A Case Report: Oral Fluorescein

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Abstract: This paper discusses our experience with oral fluorescein in general and specifically its use on a group of Ehlers-Danlos patients. I will discuss our methods and results.

Background

The majority of our experience with oral fluorescein came in August 1992. The Detroit Medical Center, of which Kresge Eye Institute is an affiliate, was chosen by the Ehlers-Danlos Foundation to be the site for the first ever complete multidiscipline evaluation of Ehlers-Danlos. Ehlers-Danlos is a rare, autosomal dominantly hereditable condition characterized by skin, joint, vessel and viscera abnormalities. Ophthalmologically it has been associated with many problems, though familial retinal detachment and angioid streaks are the typical retinal findings to which it has been linked. The volunteers came from all over the United States and Canada in a very altruistic act and agreed to have complete medical, orthopedic, ophthalmic, and gynecologic exams. This was indeed a unique opportunity for physicians to examine a large group of Ehlers-Danlos patients. There were many subjective opinions and few objective facts about the physiological status of Ehlers-Danlos patients.

In all, 85 Ehlers-Danlos patient volunteers came to the Detroit Medical Center, 67 of which were to have complete eye exams, including fundus photos and fluorescein angiogram. The others had previously used Indocyanine Green and Sodium Fluorescein dyes in Ehlers-Danlos patients to determine microvascular changes in the skin. In the case described herein, only fluorescein was considered since we did not have the ability to acquire Indocyanine Green retinal images at that time.

Our challenge was that the volunteers were available for photography for only two days, and for just a few hours each day. In discussions with the physicians, we determined the goal for the fluorescein angiogram was to observe the absence or presence of angioid streaks. Angioid streaks are easily seen in the late...
phase of a fluorescein angiogram, so early phase photographs would be of limited benefit. Volunteers were scheduled to endure a large number of tests in a short amount of time. Additionally, only one photographer and one camera were available, which meant an average often minutes per patient. The time required to perform an actual injection on each patient (about five minutes each) when compared to the time it took to prepare sixty oral doses (about 30 minutes altogether) made a big difference. Not only can one prepare oral doses in advance, but an oral dose does not require the same sterile technique as an injecting dose. We elected to utilize oral fluorescein, allowing us to acquire the desired data efficiently while also being the least invasive to the patient. In the end, 65 patients had color photographs and 53 patients had fluorescein angiograms (some patients refused one or both procedures).

**Procedure**

A solution of 10cc of 10% fluorescein in eight ounces of orange juice or apple juice was used. The Gomez-Ulla, et al, study of 85 patients found that more oral dye is preferable to less, and those getting the greater amount of dye had more consistent results. We knew that some patients could not tolerate orange juice, and apple juice was a convenient and effective alternative, although other beverages or juices could have been used. Since most patients did not care for the color or taste of the dye, a strong colored and tasting juice proved helpful. An equal balance of dye to liquid ensures ingestion of the complete dosage without being so diluted that patients can not tolerate the amount of liquid. In early tests we photographed at five minute intervals from 5 to 40 minutes. The best photographs were generally at 25, 30, and 35 minutes, although one can get results from 20-50 minutes.

**Results**

After reviewing the 53 angiograms, we concluded that the quality of the Images seemed comparable to the typical late phase images taken on intravenously injected patients. We evaluated the original film negatives. Each photograph was compared against a high quality, properly exposed intravenously injected late phase angiogram of clear media patient demonstrating no obvious retinopathy. Good quality meant even exposure with good to excellent detail. Bad quality meant uneven exposure with bad to fair detail, and poor quality meant poor exposure with little or no detail. Quality seemed unaffected by age (our group ranged in age from 18-60) or by media. Of the 53 angiograms, 40 could be characterized as good (easy to read), 12 as bad (difficult to read), and one as poor (unable to read).

Our retina staff determined that this group of Ehlers-Danlos patients seemed to show no specific retinal abnormality related to their disease. Some patients had ocular pathology, but in no greater numbers than found in the general population.

**Conclusion**

Certainly the vast majority of patients are best served with IV fluorescein. However good quality images can be obtained from a patient given dye orally. The pictures will be similar to late phase photographs from a patient injected with dye. We founds best results were obtained at 20 to 30 minutes post ingestion. Oral dosage can be an acceptable solution depending upon the information required.

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**REFERENCES**


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Figure 1: One of the few patients with retinal pathology, this patient had a choroidal rupture unrelated to Ehlers-Danlos, photograph at 35 minutes.

Figure 2A: Disc Photograph at 35 minutes.

Figure 2B: Macular Photograph at 35 minutes, same patient as 2A.

Figure 3: Photograph at 25 minutes.

Figure 4: Photograph at 50 minutes.