Q.1. Which one of the following recommendations for screening for gastrointestinal cancers has been associated with improved survival?
A. Pancreatic ultrasound screening in patients with diabetes mellitus
B. Sigmoidoscopic evaluation for colon cancer
C. Endoscopic surveillance of the stomach in persons with *Helicobacter pylori* infection
D. Serial CEA evaluations in patients with a strong family history of colon cancer

**Answer:** B. Sigmoidoscopy has been demonstrated by case control studies to improve overall survival in screened patients. There is no clear, increased risk of pancreatic cancer in patients with diabetes, and no studies have been completed to demonstrate that screening ultrasound examination in the otherwise asymptomatic patient would find pancreatic cancer at a more curable stage. A similar conclusion can be made for screening endoscopy for gastric cancer for patients at high risk with *H. pylori* infections. There is no role whatsoever for screening CEA levels.

Q.2. A 36-year-old man comes to your office for your opinion concerning adjuvant therapy for stage III (T3N1MO) colon cancer. He was in good health until two months ago, when he was found to have occult blood in his stool on a routine pre-employment physical examination. He underwent colon surgery for cancer resection without complications three weeks ago and has now established normal bowel habits. He is taking no routine medications, and neither smokes nor drinks. His paternal grandfather died of rectal cancer at age 49 years, and two paternal aunts had colon cancer. After review of his pathology, you conclude that he is a candidate for adjuvant therapy. Which one of the following statements about this patient’s prognosis and surveillance is true?
A. If he develops a new primary colon cancer, he should undergo a complete colectomy
B. His risk for metastatic disease is higher than that of a similarly staged patient with no family history of colon cancer
C. Performing routine CT scans and chest radiographs for five years postoperatively will increase the likelihood of improved survival
D. Adjuvant chemotherapy will have significantly less benefit than for a similarly staged patient without a family history of colorectal cancer
E. Surveillance sigmoidoscopies should be performed every three to five years
**Answer:** **A.** This patient likely has hereditary nonpolyposis colon cancer (HNPCC), or Lynch’s syndrome. Individuals with this disorder have a high risk of colon cancer at an early age, typically in the right colon. Many experts recommend total colectomy at the time of diagnosis of a first colon cancer; a second primary should surely prompt this therapeutic intervention. Surveillance sigmoidoscopies would not be adequate in this patient population given the anatomic distribution of tumors in these patients, and annual colonoscopies would be more appropriate. The biology of cancers in patients with Lynch’s syndrome is generally more indolent than in sporadic tumors, and patients experience fewer relapses and better survival outcomes than patients with sporadic colorectal cancer, stage-for-stage. There is no evidence that adjuvant chemotherapy would be any less effective in cancers arising from HNPCC. There is no firm evidence to date that routine radiographic surveillance after the diagnosis of colorectal cancer will lead to an improvement in overall survival for patients at risk for relapse.

**Q.3.** Which of the following is *not* considered a risk factor for the development of colon cancer?

A. Ulcerative colitis  
B. *Streptococcus pneumoniae* bacteremia  
C. Familial adenomatous polyposis syndrome  
D. High-fat diet  
E. Mutations in the adenomatous polyposis coli (APC) gene

**Answer:** **B.** Colon cancer is associated with all of the factors listed except for *Streptococcus pneumoniae* bacteremia. Although the mechanism is currently unknown, *Streptococcus bovis* bacteremia is associated with colon cancer. Patients with this infection should have an evaluation for GI cancers.

**Q.4.** A 41-year-old man is diagnosed with iron deficiency anemia and is found to have heme-positive stools. Colonoscopy reveals a large ulcerated tumor in his transverse colon. He also has two smaller polyps in his ascending colon. Pathologic examination of the tumor biopsy reveals adenocarcinoma, while biopsies of the polyps confirm that these are adenomas. His sister has been diagnosed with uterine cancer, and two cousins have died of colon cancer. All of the following are true statements about this case except

A. Referral for genetic counseling is indicated  
B. He is at increased risk for other epithelial-derived tumors  
C. He likely has familial adenomatous polyposis (FAP), with a germ line mutation in the APC gene  
D. His condition is often associated with a defect in DNA mismatch repair
**Answer:** C. This patient likely has hereditary nonpolyposis colon cancer (HNPCC), also known as Lynch’s syndrome, characterized by defects in mismatch repair of DNA. It is associated with uterine cancer and other epithelial cancers, and is an indication for genetic counseling. FAP is characterized by innumerable colonic polyps and the development of colon cancer by age 20.

**Q.5.** Which of the follow statements regarding Peutz-Jeghers polyposis syndrome is correct?

A. Colonic polyps associated with this syndrome universally transform into colorectal carcinoma over time

B. It is also associated with malignancies of the central nervous system

C. The polyps seen in the colon are usually hamartomas and not adenomas

D. It is associated hypopigmentation of the skin

**Answer:** C. Peutz-Jeghers syndrome is one of the polyposis syndromes in which the polyps themselves have low malignant potential. Patients with this syndrome may have hamartomas of the small bowel and colon, mucocutaneous hyperpigmented lesions, and are at increased risk for cancers of the colon, breast, ovary, pancreas, and endometrium. It is not associated with tumors of the CNS that are seen in Turcot’s syndrome.

**Q.6.** Which of the following statements regarding colon cancer is correct?

A. Most sporadic cases of colon cancer are associated with mutations in the adenomatous polyposis coli (APC) gene

B. Patients with newly diagnosed colon cancer should have a CT or MRI of the brain prior to surgery to attempt to identify metastases

C. Although adjuvant chemotherapy is often used for stage III disease, there is no evidence that it has any effect on survival

D. The serum carcinoembryonic antigen (CEA) is an acceptable screening test for patients at high risk for colon cancer

**Answer:** A. Patients diagnosed with colon cancer should have blood work (including a serum CEA), chest x-ray, and abdominal and pelvic CT scan as part of their staging workup. Colon cancer does not routinely metastasize to the brain so routine scanning is not indicated. Carcinoembryonic antigen is an acceptable method for following disease recurrence but is not a good screening test due to its low sensitivity and specificity. Adjuvant chemotherapy has been shown to prolong survival in patients with stage III disease. Eighty percent of colon cancer cases are sporadic with 70% of those being associated with a mutation in the APC gene.

**Q.7.** A 62-year-old woman presents to you three months after having a hemicolecction for colon cancer. She apparently had a mass detected by screening
colonoscopy and was then sent to a surgeon for resection. The colonoscopy revealed no synchronous lesions or polyps. The adenocarcinoma apparently invaded into the submucosa. No lymph nodes or metastases were noted. She presents today asking you how she should be followed in the future. Which of the following is recommended for surveillance?

A. Annual fecal occult blood testing
B. Colonoscopy every six months for two years then every year
C. Colonoscopy in one year then every three years
D. Liver function tests and carcinoembryonic antigen every three months for one year then every year
E. Both B and D are correct

**Answer: C.** This woman had a resection of a stage I colorectal cancer. She had no synchronous lesions or polyps noted on her index colonoscopy. Aggressive surveillance beyond regular colonoscopy is not recommended for stage I disease, since 95% of these patients can be considered cured. Currently, a three-year interval for colonoscopy is suggested after an initial follow-up in one year. Annual fecal occult blood testing and liver function test monitoring has not been shown to be beneficial for surveillance, even for patients with stage II or III disease. The utility of carcinoembryonic antigen (CEA) has been debated, but has yet to show a survival advantage over colonoscopy alone for patients with stage II or III disease. CEA monitoring is not indicated for stage I disease.

**Q.8.** Which of the following statements regarding colorectal cancer is correct?
A. Most cancers arise in the sigmoid colon and rectum
B. Familial polyposis syndromes and hereditary nonpolyposis colon cancer are responsible for about 25% of colorectal cancer cases
C. Most cases of colorectal cancer are not amenable to surgical resection
D. Adjuvant chemotherapy with 5-fluorouracil and leucovorin should be offered to all patients with stage I or II disease
E. None of the above is correct

**Answer: A.** Just under half of all colorectal cancers (CRC) arise in the sigmoid colon and rectum. The rest are spread out throughout the colon with the cecum being the next most common site. Familial polyposis syndromes account for about 1% of CRCs while hereditary nonpolyposis colon cancer (HNPCC) accounts for about 4%. About 75% of CRC cases are amenable to resection, so this should be the goal of therapy, even when there is a recurrence. Adjuvant chemotherapy has been shown to improve survival for stage III colon cancer and stage II and III rectal cancer. Adjuvant chemotherapy is not indicated for stage I disease.
Q.1. You follow a 35-year-old woman who has a family history of breast cancer (her mother at 42 years of age and ovarian cancer in a maternal aunt). Both of these family members are deceased. A maternal first cousin, daughter of the aunt with ovarian cancer, was recently diagnosed with breast cancer and was found to have a deleterious (cancer-associated) mutation in a BRCA gene. Your patient is concerned about her own risk of developing cancer and the risk to her two daughters ages 4 and 8. Which of the following do you recommend for your patient?

A. Annual screening mammography and screening breast MRI beginning now
B. Tamoxifen for breast cancer prevention
C. Prophylactic oophorectomy
D. Genetic counseling for BRCA testing
E. BRCA testing of her children

Answer: D. The presence of a deleterious BRCA mutation in an affected family member is highly suggestive that the breast and ovarian cancers in the mother and aunt are also explained by this mutation. BRCA mutations are inherited in an autosomal dominant manner. Given the likelihood that your patient’s mother had this BRCA mutation, your patient has a 50% chance of inheriting the mutation. Testing for the mutation is the most reasonable option at this time. All patients should receive genetic counseling before gene testing. Answers A, B, and C would be options if she has the familial BRCA mutation. However, if she tests negative her cancer risk is the same as the general population in which case choices A, B, and C are not recommended. Breast MRI increases the sensitivity of breast cancer screening in high-risk women but due to its cost, complexity (requiring IV contrast), and potential for false positive findings, it is not recommended for the general population. In randomized trials, the use of tamoxifen reduces the risk of developing breast cancer by approximately 50%. Women as young as 35 years were allowed in these trials. Tamoxifen has no effect on ovarian cancer risk. Because screening for ovarian cancer is so poor, oophorectomy is considered for women at high risk (e.g., those with an inherited BRCA mutation) when they have completed childbearing. Testing of individuals below the age of 18 is not recommended.

Q.2. You see a new patient who has recently moved to your area. She is 56 and has been on tamoxifen for four years as adjuvant therapy for node-negative breast cancer. She has been postmenopausal for eight years but reports to you that she recently developed new onset vaginal spotting. What do you recommend?

A. A short course of progesterone
B. Discontinuation of the tamoxifen and observation  
C. Endometrial biopsy  
D. Hysterectomy  

**Answer: C.** Tamoxifen has estrogen agonist activity in the endometrium and is associated with an increased risk of developing endometrial cancer. Progesterone therapy is contraindicated in a woman with a history of hormone receptor positive breast cancer. Although tamoxifen may be discontinued during evaluation, observation is not sufficient. Hysterectomy can be recommended if an endometrial cancer is found but, unless there are other indications for the surgery, it should not be done as the initial diagnostic test. Endometrial biopsy will usually be sufficient to assess for endometrial pathology. Of note, the aromatase inhibitors are not associated with an increased risk of endometrial cancer, which is one reason why they are increasingly used as hormonal therapy for postmenopausal breast cancer patients.

**Q.3.** Which of the following factors is not associated with an increased risk of developing ovarian cancer?  
A. Infertility  
B. Oral contraceptive use  
C. Early menarche  
D. Late menopause  

**Answer: B.** Factors that alter the number of lifetime ovulations may alter the risk of ovarian cancer. Infertility, early menarche, and late menopause all are associated with an increased risk for ovarian cancer, whereas early pregnancy, oral contraceptive use, and long-term breast-feeding are associated with a lower risk.

**Q.4.** A 45-year-old woman with no family history of ovarian cancer requests a CA-125 be done as a screening test. She has no symptoms or complaints at the time of her examination. Which of the following statements would not be true?  
A. If she had stage I ovarian cancer her CA-125 would definitely be elevated  
B. CA-125 is not a useful screening tool because it lacks sensitivity and specificity in a low-risk population  
C. It would be helpful to follow CA-125 titers if she had ovarian cancer  
D. CA-125 antigen is common to most ovarian tumors  

**Answer: A.** Less than 50% of patients with stage I disease will show an elevation of CA-125, however, 82% of advanced ovarian cancer patients will have an elevation. It is true that CA-125 is not a useful screening tool in a low-risk population because it lacks sensitivity and specificity. CA-125 is a useful tool for
monitoring disease activity and CA-125 antigen is common to most ovarian tumors.

Q.5. Which of the following would not be a contraindication for a lumpectomy for invasive breast cancer?

A. Pregnancy
B. Tumor size of 1 cm
C. Patient history of prior breast radiation
D. More than one distinct tumor

**Answer: B.** Contraindications to a lumpectomy include pregnancy, history of breast irradiation, diffuse breast calcifications, and more than one distinct tumor. A tumor of 1 cm would not be a contraindication to a lumpectomy.

Q.6. A 52-year-old woman was just diagnosed with stage I invasive breast cancer. She is contemplating a lumpectomy with radiation therapy versus a modified radical mastectomy. In counseling her, you tell which of the following is true:

A. If the tumor is located under the nipple a modified radical mastectomy is contraindicated
B. Survival is improved if the patient undergoes a modified radical mastectomy
C. The patient's preference should weigh heavily in the decision process
D. If local recurrence of the tumor occurs after lumpectomy, modified radical mastectomy is usually not effective in treatment

**Answer: C.** The patient’s preference is an equally important part of the decision process. For a tumor under the nipple, a mastectomy may be the treatment of choice. Survival is the same for lumpectomy/radiation therapy versus mastectomy, and if there is recurrence after a lumpectomy, a mastectomy is indicated for further treatment.

Q.7. A 56-year-old woman presents to your office one year after having a lumpectomy and radiation therapy for breast cancer. She reports that she is feeling fine and is just here for a checkup. All of the following are recommended surveillance interventions except

A. Recommending monthly breast self-examination
B. Bone scan
C. CA 15-3 tumor marker
D. Mammography
E. Both B and C are not routinely recommended
Answer: E. Follow-up for a patient after treatment of localized breast cancer should focus upon signs and symptoms of recurrence. If no such signs exist, then routine surveillance with mammography, self-breast exams, and regular history and physicals is recommended. Nuclear scanning, CT scanning, and tumor markers are not indicated for such patients without symptomatology.

Q.8. All of the following are associated with an increased risk for the development of ovarian cancer except
A. BRCA1 mutations
B. BRCA2 mutations
C. Oral contraceptive use
D. Hereditary nonpolyposis colorectal cancer (HNPCC)
E. Late onset of menopause

Answer: C. The risk of ovarian cancer is increased in women with a greater number of lifetime ovulations. Therefore, early menarche and late menopause are associated with an increased risk. Conversely, oral contraceptive use is associated with a reduction in the number of ovulations and can reduce the risk of ovarian cancer significantly when used for more than five years. BRCA1, BRCA2, and HNPCC are all genetic mutations that are associated with ovarian cancer.

Q.9. A 56-year-old postmenopausal woman presents with a 2-cm left breast lump. She undergoes biopsy, which reveals invasive ductal carcinoma. She then undergoes a modified radical mastectomy. The lymph node dissection is negative for disease. The tumor is found to be estrogen and progesterone receptor negative. Which of the following adjuvant measures is most appropriate at this time?
A. Radiation therapy
B. Tamoxifen (hormonal therapy)
C. Chemotherapy
D. Both A and B should be done
E. Adjuvant therapy is not necessary in this patient

Answer: C. This patient presents with invasive ductal carcinoma that is node negative and receptor negative. Radiation therapy would have been indicated if the patient had undergone a lumpectomy. Her choice of a mastectomy obviates the need for radiation therapy. Hormonal therapy is beneficial for patients with receptor-positive tumors but not for patients with receptor-negative disease. Chemotherapy has been shown to improve survival in women under the age of 70 regardless of node or receptor status, so it should be offered.
CHAPTER 55: GENITOURINARY CANCER

Q.1. A 63-year-old engineer asks his physician for a PSA test. The patient has noted slow urinary stream, occasional urgency, and nocturia up to three times a night. Which of the following is true regarding the usefulness of the PSA?
A. PSA is prostate cancer specific
B. False positive elevations of PSA are commonly noted with urinary obstruction, Foley catheter placement, digital rectal examination, and frequent intercourse with ejaculation
C. Obtaining a PSA in this individual is not a screening test
D. A digital rectal examination is a better screening or diagnostic test for prostate cancer than is the PSA

Answer: C. PSA is prostate specific, not prostate cancer specific. Digital rectal examination (DRE) should not elevate the PSA reading unless there is a significant delay from prostatic massage and blood sampling. Urinary obstruction, Foley catheter placement, and ejaculation may increase the PSA. The PSA is a better screening test than the DRE. PSA can detect 70% of prostate cancer, whereas the DRE detects only 2% to 3%. In this patient’s case, the PSA is more for diagnosis than for screening because the patient is symptomatic.

Q.2. Which of the following is true regarding transitional cell carcinoma of the urinary bladder?
A. It is increasing in incidence in women secondary to increased tobacco use
B. It is associated with a 40% incidence of upper tract (renal pelvis, ureter) involvement
C. It is associated with a high likelihood of metastatic disease at presentation
D. It is always treated with radical cystectomy

Answer: A. With involvement of the bladder, there is only a 2% to 3% incidence of upper tract involvement. Over 75% of bladder cancer is superficial. Radical cystectomy is the treatment of choice for muscle invasion, not for superficial disease.

Q.3. Which of the following paraneoplastic syndromes is not commonly associated with renal cell cancer?
A. Thrombocytosis secondary to interleukin-6 overexpression
B. Polycythemia secondary to erythropoietin overexpression
C. Hypercalcemia secondary to production of a PTH-like protein
D. Cerebellar ataxia secondary to Purkinje cell antibodies
Answer: D. Cerebellar ataxia is quite rare in renal cell cancer and is associated more with lung cancer. Polycythemia, thrombocytosis, and hypercalcemia are much more likely to be seen.

Q.4. A 34-year-old mother of two boys develops painless hematuria. She is treated with antibiotics for presumed cystitis. The hematuria persists and she also has a documented unintentional weight loss of 12 pounds over 3 months. Workup reveals bilateral masses in the kidneys. Computed tomography confirms the kidney masses, which are consistent with bilateral renal cell carcinoma. Her family history is notable for a mother with polycystic kidney disease and a maternal aunt with a benign cerebellar hemangioblastoma. Which of the following statements is false?

A. Von Hippel-Lindau disease is autosomal dominant
B. Von Hippel-Lindau disease is associated with deletions of chromosome 3p
C. Sporadic renal cell cancers are rarely bilateral
D. The patient requires an ophthalmologic examination to evaluate for retinal angiomas
E. Von Hippel-Lindau disease carries a worse prognosis than does sporadic renal cell cancer

Answer: E. All of the other statements are true. von Hippel-Lindau is an autosomal dominant genetic disorder associated with renal angiomas, cerebellar hemangioblastomas, and renal cell carcinomas. It is thought to be caused by deletions of chromosome 3. It carries the same prognosis as sporadic forms of renal cell carcinoma.

Q.5. Which of the following statements is correct regarding genitourinary cancers?

A. Testicular cancer is the most common cancer in men
B. Squamous cell carcinoma accounts for about 90% of bladder cancers in the United States
C. Patients with seminomas of the testicle should be treated with radiation after inguinal orchietomy
D. Treatment of early stage nonseminomatous testicular cancer should be treated with inguinal orchietomy and inguinal lymph node dissection

Answer: C. Seminomas are very sensitive to radiation therapy and should occur after orchietomy. Prostate cancer is the most common cancer in men, although testicular cancer is the most common in young men. Most bladder cancers are transitional cell carcinomas. Only about 5% are squamous cell. Since the lymphatics of the testicle drain into the retroperitoneum and not the inguinal lymph nodes, retroperitoneal lymph node dissection is appropriate for nonseminomatous tumors. The inguinal lymph nodes do not need to be explored.
Q.6. A 52-year-old healthy man is diagnosed with prostate cancer (Gleason score 2 + 3) that is confined within the prostate capsule. His cancer was diagnosed after a general check-up revealed a PSA of 6.7 ng/mL. Which of the following statements regarding his treatment is correct?

A. A radical prostatectomy should be recommended given his young age and good health
B. A radical prostatectomy should be recommended but only after androgen ablation with a luteinizing hormone releasing hormone (LHRH) antagonist or bilateral orchiectomy
C. Watchful waiting should be recommended. Surgery should only be performed if the PSA rises above 11 ng/mL
D. Either a prostatectomy or radiation should be recommended

Answer: D. This middle-aged, otherwise healthy man has localized prostate cancer and no other known underlying illnesses that would reduce his life expectancy. He should be treated with either a prostatectomy or radiation therapy as both have been shown to have comparable 10-year survival rates. Androgen ablation is not recommended for localized disease since the cure rate is quite high with the surgery or radiation.

Q.7. A 68-year-old retired fireman has recurrent prostate cancer as evidenced by a rising PSA after surgery. He wishes to discuss with you the need for androgen ablation. Which of the following is false?

A. Bone fractures may occur after two to three years of androgen ablation secondary to accelerated osteoporosis
B. A rising PSA after prostatectomy is not necessarily indicative of recurrent prostate cancer
C. Hot flashes occur commonly in men receiving androgen ablation
D. Anemia is common after androgen ablation

Answer: B. All the statements are true, except for B. A rising PSA after prostatectomy is indicative of a recurrence. In many cases there is a time lap between the rise in PSA and being able to detect visible disease. The only source of PSA in a patient without a prostate gland has to be from a recurrent or metastatic cell. Hot flashes, osteoporosis, anemia, gynecomastia, and sexual dysfunction are all consequences of androgen ablation.

Q.8. A 33-year-old man presents to the office complaining of sudden onset of a bulge in his right scrotum. He notes that it is associated with some discomfort while exercising but it is otherwise asymptomatic. Examination reveals a bulge above the right testicle while the patient is in the standing position. The bulge
does not recede on lying supine. Palpation of the affected area reveals soft, wormlike extensions from the testicle to the spermatic cord. The most appropriate next step in the management of this patient would be
A. Obtain CT scan of the abdomen and pelvis
B. Obtain a testicular ultrasound
C. Refer to a urologist for excision of a varicocele
D. Reassure the patient and prescribe use of an athletic supporter when the patient chooses to exercise
E. Refer to a urologist for an inguinal orchiectomy

Answer: A. This patient presents with an acute, right-sided scrotal lump. His examination is consistent with a varicocele that does not decrease in size by lying supine. This is a worrisome sign for obstruction of the inferior vena cava by a retroperitoneal mass (e.g., renal cell carcinoma). Therefore, a CT scan would be the appropriate test to find an obstruction. Most varicoceles are not associated with underlying obstruction. Typically they occur on the left side, are insidious in onset, and retract with lying supine. Any deviation from this pattern should be investigated further.

Q.9. A 24-year-old man presents with a lump in his right testicle. An ultrasound is done that confirms the presence of a 2-cm nodule. A CT scan of the abdomen and pelvis are normal. Serum tumor markers reveal a beta-hCG of 500 mIU/mL (normal <5) and a serum alpha-fetoprotein level of 200 mIU/mL (normal <15). He undergoes inguinal orchiectomy which reveals tumor limited to the testis. The pathology reveals a seminoma. Which of the following is the most appropriate for this patient?
A. Radiation therapy
B. Radiation therapy plus chemotherapy with bleomycin/etoposide/cisplatin (BEP)
C. Chemotherapy with BEP
D. Retroperitoneal lymph node dissection (RPLND)

Answer: D. This man has testicular cancer that is thought to be seminoma by pathology. However, the presence of an elevated alpha-fetoprotein suggests that nonseminomatous elements are present within the tumor. He should, therefore, be treated for a nonseminomatous germ cell tumor. The limited extent of the disease and the negative CT scan suggest early stage disease. However, micrometastasis may be present in the lymph nodes of up to 30% of patients, so retroperitoneal lymph node dissection may be indicated. Radiation is useful for early stage pure seminomas. Chemotherapy is added for later stage seminomas and nonseminomas.
Q.10. A 62-year-old man with advanced prostate cancer presents to discuss his treatment options. He reports that his urologist has recommended that he undergo bilateral orchiectomy but he is not comfortable with the procedure. You bring up the option of androgen ablation with LHRH agonists. All of the following are side effects of this class of medications that you should discuss except

A. Hot flashes
B. Gynecomastia
C. Sexual dysfunction
D. Osteoporosis
E. Elevation of blood sugars

**Answer: E.** This man needs androgen ablation therapy for his advanced prostate cancer. Such therapy has been associated with fatigue, bone pain, osteoporosis, gynecomastia, sexual dysfunction (including loss of libido and erectile dysfunction), and anemia. Glucose intolerance does not result from such therapy.

CHAPTER 56: LYMPHOMA AND CHRONIC LYMPHOCYTIC LEUKEMIA

Q.1. A 43-year-old business executive sees you for multiple small “glands” in his neck. He reports that they have been increasing and decreasing in size over the last one to two years. He has been treated with antibiotic therapy for pharyngitis when the glands are large, and they always seem to resolve. They are now large and he seeks your opinion. He feels well. A full review of systems is negative. His past medical history is unremarkable. He worked on a farm for several summers while in school. His physical examination is normal except for multiple posterior cervical lymph nodes, each small (1.5 cm in size), nontender, and moveable. He also has multiple 1.5 cm axillary lymph nodes bilaterally and 1.4 cm inguinal lymph nodes bilaterally. Laboratory studies, including a CBC and comprehensive chemistry panel, are normal. What do you recommend?

A. Antibiotic therapy for an upper respiratory infection
B. CT scans to stage the patient and, if positive, biopsy the cervical lymph nodes
C. Biopsy the cervical lymph nodes
D. Biopsy the inguinal lymph nodes

**Answer: C.** The most probable diagnosis is a low-grade lymphoma. This is based on the widespread distribution of lymph nodes, the small, soft characteristics of the lymph nodes, and the waxing and waning nature of the nodes. The response to antibiotics is probably more correlated with the usual waxing and waning than with a true treatment effect. Lymph nodes of this size and this persistence are not normal. A full evaluation would not change the need
for biopsy. Biopsy of axillary or inguinal lymph nodes is potentially less revealing because these nodes are more likely to be reactive. Therefore a cervical biopsy would be optimal.

Q.2. A 21-year-old man comes to see you for persistent abdominal pain over the last two to three weeks. He also believes his abdomen is getting bigger. He has started to have sweats at night that soak the sheets. His appetite has decreased. His past history is negative. His physical examination is normal except for an 8-cm mass in the mid-abdomen. Laboratory studies reveal the following:

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<th>Test</th>
<th>Value</th>
<th>Normal</th>
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</thead>
<tbody>
<tr>
<td>WBC</td>
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<td>4500–11,000/uL</td>
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<tr>
<td>Hemoglobin</td>
<td>13.9</td>
<td>13.9–16.3 g/dL</td>
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<tr>
<td>MCV</td>
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<td>80–100 fl</td>
</tr>
<tr>
<td>Platelet count</td>
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<td>150,000–350,000/µL</td>
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<td>BUN</td>
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<td>Creatinine</td>
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<tr>
<td>Prothrombin time</td>
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<td>10.8–13.0 sec</td>
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<tr>
<td>APTT</td>
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<td>23.4–33.5 sec</td>
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<tr>
<td>Fibrinogen</td>
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<td>150–450 mg/dL</td>
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<td>ALT/AST</td>
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<td>0–40 IU/L</td>
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<td>0.2–1.2 mg/dL</td>
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<tr>
<td>LDH</td>
<td>1539</td>
<td>122–220 IU/L</td>
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<tr>
<td>Uric acid</td>
<td>10.5</td>
<td>2.4–6.4 mg/dL</td>
</tr>
</tbody>
</table>

Which of the following is the most reasonable next step?
A. Referral to a gastroenterologist for endoscopy
B. Ultrasonography of the abdomen
C. Immediate CT scan and referral for biopsy
D. Culture and antibiotic therapy for three days before further evaluation

Answer: C. Relevant facts are the young age, male sex, abdominal mass, systemic symptoms, elevated WBC (a differential might show excess lymphocytes which are really malignant), the elevated uric acid (indicating tumor lysis), and the very high LDH. This is a typical presentation of a high-grade lymphoma, possibly Burkitt’s lymphoma. This is one of the most rapidly growing tumors, and it approaches a medical emergency. An immediate biopsy is the proper approach and the CT would direct the biopsy. Since the disease is not in the lumen of an organ, endoscopy would not help. Ultrasonography is less ideal as an imaging study in this setting. This is not an infection, so answer D is not correct.

Q.3. A 20-year-old college student presents with several months of intermittent low-grade fevers and fatigue. Two years ago he had infectious mononucleosis, and has otherwise been healthy. A year ago he had a negative HIV test. Travel history and exposure history are unremarkable. On examination, he appears nontoxic. A
nontender, 2.5-cm right supraclavicular lymph node is palpated. Examination is otherwise unremarkable. Labs include the following:

<table>
<thead>
<tr>
<th>Value</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC</td>
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</tr>
<tr>
<td>Lymphs</td>
<td>15% /24%–44%</td>
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<tr>
<td>Polys</td>
<td>80% /40%–70%</td>
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<tr>
<td>Hemoglobin</td>
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<tr>
<td>Platelet count</td>
<td>475,000 /150,000–350,000/µL</td>
</tr>
</tbody>
</table>

Needle biopsy of this lymph node reveals large atypical lymphocytes concerning for, but not diagnostic of, Hodgkin’s lymphoma. CT also reveals mediastinal adenopathy, with lymph nodes measuring up to 3 to 4 cm. What is the appropriate next step?

A. Bone marrow biopsy
B. Mediastinoscopy with lymph node biopsy
C. Excisional biopsy of the supraclavicular lymph node
D. Whole body FDG-PET scan

**Answer: C.** The result of needle biopsy is not definitive. Excisional lymph node biopsy for “architecture” is often critical in definitively diagnosing the type of lymphoma, particularly Hodgkin’s, and therefore this is the appropriate next step. Mediastinoscopy could be considered, but it is easier to biopsy the supraclavicular node. Despite this patient’s classic presentation of Hodgkin’s lymphoma—including the young age, constitutional symptoms, lymphopenia, and thrombocytosis—a non-Hodgkin’s lymphoma has not been ruled out and the management and prognosis would be different. An FDG-PET scan is useful in staging of lymphoma. However, the first step is to confirm the diagnosis. Bone marrow biopsy would also be helpful for staging, but the diagnostic yield of a lymph node biopsy is generally greater.

Q.4. A 30-year-old man presents with a pathologic fracture of the left femur. He is found to have a bony lesion in the femur, with extension into the surrounding soft tissues. Biopsy reveals a large B-cell lymphoma. In addition to CT of the chest, abdomen, and pelvis, necessary baseline evaluations include which of the following:

A. LDH
B. Uric acid
C. HIV antibody test
D. Bone marrow biopsy and aspirate
E. All of the above

**Answer: E.** HIV antibody testing is indicated for any patient with diffuse large B-cell lymphoma (and also for patients with Burkitt’s lymphoma and Hodgkin’s lymphoma). Diffuse large B-cell lymphoma is an AIDS-defining illness, and tends to be more aggressive with a propensity for widespread dissemination. The young
age and unusual site of lymphoma in this patient especially mandate that this be ruled out. The LDH is commonly elevated in aggressive non-Hodgkin’s lymphomas and is an adverse prognostic indicator; it is included in the International Prognostic Index (along with age, performance status, stage, and number of extranodal sites) and therefore would be useful for prognostication. Aggressive lymphomas can have spontaneous tumor lysis, and therefore uric acid should be checked along other tumor lysis labs (creatinine, potassium, phosphorus, and calcium); additionally allopurinol should be considered for tumor lysis prophylaxis. Involvement of bone by lymphoma is distinct from involvement of bone marrow, and therefore bone marrow biopsy is still required for staging in this case.

CHAPTER 57: PLASMA CELL DYSCRASIAS

Q.1. You are examining a 57-year-old man with a one-year history of multiple myeloma. He complains of a fever of 101°F, shaking chills, and a nonproductive cough. Chest x-ray reveals a right lower lobe infiltrate. What is the most likely organism to be causing his difficulty?

A. Haemophilus influenzae
B. Streptococcus pneumoniae
C. Escherichia coli
D. Pneumocystis carinii
E. Legionella pneumophila

Answer: B. Patients with myeloma are at risk for recurrent bacterial infections because of disease-associated reductions in normal immunoglobulins. Patients should be immunized against pneumococcus and influenza even though many will not mount adequate immune responses to provide complete protection. Although any of the organisms listed could cause pneumonia, S. pneumoniae is the most likely. When P. carinii occurs in these patients, it is typically in those receiving long-term steroid therapy in the form of combination chemotherapy (e.g., vincristine, adriamycin, and dexamethasone) or melphalan and prednisone. These patients should receive TMP/SMX or dapsone prophylaxis.

Q.2. A 56-year-old woman presents to the emergency room with new onset epistaxis, blurred vision, and confusion. Her past history is notable for hypertension, for which she takes HCTZ. She has no medication allergies. She does not drink alcohol and does not smoke. On examination her blood pressure is 160/80. Other vital signs are normal. She is oriented only to herself. On head and neck examination you note evidence of recent epistaxis, and her gums are bleeding. Chest examination reveals bibasilar crackles, and there is an S3 gallop
on cardiac examination. Her abdomen is unremarkable and there is no peripheral edema; however, she does have multiple ecchymoses on her lower extremities. Labs are as follows:
Hgb: 8.0
Hct: 24.0
Platelets: 350,000
WBC: 8.5 (normal differential)
Na: 144
K: 3.8
Cl: 105
CO\textsubscript{2}: 25
BUN: 20
Creatinine: 1.1
Total protein: 10.2
Albumin: 3.0

What is the most likely cause of her symptoms?
A. Essential thrombocythemia
B. Chronic myeloid leukemia
C. Glanzman’s thrombasthenia
D. Hyperviscosity syndrome

**Answer: D.** This patient’s symptoms of oropharyngeal bleeding, blurred vision, and confusion are most consistent with hyperviscosity syndrome. On examination, the patient appears to have evidence of congestive heart failure, which would support a diagnosis of hyperviscosity syndrome. Essential thrombocythemia would not cause symptoms with a normal platelet count. Similarly, chronic myeloid leukemia could cause these symptoms because of leukostasis, but this is usually only seen in patients in blast crisis with high WBC counts and large number of circulating blasts, again not seen here. Glanzman’s thrombasthenia is caused by the loss of a functional von Willebrand factor receptor and causes lifelong bleeding, not new onset bleeding at age 56 years.

**Q.3.** What is the most appropriate therapy for a patient with hyperviscosity syndrome?
A. Platelet transfusion
B. Packed RBC transfusion
C. Plasmapheresis
D. Prednisone
Answer: C. The treatment of hyperviscosity syndrome is urgent plasmapheresis on a daily basis until symptoms resolve. Exchange should be with albumin, not plasma. Platelet transfusions and RBC transfusions are not appropriate, nor is prednisone therapy.

Q.4. You are evaluating a patient who has presented with hypercalcemia, and suspect a diagnosis of multiple myeloma. You are surprised that the urinalysis reveals only 1 protein, expecting higher amounts of protein to be present because of immunoglobulins produced by the multiple myeloma. As part of the evaluation, you send a 24-hour urine protein collection for electrophoresis and immunofixation. This reveals 12 grams of kappa light chains (a high value). What is the most likely reason for the discrepancy between the urine dipstick value and the 24-hour urine collection?
A. Random sampling and variable protein excretion during the day
B. Lab error
C. Dehydration
D. Differences in test technique

Answer: D. Urine dipsticks detect albumin and often miss the smaller proteins such as light chains. Therefore, a urine dipstick often underestimates the degree of Bence-Jones proteinuria that can be present in multiple myeloma. Sulfosalicylic acid will precipitate these small proteins and is a rapid method for looking for the presence of proteinuria, especially if the urine dipstick is negative.

Q.5. A 52-year-old woman presents to the clinic for a routine checkup. She is without complaints. Her physical examination is normal. Appropriate screening studies are negative. She is incidentally found to have an elevated total protein when a chemistry panel is obtained. The value is repeatedly elevated. Serum protein electrophoresis reveals an IgG kappa monoclonal protein at 2.5 g/dL. Urine protein electrophoresis is negative. She is not anemic and her calcium and creatinine are normal. What is the most appropriate next step?
A. Begin therapy for multiple myeloma
B. Diagnose the patient with MGUS that requires no further follow-up
C. Obtain serial SPEPs
D. Bone marrow aspirate and biopsy

Answer: D. This patient has a monoclonal M-protein without evidence of Bence-Jones proteinuria, anemia, or hypercalcemia. You are not told her quantitative immunoglobulin levels. A bone marrow aspirate and biopsy is needed to quantify the number of plasma cells and evaluate the other hematopoietic elements. If she has 30% or more plasma cells on bone marrow, she would be given a diagnosis of multiple myeloma based on one major (BM-plasma cells) and
Q.6. A 65-year-old man presents to clinic for follow-up of hypertension. He reports that he is feeling well, has been compliant with his medications and diet, and has no complaints. He is currently receiving atenolol 50 mg a day with HCTZ 25 mg a day. Physical examination reveals a blood pressure of 120/75, pulse 60, respiratory rate 18, and weight of 85 kg. His examination is normal without evidence of S3 or S4 and extremities reveal no edema with good distal pulses. Laboratory studies reveal a total protein of 8.5 mg/dL with albumin 3.6 mg/dL. The remainder of his chemistries, including BUN, creatinine, and calcium are normal. The elevation in total protein is a new finding as compared to blood work from two years ago. You call him to come in for repeat chemistries and confirm the above findings. You order additional laboratories including a CBC, serum protein electrophoresis/immunofixation, and 24-hour urine protein electrophoresis/immunofixation. These reveal the presence of a monoclonal gammopathy in his serum with an M spike measuring 0.9 g/dL and IgG kappa on immunofixation. Urine protein electrophoresis and immunofixation are negative. CBC is normal. IgG is 1900, IgA 257, IgM 110. What further tests are needed at this time to make a diagnosis?

A. Bone marrow aspiration and biopsy
B. Skeletal survey
C. Bone scan
D. MRI of spine

Answer: B. Skeletal survey. This patient has a monoclonal gammopathy, but has no evidence of suppression of normal immunoglobulins or any evidence of end-organ dysfunction. Thus, while a bone marrow could be performed, it is usually not warranted unless the M protein is greater than 1 g/dL or there is evidence of end-organ dysfunction. A skeletal survey should be done to look for evidence of lytic lesions as the finding of these would indicate the need to perform a bone marrow aspirate and biopsy. Bone scans are not helpful in identifying the lytic lesions that characterize myeloma. They are helpful in identifying blastic
lesions. Thus, this is not the correct test to evaluate patients for lytic skeletal lesions. MRI of the spine would also not be appropriate as a screening test for lytic lesions.

**Q.7.** You evaluate a 65-year-old male patient who presents with an elevated total protein, and on SPEP has a monoclonal gammopathy (M spike measuring 0.9 g/dL composed of IgG kappa). Past medical history is unremarkable; he has been married and monogamous for 30 years. Physical examination is normal. CBC and renal function are normal. Skeletal survey is negative. What is this patient’s diagnosis?

A. Multiple myeloma  
B. HIV  
C. Monoclonal gammopathy of undetermined significance  
D. Waldenström’s macroglobulinemia

**Answer: C.** Monoclonal gammopathy of undetermined significance. This patient has an elevated protein, which on further evaluation revealed an IgG kappa monoclonal gammopathy. There is no evidence of end-organ dysfunction, no symptoms and no suggestion that this has progressed to multiple myeloma. Two to three percent of people this man’s age have a monoclonal gammopathy. He warrants follow-up with a repeat SPEP, basic metabolic panel (including BUN, creatinine, calcium), and CBC in three and six months. If the values are stable, then they may be repeated annually to follow for change. His risk of progression to a more serious illness is 1% per year. While HIV is associated with monoclonal gammopathies, there is nothing in his history or laboratory studies to make this diagnosis. A diagnosis of multiple myeloma requires the demonstration of a significant plasmacytosis, suppression of normal immunoglobulins, and/or evidence of end-organ dysfunction. Waldenström’s macroglobulinemia is characterized by an IgM monoclonal gammopathy, lymphadenopathy, anemia, and frequently hepatosplenomegaly, which this patient does not have.

**Q.8.** A 57-year-old woman is undergoing evaluation for newly diagnosed congestive heart failure. She reports a 12-month history of progressive orthopnea, PND, and DOE. She also complains of the development of significant lower extremity edema, as well as numbness and tingling of her feet to the level of her mid calf. Physical examination reveals blood pressure of 120/80, pulse 110, respiratory rate 26, O₂ saturation 92% on room air. Examination reveals jugular venous distension to 10 cm, decreased breath sounds at the lung bases one-quarter up with crackles half way up. PMI is nondisplaced, but enlarged with an audible S3. She has hepatomegaly with a liver span of 16 cm and positive hepatojugular reflux. Extremities reveal 3+ edema to the groin and decreased sensation from the knees distally with loss of distal reflexes. Nails are noted to be brittle with pitting.
Laboratory studies reveal BUN of 30 and creatinine of 1.6. Total bilirubin is 0.9 mg/dL, AST 80 mg/dL, ALT 90 mg/dL, and alkaline phosphatase 365 mg/dL. CBC is normal. Urinalysis shows 4+ protein. EKG reveals low voltage throughout. Echocardiography reveals a diffusely thickened ventricle without segmental wall motion abnormality. A right heart catheterization and endomyocardial biopsy is done and reveals diffusely positive staining using Congo Red and a polarizing microscope. What is the most likely cause of her symptoms?
A. AL amyloidosis
B. AA amyloidosis
C. Familial amyloidosis
D. Hypertrophic cardiomyopathy

**Answer: A.** This patient has a classic presentation of AL amyloidosis manifesting predominantly with cardiac symptoms. In other cases, depending on the affinity of the protein, renal symptoms and proteinuria may predominate. The diagnosis of amyloidosis is made by the demonstration of amyloid protein in tissue as seen by positive Congo red stain of an affected tissue. In renal amyloid, unlike myeloma, the predominant protein in the urine is albumin so this is often detected by urine dipstick. A 24-hour urine is still required to quantify this and electrophoresis and immunofixation should be done to look for evidence of a monoclonal protein. In most cases, these are lambda light chain processes. To determine the type of amyloid, the affected tissue should have further stains done looking for light chains (AL amyloidosis), transthyretin (most familial), or serum amyloid A (AA amyloidosis) deposition. Treatment is directed at the underlying cause in addition to symptomatic management of the congestive heart failure.

**Q.9.** A 70-year-old woman has recently been diagnosed with multiple myeloma. She is anemic with hemoglobin 9.0 mg/dL, and BUN and creatinine normal. SPEP demonstrates an M protein of 3.2 g/dL. IgG is 250, IgA 2500, IgM 10, and immunofixation is IgA lambda. UPEP is negative. Bone marrow biopsy reveals 40% plasma cells and her skeletal survey demonstrates lytic lesions involving her clavicles and bilateral humerii. In addition to systemic chemotherapy for this disease, what other therapy should she be given?
A. Calcium
B. Intravenous gammaglobulin
C. Prophylactic antibiotics
D. Bisphosphonates

**Answer: D.** This patient has Stage IIIa IgA lambda multiple myeloma and evidence of skeletal disease as demonstrated by lytic lesions on her skeletal survey. Randomized phase III trials have demonstrated a reduction in the risk of fracture when patients with one or more lytic lesions are treated with intravenous
bisphosphonates (thus Answer D is the correct choice). There is no role for the administration of calcium, intravenous gammaglobulin (rarely used, but when they are it is for recurrent life-threatening infections in patients with a low IgG), or prophylactic antibiotics in this situation.

Q.10. A 65-year-old African-American woman presents to the clinic complaining of sudden-onset low back pain. She denies fevers, chills, or night sweats. She denies bowel or bladder difficulty and denies lower extremity weakness or paresthesias. Past medical history is unremarkable. She takes no medications, and has no allergies. She has smoked a pack of cigarettes daily for 40 years. On physical examination, her vital signs show a temperature of 37.0° C, pulse rate of 95, respiratory rate of 16, and blood pressure of 156/90. Her lungs are clear, and cardiac examination is normal. Point tenderness is noted at the L4–L5 level. You obtain a lumbosacral spine x-ray, which reveals an L5 compression fracture. You suspect myeloma; which test should be ordered next?
A. Bone marrow aspirate and biopsy
B. Skeletal survey
C. Bone scan
D. SPEP and UPEP

Answer: D. The first test to order when a plasma cell dyscrasia is suspected is a SPEP and UPEP. Skeletal surveys are used to evaluate for the lytic lesions of bony metastases in the patient with myeloma. A bone scan, which detects blastic lesions, is not useful in the evaluation of the patient with myeloma. A bone marrow aspirate and biopsy is used to determine the extent of bone marrow involvement in a patient with a monoclonal gammopathy. Greater than 30% plasma cells in the bone marrow is diagnostic of multiple myeloma, while 10% to 30% is suggestive of this diagnosis.

Q.11. A 66-year-old African-American male is seen by his primary care provider for new-onset lower extremity swelling. He denies orthopnea, dyspnea on exertion, and chest pain. He complains of fatigue and a decrease in energy. He has no fevers, chills, or night sweats. Past medical history is notable for carpal tunnel release two years ago. He is on no medications. On examination, blood pressure is 165/100; other vital signs are normal. The cardiac exam is normal, and lungs are clear. 3+ pitting edema to the mid-thighs is noted. A comprehensive panel is normal except for the following: BUN 25, Cr 2.5, albumen 3.5, cholesterol 400. Hematocrit is 25%, with normal MCV. WBC and platelet counts are normal. 4+ protein is noted on urine dipstick. EKG and CXR are normal. You suspect that the lower extremity swelling is due to nephrotic syndrome and obtain a 24-hour urine collection for protein, electrophoresis, and immunofixation. This demonstrates 8 g of monoclonal lambda light chains. The most appropriate treatment is
A. Diuretics
B. Melphalan and prednisone
C. Ace inhibitor
D. Erythropoietin

**Answer: B.** This patient has nephrotic syndrome due to light chain disease, either due to myeloma or amyloidosis (rare with Waldenström’s macroglobulinemia). Treatment is directed at the underlying disorder and therefore prednisone is the best option available. Diuretics may help with the swelling, but will not treat the underlying disorder. ACE inhibitors are relatively contraindicated given the elevated creatinine. Although the patient is anemic, erythropoietin would not help with the nephrotic syndrome.

**Q.12.** Which one of the following is not a complication of multiple myeloma?
A. Vertebral compression fractures
B. Pneumococcal pneumonia
C. Hyperviscosity syndrome
D. Hypocalcemia

**Answer: D.** Patients with multiple myeloma may develop any of a number of complications. Lytic lesions involving the spine may result in vertebral compression fractures; in fact, any bone may be involved by multiple myeloma. Patients also have suppression of normal immunoglobulins, and are at risk for recurrent bacterial infections, including pneumococcal pneumonia. Hyperviscosity syndrome may develop as a result of overproduction of immunoglobulins. Hypercalcemia (not hypocalcemia) is also a common complication of multiple myeloma.

**Q.13.** A patient presents with new-onset congestive heart failure. He is a 65-year-old male, with a past history of hypertension, elevated cholesterol, and monoclonal gammopathy of undetermined significance. He denies chest pain, but developed pedal edema and dyspnea over the past week. He also complains of headache and dizziness, along with blurred vision. He has had nosebleeds daily over the past week. Medications include nifedipine and HCTZ, which he has been taking, and atorvastatin, which he has not been taking. The patient admits to noncompliance with medical visits; he hasn’t seen his physician in two years. On physical examination, blood pressure is 146/88, pulse rate 96, and respiratory rate 20. He is afebrile. Jugular venous pressure is elevated. Bibasilar rales are noted. Cardiac exam reveals an S3 gallop. Pedal edema extends to the thighs. On funduscopic exam, papilledema, flame-shaped retinal hemorrhages, and “box-car” changes to retinal vessels are noted. EKG is normal. Appropriate treatment of this patient includes
A. Plasmapheresis  
B. Dexamethasone  
C. Cyclophosphamide  
D. Exchange transfusion  

**Answer:** A. This patient manifests the clinical findings of a patient with hyperviscosity syndrome. While most commonly seen in patients with Waldenström’s macroglobulinemia (where the immunoglobulin overproduced is IgM), it may occur in multiple myeloma with other immunoglobulin class overproduction. Symptoms usually are seen when serum viscosity is greater than 4 centiPoises. Common symptoms are headache, dizziness, blurred vision, and spontaneous bleeding. Other symptoms include paresthesias, loss of vision, and congestive heart failure. On examination, retinal findings are characteristic, and include flame-shaped hemorrhages, papilledema, and “box car” changes to retinal vessels. Treatment is plasmapheresis.

Q.14. A 72-year-old woman presents with new-onset congestive heart failure. Evaluation includes an EKG, notable only for low voltage throughout, and an echocardiogram that demonstrates decreased LV function. No pericardial effusion is seen, but an unusual sparkle is noted on echocardiogram. Past history is notable for bilateral carpal tunnel syndrome. Which one of the following tests would provide a unifying diagnosis to these findings?  
A. Nerve conduction studies  
B. Fat pad aspirate  
C. Coronary angiography  
D. Colonoscopy  

**Answer:** B. This patient is presenting with evidence of amyloidosis, and a fat pad aspirate should be obtained and stained with Congo red (with green birefringence noted). There are three subtypes of amyloidosis: AL, AA, and familial. AL amyloid results from the overproduction of immunoglobulin light chains. Organs typically involved include the heart (with CHF, low voltage on EKG, and a characteristic sparkle on ECHO noted), the nerves (sensory or autonomic neuropathy seen, as is carpal tunnel syndrome), and the kidneys (nephrotic syndrome and proteinuria are seen). Macroglossia and hepatomegaly are common. AA amyloid results from overproduction of serum amyloid A, usually in the presence of underlying infectious or inflammatory diseases. Cardiac involvement is less common with AA amyloid. Familial amyloidosis results from the overproduction of transthyretin, with neuropathy the most common manifestation. The kidneys are relatively spared in familial amyloidosis, and macroglossia is not seen.
Chapter 58: SELECTED TOPICS IN ONCOLOGY

Q.1. A 66-year-old man with newly diagnosed lymphoma presents to your office before his first scheduled chemotherapy treatment by his oncologist. His past medical history is notable for hypertension, chronic renal insufficiency with a baseline creatinine of 1.9 mg/dL, and gout. Which of the following is not an appropriate step in preventing the development of tumor lysis syndrome?

A. Administer bicarbonate to alkalinize the urine
B. Start allopurinol
C. Administer intravenous fluids before chemotherapy
D. Start oral phosphorus at least three days before the treatment

Answer: D. This patient is at high risk for developing tumor lysis syndrome given his renal dysfunction and baseline hyperuricemia. Tumor lysis syndrome results from massive lysis of tumor cells causing hyperuricemia, hyperphosphatemia, hyperkalemia, hypocalcemia, renal failure, and lactic acidosis. Prevention is best accomplished by administration of agents to control the metabolic derangements and potential insults to the kidney. The administration of phosphorus would be harmful because it would only add to the phosphate burden from cell lysis.

Q.2. A 67-year-old white woman with stage II breast cancer is evaluated on Friday evening in the emergency room because of nausea and vomiting. She received her second cycle of adjuvant chemotherapy seven days ago and since then has had difficulty with nausea and vomiting. She reports a low-grade temperature of 37.9° C in the past 24 hours, but stopped taking her temperature because she was too nauseated to do so. She denies any cough, shortness of breath, dyspnea on exertion, dysphagia, diarrhea, dysuria, or frequency. She is currently taking a diuretic for her hypertension but no other medications. On physical examination, the patient appears volume depleted, fatigued, and nauseated, but the rest of her examination is unremarkable. Her vital signs are as follows: temperature of 38.6° C, blood pressure of 88/50, pulse of 114/min, and respiratory rate of 14/min. She is mildly orthostatic. Laboratory data revealed mild anemia, with an Hct of 32, WBC of 1400, absolute neutrophil count of 490, and platelet count of 159. Which of the following is the most appropriate management for this patient?

A. Administer intravenous fluids and antiemetics, and send the patient home with follow-up in oncology clinic
B. Administer intravenous fluids; obtain blood cultures, urine culture, chest x-ray; administer antiemetics and broad-spectrum antibiotics; hospitalize patient
C. Administer intravenous fluids; obtain blood cultures, urine culture, chest x-ray; administer antiemetics and send the patient home with follow-up in oncology clinic
D. Administer intravenous fluids, antiemetics, a dose of oral antibiotic, and send the patient home

**Answer: B.** The patient is a febrile neutropenic patient. Even though her total WBC count is 1400, the absolute neutrophil count is low and is most likely going to decrease further because she is only seven days post-treatment. Intravenous fluids with antiemetics are important, as is the immediate administration of intravenous antibiotics. Her blood pressure may be low because of volume depletion and diuretic use, but it may also be because of sepsis. Sending the patient home for follow-up in the oncology clinic is not appropriate for this situation.

Q.3. A 62-year-old postmenopausal woman was found to have a 2-cm fixed, nontender right axillary mass on routine physical examination. Previous mammograms, including one a year ago, were unremarkable and she has no family history of breast cancer. The patient denies weight loss, fatigue, shortness of breath, or other symptoms. Breast examination is unremarkable. Which of the following is the most appropriate management for this patient?

A. Send her home with heat packs to the axilla and follow up in six months
B. Chest x-ray; MRI of her axilla; CT scan of head, neck, chest, abdomen, and pelvis
C. Bone scan only
D. Mammogram, chest x-ray, and referral to a surgeon for biopsy
E. Colonoscopy and upper endoscopy

**Answer: D.** The patient has isolated axillary adenopathy. A mammogram should be repeated because the last one was one year ago. Biopsy by the surgical oncologist for obtaining histologic diagnosis is paramount. Once a diagnosis is established, the patient can be treated as having stage II breast cancer if the primary site is unclear. Sending the patient home with remote follow-up is not optimal. Other radiologic studies are not warranted at this stage of the workup.

Q.4. A 50-year-old female is seen in the emergency room for falling at home and not being able to stand up. She called 911 and they brought her in for further workup. The patient noted that in the past month, she was having difficulty arising out of her chair and her bed. However, once she started to become mobile during the day, the weakness would improve, and she would be able to function at work. In the past two days, she noted that the weakness was worsening and overall she felt unwell. She denies fever, shortness of breath, or chest pains, but has dyspnea on exertion. She has a significant smoking history of three packs per day for the last 15 years. She admits to dysphagia with solids, but no odynophagia. On examination, she is noted to have proximal muscle weakness. Her skin
examination is unremarkable. Which of the following is the most appropriate management for this patient?
A. Observation
B. Physical therapy and speech therapy
C. Nerve conduction studies and inpatient hospitalization for further workup including a chest x-ray
D. Give her the number of a smoking cessation clinic

Answer: C. The leading diagnosis is Eaton-Lambert syndrome. The patient’s symptoms may be consistent with myasthenia gravis, but her weakness improves with exercise. The patient needs to be hospitalized for possible plasmapheresis and initiation of immunosuppressive therapy. Once treatment has been established, it may be completed as an outpatient; but at this time, inpatient workup is indicated. A chest x-ray to evaluate for lung cancer is reasonable because the association of this syndrome and small cell lung cancer is high.

Q.5. A 45-year-old white male notes swelling below his left jaw. He has a negative smoking history but has chewed tobacco for the past 15 years. He has worked in construction for 20 years and has no family history of cancer. On examination, the patient has a 3-cm, immobile, nontender mass in the left submandibular area. The rest of his examination is unremarkable. Laboratory data and a chest x-ray are unrevealing. Needle aspiration biopsy of the mass suggests the presence of a poorly differentiated carcinoma, but the pathologic specimen is not optimal. Immunoperoxidase staining is faintly positive for S100. Which of the following is the most appropriate management for this patient?
A. Obtain CT scan of neck and refer to otolaryngology for panendoscopy
B. Obtain PET scan and treat positive areas with radiation therapy
C. Perform surgical biopsy of mass and repeat immunostaining
D. Treat with chemotherapy
E. Obtain CT scan of head, neck, chest, abdomen, pelvis, and bone scan

Answer: C. The needle aspiration biopsy is not an optimal sample. There is a suggestion that the mass may be consistent with melanoma, but confirmation is necessary with surgical biopsy. Checking immunoperoxidase staining of S100 and HMB45 would be helpful for diagnosis of melanoma. Treatment with any modality is premature. Extensive radiological workup in this situation is not warranted.

Q.6. A 54-year-old woman presents complaining of a two-week history of progressive dyspnea and facial swelling. She has no significant past medical problems but has a 40 pack-year smoking history. Her physical examination reveals a pulse of 90/min, a blood pressure of 122/78, a respiratory rate of 22/min, and an oxygen saturation of 92%. Cardiac and pulmonary auscultation
reveals no significant abnormalities. Inspection of her face and chest reveal swelling of the face, right arm swelling, and prominent, dilated veins on her chest. Which of the following is the most appropriate next step?
A. Obtain a 24-hour urine for free cortisol
B. Obtain a CT scan of the chest
C. Obtain an ultrasound of the liver and abdomen
D. Refer for emergent radiation therapy to the chest
E. Start intravenous heparin

**Answer:** B. This woman presents with a fairly acute presentation of facial swelling, neck swelling, and dyspnea with evidence of hypoxemia. Her exam is notable for dramatically dilated chest veins. The most likely etiology would be superior vena cava (SVC) syndrome. A CT scan of the chest with contrast (or MRI with gadolinium) would be the best next step to evaluate the vasculature in the upper chest and make a diagnosis.

Q.7. The above 54-year-old woman undergoes CT scanning of the chest that reveals a 5-cm diameter lung mass compressing the superior vena cava. Which of the following should be done next?
A. Refer for CT-guided biopsy of the mass
B. Start intravenous thrombolytic therapy
C. Refer to an oncologist for chemotherapy
D. Refer for emergent radiation therapy
E. Start intravenous heparin

**Answer A.** The patient has confirmed SVC syndrome due to extrinsic compression of a lung mass. Thrombolytics and heparin have no role in this case as there is no evidence of intrinsic thrombosis. Emergent radiation was previously thought to be the treatment of choice; however, recent data has shown that delaying therapy until a histologic diagnosis has been obtained poses no imminent risk to patients. Additionally, prebiopsy radiation has been shown to obscure histology and hinder tumor identification. A CT-guided biopsy or bronchoscopy should be done to establish a diagnosis, and treatment should be geared towards the specific tumor type. In patients who need urgent symptomatic relief or have shown no response to tumor therapy, endovascular intraluminal stenting may be appropriate.

Q.8. A 64-year-old man with a history of lung cancer presents 10 days after his last chemotherapy with fevers and chills. His pulse is 95 and his blood pressure is 122/77. His white blood cell count is 1000/µL with 30% neutrophils, 5% bands, 60% lymphocytes, 3% monocytes, and 2% eosinophils. Which of the following statements is correct?
A. Antibiotics should be withheld until a source of infection has been identified
B. A tagged white blood cell scan should be ordered to identify the source of infection
C. He should be empirically started on ivermectin to treat a potential parasitic infection, given his eosinophilia
D. Empiric antibiotic therapy with ampicillin or erythromycin should be started
E. Even though a primary source of infection is unlikely to be discovered, he should undergo panculture of blood, stool, urine, and throat, and get a chest x-ray

**Answer E:** This man has neutropenic fever, with an absolute neutrophil count of 350/µL (neutrophils + bands). It is important to panculture these patients even though a primary source of infection will only be obtained 20% of the time. Empiric antibiotic therapy with a broad-spectrum agent (e.g., cefipime) or combination of agents is indicated. Ampicillin or erythromycin would not be sufficient. The patient should not receive a tagged white cell scan as it will have very low utility in a patient unable to mount a neutrophilic response. The patient does not have eosinophilia and should not be treated with ivermectin.

**Q.9.** A 60-year-old African-American female with metastatic lung cancer is brought to the emergency room by her husband due to increasing confusion and sedation. Her husband noted that the patient was recently diagnosed with stage IV lung cancer and has not undergone any treatment as of yet. She was to see the medical oncologist in the following week to receive chemotherapy. The patient has metastatic disease in her liver and thoracic spine. Due to disease in her spine, she started taking low-dose narcotics one week ago. About the same time, the patient started becoming confused. She also has been constipated and not had a bowel movement in one week. On examination, the patient was sedate, but alert. She was not oriented to place or time, but knew her husband. The rest of her physical examination, including neurologic examination, was unremarkable. Laboratory data revealed the following:

- Creatinine: 1.4 (slightly elevated)
- Sodium: 138
- Potassium: 3.9
- Glucose: 130
- Calcium: 11.0
- Albumin: 2.0
- WBC: 9800
- HCT: 29
- Platelets: 158

Which of the following is the most appropriate management for this patient?
A. Administer naloxone and an enema
B. Administer IV fluids and hospitalize the patient
C. Administer IV fluids and send the patient home with follow-up with the medical oncologist next week
D. Administer naloxone, an enema, and broad-spectrum antibiotics

Answer: B. The patient has hypercalcemia probably due to her lung cancer. Corrected level of calcium is 12.6. She should be treated with intravenous fluids, a diuretic if necessary, and bisphosphonates. Aggressive treatment usually requires inpatient hospitalization. The patient’s sedation and somnolence may be a result of overmedication. However, her respiratory status was stable and administering naloxone at this time is not indicated.

Q.10. A 53-year-old woman with no significant past history presents with bloating and increased abdominal girth. She denies any fevers, chills, abdominal pain, diarrhea, hematochezia, melena, hematuria, or vaginal bleeding. Her physical examination reveals abdominal distension and dull flanks. There is shifting dullness on percussion. Her pelvic examination is unremarkable. A CT scan of the abdomen is done which reveals ascites and suspected peritoneal studding. Paracentesis reveals a serum-ascites albumin gap of 0.8 mg/dL. Cytologic analysis is consistent with adenocarcinoma. Which of the following is most appropriate in the management of this patient?
A. Obtain a colonoscopy
B. Send off tumor markers CA 19-9 and a carcinoembryonic antigen
C. Treat the patient for stage III ovarian cancer
D. Treat the patient for stage IV colon cancer
E. Refer for hospice care

Answer: C. This woman presents with peritoneal carcinomatosis without evidence of a primary tumor. These patients should be assumed to have stage III ovarian cancer since it is the most treatable cause for peritoneal adenocarcinoma. Further workup to identify a gastrointestinal primary is not indicated since it would not alter therapy. Patients with stage III ovarian carcinoma have a 15% to 20% 5-year survival so they should be treated with surgical debulking (laparotomy) and chemotherapy. At this point, hospice care would be premature.

Q.11. A 62-year-old woman with stage II breast cancer presents to your office complaining of fevers. She received her second cycle of adjuvant chemotherapy nine days ago and noticed fevers and chills for the last two days. On physical examination, her temperature is 38.9 °C, blood pressure 100/50, pulse 100/min, and respiratory rate 16/min. The rest of her examination is unremarkable. Laboratory data reveals a hematocrit of 26%, leucocyte count of 500/ L with
30% polymorphonuclear leukocytes and 70% lymphocytes, and a platelet count of 159/L. Which of the following is the most appropriate management for this patient?

A. Send the patient home after obtaining blood cultures, a urinalysis and culture, and a chest x-ray, tell her to take acetaminophen for fever as needed and to call you if other symptoms develop

B. Admit the patient, obtain blood cultures, a urinalysis and culture, and a chest x-ray but hold on antibiotics pending the culture results

C. Admit the patient, obtain blood cultures, a urinalysis and culture, and a chest x-ray, and start empiric antibiotic therapy with erythromycin and cefuroxime

D. Admit the patient, obtain blood cultures, a urinalysis and culture, and a chest x-ray, and start empiric antibiotic therapy with erythromycin, cefuroxime, and vancomycin

E. Admit the patient, obtain blood cultures, a urinalysis and culture, and a chest x-ray, and start empiric antibiotic therapy with ceftazidime

**Answer: E.** This patient has febrile neutropenia. Admission to the hospital is indicated at this time although some studies are suggesting that outpatient antibiotic therapy may be an option in low-risk patients. Panculture and empiric antibiotic therapy is the appropriate management choice. Antibiotic therapy with broad-spectrum single agents (e.g., cefipime, cefotetan, imipenem-cilastin, meropenem, ceftazidime) or with a combination of medications (e.g., β-lactam plus an aminoglycoside, quinolone, or a second β-lactam) can be used. The combination of erythromycin and cefuroxime is not appropriate since it would fail to cover some gram-negative organisms such as pseudomonas. Use of vancomycin is usually limited to cases where a methicillin resistant staphylococcus has been identified or when the patient fails to improve on empiric therapy.

**Q.12.** A 62-year-old smoker is brought to the emergency room by his wife who reports that he has been increasingly confused for the last month. She reports that she tried to have him see his doctor but he refused. His physical examination reveals a normal temperature and blood pressure. His oxygen saturation is 95% on room air. His breath sounds are diminished throughout his lungs but there is no evidence of consolidation. He is oriented to person only and is somewhat lethargic. No focal abnormalities are noted on examination. He undergoes a head CT scan that is negative for abnormalities. His labs reveal a normal complete blood count. His chemistries reveal sodium of 120 mEq/L, potassium of 4.4 mEq/L, blood urea nitrogen of 18 mg/dL, and creatinine of 1.0 mg/dL. His transaminases are normal. A chest x-ray is done that reveals a 4-cm left upper lobe mass without evidence of surrounding infiltrate. If this man turns out to have a lung cancer, what is the most likely histologic type?

A. Small cell carcinoma
B. Squamous cell carcinoma  
C. Adenocarcinoma  
D. Large cell carcinoma  
E. Mesothelioma  

**Answer: A.** This patient has a suspected lung cancer and presents with hyponatremia. The most likely histologic type would be small cell carcinoma, which can secrete antidiuretic hormone (ADH). Less than 1% of non–small cell lung carcinomas will present with hyponatremia.

**Q.13.** A 69-year-old man with a history of prostate cancer presents complaining of a one-week history of worsening low back pain. He notes that he has also been having progressive lower extremity weakness to the point where it is difficult for him to walk more than a block. He denies any bowel or bladder incontinence. His physical examination reveals tenderness at the level of the L5 vertebral body, four-fifths lower extremity strength, and an absent Achilles deep tendon reflex on the left. Plain spinal radiographs are done and reveal no significant abnormalities. Which of the following steps is **least** appropriate?  
A. Obtain an MRI of the spine  
B. Refer for physical therapy  
C. Begin steroid therapy  
D. Obtain a CT myelogram  

**Answer: B.** This man has a history of prostate cancer and acute-onset back pain with neurologic sequelae. Epidural metastases and spinal cord compression should be suspected until proven otherwise. The normal plain x-ray does not rule this out since it has a high false negative rate. MRI of the spine is the best available test to rule out this condition. CT myelogram is an alternative in patients who cannot have an MRI. Steroid therapy is reasonable given the rapidity of his neurologic status. If he is found to have a spinal cord compression, an urgent radiation oncology referral should be made. Physical therapy is not appropriate given this patient’s age, history of cancer, and rapid progression of symptoms.

**CHAPTER 59: LUNG CANCER AND HEAD AND NECK CANCER**

**Q.1.** A 56-year-old woman presents to your office complaining of cough and weight loss. A chest x-ray reveals a peripheral lung mass that does not abut the pleura. She has no history of asbestos or cigarette exposure. If this patient turns out to have a lung cancer, what is the most likely histologic type?  
A. Mesothelioma
B. Squamous cell carcinoma  
C. Adenocarcinoma  
D. Large cell carcinoma  
E. Small cell carcinoma  

**Answer: C.** This patient is a nonsmoker with a peripheral lung lesion. If she, in fact, has a lung cancer, the most common histology seen in this type of patient would be adenocarcinoma. Squamous and small cell cancers are more highly associated with smokers and are usually central in nature. Large cell is usually peripheral but is commonly associated with smoking as well. Mesothelioma would typically start from the pleura; it is associated with asbestosis.

**Q.2.** A 37-year-old white male was told to see you because he was found to have a small lump under his left tongue seen during his dental cleaning. The patient is asymptomatic and was not even aware the lump was there. He denies any dysphagia, odynophagia, pain at the base of his tongue, speech changes, or mouth bleeding. The patient does not smoke cigarettes. He consumes about three beers per day. Family history is negative for cancer. On oral examination, you detect a 1.5-cm, left base of tongue lesion. Neck examination is negative. Which of the following is the most appropriate management for this patient?  
A. Ask the patient whether he uses smokeless tobacco, counsel the patient if necessary to discontinue tobacco use, and refer to otolaryngologist for biopsy and further workup  
B. Biopsy mass in the office and instruct the patient to return in three months  
C. Send the patient home and schedule follow-up in three months to see if the mass enlarges  
D. CT scan of head, neck, and chest  

**Answer: A.** The patient probably chews tobacco along with drinking alcohol. He is at high risk for base of tongue cancer. The patient should be referred to otolaryngology for biopsy and panendoscopy. Biopsying the mass by fine-needle aspiration in the office is not optimal because the pathologic results depend on the quality of the biopsy specimen. The patient should not be sent home for observation for three months because an early stage, oropharyngeal tumor is highly curable.

**Q.3.** A 65-year-old male with a previous history of base of tongue cancer complains that he is experiencing dyspnea on exertion, fevers, and productive cough for the past two weeks. On examination, the patient has crackles in his left lower lobe. He is mildly short of breath at rest. A chest x-ray reveals left lower lobe pneumonia, and the patient is treated with intravenous antibiotics in the hospital. The patient’s base of tongue cancer had been treated with surgery and postoperative radiation
20 years ago. He quit smoking cigarettes 20 years ago, but switched to cigars instead. The patient was discharged in good condition, but returns to you in three weeks with similar complaints. Which of the following is the most appropriate management for this patient?
A. CT scan of the chest, bronchoscopy, and antibiotics
B. Chest x-ray
C. Treatment with the same intravenous antibiotics
D. Treatment with different intravenous antibiotics
E. Treatment with oral antibiotics

Answer: A. The patient is at risk of a second upper aerodigestive primary cancer. His original cancer 20 years ago predisposes him to develop a second primary tumor at a rate of 3% to 7% per year. The patient also continued to smoke cigars, which carries the same risk as cigarette smoke. Clinically, the patient appears to have postobstructive pneumonia and is in need of a bronchoscopy with biopsy.

Q.4. A 72-year-old African-American male presents with a 25-pound weight loss and right shoulder pain for two months. The pain is intermittent, increasing in intensity, and radiates down his right arm. On physical examination, there is no weakness or sensory deficits. He is an ex-smoker, quitting five years ago after smoking three packs per day for 30 years. CBC reveals Hct of 30.0 and chemistry panel reveals a slightly elevated alkaline phosphatase. PA and lateral chest x-ray are unremarkable. Which of the following is the most appropriate management for this patient?
A. Send the patient home with follow-up in three months
B. Refer to physical therapy, treat with NSAIDs, follow up in three months
C. Refer to radiation oncologist for radiation treatment to the right shoulder
D. Obtain CT scan of the chest and neck and a bone scan
E. Refer to physical therapy, prescribe iron supplements, follow up in one month

Answer: D. The patient has a high risk of developing lung cancer despite his smoking cessation. Even after five years, the patient’s risk remains elevated when compared with that of a nonsmoker. Despite a negative physical examination and chest x-ray, a CT scan should be obtained to evaluate the lung apices and brachial plexus area. This patient may have an apical tumor (Pancoast tumor) causing brachial plexus compression resulting in shoulder and arm pain. A chest x-ray is not an optimal study for detection of apical tumors. Although radiation therapy may very well be part of the patient’s treatment regimen, biopsy of a new mass is important in establishing the diagnosis and should be done before the institution of any treatment. A bone scan in this situation would be important to document bone invasion. Sending the patient home for later follow-up is not optimal management
because his symptoms have been present for two months and he has significant weight loss.

Q.5. A 55-year-old white female presents to the emergency room with shortness of breath. Her husband states that the symptoms began two weeks ago. She has a smoking history of two packs per day for the past 20 years, but has no other medical history. She denies hemoptysis but has dyspnea on exertion. A chest x-ray of the chest reveals hilar and mediastinal adenopathy with a questionable right upper lobe shadow. CT scan of the chest confirms a 1.5-cm right upper lobe lesion with 3- to 4-cm multiple hilar and mediastinal nodes. Bronchoscopy done in the emergency room reveals small cell lung cancer. Which of the following is the most appropriate for this patient?

A. Encourage smoking cessation, administer chemotherapy and radiation therapy in three months
B. Encourage smoking cessation, administer chemotherapy and radiation therapy in six months
C. Encourage smoking cessation, administer chemotherapy only, and obtain CT scan of brain
D. Encourage smoking cessation, administer radiation therapy only
E. Encourage smoking cessation, obtain CT scan of brain and, if negative, administer chemotherapy and radiation therapy

**Answer: E.** The patient has limited-stage small cell lung cancer. Her median survival is approximately 18 months, and treatment delay would be detrimental to her survival. If she is otherwise without any limiting medical conditions, she should receive combined chemotherapy and radiation therapy. It is also important to rule out asymptomatic brain metastases. A brain CT should be performed. If metastases are found, one could consider prophylactic cranial irradiation.

Q.6. A 62-year-old man presents to your office complaining of right shoulder pain that radiates down his arm. He notes a 15-pound weight loss over the past two months. He has smoked two packs of cigarettes per day since he was 17. He worked in a shipyard and has a history of asbestos exposure. Transthoracic needle biopsy of a right upper lobe lung lesion reveals a primary lung cancer. Which of the following is a true statement about this case?

A. One of the most common histologic subtypes for this patient’s disease is bronchioloalveolar carcinoma
B. Findings on physical examination may include ipsilateral miosis, ptosis, and anhydrosis
C. The presence of malignant cells within an associated pleural effusion does not necessarily imply advanced stage
D. Screening with sputum cytology and serial chest x-rays would have improved his odds of surviving this cancer through earlier detection
E. Asbestos exposure is not associated with this disease

Answer: B. A patient with an apical lung cancer might well present with a Horner’s syndrome. Bronchoalveolar carcinoma is an unusual subtype of adenocarcinoma that is often not associated with tobacco use. A malignant pleural effusion is considered stage IV disease. There is as yet no known screening test that has been shown to lower death from lung cancer. While asbestos exposure is causally related to mesothelioma, it is also clearly associated with the development of primary lung cancer

Q.7. A 58-year-old man comes to your office complaining of a painless lump on the side of his neck. He has a firm, nontender, 3-cm left cervical lymph node. Examination of the oropharynx with a penlight is unremarkable, and a chest X-ray reveals no evidence of masses. He has a 50 pack per year smoking history and drinks one-half pint of gin each day. Needle biopsy of the lymph node reveals a squamous cell carcinoma. Choose the correct statement:
A. If this is cancer of the hypopharynx, his tobacco use, but not his alcohol use, likely contributed to the development of his disease
B. The squamous cell histology makes it unlikely that the primary tumor is esophageal
C. Smoking cessation at this time will not impact his survival from this disease
D. Triple endoscopy (esophagoscopy, bronchoscopy, laryngoscopy) is a reasonable diagnostic strategy at this time

Answer: D. Identification of the primary tumor will guide therapy. Significant alcohol use is clearly associated with head and neck cancers. Esophageal cancers are commonly of squamous cell histology (particularly those of the upper esophagus). It is important that patients and physicians understand that continuing to smoke following a diagnosis of head and neck cancer decreases survival, primarily via the increased risk for new primary tumors.

Q.8. All of the following are risk factors for developing head and neck cancer except
A. Epstein-Barr virus
B. Herpes simplex virus
C. Tobacco
D. Heavy alcohol use
E. Plummer-Vinson syndrome

Answer: B. Epstein-Barr virus is a risk factor for development of nasopharyngeal carcinoma, seen more commonly in southern China. Tobacco use
and heavy alcohol use have also been shown to increase the risk of these cancers, although moderate alcohol use is not a risk factor for disease development. Plummer-Vinson syndrome is rarely seen today. It is characterized by iron deficiency anemia, esophageal webs, and cancer of the hypopharynx or upper esophagus. Herpes simplex virus infection does not increase the risk of head and neck cancers but human papillomavirus (especially type 16) does.

**Q.9.** A 72-year-old woman with a history of diabetes presents to your office complaining of fatigue and dyspnea. She has no other past medical history. Her current medications include metformin and glyburide. She has no history of smoking and reports no significant exposure to secondhand smoke or asbestos. Her family history is only notable for diabetes in her mother and sister. Her review of systems reveals a 10-pound weight loss over the last month. Her physical examination reveals no abnormalities. A chest x-ray is done which reveals a 4-cm mass in the right lower lobe. A CT scan of the chest is then done which reveals a 3.5-cm mass in the outer portion of the right lower lobe. You then refer her for CT-guided biopsy of the mass. If this woman turns out to have bronchogenic carcinoma, what is the most likely histopathologic type?

A. Adenocarcinoma  
B. Squamous cell carcinoma  
C. Small cell carcinoma  
D. Large cell carcinoma  
E. Mesothelioma

**Answer: A.** This woman presents with a lung mass but has no history of cigarette use or exposure. Lung cancer can present in nonsmokers. The pathology is usually adenocarcinoma. Adenocarcinoma and large cell carcinoma typically present in a peripheral location while squamous cell and small cell are more likely to present centrally.

**Q.10.** A 62-year-old man presents with hemoptysis in the setting of a 100 pack per year smoking history. His examination is completely unremarkable but his chest x-ray shows a right hilar mass. A biopsy of the mass is done that reveals non–small cell lung cancer. All of the following statements regarding this patient’s care are correct except

A. If he is found to have stage I or II disease, surgery would be recommended  
B. A CT scan of the head does not need to be done as part of the workup  
C. Even when localized by all available tests, most patients have micrometastases, which will become evident later  
D. Almost 80% of patients will respond to initial therapy using a taxane and platinum analog
E. Radiotherapy is more likely to help than chemotherapy if epidural compression is discovered by further evaluation

**Answer:** D. **Surgical resection** is indicated for early stage disease in cases of non–small cell lung cancer. Even so, most patients with non–small cell lung cancer have micrometastases even when they appear localized. Stage I patients have less than a 50% disease-free survival at 10 years. Currently, CT scanning of the head is not recommended unless neurologic symptoms are present. The best chemotherapy regimens have no better than a 40% response rate, while radiotherapy has a 60% to 70% response rate, which is more reliable for epidural compression.

**Q.11.** A 52-year-old Chinese man presents complaining of fullness and decreased hearing in his left ear. He reports that the symptoms have been present for about three months and seem to be worsening. He was evaluated at a walk-in clinic about one month ago and was told to take pseudoephedrine and use a topical decongestant. He was also treated with an intranasal steroid and 14 days of trimethoprim/sulfamethoxazole. These measures led to minimal improvement in his symptoms but that improvement was short lived. He has no significant past medical history. He denies any cigarette or alcohol use. He is an engineer who immigrated to the United States about 10 years ago. He has two children. One of his children had a recent upper respiratory infection that resolved after two weeks. His physical examination reveals a slightly thickened left tympanic membrane with a visible air-fluid level behind it. There is no erythema. The tympanic membrane does not move on pneumatic otoscopy. The Rinne tuning fork test reveals that bone conduction is greater than air conduction on the left but air conduction is greater than bone conduction on the right. Weber’s test lateralizes to the left.

What is the most appropriate next step in his management?

A. Prescribe oral corticosteroids that should be tapered over six weeks
B. Prescribe a 21-day course of ciprofloxacin
C. Prescribe an antihistamine and a decongestant
D. Refer to an otolaryngologist
E. Both A and B

**Answer:** D. This patient presents with fullness in his left ear with hearing loss. His physical examination reveals conductive hearing loss without evidence of acute infection but evidence of fluid behind the tympanic membrane. These findings are consistent with serous otitis. Most cases of serous otitis are due to upper respiratory infection, chronic rhinosinusitis of bacterial or allergic origin, or dysfunction of the soft palate (from clefts or surgical defects). Rarely, nasopharyngeal carcinoma can cause serous otitis that does not respond to treatment. This patient of Chinese descent is at higher risk for nasopharyngeal carcinoma and he has not responded to treatment with appropriate antibiotics and
decongestants. He should be referred to an otolaryngologist for endoscopic evaluation of his nasopharynx.