

# **Surgery II Clerkship Objectives Cases/Discussion Questions**

## **Aortic Disease**

1. Discuss the immediate medical therapy for an aortic dissection and indications for emergency versus elective surgery.
2. Differentiate between an aneurysm and a dissection.
3. Discuss the various surgical options for correction of an aortic aneurysm or a dissection.

## **Benign Prostatic Hypertrophy**

1. Describe the signs and symptoms of benign prostatic hyperplasia (BPH).
2. Discuss the pathophysiology and differential diagnosis of BPH.
3. List the basic work-up required before institution of medical therapy.
4. List the indications for surgical therapy and the pros and cons of different surgical approaches.

## **Breast PPP**

1. In discussion of cases identify and discuss the most appropriate studies for confirming diagnosis of a malignant versus benign breast lesion. Include the following:
  - a. Fine needle aspiration.
  - b. CORE needle biopsy
  - c. Surgery – excisional biopsy
  - d. Mammography
  - e. Mammatome
  - f. Ultrasound

## **Case History**

48 year old Hispanic female presents with a history of a suspicious finding on a screening mammogram. PMH and PSH not significant. Denies the use of medications. Father died of bone cancer. Menarche at age 12. First pregnancy at age 18, G5P4A1. Normal clinical breast exam.

## **Discussion Questions**

1. What is the recommended diagnostic modality?  
Findings revealed 1 cm infiltrating ductal carcinoma in the left breast. T1, N0, Mx, Stage 1.
2. What are the treatment considerations?
3. What are the indications for breast conservation therapy?

## Case History

39 year old Hispanic female presents with a right breast mass which she has been aware of for six months and a right axillary mass for three months. PMH, PSH non- significant. FMH without cancer. Menarche age nine. G3P3, first at 22. PE revealed a firm mass in the right breast which was erythematous with peau d' orange skin changes. Positive fixed mass in the right axilla, as well as a right supraclavicular palpable nodule.

## Discussion Questions

1. What is the recommended diagnostic Modality?  
Findings revealed right breast inflammatory cancer – T4d, N2, Stage III, ER/PR/Her2neu negative.
2. What are the treatment considerations?

## Breast Skills Workshop

1. Identify and describe the major types of breast lumps: fibroadenoma, fibrocystic disease, carcinoma, and cysts. Describe the typical age range for each.
2. Discuss the most anatomical location for breast cancer to occur.
3. Describe common risk factors associated with breast cancer.
4. Demonstrate the ability to do the following:
  - a. Perform a breast exam.
  - b. Locate a lump on breast examination.
5. Demonstrate the ability to predict whether a breast mass is benign or malignant based upon physical examination findings and radiologic studies.
6. Accurately interpret a mammogram of a patient with a benign appearing breast mass.
7. Accurately interpret a mammogram of a patient with a carcinoma of the breast.

## Burn Surgery

1. Define first degree, second degree and third degree burns in relationship to skin anatomy.
2. Given a description of a patient's burn injuries, calculate the percentage of body surface burned.
3. Briefly describe the body's metabolic response to a burn injury.
4. Demonstrate a familiarity with the Parkland formula for fluid resuscitation by using it to calculate fluid requirements for a burn injury patient, given the total body surface area of the burn.
5. Discuss the various options available for management of the burn wound including topical antibiotics, biological dressings and operative debridement.
6. List the more common early and late complications of a burn injury.
7. Discuss the management of carbon monoxide poisoning.
8. Given a patient with severe burn injury, present a plan for evaluation of the patient for inhalation injury.
9. Discuss management of inhalation injuries.

## Case History

A 47 year old white male is rescued from a burning apartment building. On presentation to the emergency room, the patient is awake with a blood pressure of 105/70, pulse 90, respiratory rate of 35. Examination reveals several areas of first-degree burns on the face, second-degree burns of the left arm, second and third degree burn of the posterior aspect of the leg, and circumferential full thickness burns of the trunk. Carboxyhemoglobin level is 20%. Blood gas values on a 30% face mask show a PO<sub>2</sub> of 120, PCO<sub>2</sub> of 50, and a PH of 7.25.

## Discussion Questions

Using the “rule of nines,” what do you estimate the percentage of the body surface burn area to be?

1. What is your assessment of this patient’s respiratory conditions? What is your plan for management? What diagnostics studies are available to rule out a smoke inhalation injury in this patient?
2. Use the Parkland formula to prepare a fluid resuscitation protocol for the next 48 hours.
3. How are you going to manage the area of second degree burns with respect to wound care? Of the treatments available, which yields the most rapid dermocapillary regeneration of a partial thickness burn?

## Mini Cases

Suggest an appropriate plan for evaluation and management for each of the following cases:

1. A 26 year old man has sustained a severe electrical burn with entry wound on his left foot and exit wound on both hands and his back. In the emergency room, the urine is noted to reddish brown in color.
2. A 34 year old white male sustains a circumferential third degree burn of the right forearm. Three hours later the patient loses sensation to touch in his fingers and motor function in the digits begins to deteriorate.
3. A 31 year old white male presents to the emergency room with second-degree burns of the right arm and hand. The decision is made to manage this patient on an out-patient basis. What is your plan for emergency room care and follow-up?
4. A 45 year old woman is admitted to the hospital with a 40% total body surface are burn and her wounds are treated with Silvadene. Three days later burn wound biopsy semi-quantitative culture shows 10 to 14 Pseudomonas organisms per gram of tissue. The patient is clinically stable.
5. A 60 year old white female sustained a burn on the anterior surface of the thigh 25 years previously. During the past four years there has been recurrent ulceration in the site and biopsy now reveals squamous cell carcinoma.

## Colorectal Cancer

1. Discuss the factors which predispose patients to developing colon carcinoma.
2. Identify the most common symptoms associated with colon, rectal and anal carcinoma.
3. Discuss the appropriate laboratory and x-ray studies for diagnosing and treating colon, rectal and anal carcinoma.
4. Outline the treatment for colon, rectal, and anal carcinoma and discuss the appropriate resection levels for each based on the lymphatic drainage.
5. Discuss the role of radiotherapy and chemotherapy in managing patients with colon, rectal and anal carcinoma.
6. Given a patient with an obstructive colon lesion, outline the appropriate preoperative and operative management.
7. Define the postoperative follow-up of curative cancer resection necessary to detect recurrent and new cancer.
8. Discuss the role of CEA in diagnosing and follow-up care of patients with colon carcinoma.
9. Using the TNM classification (T = primary tumor size, N = regional lymph nodes and M = distant metastasis), discuss the staging and five year survival for colon and rectal carcinoma.

### Case History

A 61 year-old white male presents to the surgical clinic with a three month history of blood streaking in his stool and a decrease in the caliber of stools. He also describes a seven-pound weight loss. His past medical history is unremarkable except for a cholecystectomy four years ago. He takes no medications. Physical exam reveals a healthy male in no acute distress. Abdominal exam is unremarkable. Rectal exam reveals no masses and guaiac positive stool. Laboratory studies reveal a normal hemoglobin and hematocrit and renal panel. Liver functions are normal. CEA is 27.

### Discussion Questions

1. What is the differential diagnosis in the preceding case of bright red blood per rectum? How would you proceed with the work-up to confirm a diagnosis?
2. When the work-up is complete, the final diagnosis is adenocarcinoma of the sigmoid colon without evidence of metastatic disease. What is your recommendation for management? How do you prepare this patient for surgery? What are the potential complications of a colon resection?
3. Discuss the staging of colon cancer and the associated prognosis. How does colorectal cancer spread?
4. The patient recovers uneventfully from his operation and is ready for discharge. What is your plan for follow up? What is the role of CEA in colorectal cancer management?
5. What etiologic factors are involved in the development of colorectal cancer? Are there any screening methods useful in the prevention and early detection of colorectal cancer?

## Mini Cases

For each of the following cases suggest a plan for evaluation and management.

1. A 67 year old white male presents to you with guaiac positive stools. An air contrast barium enema study reveals a 2.5 cm polyp at the splenic flexure. Discuss appropriate management. Discuss the association between polyp size and risk of carcinoma.
2. A 68 year old white female presents with a three-month history of watery diarrhea. Physical exam reveals a large cauliflower lesion four centimeters above the anal verge. Laboratory studies reveal a potassium of 2.8.
3. A 69 year old white male presents with a six centimeter carcinoma of the sigmoid colon and obstructive symptoms. Work-up reveals widespread metastatic disease in both lungs and the right lobe of the liver.
4. A 72 year old male presents with a complete large bowel obstruction. Colonoscopy reveals a large adenocarcinoma in the distal left colon. The patient is febrile and examination reveals a remarkably distended abdomen with peritoneal signs.
5. A 70 year old man has an ulcerated lesion in the perianal area. Biopsy reveals squamous cell carcinoma. Describe the treatment options.

## Coronary Artery Disease/Coronary Artery Bypass Grafting

1. Know the indications for coronary artery bypass grafting.
2. Understand the surgical concepts and expected results from coronary artery bypass grafting.
3. Discuss the indications for and physiology behind intra-aortic balloon counterpulsation.

## ENT (Otolaryngology) Overview

1. Discuss the viral and bacterial causes of pharyngitis and tonsillitis.
2. Recognize the typical symptoms of viral and bacterial pharyngitis.
3. Describe the diagnosis and treatment of sinusitis.
4. List the common causes of a mass in the neck or face.
5. Describe the initial diagnostic approach to the patient with maxillofacial trauma.
6. List the cosmetic implications in head and neck surgery.
7. List the risk factors for head and neck cancer.
8. Discuss the differential diagnosis, work-up and treatment of common head and neck infections.

## Foot and Ankle Disorders

1. Describe the diagnosis and treatment of ankle sprains.
2. Define the pathoanatomy, physical examination, and treatment of bunions.
3. Describe the pathoanatomy, clinical findings, and treatment of plantar fasciitis.
4. Describe the pathogenesis and basic treatment principles of diabetic foot ulcers.

## **Hand Exam – Medical and Surgical Interventions**

1. Describe the sensory and motor examination of the hand and its relation to injuries of the three major nerves.
2. Describe the vascular examination of the hand.
3. Describe the symptoms and physical findings of patients with carpal tunnel syndrome.
4. Outline the principles of treatment of patients with carpal tunnel syndrome.
5. Describe the functional deficits resulting from division of the superficial and deep tendons of the fingers and the long flexor tendon of the thumb and the diagnostic techniques for demonstration of these deficits.
6. Describe the clinical presentations and significance of scaphoid fractures.
7. Describe the clinical features and indications for treatment of common hand infections (e.g. tenosynovitis, paronychia, felon).

## **Hematuria, Bladder & Kidney Cancer/ Evaluation of**

1. Know the basic evaluation of hematuria in the adult male and female.
2. Describe the different natural histories of superficial and invasive bladder cancer.
3. Know the indication for radical cystectomy in the treatment of bladder cancer.
4. Describe the appropriate radiological evaluation of a patient with an irregular renal outline on IVP.
5. List the prognostic factors for survival in renal cell carcinoma.
6. List the eight possible presenting signs and symptoms of renal cell carcinoma and why it is called the “the internist tumor.”

## **Incontinence/ Urinary**

1. Describe the basic neurophysiology of bladder storage and emptying.
2. Describe the basic terminology and definitions of voiding dysfunction.
3. Classify voiding dysfunction into failure to store and failure to empty.
4. Discuss the basic work-up for urinary incontinence and associated lower urinary tract voiding disorders, as well as, the specific indications for more advanced tests such as videourodynamics.
5. Describe the various treatment options for urinary incontinence, including surgery and pharmacotherapy.

## **Inflammatory Bowel Disease**

1. Differentiate between ulcerative colitis and Crohn’s disease of the colon in terms of history, pathology, x-ray findings, treatment and risk of cancer.
2. Discuss the role of surgery in the treatment of patients with ulcerative colitis who have the following complications: intractability, toxic megacolon, cancer, perforation, and bleeding.
3. Discuss the role of surgery in treating patients with Crohn’s disease and the following complications: fistula, obstruction, bleeding and stricture.
4. Discuss the non-operative therapy for ulcerative colitis and Crohn’s disease.

## Case History

A 27 year old white male presents with a four week history of bloody diarrheal stools. Over the last one to two weeks he has noted six to eight such stools per day. He also complains of mild, crampy abdominal pain and tenesmus. His past medical history is unremarkable with no previous surgical procedures. Physical exam reveals a temperature of 99.8°F. Mucous membranes are extremely dry. The abdomen is soft but mildly tender especially in the left lower quadrant. Rectal exam reveals no masses but bright red blood and mucus are present. Laboratory findings include a normal hemoglobin and hematocrit, normal electrolytes, and a serum albumin of 3.8. A plain film of the abdomen reveals no free air and is unremarkable.

## Discussion Questions

1. What is the differential diagnosis in such a presentation? What is your plan for diagnostic work-up? What is your immediate plan for management once a diagnosis has been made?
2. Compare and contrast the endoscopic findings of ulcerative colitis and Crohn's disease.
3. Compare and contrast ulcerative colitis and Crohn's disease with regard to gross bleeding, perianal lesions, toxic dilation, and systemic manifestations.
4. The above patient is treated aggressively with medical management for ten days. Despite treatment he continues to worsen with increasing bloody diarrheal stools. What are the indications for surgery in ulcerative colitis?
5. If the above patient had recovered uneventfully with medical management what would have been your recommendations for follow-up?

## Mini Cases

1. A 39 year old white male with a four year history of medically managed ulcerative colitis presents with a sharp decrease in the number of stools. He is accustomed to having three to four slightly bloody stools per day but has had no bowel movements over the last three days. Physical exam reveals the patient to be obtunded, febrile and with a distended, tender abdomen. Abdominal series reveals the transverse colon to be dilated to 10 centimeters.
2. A 41 year old white male with a three year history of Crohn's disease presents with his fourth episode of small bowel obstruction. An upper GI series reveals a string sign in the medilium.
3. A 41 year old with a six year history of ulcerative colitis presents for his follow-up colonoscopy. Colonoscopic biopsy reveals several foci of adenocarcinoma in the left colon. The lowest lesion is noted four centimeters above the anal verge.
4. A 44 year old white female with a four year history of Crohn's disease presents with a draining sinus tract in the left lower quadrant of the abdominal wall. An upper GI study reveals an enterocutaneous fistula. Hyperalimentation is started but there is no change after two weeks of TPN with the patient remaining NPO.

5. A 28 year old white male presents with a 12 hour history of right lower quadrant pain, fever, and leukocytosis. Physical exam is consistent with acute appendicitis. He is taken to surgery and a normal appendix identified. The only intraoperative finding is a markedly inflamed terminal ileum and the diagnosis of acute regional enteritis is made.

## **Joints Disorder/Surgical Treatment of**

1. Discuss the basic understanding of arthroplasty including longevity, limitations and complications.
2. List the absolute and relative contraindications for joint replacement surgery.
3. List osteotomy indications.

## **Lung Cancer/Pleural Space**

1. Briefly describe the epidemiology of lung cancer.
2. List presentation symptoms of lung cancer.
3. List the pathologic features of the various lung carcinomas.
4. Describe the work up of a patient prior to surgery.
5. Briefly describe the physiology of the pleural space.
6. When are chest tubes indicated and how are they managed?
7. Describe empyema and its' management.

## **Nephrolithiasis, Surgical Management of**

1. Know the most common presenting signs and symptoms of kidney stones and the initial evaluation steps to make the diagnosis.
2. Describe the treatment options for a patient with urinary tract calculi.
3. Discuss the pathophysiology of calcium and non-calcium stones.

## **Neurosurgery Emergencies**

1. Define epidural, subdural and intracranial hematomas and discuss their etiologies, characteristics and management.
2. Discuss the potential consequences of failure to decompress the cauda equine with cauda equine syndrome.
3. Discuss clinical signs/symptoms and workup of cerebral aneurysms.

## **Ocular Emergencies**

1. Discuss the causes, signs/symptoms, complications and treatment of the following:
  - a. Chemical burns
  - b. Ruptured globe
  - c. Hyphema
  - d. Orbital trauma

- e. Lid lacerations
- f. Corneal abrasion and foreign bodies
- g. Red eye
- h. Cellulitis
- i. Sudden visual loss
- j. Contact lens problems

## **Orthopedic Trauma**

1. Define fractures (open and closed), subluxations and dislocations.
2. Describe the clinical and radiological features of fractures and dislocations.
3. Outline management priorities.
4. List associated complications: vascular, neurological and musculoskeletal.
5. Discuss diagnosis and management of compartment syndrome.
6. List complications of cast immobilization of acute extremity injuries.

## **Pediatric Surgery Overview**

1. Briefly discuss esophageal anomalies – clinical findings, differential diagnoses and management.
2. Describe congenital diaphragmatic hernias – incidence, detection, surgical options and common outcomes.
3. Discuss inguinal hernias – clinical findings, differential diagnoses and treatment.

## **Plastic Surgery**

1. Briefly discuss the elements of wound healing.
2. What are the phases of and what is the timing of wound healing?
3. Discuss factors of wound management and the functions of dressings.
4. In which instances might FFMT (functioning of free muscle transplantation) be utilized and what are the patient qualifications for such?

## **Prostate Cancer**

1. Review the epidemiology and risk factors for prostate cancer.
2. Discuss the pros and cons of screening.
3. Discuss the basics of prostate cancer treatment.

## **Spine**

1. List and discuss common causes of cervical pain and low back pain.
2. Describe the symptoms and signs and outline the diagnostic workup for a patient with cervical and/or lumbar disc herniation.
3. Describe discogenic disease and spinal stenosis of the lumbar spine.
4. List which reflexes, muscles, and dermatomes are associated with each of the nerve roots.

## **Sports Medicine**

1. Describe the biomechanics of ligamentous injury and specific tests to assess each ligament (specifically ACL, PCL, MCL, LCC).
2. Describe injury patterns with the meniscus and its healing ability.
3. Describe the injury response to articular cartilage damage, x-ray findings and its non-surgical and surgical treatment.
4. List the differential diagnosis of shoulder bursitis.
5. Demonstrate recognition of shoulder instability, rotator cuff tear, impingement syndrome and bursitis.
6. Describe and recognize lateral epicondylitis (tennis elbow) and medial epicondylitis (golfer's elbow).

## **Thyroid and Parathyroid Disease**

1. List the risk factors for carcinoma of the thyroid gland.
2. Discuss the common presenting symptoms and physical findings in a patient with a thyroid carcinoma.
3. Discuss the differential diagnosis and work-up of a patient with a thyroid nodule.
4. Discuss the role of surgery and medical treatment in treating patients with hyperthyroidism and with thyroid carcinoma.
5. Discuss the multiple endocrine adenoma syndromes which involve the thyroid gland and their clinical significance.
6. Describe the usual surgical treatment for papillary, follicular and medullary cancer of the thyroid.
7. Differentiate between primary, secondary, and tertiary hyperparathyroidism.
8. Discuss the work-up of a patient with hypercalcemia.
9. List the diseases which may cause hypercalcemia.
10. Discuss management of a hypercalcemic crisis.
11. Discuss the role of surgery in primary, secondary, and tertiary hyperparathyroidism.
12. Describe the potential complications of parathyroid surgery.

## **Case History**

A 42 year old white male presents with a small lump on the left side of his neck. He states that he noticed the lump while shaving two weeks ago and since then the lump has remained unchanged and has caused no pain. He is otherwise asymptomatic. He denies any symptoms of hypo or hyperthyroidism. His only significant medical problem is diet-controlled diabetes mellitus. His family history is unremarkable. Physical exam reveals a well nourished, athletic-appearing 42 year old male in no distress. Vital signs are entirely normal. Examination of the neck reveals a firm, non-tender, two centimeter nodule in the left lobe of the thyroid gland. Also noted on neck exam is a one and one half centimeter Delphian lymph node. There are no bruits noted in the neck. The rest of the physical examination is entirely normal.

## Discussion Questions

1. What diagnostic studies are appropriate for work-up of this thyroid nodule?
2. Differentiate papillary from follicular thyroid cancer on the basis of natural history, surgical treatment, and prognosis?
3. What would you recommend if a diagnosis of papillary thyroid cancer were made in this case?
4. What are the potential complications of thyroid surgery?

## Case History

A 29 year old white female presents to the emergency room with her second episode of severe right flank pain. Work-up reveals the presence of hematuria and an IVP shows a ureteral calculus. The emergency room physician ordered a chemistry panel and noted the serum calcium to be 11.8. The patient states that no calcium level was done for her previous episode. The patient's past medical history is unremarkable except for a two-year history of peptic ulcer disease, diagnosed endoscopically and treated with H<sub>2</sub> blockers. Her physical examination is entirely normal.

## Discussion Questions

1. In addition to ureteral calculus, what other diagnosis should be considered at this time? How can this diagnosis be confirmed?
2. What correlation is there between the patient's history of peptic ulcer disease and her current diagnosis?
3. What is the most likely etiology of primary hyperparathyroidism? What is the other, less frequent, etiology?
4. Discuss how you would treat primary hyperparathyroidism.

## Mini Cases

For each of the following cases, suggest the diagnostic work-up and management plan.

1. A 24 year old white female presents with a three centimeter nodule in the right lobe of the thyroid gland.
2. A 24 year old white female complains of circumoral numbness and tingling 36 hours after a total thyroidectomy for papillary carcinoma. Examination reveals a positive Chvostek's sign and the serum calcium is 6.8.
3. Two years after a total thyroidectomy for follicular carcinoma of the thyroid a 44 year old white male presents with three nodules in the lower lobe of the right lung and two nodules in the upper lobe of the left lung.
4. A 59 year old white female presents with a rapidly expanding neck mass. She complains of difficulty swallowing and has signs of early airway compromise.
5. A 52 year old white male presents with a three centimeter thyroid nodule. His history is significant in that his mother and four other relatives have died from thyroid carcinoma.

6. A 34 year old white female presents with a several month history of enlargement of the neck with pain and tenderness. She notes that with the onset of the neck swelling she experienced marked heat intolerance and profuse sweating. These symptoms have abated over the last several weeks. The thyroid gland is now diffusely enlarged and thyroid functions studies revealed hypothyroidism.
7. A 37 year old white female presents with signs and symptoms of hyperthyroidism and the diagnosis of Grave's disease is made.

### **Valvular Heart Disease**

1. Discuss the pathophysiology of stenosis or regurgitation for aortic and mitral valve disease.
2. Differentiate risks/benefits of choosing a mechanical versus a biologic valve prosthesis.
3. List the indications for surgical replacement/repair of a diseased valve.
4. Discuss the risk/benefit ratio of chronic oral anticoagulation.
5. Follow a logical treatment algorithm for a patient with acute versus subacute bacterial endocarditis.

### **Vascular Medical and Surgical Case Studies**

See "The Standardized Vascular Clinic Handbook"