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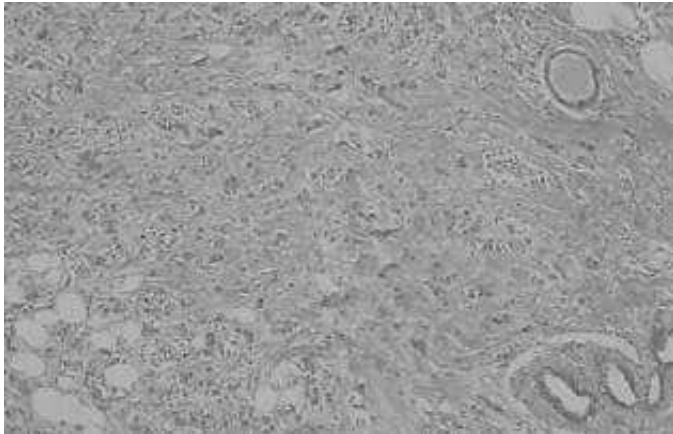
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**QUESTION 1**

A 60-year-old woman presents with an abnormal cluster of microcalcifications on a routine mammogram, and undergoes a needle-localized excisional biopsy. The pathology is shown in Figure. When counseling the patient regarding her surgical options, which of the following statements would be correct?



- A. Modified radical mastectomy differs from a Halsted mastectomy in that the pectoralis major is spared in the modified radical approach.
- B. Modified radical mastectomy differs from Halsted mastectomy in that an axillary lymphadenectomy is not performed in the modified radical approach.
- C. The anatomic limits of the modified radical mastectomy include the sternum medially and the anterior border of the serratus anterior muscle laterally.
- D. Injury to the thoracodorsal nerve during mastectomy results in a "winged scapula."
- E. Lymphedema occurs mainly as a complication of the Halsted radical mastectomy and should not be seen after modified radical mastectomy.

Correct Answer: A Section: (none)

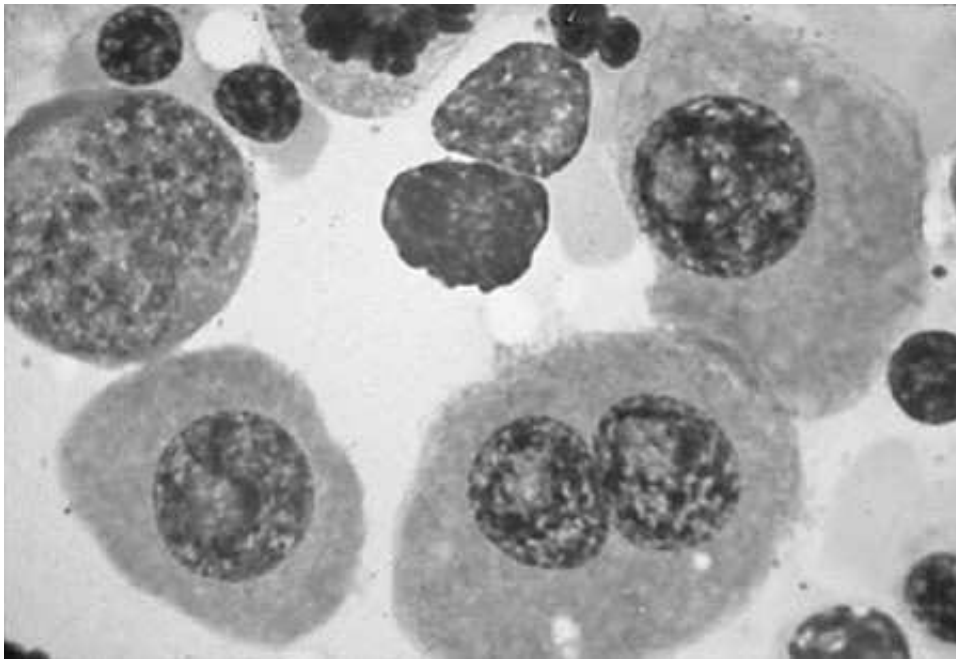
Explanation:

The Halsted radical mastectomy involves removal of all breast tissue, lymphadenectomy, and removal of the pectoralis major. The modified radical mastectomy preserves the pectoralis major muscle thus decreasing the morbidity of the surgery with the same survival. The modified radical mastectomy does include a lymph node dissection. The anatomic limits of the modified radical mastectomy include the sternum medially, the subclavius muscle superiorly, the inframammary fold inferiorly, and the latissimus dorsi muscle laterally. The surgeon must identify the thoracodorsal nerve and the long thoracic nerve, which innervate the latissimus dorsi muscle and the serratus anterior muscle, respectively. Damage to the long thoracic nerve results in a "winged scapula." After a complete dissection of level I, II, and III lymph nodes, the use of radiation therapy needs to be critically evaluated because of the long-term morbidity of lymphedema.

QUESTION 2



A 67-year-old female was admitted to the hospital because of chronic fatigue and low back pain. An x-ray of the vertebral column showed diffuse osteoporosis and compression fractures of L1 and L2 vertebral bodies. The complete blood count (CBC) was within normal limits. The peripheral blood smear showed rouleaux formation. The immunoelectrophoresis showed a monoclonal spike of more than 3 g. A bone marrow biopsy was performed and showed an increase of more than 20% in plasma cells see Figure below Microscopically, the bone marrow examination will reveal which of the following?



- A. normocellular marrow with normal hematopoiesis
- B. an increase in myeloid elements
- C. increase in megakaryocytes
- D. increase in mature lymphocytes
- E. increase in plasma cells, usually more than 30% of the total cells

Correct Answer: E Section: (none)

Explanation:

Multiple myeloma is a plasma cell dyscrasia that is characterized by involvement of the skeleton in multiple sites. The characteristic x-ray shows punched-out bone lesions that are very easily seen in the calvarium. Extension of the disease to lymph nodes and extranodal sites, such as skin, can be seen. The bone marrow biopsy and smears reveal an increased number of plasma cells, which usually constitute greater than 20% of all of the cells. The cells either diffusely infiltrate and replace the marrow elements or can be seen scattered throughout the hematopoietic elements. The neoplastic plasma cells have a perinuclear hof and an eccentrically placed nucleus which allows the recognition. In 99% of patients with multiple myeloma, electrophoretic analysis reveals increased levels of IgG in the blood, light chains (Bence-Jones proteins) in the urine, or both. The monoclonal IgG produces a high spike when seen in the serum or in the urine, subject to electrophoresis. In general, the quantitative analysis of the monoclonal IgG is more than 3 g. The clinicopathologic diagnosis of multiple myeloma rests on radiographic and laboratory findings. Marrow examination may reveal increased plasma cells or sheet-like aggregates that may completely replace the normal elements. The prognosis for this condition is variable, but generally poor.



QUESTION 3

A 19-year-old woman who is 2 months postpartum complains of palpitations, heat intolerance, tremulousness, weight loss, and fatigue. Her thyroid is prominent and firm but nontender. Serum TSH level was undetectable. A nuclear medicine radioactive iodine uptake is performed and shows no uptake of iodine in the neck.

Which of the following is the most appropriate next step?

- A. administer radioactive iodine
- B. initiate glucocorticoid therapy
- C. initiate levothyroxine therapy
- D. initiate propranolol therapy
- E. initiate methimazole therapy

Correct Answer: D Section: (none)

Explanation:

The patient has the clinical features of hyperthyroidism due to postpartum thyroiditis. This is caused by an autoimmune process with leakage of stored thyroid hormone from the gland. The hyperthyroidism is self-limited and is not associated with new synthesis of thyroid hormone. Therefore, methimazole is not indicated. The thyroid is not painful, as it is in subacute (de Quervain) thyroiditis, so glucocorticoids are not indicated. The radioactive iodine uptake is low, so radioactive iodine treatment is not indicated. Symptom control with propranolol is the only therapy needed during this phase of the illness.

QUESTION 4

A 28-year-old male, well known to your clinic, presents for management of swelling, pain, and tenderness that has developed in his left ankle and right knee. It has persisted for 1 month. Your patient reports that he developed severe diarrhea after a picnic 1 month prior to the onset of his arthritis. During the interval between the diarrhea and onset of arthritis, he developed a "pink eye" that lasted for 4 days. He denies any symptoms of back pain or stiffness. You remember that he was treated with ceftriaxone and doxycycline for gonorrhea 2 years ago, which he acquired from sexual activity with multiple partners. Since that time, he has been in a monogamous relationship with his wife and has not had any genitourinary symptoms. He promises that he has been faithful to his wife and has not engaged in unprotected sexual activity outside his marriage. His physical examination is notable for a swollen left ankle, swollen right knee, and the absence of penile discharge or any skin lesions. Which of the following is the most likely diagnosis?

- A. pseudogout
- B. gout
- C. reactive arthritis
- D. resistant gonococcal arthritis
- E. ankylosing spondylitis

Correct Answer: C Section: (none)

Explanation:

Reactive arthritis consists of a triad of nonspecific urethritis, conjunctivitis, and asymmetric arthritis, usually involving the large joints of the lower extremities. Genitourinary causes of reactive arthritis include Chlamydia or Ureaplasma. GI infections due to Salmonella, Shigella, Yersinia, Klebsiella, and Campylobacter can also cause reactive arthritis. Gout attacks are typically monoarticular and begin abruptly with the affected joint being exquisitely painful, warm, red, and swollen. These attacks often spontaneously resolve in 310 days. While the symptoms from pseudogout may mimic those of gout, they tend to be less painful and take longer to reach peak intensity. Gonococcal arthritis is seen more often in females, is associated with migratory arthralgia, tends to favor the upper limbs and knees and may be associated with cutaneous lesions (pustules). The absence of attacks and joint distribution makes gout and pseudogout less likely. The history of conjunctivitis and association with diarrhea makes the diagnosis of reactive arthritis more likely than resistant gonococcal arthritis. His clinical symptoms do not suggest ankylosing spondylitis, although if he was HLA-B27 positive he would be at increased risk of developing spondylitis. This patient has the classic symptoms and exposure risk (GI infection) to suggest reactive arthritis. For the articular symptoms, reduction of inflammation and restoration of function can be achieved with nonsteroidal antiinflammatories alone. A sufficient number of patients with reactive arthritis will not be HLA-B27 positive, thus rendering this test useless as a screening test. However, it may be useful when the clinical picture is incomplete (such as absence of antecedent infection or lack of extraarticular features).

Once an antecedent infection has triggered reactive arthritis, it is unlikely that antibiotics will affect the course of the illness (except in the case of chlamydia-associated urogenital disease where a trial of prolonged antibiotic therapy may be reasonable).

Systemic corticosteroids are usually ineffective in reactive arthritis, but may be tried for resistant disease or conditions such as AIDS in which cytotoxic therapy is contraindicated. Given the absence of skin lesions, penile discharge, or urogenital symptoms, one would be hard-pressed to challenge the patient's statement that he has not engaged in unprotected sex at the risk of jeopardizing the physician-patient relationship. Reactive arthritis may be the first manifestation of HIV infection. Therefore, HIV antibody status should be determined when the appropriate risk factors and/or clinical features are present. As mentioned previously, systemic steroids are usually ineffective for reactive arthritis and, with the possibility of joint infection, would necessitate ruling out infection by arthrocentesis of the affected joints. Joint infection cannot be ruled out based on his presentation, and joint sepsis must be excluded prior to corticosteroid injection. The clinical presentation is classic for reactive arthritis, and the absence of systemic symptoms makes the likelihood of disseminated bacterial infection low. Indomethacin, at a dose of 150-200 mg/day, is the prototypic NSAID medication for treatment of reactive arthritis. Doses higher than this are associated with significant GI complications and do not improve efficacy in a patient resistant to the standard dose. In the event that the patient does not respond to 200 mg of indomethacin or alternative NSAIDs, disease-modifying antirheumatic drugs (DMARD) such as methotrexate, azathioprine, or sulfasalazine may be used, provided that HIV test results are negative, as these immunosuppressants have been reported to precipitate the onset of AIDS in HIV-positive patients.

QUESTION 5

A 50-year-old male presents to your office after reading an article on the Internet stating that a recent study showed that the drug finasteride can prevent prostate cancer. He asks you to prescribe this medication for him. You review the article and find the following information: a randomized-controlled trial of men over the age of 55 with normal prostate-specific antigen (PSA) readings was performed comparing finasteride and a placebo. At the end of the study, 18% of the men in the finasteride group and 24% of the men in the placebo group had developed prostate cancer.

Further review of the article reveals that 6.4% of the men in the finasteride group and 5.1% in the placebo group developed high-grade prostate cancers. How many men need to take finasteride in order to have one excess case of high-grade prostate cancer (number needed to harm [NNH])?



- A. 1.3
- B. 12
- C. 37
- D. 77
- E. 94

Correct Answer: D Section: (none)

Explanation: Explanations: The NNT is calculated by first determining the ARR for a specific outcome between two groups in a study. The ARR, or risk difference, is calculated by subtracting the percentage of subjects who develop an outcome in the treatment group from the percentage who develop the outcome in the control group. In question 35, the outcome considered is the development of prostate cancer. This occurred in 24% of the control group and 18% of the finasteride group. The ARR is calculated as $24\% - 18\% = 6\%$ or

0.06. The NNT is calculated as: $NNT = 1/ARR$. In this example, the $NNT = 1/0.06 = 16.67$, approximately 17. This suggests that for every 17 men who took finasteride there was one fewer case of prostate cancer. The NNH is calculated in exactly the same manner as the NNT. The only difference is that the outcome is adverse. In this study, highgrade prostate cancers occurred more often in the finasteride group than the placebo group; 6.4% of men who took finasteride and 5.1% who took a placebo developed high-grade prostate cancer. The risk difference, in this case an absolute risk increase, is $6.4\% - 5.1\% = 1.3\%$ or 0.013. The NNH = $1/\text{absolute risk increase} = 1/0.013 = 77$

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