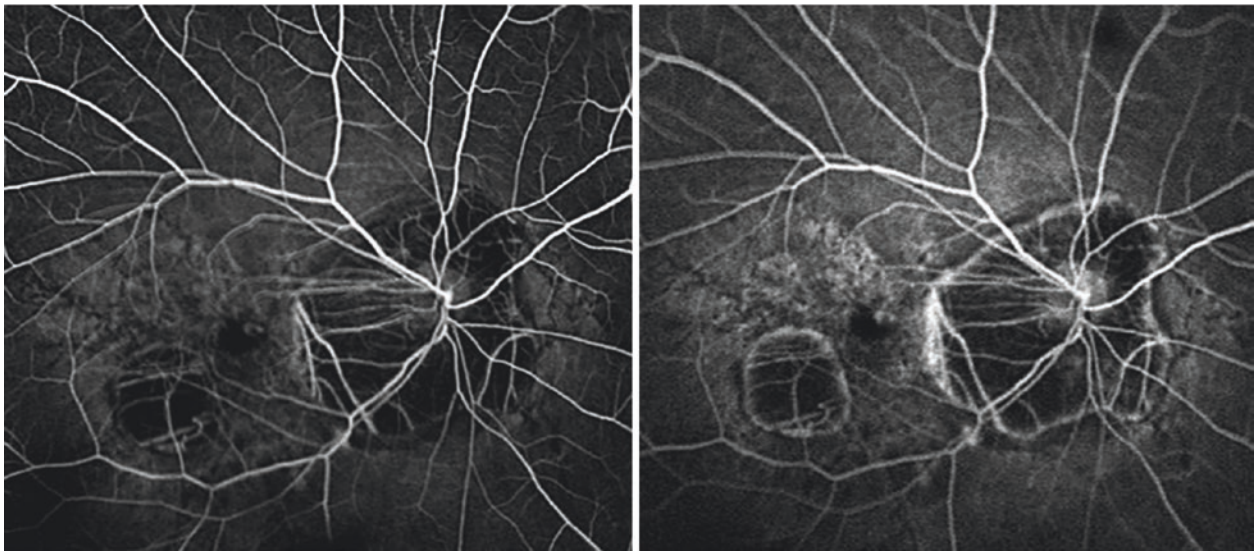

Fig. 10.2 (continued)

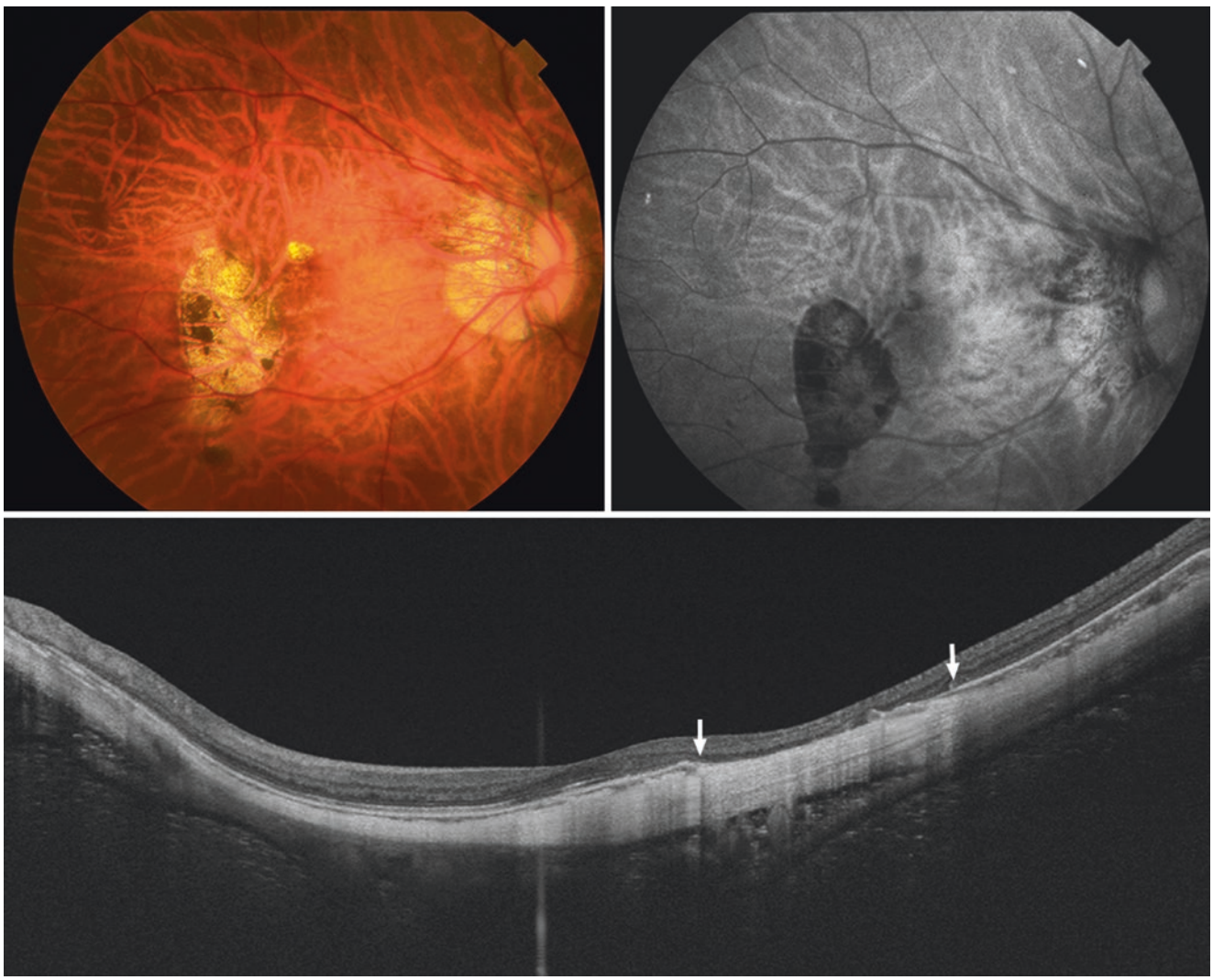

Fig. 10.3 Patchy atrophy originated from lacquer cracks. (Top Left) Left fundus of a 48-year-old woman with axial length of 34.8 mm shows vertically oval patchy atrophy temporal to the fovea. (Top Right) Fundus autofluorescence image shows hypo-fluorescence in the area of patchy atrophy. (Bottom) OCT image across the area of patchy atrophy shows a defect of the retinal pigment epithelium (RPE) as well as Bruch's membrane. Arrows indicate the end of RPE. In the area of patchy atrophy, the outer retina and the choroid has also disappeared. Inner retina directly sits on the sclera

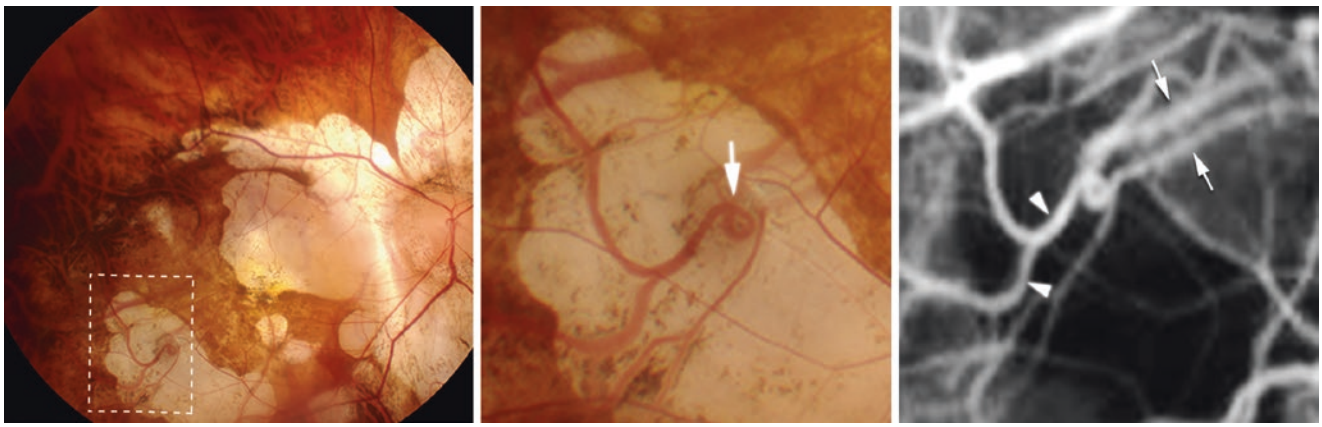

Fig. 10.4 (Cited with permission from [7]): Abruptly emerging vessel in the area of patchy atrophy. (Left) Right fundus of a 79-year-old woman with an axial length of 32.9 mm shows a large patchy atrophy lower to the fovea as well as a large parapapillary atrophy. (Middle) Magnified image of the squared area in the Left image shows that one large vessel has abruptly emerged (arrow), then takes a curled turn and then courses within the area of patchy atrophy, and finally continues as a choroidal vessel outside the patchy atrophy. (Right) Early phase of ICG angiography shows the more peripheral course of this emerging vessel (arrowheads). Two parallel running vessels (arrows, considered as intrascleral branches of short posterior ciliary arteries) seem to be continuous with this abruptly emerging vessel

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