

## CASE REPORT

# Intro-Arterial Injection of Indocyanine Green Dye

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**Abstract:** *During the injection phase of ICG diagnostic photography, 3.5cc's of ICG dye was inadvertently injected intra-arterially in the antecubital fossa. An immediate green flush was noted in the patient's arm from the injection site moving in a wavelike fashion to her hand and then clearing from the hand back to the elbow at approximately the same speed. The patient experienced no pain at the time of the injection, but described a slight "pins and needles" sensation in her forearm and hand about two minutes after the injection. The sensation lasted less than five minutes and required no treatment.*

### INTRODUCTION

The antecubital vein is a commonly chosen site for sodium fluorescein and Indocyanine Green dye injection for the purpose of diagnostic photographic studies. The effects of accidental arterial injection of fluorescein dye have been previously reported.<sup>1</sup> Intro-arterial Indocyanine Green dye injection has not been reported.<sup>2</sup>

### CASE REPORT

A 72 year old female was referred to our retinal service for evaluation of an occult subretinal neovascular membrane in the juxtafoveal area of the right eye. She initially visited her optometrist for a regular yearly checkup and at that time was noted to have "something behind her right eye." The patient was unaware of visual changes in the right eye. We

found her vision to be OD 20/40, PH no improvement; OS 20/30, PH no improvement. The patient was noted to have bilateral macular drusen with a serous fluid elevation in the central foveal avascular zone of the right eye consistent with an ill-defined RPE detachment and without evidence of hemorrhage or exudate. The left eye was non-exudative. Fluorescein and Indocyanine Green (ICG) angiography were recommended for evaluation of the right eye.

The ICG study was performed first. A tourniquet was placed around the left arm above the elbow. 50mg of ICG dye in 3.5ml of sterile aqueous solvent was injected into the antecubital vessel. The dye entered quickly and easily. After approximately half of the dye had been injected, the antecubital area developed a greenish hue—unlike the firm, green

elevation of an extravasation. The green color moved down the length of the arm and into the patient's hand in a wave-like fashion over a period of about thirty seconds. The patient's arm and hand remained markedly green for another thirty seconds and then began to return to their normal color; again in a wave-like pattern from the hand proximally. Within two minutes of the injection, the affected arm was completely normal looking, with the exception of a dime-sized green patch at the base of the left palm (Fig. 1). The discoloration cleared within five minutes of the injection.

At no time did the patient complain of associated pain. Upon questioning, she noted only a mild "pins and needles" sensation in her arm which quickly resolved spontaneously. During a follow-up phone call, the patient reported that her affected hand was noticeably green in comparison to her other hand for about a week. Otherwise, she reported no complications.

The ICG study itself showed no evidence of an unusual injection. The subsequent fluorescein injection at another site was uneventful.

#### DISCUSSION

The blood vessels in the human body frequently vary from their usual course.<sup>3</sup> In the arm, either the brachial, radial, or ulnar artery may divide at a higher level than usual which can result in a superficial artery in the antecubital fossa. Studies document a superficial ulnar artery in .75% to 2.7% of patients.<sup>3,4</sup> Situated in close proximity to the veins in the antecubital fossa, this artery may easily be entered in error while attempting a venipuncture.<sup>4,5</sup>

Intra-arterial injection of some drugs (for example hydroxyzine, phenytoin, benzathine penicillin, rolitetracycline, and sodium pentothal) has resulted in severe pain and lead to gangrene and eventual amputation.<sup>5,6,7,8</sup> Accidental intra-arterial injection of sodium fluorescein produces an immediate orange discoloration of the skin distal to the injection site and a burning pain which gradually subsides over the course of 20 minutes upon treatment with acetaminophen and ice packs.<sup>1</sup>

Sodium fluorescein and ICG dye are often injected under less than ideal lighting conditions, sometimes in awkward positions. The inadvertent arterial injection of ICG dye in our office produced an immediate green color in the injected arm distal to the injection site but no pain and no long term complications. A mild pins and needles effect was felt by the patient initially but this resolved quickly with no treatment.

Some steps can be taken to avoid inadvertent intra-arterial ICG injections. The vessel intended for the venipuncture should be palpated prior to application of a tourniquet. Once a tourniquet has been applied, pulsation of an aberrant artery cannot be detected.<sup>4</sup> Examine the intended<sup>y</sup> es-



Figure 1

sel and monitor the injection under the best lighting circumstances possible. Report any unusual events to the attending physician as soon as possible. Following up with a phone call to the patient is appropriate.

#### REFERENCES

1. Bovino J, Marcus D. Accidental intra-arterial Injection of fluorescein dye Ophthalmic Surgery. 1984;15(12) 983-984
2. Same P, Tyler M. Ophthalmic Photography: A Textbook of Retinal Photography, Angiography, and Electronic Imaging. Boston: Butterworth-Heinemann. 1997;117-146
3. Hazlett J. The superficial ulnar artery with reference to accidental intra-arterial injection. Canad. M.A.J. 1949; 61:289-293.
4. Weathersby H. Anomalies of brachial and antebrachial arteries of surgical significance. Southern Medical Journal. 1956; 49:46-49
5. Cohen, S. "Accidental intra-arterial injection of drugs" Lancet. 1948; 2:361-416.
6. Sintenie JB, Tuinebreijer WE, Kreis RW, Breederveld RS. Digital gangrene after accidental intra-arterial injection of phenytoin (epanutin). European Journal of Surgery. 1992; 158(5):315-6.
7. Wynne JM, Williams GL, Ellman BA. Accidental intra-arterial injection. Archives of Disease in Childhood. 1978; 53(5):396-400.
8. Tokodi G, Huber FC. Massive necrosis after hydroxyzine injection. JAOA. 1995; 95(10):609-12.

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Kimberly McQuaid has 10 years experience as both an ophthalmic photographer and ophthalmic technician.

Patrick Same co-authored the book "Ophthalmic Photography: A Textbook of Retinal Photography, Angiography, and Electronic Imaging" and is active in the Ophthalmic Photographers' Society.

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