Fluorescent Augmentation Of The Wisconsin “Blue-Blood” Chicken Thigh Model Enhances The Assessment Of Anastomotic Patency In Supermicrosurgical Training

Nicholas J. Albano, MD

ACAPS Winter Retreat
February 22, 2020
Background

- UW’s “blue-blood” chicken thigh model

- Reliable anatomy
  - 1.0 – 3.0mm vessels

- Visceral experience

- Immediate feedback
Background

Lesson 4

End-To-End (ETE) Anastomosis in Chicken Thigh 1
(two-stay method 1 & 2)

Course Description – Perform ETE anastomosis on femoral A with 2 methods

Models: Blue-blood Chicken thigh model

Hours: 2 hours

Topics:
1. Microdissection (preserve the muscle and the branches)
2. Small branches ligation
3. Vessel end preparation (Strip the adventitia, dilate the vessel, place the double clamp the vessel)
4. The sequence of placing stitches for two-stay method
5. How to judge the number of necessary stitches and place stitches evenly
6. Skill of placing the first and 2nd entry bite and exist bite
7. Skill to avoid hook up the back wall
8. Method to pull the suture out without tearing the vessel
9. Understand how big is good for the bite.
10. Method of making loop

Original Article

Multispecialty Microsurgical Course Utilizing the Blue-Blood Chicken Thigh Model Significantly Improves Resident Comfort, Confidence, and Attitudes in Multiple Domains

Nikita O. Shulzenko, BA1, Wenting Zeng, MD1, Nicholas J. Albano, MD1, Sarah M. Lyon, MD1, Aaron M. Wieland, MD2, Ashish Y. Mahajan, MD3,4, Daniel Williams, MD5, Michael L. Bentz, MD1, Samuel O. Poore, MD, PhD1

University of Wisconsin
Division of Plastic and Reconstructive Surgery
Microsurgery Training Curriculum
Background

- Excellent source of small vessels
  - $\geq 0.3\text{mm vessels}$
- Require “blue-blood” to identify
- Difficult to assess quality of anastomoses
1. Demonstrate the feasibility of live fluorescence imaging in supermicrosurgical training model.

1. Use fluorescence data to enhance real-time training feedback.
Methods

Supermicrosurgical anastomoses

- $n = 11$
- 0.35 – 0.45mm diameter
- Infuse “blue-blood” and ICG mixture

Imaging

- Simultaneous capture (OnLume):
  - White light and fluorescence
Methods

Grading key
- Live group consensus

Staff assessment of anastomoses
- Separate and randomize video clips (n = 22)
- Grade each clip:
  - Patent
  - Not Patent
  - Unsure
  - Leak Present

Staff opinion
- Likert scale
Methods

Metrics
- Accuracy
- Uncertainty
- Inter-rater agreement
- Surgeon opinion

Analysis
- Unpaired t-tests
Results
7 Microsurgeons

- 4 Plastic Surgery
- 3 ENT

100 Percent Completion
Improved Accuracy

Correct Responses (%)

White Light

ICG Overlay

$p = 0.0147$
Decreased Uncertainty

$p = 0.011$
Increased Inter-rater Agreement

$p = 0.016$
ICG Improves Assessment of:

- **Patency**
  - 100% Strongly Agree

- **Leak**
  - 43% Agree
  - 57% Strongly Agree
Conclusions

Fluorescent augmentation:

• Enhances accuracy
• Decreases uncertainty
• Increased inter-rater agreement
• Strongly preferred by surgeons
Thank you!
Fluorescent Augmentation Of The Wisconsin “Blue-Blood” Chicken Thigh Model Enhances The Assessment Of Anastomotic Patency In Supermicrosurgical Training

Nicholas J. Albano, MD

ACAPS Winter Retreat
February 22, 2020