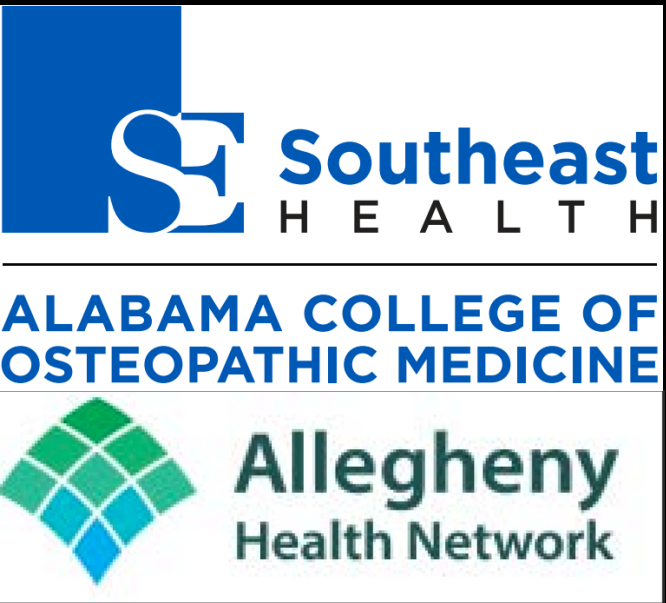


AMSER Rad Path Case of the Month

67 y/o female with cutaneous lesion of right thigh



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Allegheny Health Network



Patient Presentation

- KK is a 67-year-old female recently noticed a raised lesion in May 2023 after she was involved in a snow mobile accident and sustained a right femur fracture.
- SH: Non-smoker, no FHx of melanoma

Skin Examination



08/23



11/23

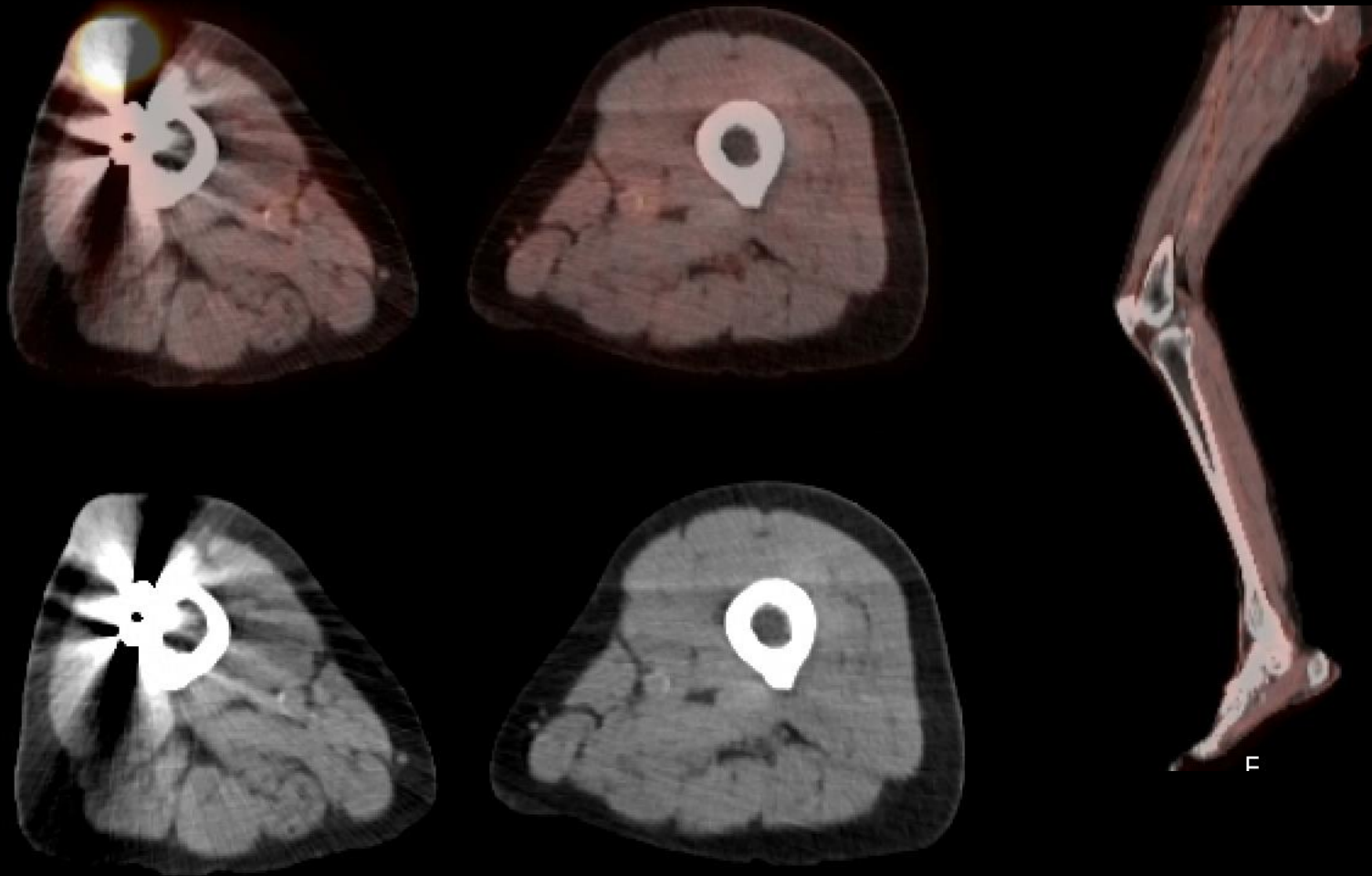
What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

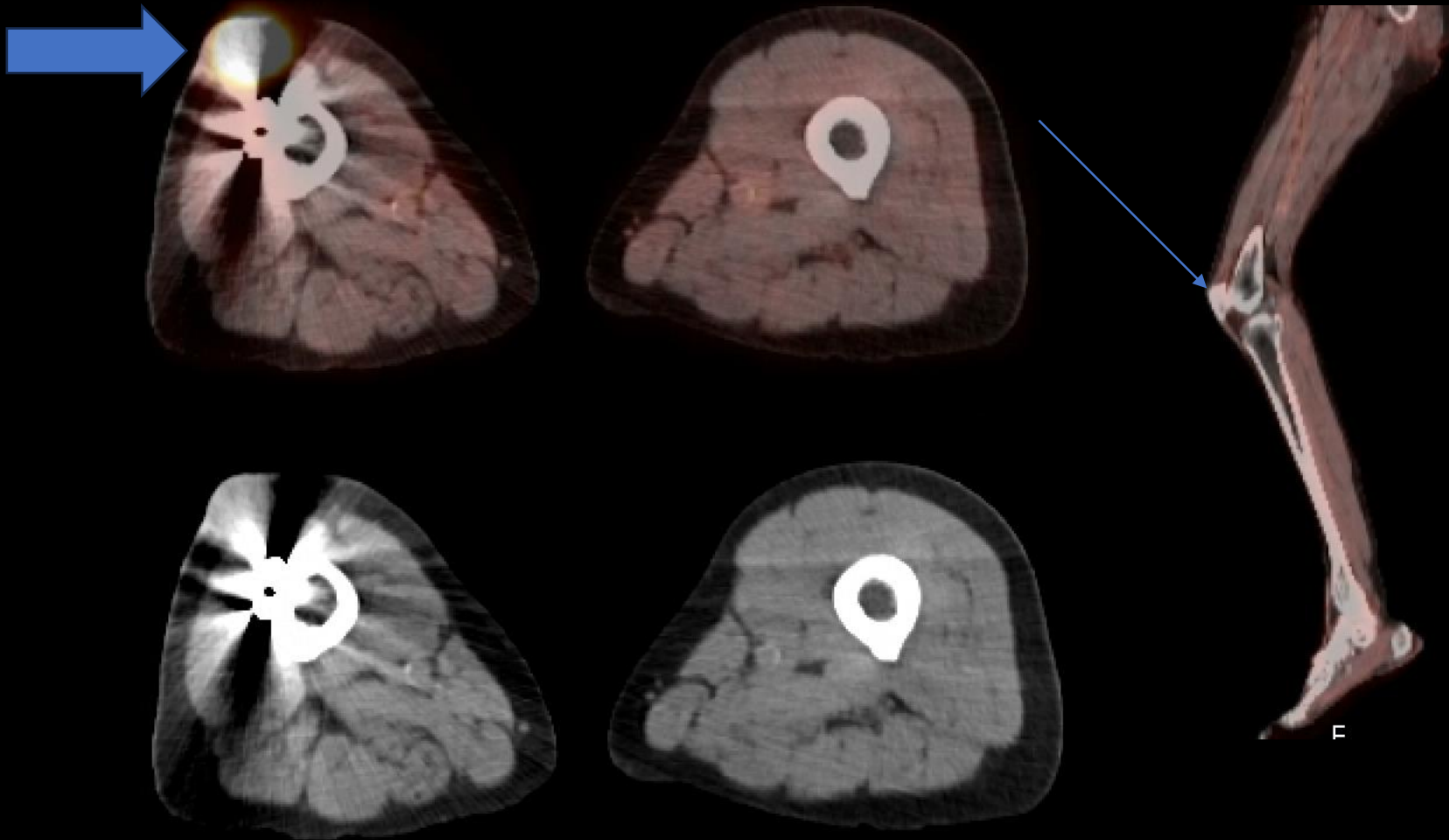
Variant 2: Malignant or aggressive primary musculoskeletal tumor. Initial staging. Evaluation for extrapulmonary metastasis.

Procedure	Appropriateness Category	Relative Radiation Level
FDG-PET/CT whole body	Usually Appropriate	⊕⊕⊕⊕
MRI whole body without IV contrast	May Be Appropriate (Disagreement)	○
Bone scan whole body	May Be Appropriate	⊕⊕⊕
Bone scan whole body with SPECT or SPECT/CT area of interest	May Be Appropriate	⊕⊕⊕
FDG-PET/MRI whole body	May Be Appropriate	⊕⊕⊕
Fluoride PET/CT whole body	May Be Appropriate (Disagreement)	⊕⊕⊕⊕

FDG-PET/CT Whole Body (Unlabeled)



FDG-PET/CT Whole Body (Labeled)



- Hypermetabolic soft tissue density (SUV max 16.9) along distal right anterior thigh
- Slightly obscured by artefact from postsurgical changes of right hip arthroplasty and right femur ORIF

DDx of Hypermetabolic Soft Tissue Density

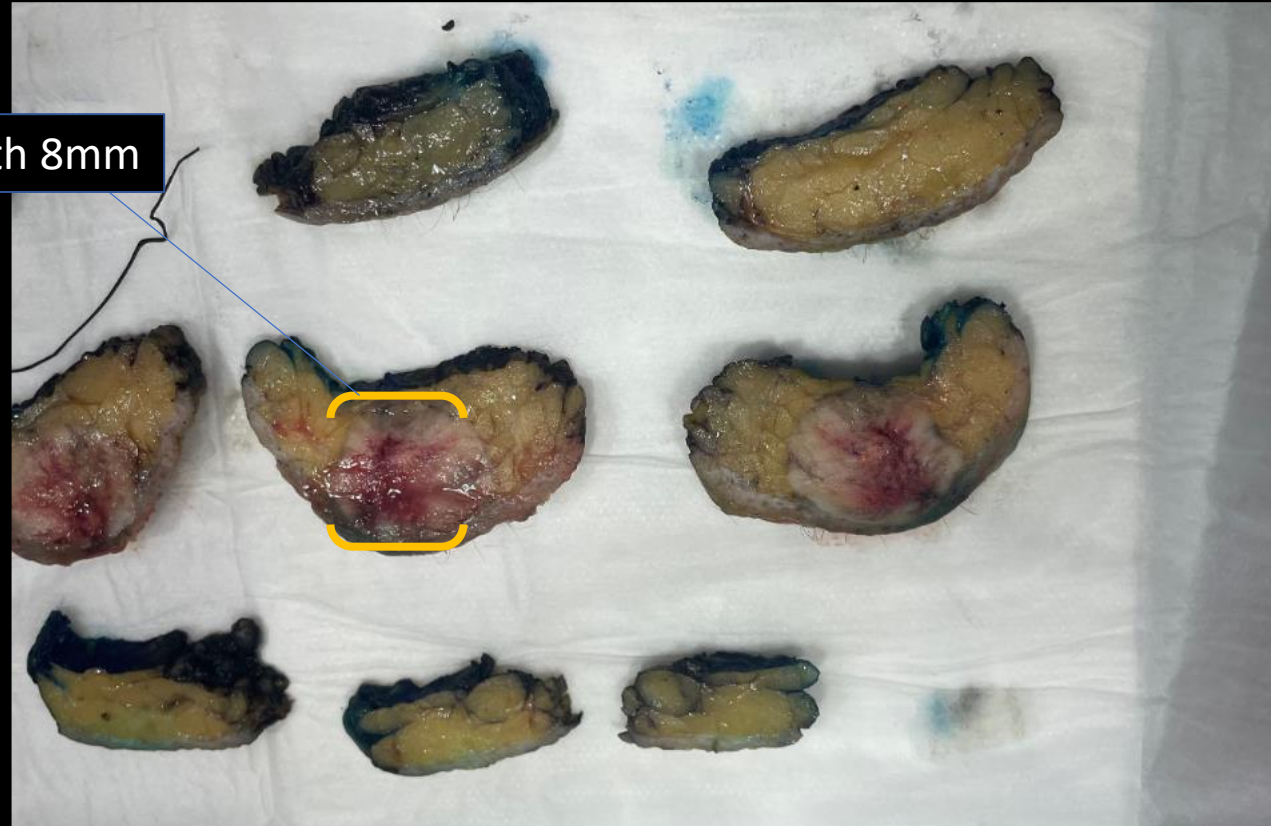
- Hypermetabolic soft tissue densities can typically be classified as either malignant or benign.
- Malignant soft tissue tumors (MSTs) can be further characterized as either melanoma or non-melanoma.
- The three most common MSTs are as follows:
 - Cutaneous basal cell carcinomas
 - 80-85% of non-melanotic skin cancers
 - Cutaneous squamous cell melanomas
 - 10% of non-melanotic skin cancers
 - Cutaneous malignant melanomas
 - Most common MST in western countries

Surgical Biopsy

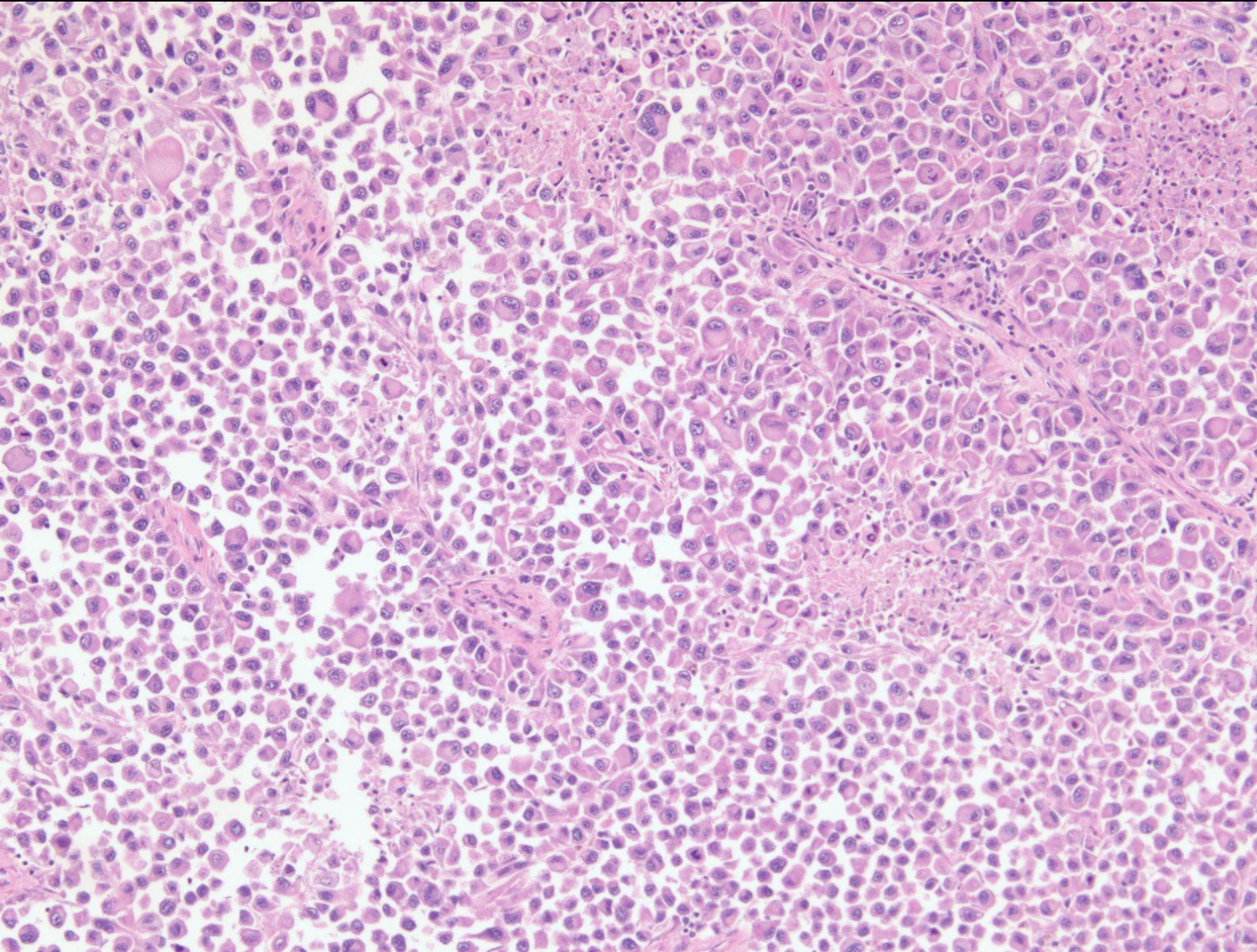
- She underwent biopsy in October 2023 three to four weeks after a clear discharge was seen at lesion site.
- Surgical biopsy was consistent with dermal melanoma with a Breslow depth of 8mm with necrosis, no ulceration, stage pT4a.

Gross Pathology

Breslow Depth 8mm

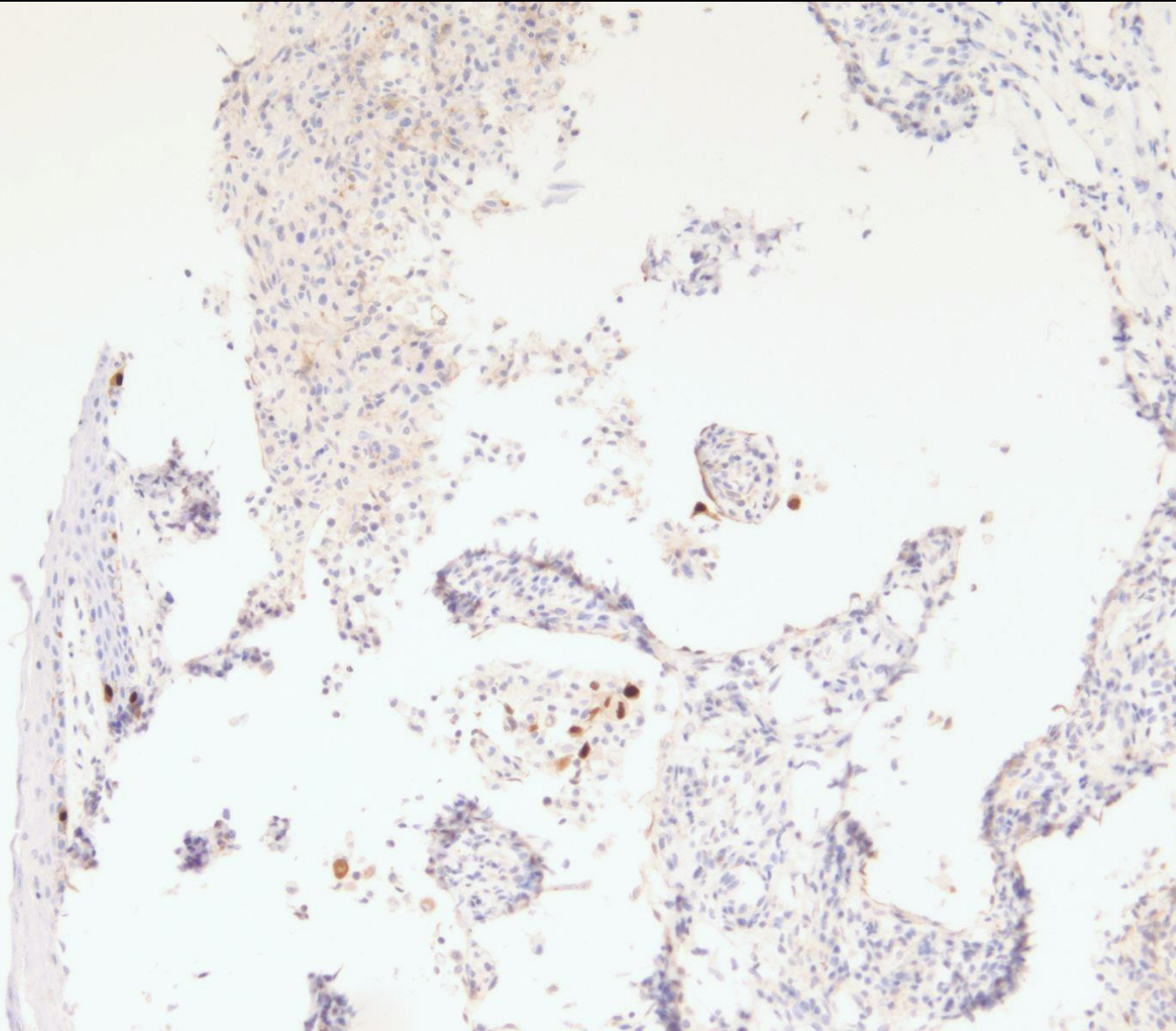


Histopathology



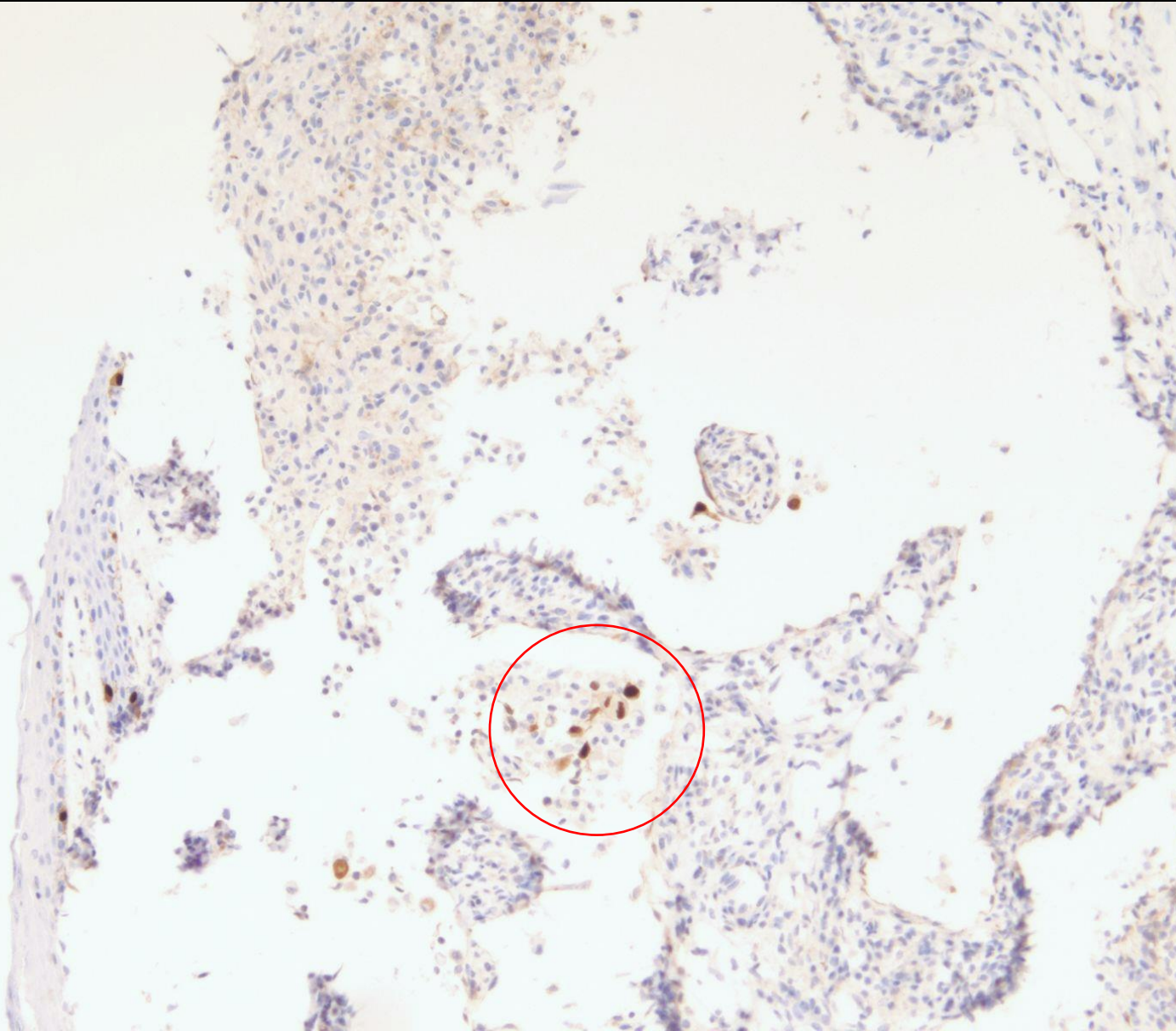
- Histologic sections demonstrate a large tumor nodule expanding the dermis and subcutis, formed by a collection of malignant cells exhibiting varied (epithelioid to plasmacytoid to vaguely rhabdoid) morphology.
- There are foci of tumoral necrosis.

Immunohistochemistry



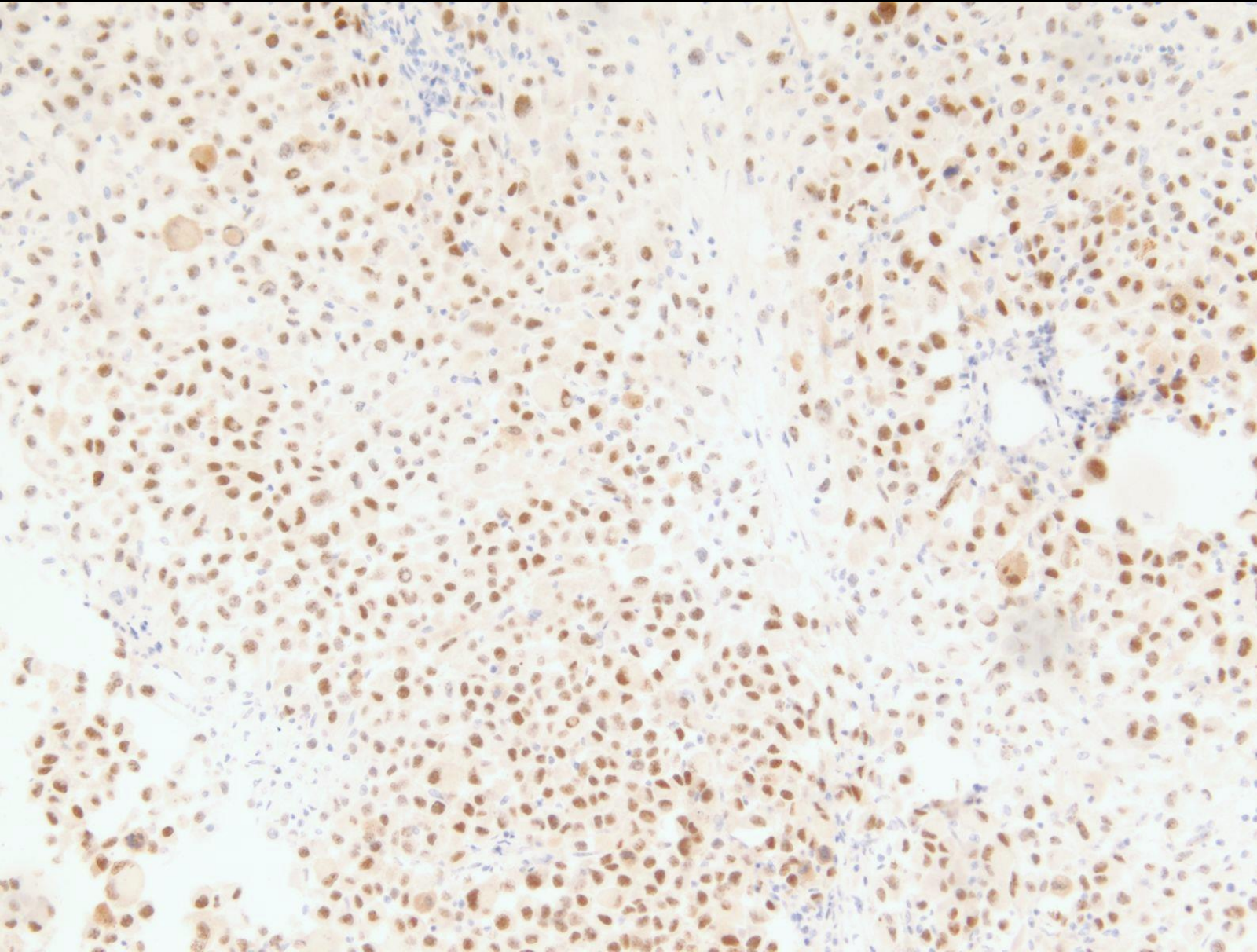
- **SOX-10** enhances the visualization of rare tumor cells within lymphovascular spaces (staining dark brown).

Immunohistochemistry



- **SOX-10 enhances the visualization of rare tumor cells within lymphovascular spaces (staining dark brown).**

Immunohistochemistry



- **PRAME immunohistochemical stain labels the tumor nodule (brown staining).**

Final Dx:

Malignant Cutaneous Melanoma (Nodular Subtype)

Case Discussion

- Melanoma is the 5th most common cancer in males and females in the United States.
- Nodular melanoma (NM) is the 2nd most common type and makes up 15-30% of all melanomas.
- Visual skin examination is preferred for initial diagnosis of melanoma with sensitivity and specificity of 92.4% and 79.7% respectively.
- NM is frequently mistaken for benign nevi and can make early detection difficult.

Case Discussion

- NM can be differentiated from benign nevi with immunohistochemical studies using proliferation antigens, HMB-45, or fluorescence in situ hybridization (FISH).
- Dermal melanomas are typically diagnosed at over 2 mm thickness.
- Dermal melanomas typically have metastatic potential.
- Metastatic potential is typically predicted with the Breslow depth, which is defined as the thickness of the tumor in mm from the granular layer of the epidermis to the deepest malignant cell in the dermis or subcutaneous fat.

Case Discussion

- NM is typically treated with surgical excision followed by systemic adjuvant therapies.
- Patients that relapse or present with advanced stage NM typically benefit from immunotherapies or targeted therapies as adjuvant therapy.
- NM has a significantly worse prognosis compared to other types of melanoma, and accounts for over 40% of all deaths related to melanoma.

References:

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3. Dinnes J, Deeks JJ, Grainge MJ, Chuchu N, Ferrante di Ruffano L, Martin RN, Thomson DR, Wong KY, Aldridge RB, Abbott R, Fawzy M, Bayliss SE, Takwoingi Y, Davenport C, Godfrey K, Walter FM, Williams HC; Cochrane Skin Cancer Diagnostic Test Accuracy Group. Visual inspection for diagnosing cutaneous melanoma in adults. *Cochrane Database Syst Rev*. 2018 Dec 4;12(12):CD013194. doi: 10.1002/14651858.CD013194. PMID: 30521684; PMCID: PMC6492463.
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