

MODULE 7.1

Fluorescein Angiography

Fluorescein angiography (FA) is an imaging technique in which a fluorescent dye is used to highlight features of the retinal vasculature. A series of black-and-white fundus photographs, taken as sodium fluorescein dye fills the retinal vessels, helps to document vascular leakage and other abnormalities.¹ Diabetic macular edema (DME) is the clinical feature most closely associated with vision loss in diabetic retinopathy, and the degree of fluorescein leakage on FA is strongly correlated with visual acuity in DME.²

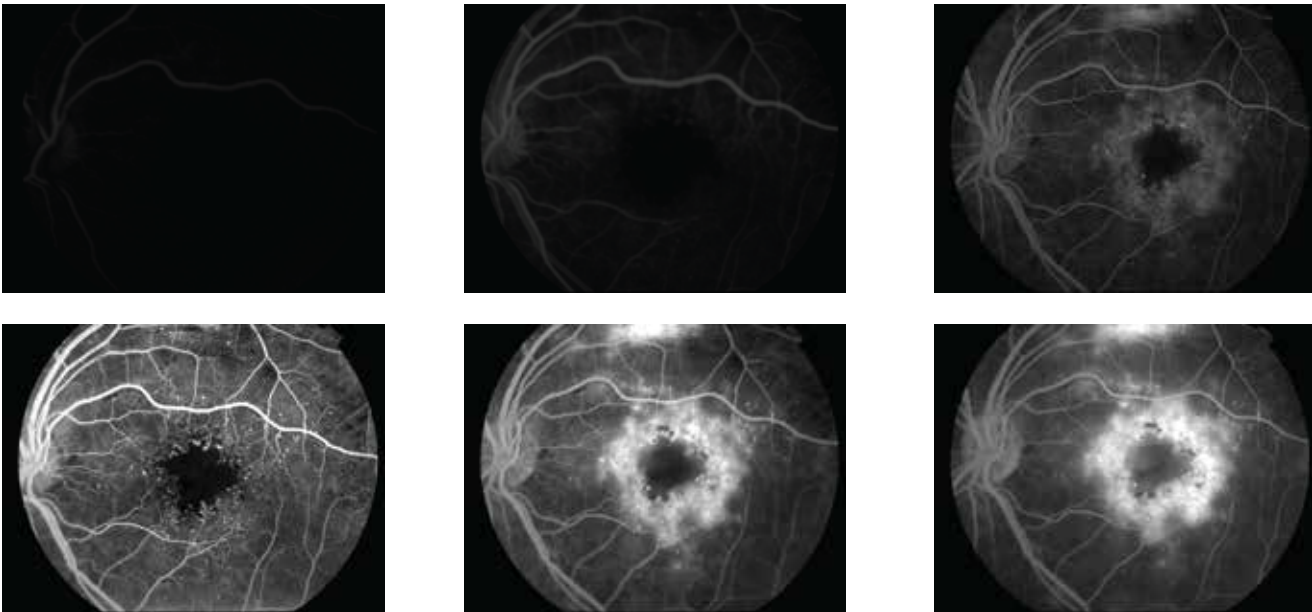
The early phase of dye filling in FA shows dilation of capillaries in the perifoveal region. Later in the sequence, if accumulation of dye takes place in the perifoveal region, a petaloid pattern of dye pooling may be seen. If accumulation is outside the perifoveal region, it may assume a honeycomb appearance.¹ Recently it has been recognized that peripheral retinal ischemia, as diagnosed

with ultra-widefield FA, is associated with DME, and this may have implications for diagnosis and treatment.³

Clinicians must remember that the presence of clinically significant macular edema (CSME) should be established based on retinal biomicroscopic examination, not based on FA.¹ The only indication for FA in relation to DME is to identify areas and lesions that require laser treatment once the decision has been made to treat based on clinical factors. FA is used to identify microaneurysms that are leaking and causing DME and to identify focal lesions that were not apparent on clinical exam. Incompetent vessels that allow leakage of dye into retinal tissues are evident on FA.¹

Fluorescein Angiography

Fluorescein angiography (FA) sequence: filling, early, mid, and late phases.



In the early phase of the angiogram, capillary dilation may be seen in the perifoveal region. Late pooling of the dye may be evident, assuming a petaloid pattern when accumulation of dye involves the perifoveal region, or it may show a honeycomb appearance when occurring outside the perifoveal area.

Diabetic macular edema (DME): overview of etiology, diagnosis, and treatment options, Patricio G. Schlottmann, M.D.

Fluorescein Angiography

The angiogram is used to identify which microaneurysms are leaking and causing the edema and to help locate focal lesions that may not have been obvious on clinical examination.



Fluorescein angiography visualizes leakage from incompetent vessels that have lost their ability to prevent the egress of dye into the retinal tissue.

Diabetic macular edema (DME): overview of etiology, diagnosis, and treatment options, Patricio G. Schlottmann, M.D.

References

1. Schlottman PG. Diabetic macular edema (DME): overview of etiology, diagnosis, and treatment options. Paper presented at: International DME Expert Summit; June 22, 2014; Paris, France.
2. Antonetti DA, Klein R, Gardner TW. Diabetic retinopathy. *N Engl J Med*. 2012;366:1227-1239.
3. Wessel MM, Nair N, Aaker GD, Ehrlich JR, D'Amico DJ, Kiss S. Peripheral retinal ischaemia, as evaluated by ultra-widefield fluorescein angiography, is associated with diabetic macular oedema. *Br J Ophthalmol*. 2012;96:694-698.