2007 Radiation Oncology Exam Cases

Physics

The 30° wedge transmission factor for a 6 MV linear accelerator is 0.71. The MU setting for an open beam is 150 MU. The MU to deliver the same dose on the axis with the wedge in place is _____ MU. (1.5 points)

A. 298

B. 211

C. 150

D. 107

E. 76

MU = open beam MU /WTF

The Physics of Radiation Therapy, Faiz M. Khan, Lippincott, Williams & Wilkins, Philadelphia, 2003 p 207

Objective: The physical principles regarding calibration and quantification of radiation output by therapy machines, radiation dose in tissue (SSD and SAD), and all dose units and terminology that apply. The correct answer is B.

General

Cells of the histiocytic lineage are generally positive for which one (1) of the following antigens? (1 point)

A. CD3

B. CD8

C. CD45a

D. CD18

E. CD79

Objective: Basic cancer related immunology and molecular biology

Reference: Vail D. Histiocytic disorders. In: Small Animal Clinical Oncology, 3rd ed. Withrow, MacEwen, pp667-670. The correct answer is D.

Radiobiology

Which one (1) of the following is NOT a principal chromosomal aberration that may be observed after irradiation of a cell. (1.5 points)

A) Dicentrics

B) Rings

C) Centric fragments

D) Translocations

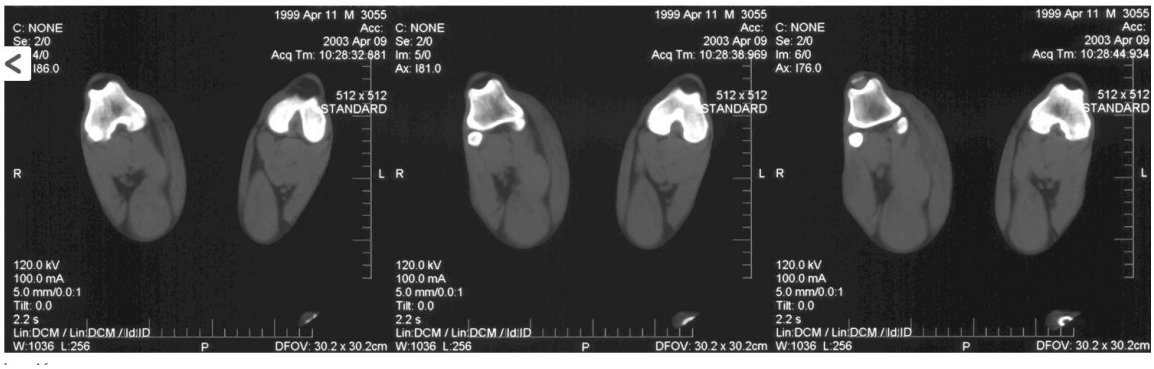
E) Anaphase bridges

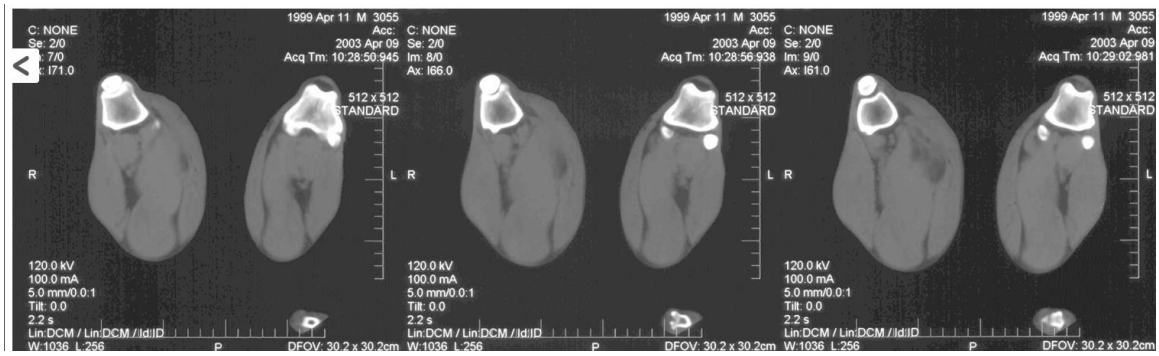
Objective: The molecular effect of radiation on DNA and chromosomes

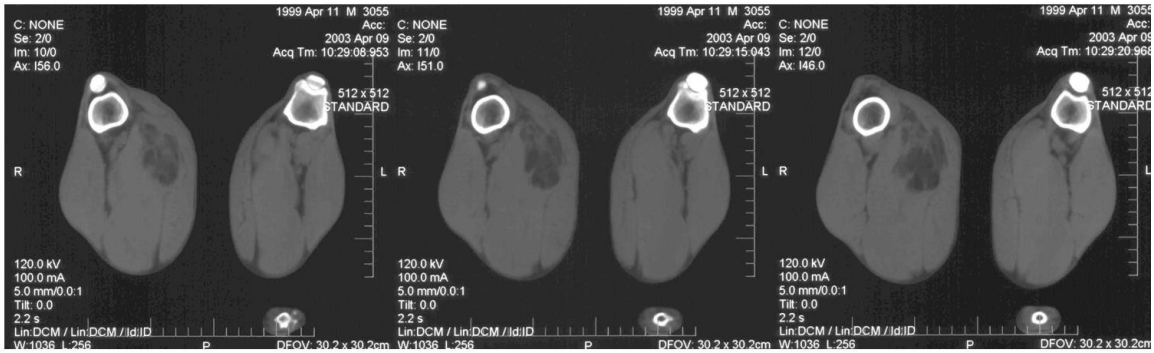
Reference: Radiobiology for the Radiologist, Hall, 5th ed., Chapter 2 DNA Strand Breaks and Chromosomal Aberrations, pages 23-30. The correct answer is C.

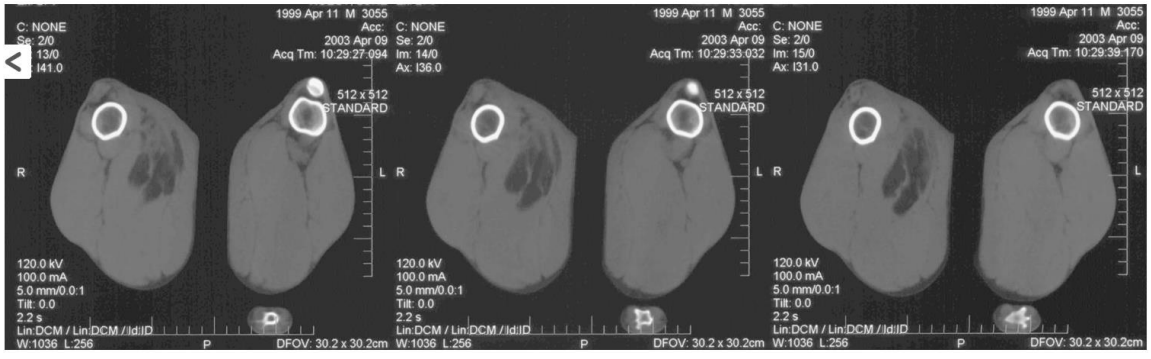
Clinical Section

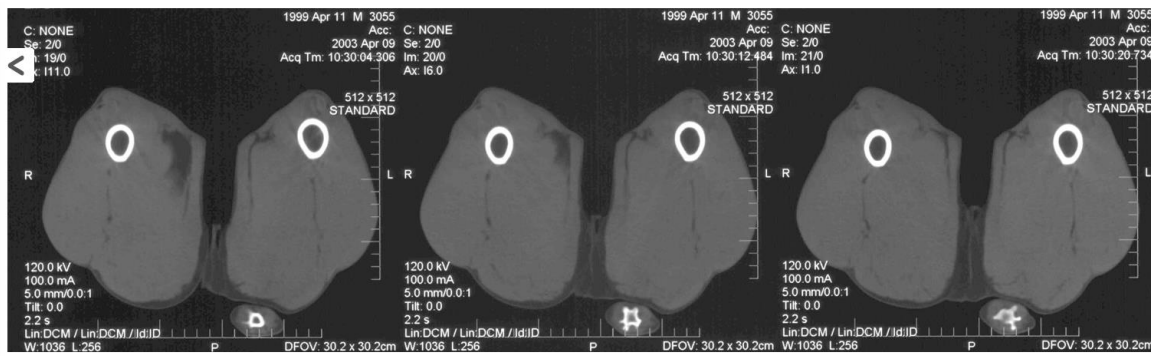
A four year old male neutered Rhodesian Ridgeback presented with a swelling along the right medial thigh and right hindlimb lameness. A CT scan was performed to evaluate the region.

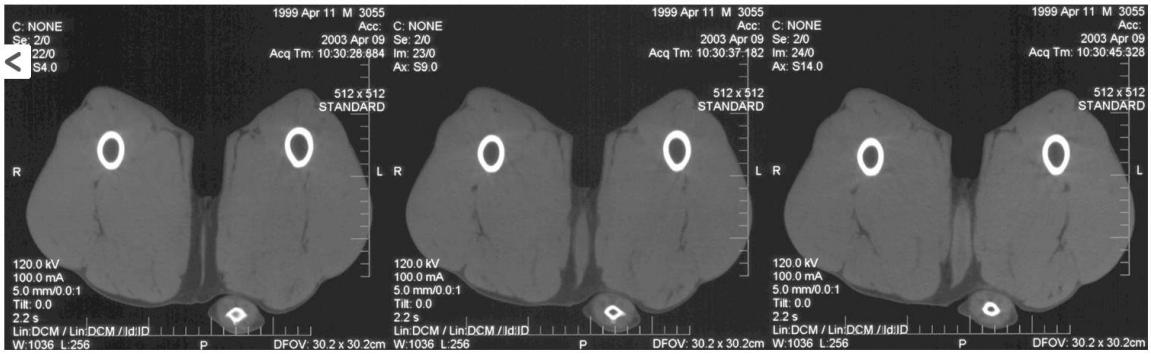












A) Which one (1) of the following best describes the radiographic findings? (1.5 points)

A) Soft tissue attenuating mass within the adductor femoris muscle.
B) Fat attenuating mass within the sartorius muscle.
C) Fat attenuating mass within the adductor femoris muscle.
D) Fat and gas attenuating mass within the adductor femoris muscle.
E) Fat and gas attenuating mass within the sartorius muscle.

B) Which one (1) of the following is the most likely diagnosis? (1.5 points)

A) Necrotic lipoma
B) Neurofibrosarcoma
C) Infiltrating lipoma
D) Hemangiosarcoma
E) Histiocytic sarcoma

Objective: The radiographic signs of cancer in domestic animals, and other abnormalities likely to be found in diagnostic images of cancer patients. Examples include: radiography of lung metastasis; osseous and spinal neoplasia; sonography of the liver, spleen and lymph nodes; neuroimaging related to cancer. Be able to read and interpret radiographs, nuclear scans, sonograms, CT images, MR images, and port films from cancer patients.
Reference: Margaret C. McEntee DVM, Donald E. Thrall DVM, PhD (2001)
COMPUTED TOMOGRAPHIC IMAGING OF INFILTRATIVE LIPOMA IN 22 DOGS
Veterinary Radiology & Ultrasound 42 (3), 221–225.
JM Liptak, LJ Forrest. Soft tissue sarcomas in Withrow & MacEwen's Small Animal Clinical Oncology, 4th edition, p. 430. **The correct answer to both parts A and B is C.**