A Superior Method of Achieving High Myopic Retinal Focus

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With the use of a Zeiss FF4 fundus camera, critical retinal focus of individuals with a degree of myopia beyond the normal focusing range of the camera requires insertion of a diopter compensating lens. Although this auxiliary lens allows focus to be achieved, three inherent problems are noted and currently tolerated.

The auxiliary lens causes imaging of the Allen Dot, centrally located in each photograph. Imaging of the Allen Dot can potentially obscure crucial detail. The current solution to this problem is to slightly adjust the patient’s fixation to de-center the fovea or area of interest, thereby ‘placing’ the Allen Dot in a less critical area. Secondly, the auxiliary lens exaggerates any optical artifacts that may be present, most notably in the central portion of the photograph. Lastly, the auxiliary lens causes distortion of the image, increasing evenly towards the outer edges of the photograph.

Fundus photography and fluorescein angiography was performed on a patient with myopic retinal degeneration using the Zeiss FF4 fundus camera with the -32, -15 diopter compensating lens to achieve focus (Fig. 1 and 1a). The patient returned one month later for a follow-up visit. Fundus photography and fluorescein angiography was again performed, this time using the patient’s own contact lens as the corrective element, rather than the diopter compensating lens (Fig. 2 and 2a). The photographs taken with the patient’s own contact lens in place were higher in quality when compared to those previously taken using the diopter compensating lens of the fundus camera. Allowing the patient’s own contact lens to act as the corrective element eliminates all three previously discussed photographic problems inherent in the use of the auxiliary lens.

Several subsequent patients have been photographed in this manner with success. One patient was photographed through hard contact lenses, the others wore soft lenses. Difficulty was encountered with one light-sensitive patient who wore a soft lens. Because he needed to blink often, his contact lens would rarely have time to return to the central cornea before the next blink. This allowed few opportunities to take the required photographs.

The use of disposable contact lenses can be considered for retinal photography and angiography in highly myopic patients who rely on spectacles for correction, provided there is no contraindication to the application of the lens, and that the patient can comfortably tolerate the lens. Disposable lenses are available in a variety of powers. Although a disposable contact lens of the exact appropriate power would be an ideal choice, a lens that simply provides correction to within the normal focusing range of the camera is adequate. It is important to note that these lenses are for one time use only and should be discarded at completion of the procedure.

Two color fundus photographs of the same field of view of the same myopic patient were compared. One photograph was taken using the contact lens method, the other using the diopter compensating lens. The images were overlayed and aligned on a light box and viewed with a lupe. Vessel shift was noted indicating magnification distortion. This distortion should be taken into consideration if performing digital or other overlays for image comparison.

Retinal fundus photographs taken through the high myopic patient’s own contact lens, or an appropriate disposable contact lens can be superior in quality to those taken using the diopter compensating lens. This method should be considered for patients referred for photography who have a degree of myopia beyond the normal focusing range of the fundus camera.
**Figure 1:** Fundus photograph of a highly myopic patient taken using a Zeiss FF4 fundus camera with -32, -15 diopter compensating lens. Note the Allen Dot, exaggeration of the optical artifacts near the center of the image, and the distortion of the image increasing evenly towards the outer edges of the photograph.

**Figure 2a:** Fluorescein angiogram of the patient depicted in Figure 1, showing the Allen Dot (arrow).

**Figure 2:** Fundus photograph of the patient depicted in Figure 1 taken on a subsequent visit using the same fundus camera with the normal diopter setting and photographing through the patient’s own contact lens. The Allen Dot is not visible and the image is of even quality from the edge to edge, lacking distortion.

**Figure 2a:** Fluorescein angiogram taken on the subsequent visit using the normal diopter setting and photographing through the patient’s own contact lens.

**Key Words:** high myopia, Allen Dot, artifact, contact lens, disposable contact lens, fundus photography, diopter compensating lens, focus, fluorescein angiography

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