Introduction to The Fluorescein Angiography Procedure

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Electronic CEC Submission

http://www.opsweb.org/?page=AnnualCECaccess2013

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Purpose:

- Fluorescein Sodium Dye
- Blood Flow to The Eye
- Preparation of the FA Materials
- Sequence Properly: FC, RF, FA.
- Performing a Fluorescein Angiogram in a timely manner.
Fluorescein Sodium Dye

- First synthesized in 1871 by Adolf von Baeyer
- pH = 8.0 – 9.8, Very Stable
- Preparations with:
  - Sodium Hydroxide
  - Hydrochloric Acid
  - Sodium Hydroxide
Fluorescein Sodium Dye
Sodium Fluorescein Dye

- Imperial Formula: $\text{C}_{20}\text{H}_{12}\text{O}_5$
- Molar Mass: 332.31
- Usable form: Lyophilized Powder
- Carrier: Water
- M.P. 314-316 C
Wavelength Spectra
FA Dye and Circulation to the Eye – Arteries and Veins

Arterial Blood Flow

Venous Blood Flow

Antecubital Fossa Left Arm

Left Hand Vein
FA Dye and Circulation to the Eye – Arteries and Veins

Brain and Circle of Willis

Vertebral Arteries L/R

Common Carotid Arteries L/R

Aorta

4 Chambers of the Heart Muscle
FA Dye and Circulation to the Eye – Arteries and Veins

The Cerebrovascular System
(a sagittal view)
FA Dye and Circulation to the Eye – Circle of Willis
FA Dye and Circulation to the Eye – Circle of Willis
FA Dye and Circulation to the Eye – Ophthalmic Artery
FA Dye and Circulation to the Eye – Central Retinal Artery
Fluorescein Sodium Dye
Preparation of Intravenous FA Dye
Injection Preparation
Carefully Recap Needle
Carefully Recap Needle
Rotate Capped Needle Upwards
Secure Needle Cap
Testing Camera
Alcohol Swab – Add 1 drop of dye
Dilution is Critical
Photograph the Dye
Photograph of the Dye
Selection of Butterfly Delivery
Phenotype of Hand Veins/ Arm Vein

- First impression
- Large bore vein – Larger butterfly needle
- 23 Gauge
- Small bore vein – Smaller butterfly needle
- 25 Gauge
Phenotype of Hand Veins
Phenotype of Hand Veins
Table Preparation

- Alcohol Wipe(s)
- 2 x 2 Gauze(s)
- Tourniquet
- Tape
- Sodium Fluorescein Dye – Loaded in Syringe
- Butterfly Needle – Attached (?)
- Waste Barrel / Sharps Barrel
- Gloves
Table Preparation
Preliminary Photo Documentation

- Color External Photos OU
- Color Fundus Photos OU, Pathology OU
- Red Free Photos OU.
Infusion Therapist, RN, or MD
Infusion Therapist or RN
Two Tourniquets
Two Tourniquets
40 mm pressure
Prior to FA Dye Injection

- Camera Controls set to FA Capture
  - Exciter Filter = Out / In / Automatic
- Computer Controls for FA Capture
- Starting Eye is in Position.
- Target In Use: External / Internal
- Posterior Pole in Focus.
- Clock/Timer = Set to Zero / Not Started
Confirmation of Venipuncture
Prior to FA Dye Injection
Dialogue Prior to Dye Injection

- Communicate your status with your injecting personnel, MD, RN, Infusion Therapist.
- When asked ‘Are You Ready?’
- Give confirmation signals:
  - “….And Inject !”
  - “….And Go !”
- Depress Camera Trigger Simultaneously !
Dye Injection Begins
Photographer Controls The Room

- Take a Photograph as Dye Enters the Body
  - T=0
- Take a Photograph as the Injection Period Ends
  - T= 5-7 seconds
- Take Photographs of the Starting Eye every **2 seconds** for the first **45 - 50 seconds**
- Take Photographs of the Fellow Eye
Photographic Sequence

- **Early Phase FA**
  - Start: Zero to 1 minute – Study Eye
  - 1 + minute – Fellow Eye

- **Mid Phase FA**
  - 2-3 minutes – Study Eye / Fellow Eye

- **Late Phase FA**
  - 5-7 minutes – Disease Dependent
FA Right Eye, Color Photo
FA Right Eye, Red Free (B+W)
FA Right – Early Photos – 15 sec
FA Right – Early Photos – 18 sec
FA Right – Early Photos – 21 sec
FA Right – Early Photos – 25 sec
FA Right – Early Photos – 30 sec
FA Right – Mid phase – 2 mins
FA Right – Late Phase – 5 mins
FA Left, Color Photo
FA Left, Red Free Photo (B+W)
FA Left, Early Phase – 29 sec
FA Left, Early Phase – 31 sec
FA Left, Early Phase – 33 sec
FA Left, Early Phase – 36 sec
FA Left, Early Phase – 38 sec
FA Left, Early Phase – 43 sec
FA Left, Early Phase – 47 sec
FA Left, Mid Phase – 2 min 37 sec
FA Left, Late Phase – 5 min 42 sec
Over Exposure

- Masks Detail, Leakage, and Pathology

- Compensate Over Exposure:
  - Increase opening of aperture
  - Decrease flash setting by only
    \( \frac{1}{2} \) Half stop at a time
Examples of Over Exposure that are correctable

Wet ARMD with Foci of Leakage OS – FA Mid Phase
Examples of Over Exposure that are correctable

- Branch Retinal Vein Occlusion OD – FA Mid Phase
Examples of clarity that are uncorrectable

- External Photos OU
Examples of clarity that are uncorrectable

- FA Mid Phase OU
Examples of clarity that are uncorrectable
Examples of clarity that are uncorrectable

- Vacuoles on Posterior Capsule following IOL Implant
Examples of Long Fluorescein Angiography

- Diabetic Macular Edema, OU, 8 mins.
Clinical History

- ACIOL, Iris adhesion to the cornea at 2:00 and, an open posterior capsule.
Clinical History

- 3/1/12  BCVA OS 20/63
- BRVO, CME OS.
- FC
Clinical History

- 1/20/11  BCVA OS 20/63
- BRVO, CME OS.
- RF
Clinical History

- 3/1/12  BCVA OS 20/63
- BRVO, CME OS.
- FA, Late Phase, 8’
References

● FA Fundamentals
  http://www.opsweb.org/?FA

● FA Equipment and Technique:
  http://www.opsweb.org/?FAequipment

● Descriptive Interpretation
  http://www.opsweb.org/?FAinterpretation

● FA Step - By - Step:
  http://www.opsweb.org/?FAsteps
Thank You

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