Vascular Emergency Surgery: Simulated Exercises for Limb Salvage (VESSELS)

Curriculum Needs Assessment For Deployed Military General Surgeons

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INTRODUCTION

Lower and upper limb amputations are some of the most life-altering combat injuries sustained by our military personnel.
From January 2001 through October 2017:

- total of 1,705 service members suffered deployment-related amputations
- 21-29 years old
- 1,914 lower + 302 upper limb amputations. [1]

Salvage of a limb saves someone from impaired mobility, abnormal physiology, and social effects of amputation and is, therefore, a needed skill to the deployed surgeon. We aim to create a vascular emergency surgery simulation curriculum for the general surgeon that encompasses vascular and limb-salvage techniques.

METHODS

A targeted needs assessment (Figure 1) of general and subspecialty surgeons was performed to identify vascular emergencies and procedures faced while deployed or without access to a vascular surgeon to guide curriculum development and create a simulation model.
Collected data included:

- years of experience
- subspecialty
- vascular emergencies encountered while deployed
- previous vascular training opportunities
- whether additional preparation would have been helpful before deployment

Name _____

Vascular Emergency Surgery: Simulated Exercises for Limbsalvage) Course Needs Assessment

1) What year did you complete general surgery residency? _____
   a. What is your subspecialty (if applicable)? _____
2) How many deployments/underways on ship, or other environment without immediate access to/assistance from a vascular surgeon have you completed? _____
3) How many vascular emergencies have you encountered during deployments/underways without immediate access to/assistance from a vascular surgeon? _____
   a. Please list emergencies encountered:
4) Do you manage vascular emergencies in your current practice without consulting vascular surgery? Y/N
   a. If yes, please specify which emergencies you manage:
5) How many emergency vascular procedures have you performed during deployments/ underways without immediate access to/assistance from a vascular surgeon? _____
   a. Please list specific procedures here with number of times procedure completed:
6) What vascular training experience did you have prior to deployment? (i.e. ASSET)
7) What vascular emergencies or emergency procedures would you have liked more training on prior to deployment?

Figure 1: Needs assessment survey

RESULTS

Thirteen general and subspecialty surgeons were surveyed.

- 6 junior (less <10 years of practice) + 7 senior surgeons
- Deployments without immediate access to a vascular surgeon → 1-10
  - 1 surgeon has yet to deploy
- Only one surgeon manages vascular emergencies in their current practice without assistance from a vascular sub-specialist
- Majority (61.5%) participated in the cadaveric Advanced Surgical Skills for Exposure in Trauma (ASSET) course

We identified a need for further vascular surgical technical training, including vessel repair, vascular control, and shunt placement.

	Junior (n=6)	Senior (n=7)
Number who manage vascular emergencies during regular practice	0	1
Number of deployments	6	23
Number of vascular emergencies encountered underway	3	31
Percent who completed ASSET course	83%	57%
Percent who would have liked more training before deployment	83%	86%

CONCLUSION & DISCUSSION

Vascular surgery is a low-volume and high-complexity specialty, where a comprehensive assessment of technical skills is essential. A needs assessment of military surgeons demonstrated a need for additional limb-salvage skills training. Many surgeons complete the ASSET course which uses human cadavers to teach surgical exposure of anatomic structures that may pose a threat to life or limb when injured. It is designed for mid/senior surgical residents, trauma and acute care surgical fellows, or any surgeon who wishes to review the anatomy. The majority of surveyed surgeons expressed that they would have like more training in addition to the ASSET course.

We will use this data to create a novel low-cost arterial model for a simulation vascular emergency surgery curriculum dedicated to limb salvage. The traditional surgical learning model of "learning by doing" does not provide vigorous vascular surgery practice during general surgery training. Simulation learning is a valuable adjunct to medical education as it provides a standardized and safe environment to learn and practice skills. Most learners favor simulators for their training due to the combined realism and ability to practice. [2] This project is with a military surgeon in mind who can learn or review skills that may be needed while deployed.

We aim to create a vascular emergency surgery simulation curriculum for the general surgeon that encompasses vascular and limb-salvage techniques. The VESSELS course will be tested at two major military training facilities, Walter Reed National Military Medical Center and Navy Medical and Readiness Training Command Portsmouth, as part of a more extensive simulation program to provide needed training for the deployed surgeon. The overarching program aims to provide skills training and practice for common surgical procedures encountered while deployed, including anorectal, urological, gynecological, orthopedic, ENT, ophthalmologic, vascular, and veterinary medicine.

REFERENCES

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