UPDATED: July 2009

ROTATION: VASCULAR SURGERY

ROTATION DIRECTOR: Peter Lawrence, M.D.

SITES: UCLA Medical Center

GOALS:

To provide trainees an opportunity to participate in the perioperative and operative aspects of vascular surgery.

LEVEL OF TRAINEE: R4

ASSESSMENT:

Monitoring of the accomplishment of the stated objectives will be performed using the following methods:

1. Global Rating: end of rotation evaluation of resident performance to assess the resident’s demonstration of Core Competencies with respect to the stated objectives by faculty, other team resident members, students, and nursing staff.
2. Case Logs: auditing of operative cases pertinent to the specialty in the Surgical Operative Log.
3. Written Examination: performance on the annual ABSITE examination, Cardiovascular and Respiratory systems section.
4. Patient Survey: performance will be assessed by patient surveys administered though the rotation.

DESCRIPTION OF THE ROTATION:

The Vascular Surgery rotation of 1 month in R1, 1 month R2 years, and 2 months R4.

1. All rotating will be part of the Vascular Surgery team and responsible for the care of the cardiac surgery patients.
2. The surgery residents will provide in-patient care including routine admissions and critical care of patients.
3. Residents will further participate in surgical operations needed on these patients under direct supervision by the surgical faculty.
4. The rotating residents will participate in all Department of Surgery educational conferences and didactic presentations.
5. Residents are expected to actively participate and present at the weekly Vascular Surgery Conference.
R4 RESIDENT

COMPETENCY BASED LEARNING OBJECTIVES

Patient Care:

1. Perform a complete and thorough history and physical examination, with emphasis in elements unique to vascular surgery patients.
2. Initiate the laboratory evaluation and any other initial diagnostic studies with an understanding of the tests to be ordered.
3. Make informed decisions about diagnostic and therapeutic interventions on vascular surgery patients with the guidance of senior residents and faculty.
4. Be proficient in the preoperative preparation of the patients for vascular surgery and routine postoperative care.
5. Understand basic pathophysiology of vascular disease and begin to master the skills necessary to care for the ICU patient under the guidance of the senior residents and faculty members.
6. Understand basic pathophysiology of vascular disease, principles of resuscitation, preoperative and postoperative care of vascular surgery patients under the guidance of the senior residents and attendings.
7. Understand the basic indications for common radiological and interventional studies used in the care of cardiac surgery patients such as plain chest, CT scans, non-invasive cardiac function tests, and angiography.
8. Demonstrate the ability to effectively set priorities and coordinate the care of vascular patients.
9. Physical Examination
   a. To understand the significance of observational signs, such as skin color and texture, swelling, gangrene, and ulcers.
   b. To detect and evaluate peripheral pulses, bruits, thrills, skin temperature, edema, tissue turgor, and vascular dimensions.
   c. To develop the skills necessary to palpate the abdomen, neck, and extremities in order to localize sites of tenderness and to recognize the presence of masses and abnormal pulsations.
   d. To be capable of performing basic neurological evaluations.
   e. To interpret physical findings, understand how they contribute to the diagnosis, recognize their limitations, and be aware of other diseases that might mimic the findings.
   f. To be familiar with commonly used noninvasive instruments and modalities, such as Doppler ultrasound, duplex and color-flow scanning, B-mode imaging, plethysmography (air, mercury, and impedance), magnetic resonance imaging (MRI), magnetic resonance angiography (MRA), and computerized X-ray tomography (CT).

Medical Knowledge:
Aneurysmal disease

1. To understand the technical aspects of aortic aneurysm repair and surgical options and alternatives including endovascular options and patient selection.
2. To have knowledge of both the immediate and long-term outcomes of surgery for aortic aneurysmal disease (including symptomatic, asymptomatic, thoracoabdominal, juxtarenal, infrarenal and recurrent).
3. To describe the management and prevention of surgical complications of aortic aneurysm repair

Peripheral Vascular Occlusive Disease (Acute and Chronic)

1. To understand the mechanism of early and late graft failure, fibro-intimal hyperplasia and progression of disease.
2. To understand the relative indications for immediate diagnostic angiography versus urgent surgical exploration.
3. To understand the arteriographic findings characteristic of different etiologies and to appreciate the diagnostic imaging options available in addition to arteriography (MRA, CT, duplex imaging).
4. To understand the difference in application of options relative to the degree of ischemia (claudication versus critical ischemia, with or without tissue necrosis).
5. To understand the importance of appropriate imaging studies prior to formulating a therapeutic management plan.
6. To appreciate the characteristic angiographic findings in patients with common patterns of peripheral vascular occlusion as well as the importance of assessing available collaterals.
7. To appreciate the relative indications for immediate angiography, thrombolytic therapy, or urgent surgical exploration relative to the duration of symptoms and magnitude of ischemia.
8. To have a comprehensive understanding of the variety of surgical exposures of the peripheral vasculature.
9. To be familiar with endovascular options for the treatment of occlusive disease.
10. To have a comprehensive understanding of all standard surgical approaches for surgical revascularization including endarterectomy, patch angioplasty and bypass (in-situ and reversed vein grafts, prosthetic grafts).
11. To have an understanding of the role of endovascular approaches in the treatment of chronic peripheral vascular disease.

Renal Artery Disease

1. To define the techniques of surgical exposure for renal artery lesions.
2. To understand the indications for surgical renal artery reconstruction as they relate to the various renal artery lesions.
3. To understand the indications, anticipated anatomic results and clinical response associated with catheter-based intervention for the various renal artery lesions.
4. To recognize and develop a plan of management for complications associated with surgical management of renal artery disease and understand how these complications relate to co-existing renal and extrarenal disease.

**Visceral Ischemia**

1. To be familiar with techniques for surgical exposure of the main mesenteric vessels, to understand standard surgical options for revascularization following acute mesenteric embolism or acute mesenteric arterial thrombosis, and to understand surgical options for the management of intestinal necrosis when this has occurred.

2. To recognize the relationship of different anatomic patterns of gut infarction to the different causes of acute mesenteric ischemia when intestinal infarction is encountered unexpectedly at the time of laparotomy.

3. To understand the relative usefulness of intraoperative techniques available for the assessment of intestinal viability at the time of surgical treatment for acute mesenteric ischemia.

4. To understand the pathophysiologic effects of intestinal reperfusion after surgical treatment of acute mesenteric ischemia and the impact of these effects on postoperative patient care.

5. To understand the role of early empiric re-exploration following surgical treatment of acute mesenteric ischemia.

6. To understand standard and alternative treatments for mesenteric venous thrombosis including the role of surgical treatment in the management of this disorder.

7. To be familiar with all standard surgical techniques for direct, elective visceral revascularization and understand the importance of comprehensive revascularization in the surgical treatment of chronic intestinal ischemia.

8. To be aware of surgical alternatives for treatment of atypical or non-atherosclerotic visceral arterial occlusive lesions.

9. To understand the possible application of interventional, nonsurgical treatments for chronic visceral arterial occlusive lesions.

**Cerebrovascular Disease**

1. To describe the standard approach to carotid endarterectomy including intraoperative shunting, patching, anesthetic techniques, tacking sutures and methods of completion evaluation.

2. To describe the etiology and management of complications of carotid endarterectomy including wound hematoma, wound infection, post-operative hyper and hypotension, peripheral nerve palsies, transient ischemic attack and stroke, intracranial hemorrhage, and post-operative seizure.

3. To discuss the intrathoracic and extrathoracic treatment of atherosclerotic stenosis or occlusion of the great vessels.

4. To discuss the clinical features and indication for vertebral artery reconstruction.
Thoracic Outlet Syndrome

1. To be familiar with surgical techniques and anatomy for first rib resection (transaxillary, supraclavicular, total anterior scalenotomy).
2. To define specific complications related to the surgical approach (traction injuries to the brachial plexus, pneumothorax, injury of the subclavian artery, injury to the subclavian vein, air embolus as a result of subclavian vein injury, nervous system injury, i.e. long thoracic nerve, intercostobrachial nerve, musculocutaneous nerve).

Diabetic Foot Problems

1. To understand the role of revascularization in the management of the diabetic foot, including endovascular alternatives and surgical reconstructions.
2. To be familiar with the surgical techniques, including approach and choice of conduit for revascularization of the diabetic foot.
3. To present an appropriate management plan for the severely septic foot.
4. To outline the indications for and illustrate the techniques of distal reconstruction, major and minor amputations.

Complications of Vascular Therapy

1. To understand techniques for surgical exposure and proximal control of aortic, femoral, and other peripheral artery false aneurysms, including the use of balloon-tipped catheters to prevent backbleeding.
2. To define the role of duplex-guided ultrasound for the treatment of common femoral artery pseudoaneurysms following diagnostic arteriography or percutaneous endovascular procedures.
3. To be familiar with criteria for IMA re-implatation during aortic surgery.
4. To be familiar with surgical techniques useful in the treatment of immediate versus late graft occlusions.
5. To define the role of thrombolysis versus surgical intervention for graft occlusion/thrombosis.
6. To be familiar with extra-anatomic bypass grafting techniques in treatment of aortofemoral graft limb occlusion.
7. To understand the role of anti-thrombotic therapy in treatment of graft thrombosis.
8. To understand the standard surgical principles used to treat wound necrosis, hemaatoma, and infection.
9. To be familiar with renal preservation techniques associated with aortic and renal surgery.

Vascular Trauma

1. To understand the operative management of acute arterial injury and the management of concomitant venous or visceral injuries.
2. To define the operative approach for specific arterial injuries (ie left and right subclavian).
3. To understand the management of postoperative complications and the management of associated injuries.
4. To understand the operative management of combined arterial and venous injuries, technical management of venous injuries (ie ligation, lateral suture repair, end-to-end anastomosis, venous patch graft or venous replacement graft).
5. To define operative approach and appropriate management of specific major venous injuries (ie management of retro hepatic IVC, subclavian vein).
6. To understand the management of postoperative complications, and associated injuries.
7. To define the clinical criteria and indications for nonoperative versus operative management of patients with vascular injuries.
8. To define the operative management of the patient with combined vascular and visceral injury.
9. To demonstrate an understanding of postoperative care for critically ill patients with combined vascular and visceral injuries, potential complications and their appropriate management.

Venous Thromboembolic Disease

1. Describe the indications and technique of vena cava filter placement.
2. Recognize the signs and symptoms of phlegmasia cerulea as a complication of severe DVT.

Extremity Amputation

1. To understand the basic techniques for toe amputation, ray amputation, transmetatarsal amputation, below knee amputation, above knee amputation and upper extremity amputation.
2. To understand the causes of stump failure, including technical problems, inadequate skin and muscle perfusion, hematoma, inadequate flaps, pressure necrosis from transected bone, and infection.

Vascular Access

1. To know the treatment of complications of arteriovenous fistulas for hemodialysis including infection, steal syndrome, aneurysms, venous hypertension, thrombosis, stenosis, and the failing graft.
2. To know the uses and benefits of using autologous or synthetic grafts for the purpose of hemodialysis including the locations, timing of placement, maturation and longevity of the various access routes and grafts.
Practice Based Learning:

1. Develop a personal program of self-study and professional growth with guidance from the teaching staff and senior residents. An understanding of the etiology, pathogenesis, pathophysiology, diagnosis and management of vascular surgery disorders will allow for sound surgical judgment, which relies on knowledge, rational thinking and the surgical literature.
2. Utilize current literature resources to obtain up-to-date information in the vascular patients and practice evidence-based medicine.
3. Participate in teaching and organization of the educational weekly conferences.
4. Participate in activities of the Department of Surgery (including all teaching conferences) and assume responsibility for teaching and supervision of subordinate surgical house staff, and medical students.
5. Participate in the Department Morbidity & Mortality conference and utilize information to further improve patient care.
6. Participate in daily teaching rounds and be able to present patients in an organized and complete fashion

Professionalism:

1. Practice compassionate patient care maintaining the highest moral and ethical values with a professional attitude.
2. Demonstrate understanding of the needs and feelings of others, including the patient's family members, allied health care personnel (nurses, clerical staff, etc.), fellow residents, and medical students.
3. Communicate and collaborate effectively in a team of health care providers
4. Demonstrate respect, compassion and integrity in the care of cardiac surgery patients on a daily basis
5. Demonstrate mature and educated approach to Ethical issues commonly encountered in a cardiac surgery setting.
6. Show sensitivity to patients culture, age, gender and disabilities
7. Recognize and appropriately handle sensitive cases of abuse
8. Be self-aware and have knowledge of professional limits by practicing on-going medical education and self-improvement.
9. Be accountable to profession in their actions and decisions

Interpersonal Relationships And Communication:

1. Create and sustain a therapeutic and ethically sound relationship with patients and patient families
2. Work effectively with other members of the medical team including allied health care personnel (nurses, clerical staff, etc.), fellow residents, and medical students.
3. Maintain professional interactions with other health care providers and hospital staff
**Systems Based Practice:**

1. Understand how the health care organization affects surgical practice of cardiac surgery
2. Demonstrate cost effective health care
3. Be able to coordinate multi-specialty and multidisciplinary trauma care practice including discharge planning, social service, rehabilitation, and long term care
4. Follow established practices, procedures, and policies of the Department of Surgery and integrated and affiliated hospitals.
5. Maintain complete of medical records operative notes staff sheets and notes, patient database cards and other patient care related documentation in a timely, accurate and succinct manner.

**Conferences:**

M&M conference (Wednesday 7-8 am)
This conference is the combined M&M of general surgery and vascular surgery. Since the 4th year resident is responsible for running the inpatient service, s/he presents all patients at this conference. The M&M presentation should concisely discuss the relevant background information, x-rays, identify the complication, as well as the management of the complication. At the end of the presentation, the PGY 4 resident should be prepared to discuss whether the complication or death was primarily due to the patient's underlying disease, an error in judgment, or an error in technique. This assessment should be discussed with the responsible faculty member before the presentation. At the end, you should be prepared to discuss what should have been done differently to avoid the complication and/or death, as well as a brief review of the relevant literature.

Decision making/pre-op conference (Thursday 5-5:45 pm)
Decision making - This conference is an opportunity to discuss any patient (clinic or pre-op) who represents an interesting or challenging diagnostic or management issue. The person who has seen the patient and is most familiar with him/her (student, resident, fellow, or faculty) should present the patient in a concise but thorough format to the faculty, residents, and students in attendance. Appropriate x-rays, angiograms, and lab data, as well as a proposed plan of treatment should be presented. An LCD projector will be set up and available. In addition, any relevant literature related to the clinical problem should be reviewed and briefly discussed. It should be possible to discuss 3-4 patients in this conference, if the presentations are well organized. The responsibility for organizing this conference and assigning patients for presentation of this conference is the second year vascular fellow.

Pre-op conference - We review pre-op cases for the coming week, to allow the resident and student team to plan the schedule and prepare for the next week by reading about the clinical problems. Margie Vallejo, R.N., our inpatient case manager, organizes this part of the conference. She prepares the cases with
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Debbie Kass, ANP, our outpatient preop and risk factor management nurse practitioner. They will discuss the preop preparation and plans for each patient. If the plan is unclear, we may have a more detailed discussion.

Thursday Vascular Educational Day (5:45-6:30 pm)
Teaching Conference
This conference is comprised of a rotating schedule of journal club, research conference, Vascular Grand rounds, and vascular lab teaching conference.

a. Research conference - this conference will be organized by Candy Vescera, RN., director of vascular research, and will focus on existing and future research projects. Students, residents, and faculty interested in vascular research are expected to attend and participate.

b. Grand Rounds - Each PGY 4 resident, Vascular Fellow 1, Vascular fellow 2, and faculty presents a formal 30 minute talk on a topic of interest in vascular disease, in rotation. Other UCLA faculty are also invited to present topics of interest to vascular surgeons.

c. Vascular lab Conference – Dr. J. Dennis Baker, Director of the Vascular Lab, and Vicki Carter, R.N., R.V.T., Technical Director of the lab, organize this conference. They will present examples of vascular studies of different diseases and vessels, with the goal of helping residents and students understand the role of the lab in the diagnosis of vascular disease and to prepare fellows for the RVT exam.

d. Journal club - This conference is organized by the Endovascular (1st year) fellow. The intent of the conference is to review 3-4 publications, either in a topic area or in a journal, organized around the APDVS core curriculum. Presentations of papers will be assigned to the residents and students on the vascular service, and will consist of a review of the paper, followed by a critique of the quality of the paper. Faculty will then comment on the quality of the presentation and the significance of the paper with respect to other vascular literature.

Wednesday Grand Rounds (8:00-9:00 am)
This conference is run by the general surgery division and required of all students and housestaff, except the vascular fellow. Fellows are expected to attend the conference when it deals with a clinical problem related to vascular disease. Presentations on a full range of topics are given by UCLA and visiting faculty. The OR first hour start is delayed on Wed for educational conferences.

Attending Ward Rounds
The attending of the week will make teaching ward rounds at least 3 times/week with the team. Students and residents should be prepared to present and discuss their patients, as well as the relevant literature related to the clinical problem. These rounds will be distinct from work rounds.

Annual UCLA Symposium
All fellows, residents, and students are encouraged to attend the annual review and endovascular course, held each fall over a 1 week period. During this time,
all formal teaching conferences in the division will be cancelled and attendance expected at this high quality CME conference, which provides a comprehensive review of vascular disease diagnosis and treatment.

REFERENCES:

TYPICAL WEEK: