

381th Chineses society of veterinary pathology conference

Pathological Analysis of Canine and Feline Tumors: Clinic Case Studies

Fang-Yi Tsai, DVM, MS.
ADDC of NCHU

2021.03.19



Introduction of biopsy

- **Biopsy**: obtaining tissue sample for histopathological interpretation
- Pre-treatment biopsy: tissue obtained before treatment initiation
- Post-treatment biopsy: tissue obtained at the time of definitive tumor resection



Biopsy techniques

- Tru-cut biopsy
- Punch biopsy
- Incisional (wedge) biopsy
- Excisional biopsy
- Endoscopic biopsy



Tru-cut biopsy

- Automatic Tru-cut needle gun



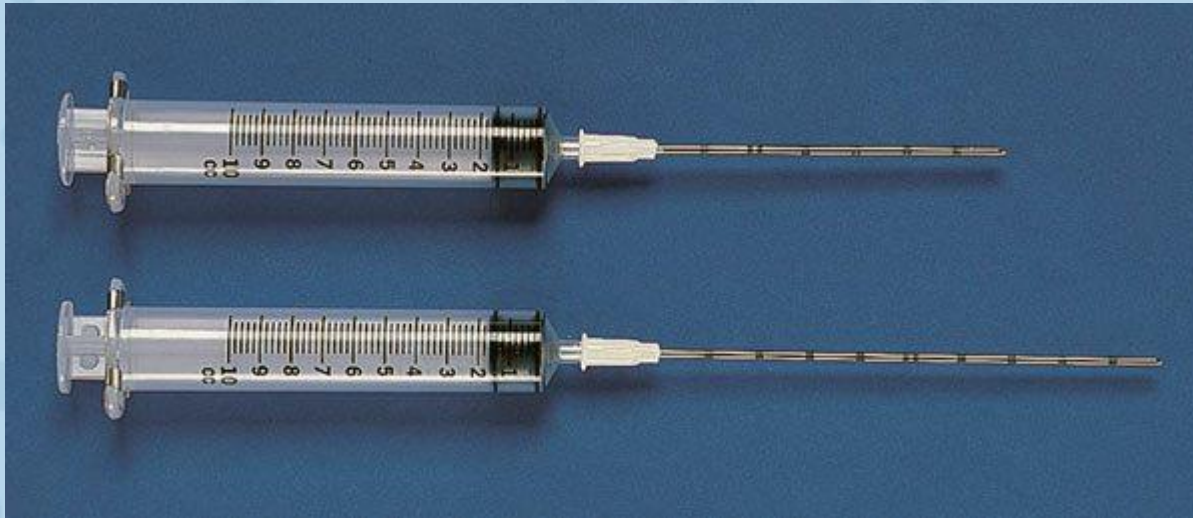
Tru-cut biopsy

- Semi-automatic Tru-cut needle



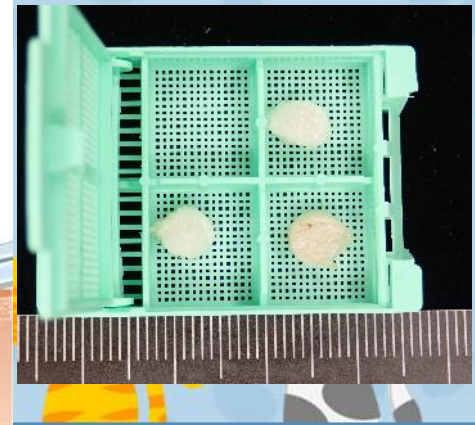
Tru-cut biopsy

- Menghini needle attached to syringe



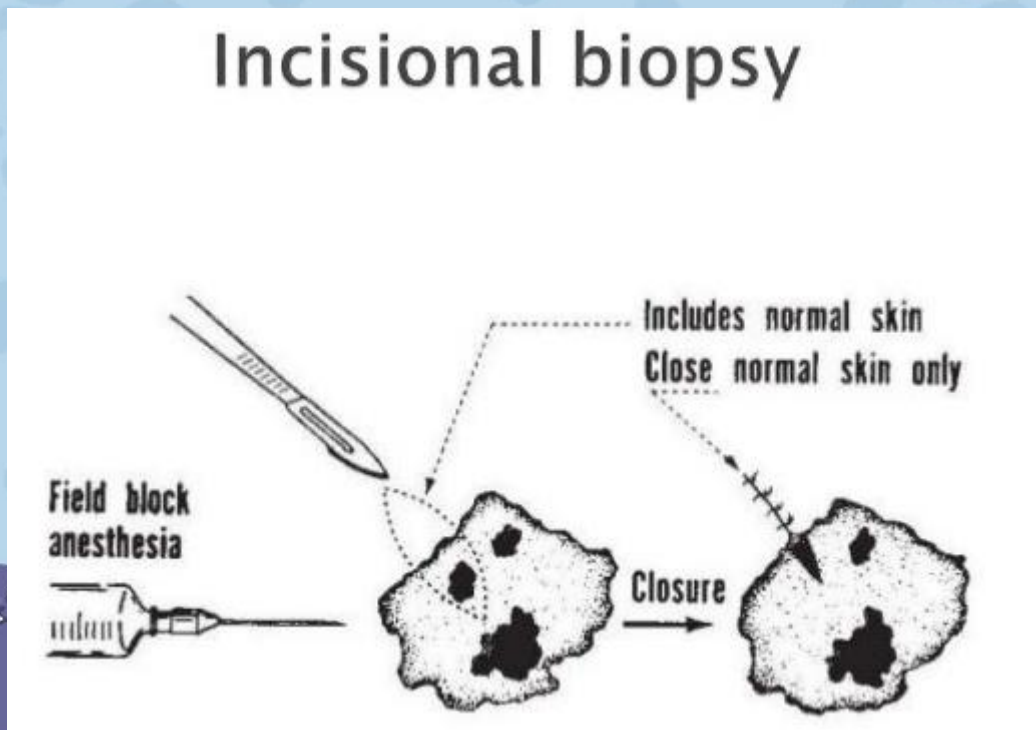
Punch biopsy

- most effective **for cutaneous lesions** as well as intraoperatively for biopsies of masses within organs such as the liver, spleen



Incisional (wedge) biopsy

- Effective for masses in all locations and generates **a larger sample** compared to Tru-cut.



Excisional biopsy

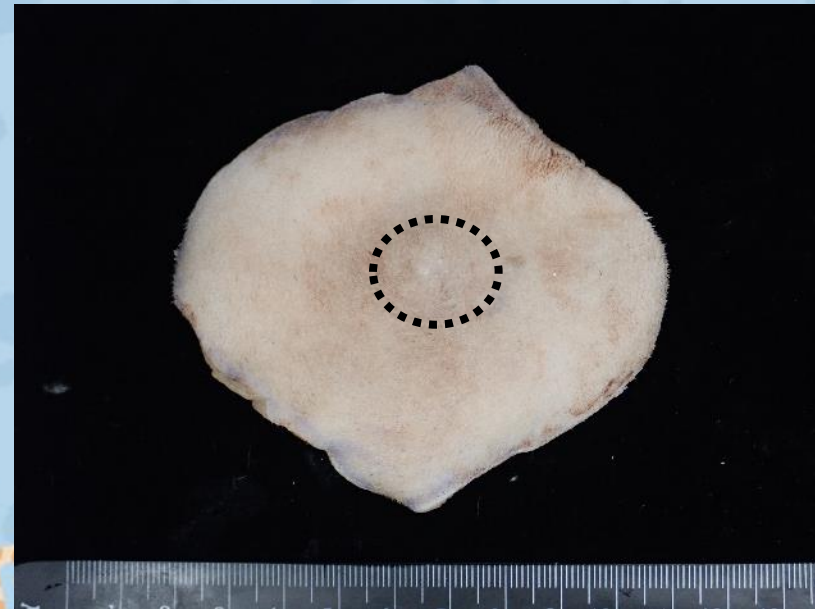
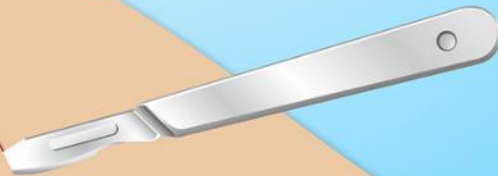
- Advantage of both diagnostic technique and treatment modality

What is an excisional biopsy?

Incision

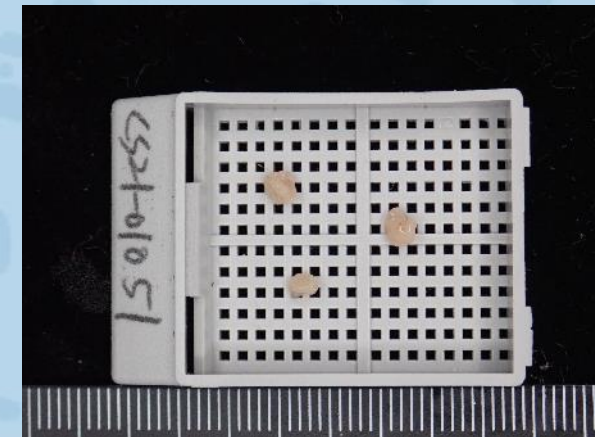
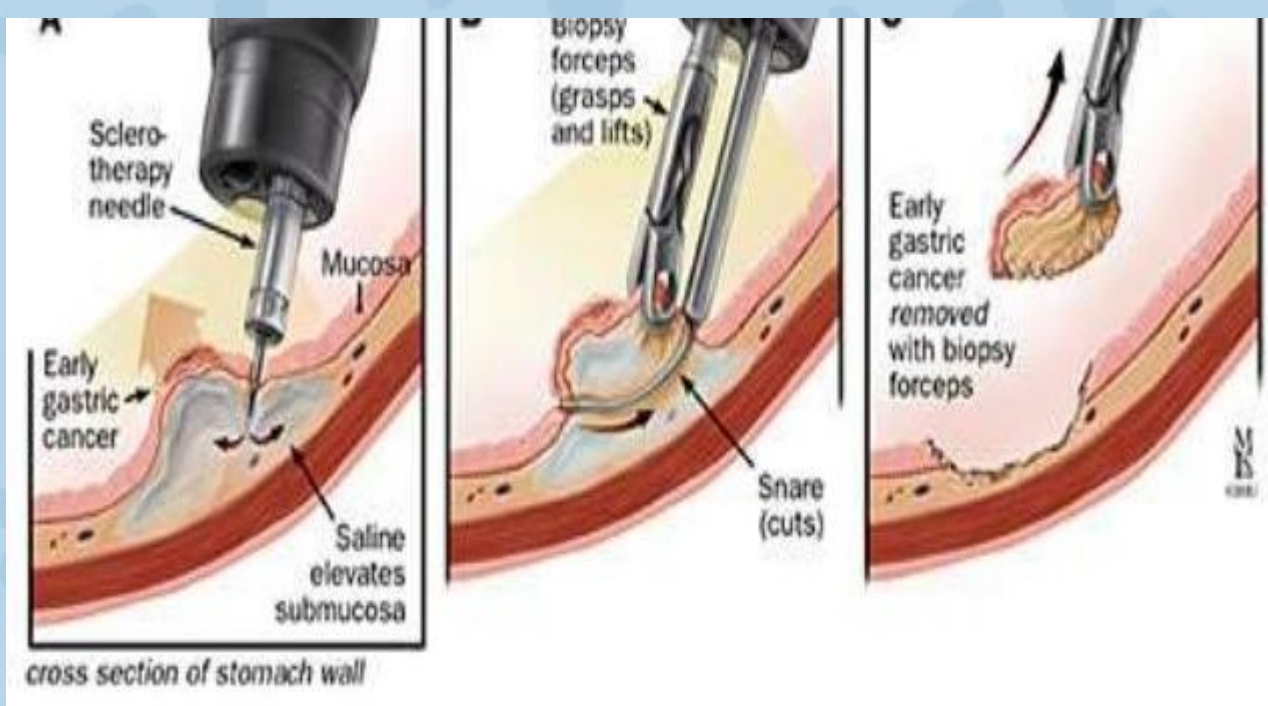
A scalpel is used to remove the mole and some of the normal skin around and below it

Safety margin of normal skin



Endoscopic biopsy

- Needle, forceps, snare



病理報告書
Pathology Report

ADDC No: 20-4863 Clinic No.: Pathol. No.: CS20-10083 Date: 2020/10/14
 Species: 雪納瑞 Sex: 母(已節育) Age: 11y
 Counselor: Owner: Pet name:
 Tel.:
 Specimen: Wet tissue Died/Euthanasia: D(0) E(0) Pathologist: 蔡芳宜

(一)病歷:

據送檢者提供病歷，檢體為左側膝關節及左側坐骨皮膚腫塊。左側坐骨皮膚腫塊大小約 2×2×1 公分，皮膚完整、軟、於皮下、周圍有輕微水腫，發現約二個星期，採樣後有輕微水腫的現象。術前一個星期有服用類固醇。

(二)檢體外觀:

腫塊位於皮下，大小約 2×2×1 公分，不具包被、與周圍組織邊界不清楚，觸感柔軟，切面呈黃白色斑駁，淋巴結直徑約 5 毫米，顏色為棕褐色(圖 1-3)。

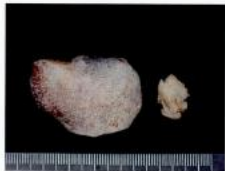


圖 1

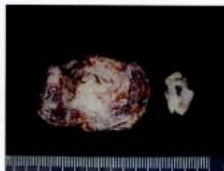


圖 2



圖 3

(三)組織病變:

- 皮膚：腫塊位於皮下層，不具包被，與周圍組織邊界不清楚(圖 4)，腫瘤細胞主要呈圓形，呈片狀或索狀浸潤於基質之間，細胞與細胞之間的邊界清楚，具有豐富雙染色細胞質，並可見不等量質內顆粒，部分細胞質邊緣模糊且質內顆粒不顯著、呈脫顆粒樣，細胞核主要呈圓形至卵圓形，十個高倍視野下可見 3 個以上 bizarre nuclei，少見有絲分裂像及多核細胞(圖 5)。基質中伴隨大量淡染水腫液體蓄積及少量嗜酸性球浸潤。
- 淋巴結：進行三個切面，於髓質及髓索內可見不等量圓形細胞浸潤，其質內疑似可見雙染色質內顆粒，伴隨水腫液體蓄積(圖 6)。



(四)組織化學染色:

以 toluidine blue 染色對皮膚腫塊及淋巴結進行染色，結果於皮膚腫瘤細胞質內可見紅染、異染色性顆粒，於多發局部髓質內可見異染色性圓形細胞呈團簇狀浸潤，其細胞大小不一，形狀為圓形、卵圓形或長梭形，細胞質內具有不等量紅染、異染色質內顆粒，部分細胞質內顆粒脫去，可見紅染顆粒浸潤於基質中(圖 7)。

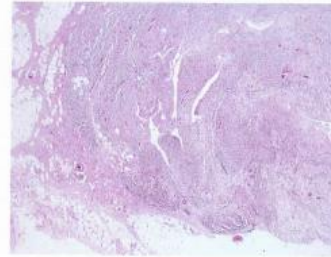


圖 4

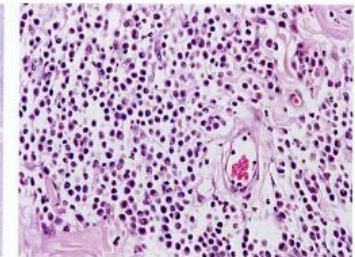


圖 5

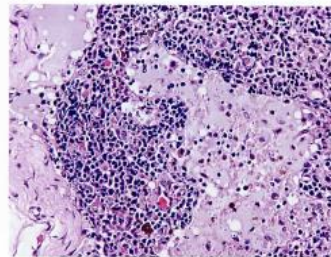


圖 6

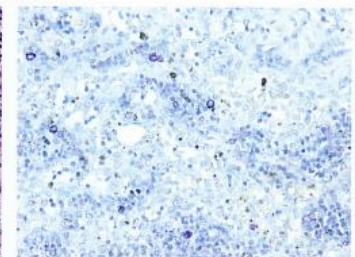


圖 7

(四)病理診斷:

肥大細胞瘤、高度惡性(Kiupel 2-tier grading scale)、伴隨淋巴結轉移、皮膚

Mast cell tumor, high grade (Kiupel 2-tier grading scale), with lymph node metastasis, haired skin

動物疾病 診斷中心	國立中興大學 獸醫學院 動物疾病 診斷中心	主 管 蔡 芳 宜 日期: 2020/10/20	獸 醫 師 蔡 芳 宜 日期: 2020/10/20	合規字號 776581 日期: 2020/10/20
--------------	--------------------------------	--------------------------------	----------------------------------	-------------------------------

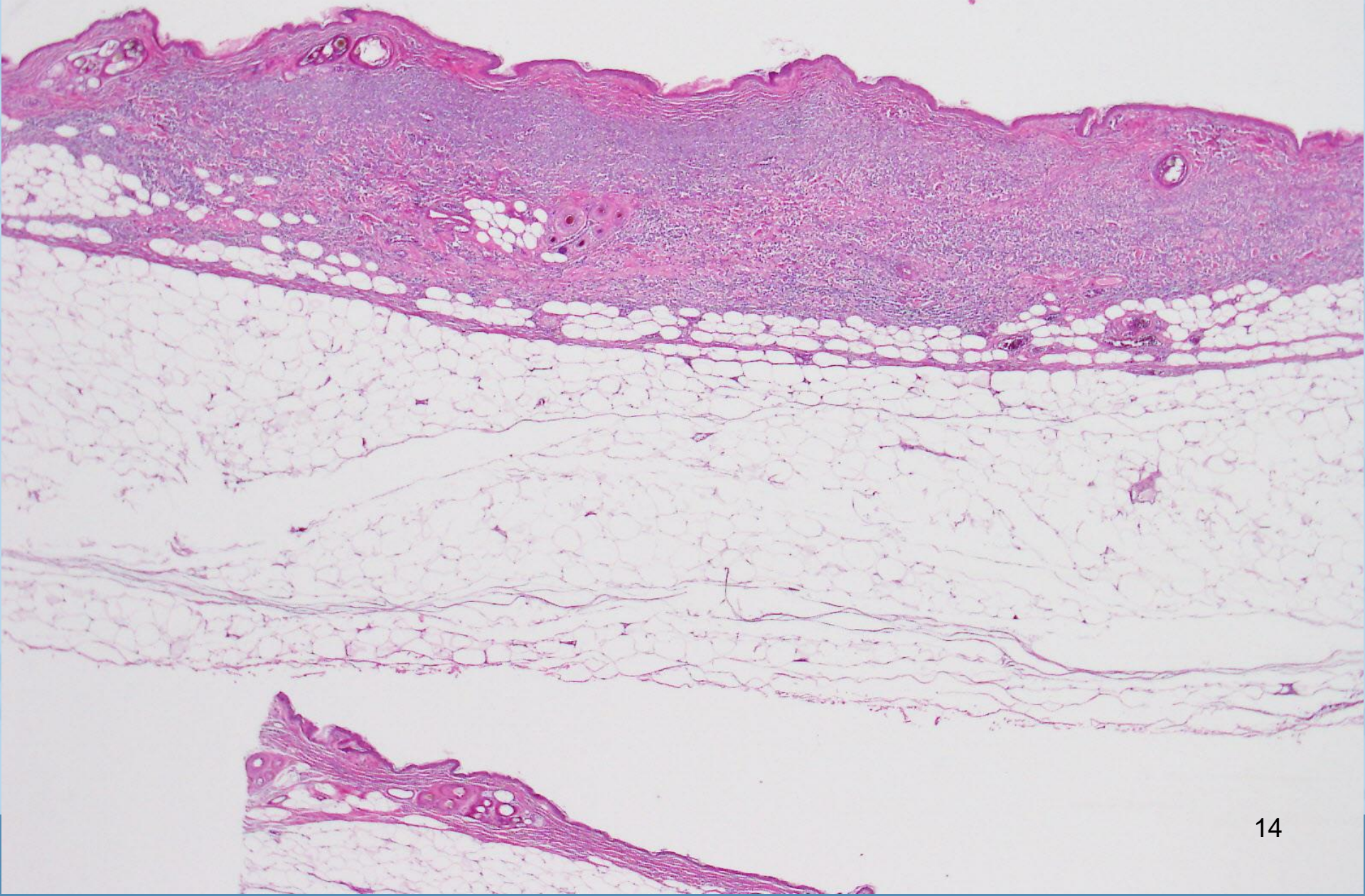
Clinic case studies

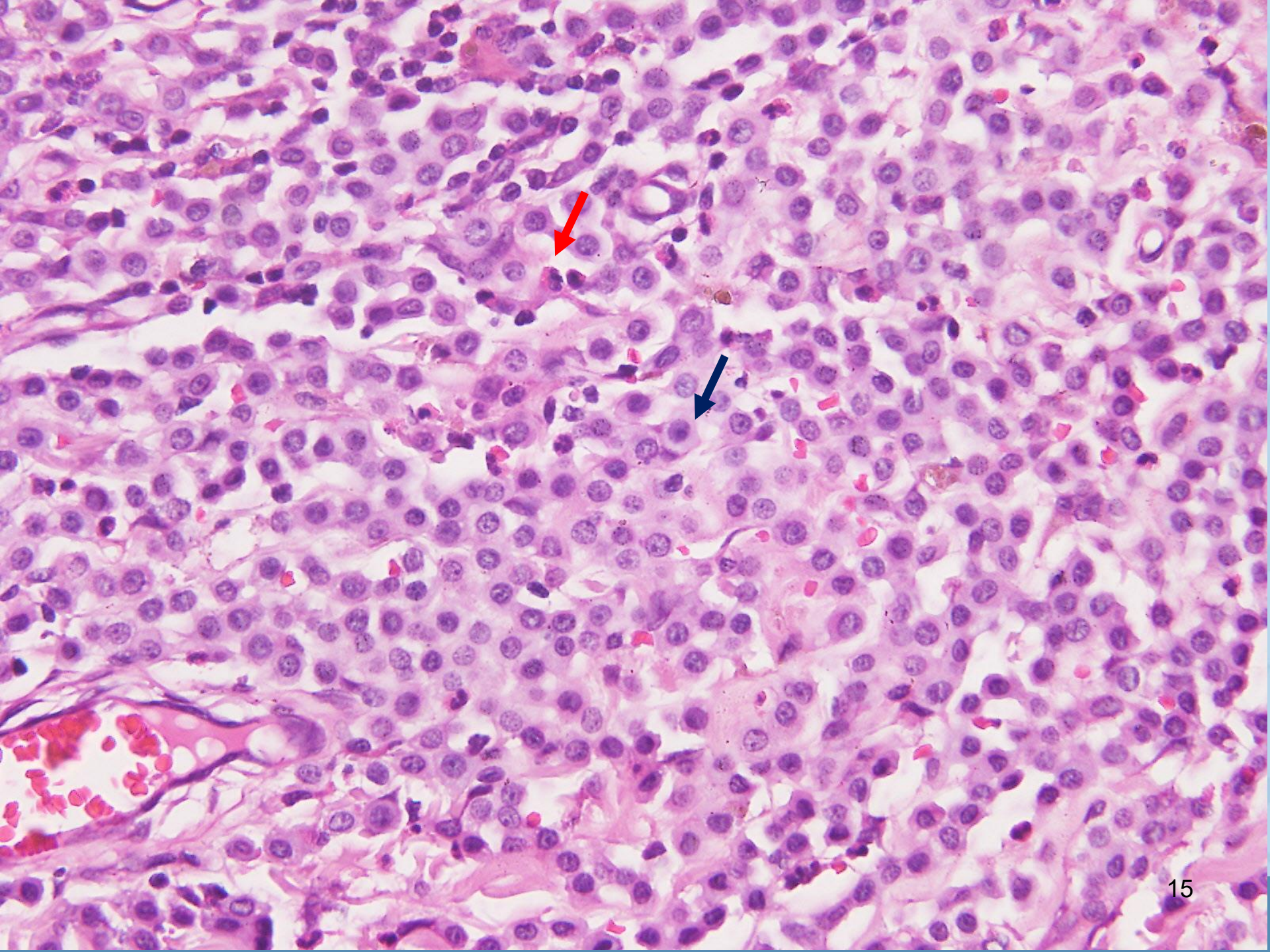


Case 1

- **Canine**, Poodle
- 11-year old, intact female
- Skin mass on right flank







Clues

- Round cells
- Relatively uniform
- Amphophilic cytoplasm (**granules**)
- **Eosinophils**



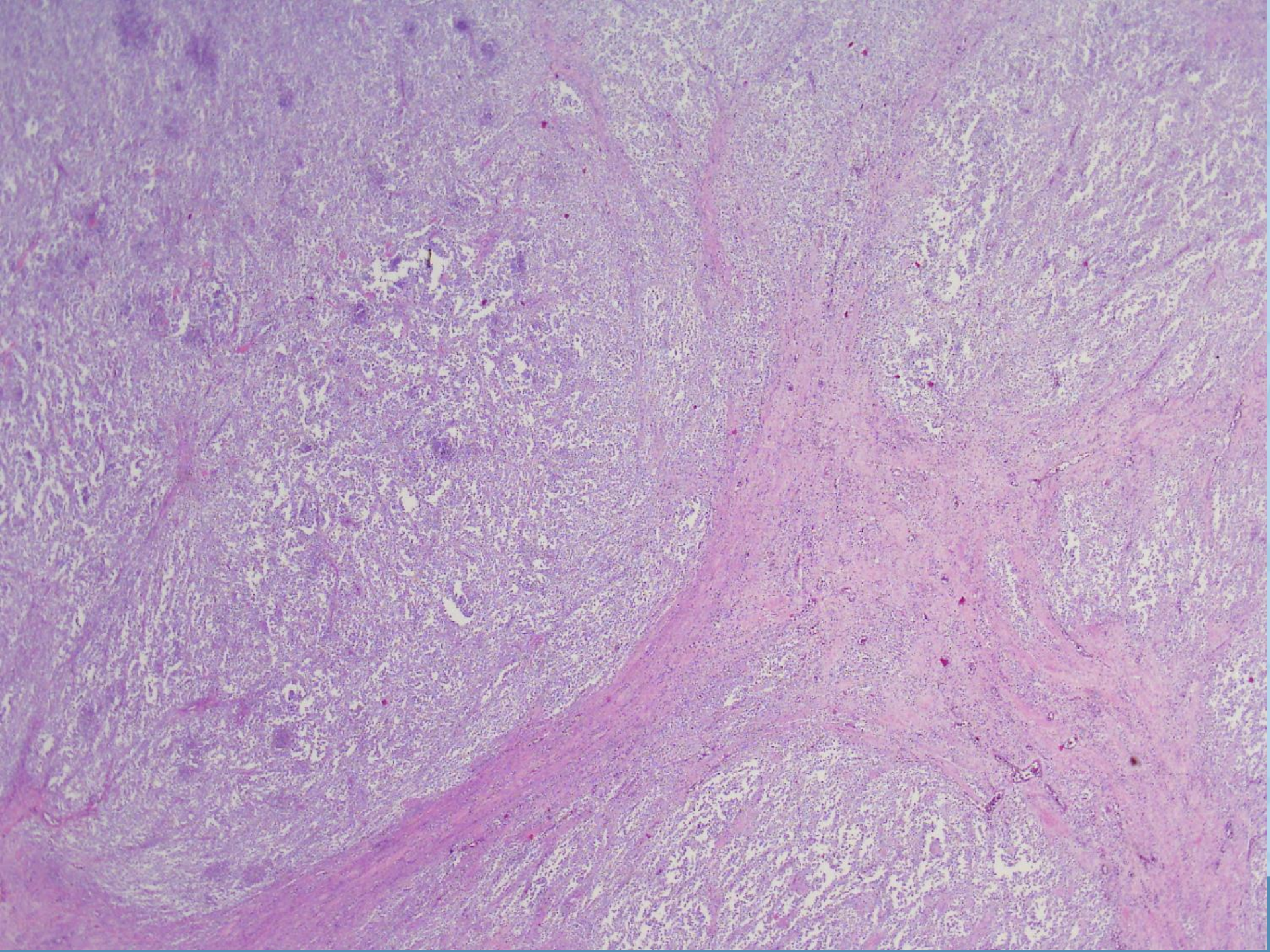
A histological section of a mast cell tumor, stained with hematoxylin and eosin (H&E). The image shows a dense population of mast cells, which are characterized by their large, round, dark purple nuclei and pale, foamy cytoplasm. A red arrow points to one such cell. The background is a pinkish-purple stroma. A yellow rectangular box is overlaid on the center of the image, containing the text "Mast cell tumor".

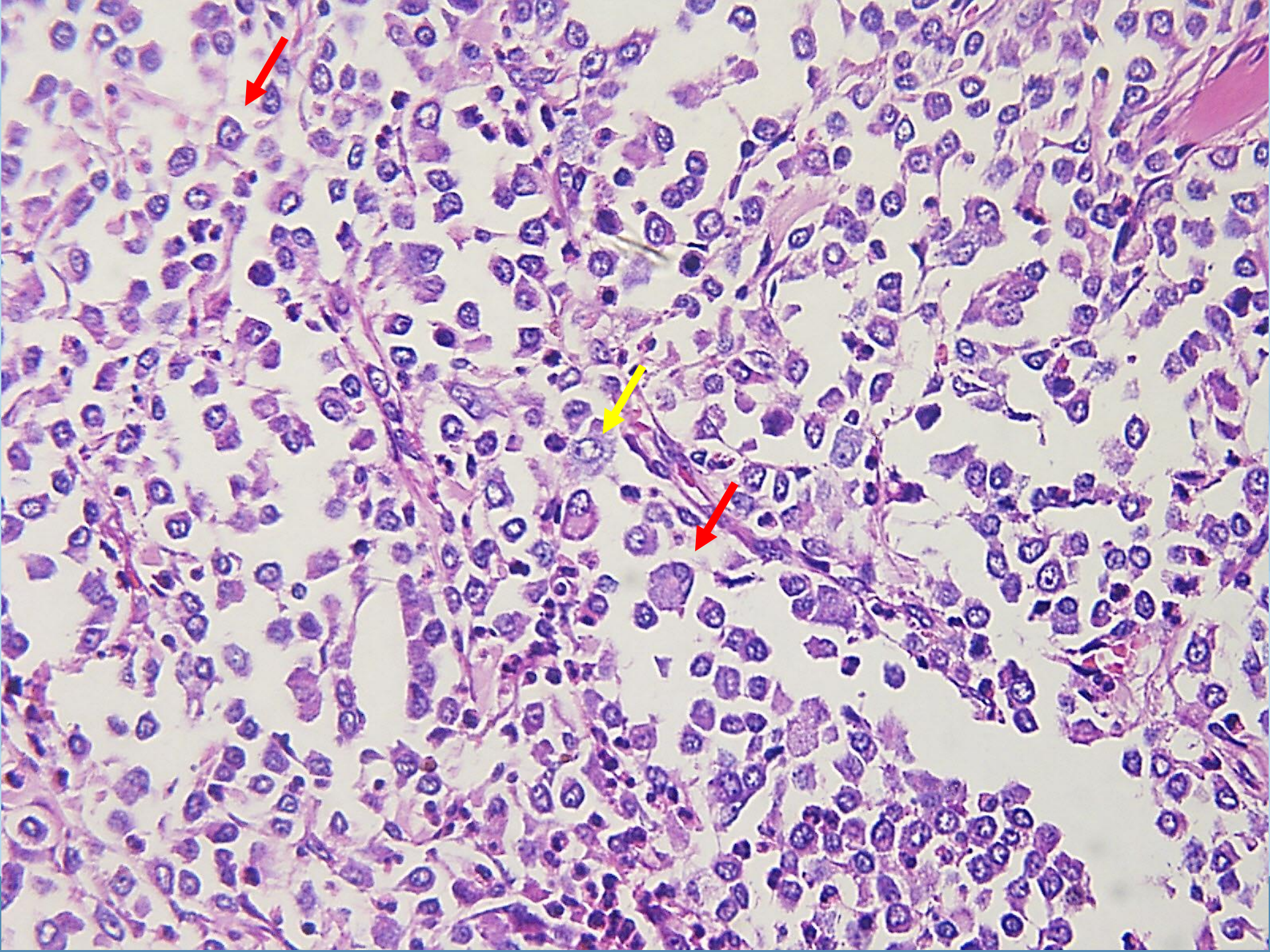
Mast cell tumor

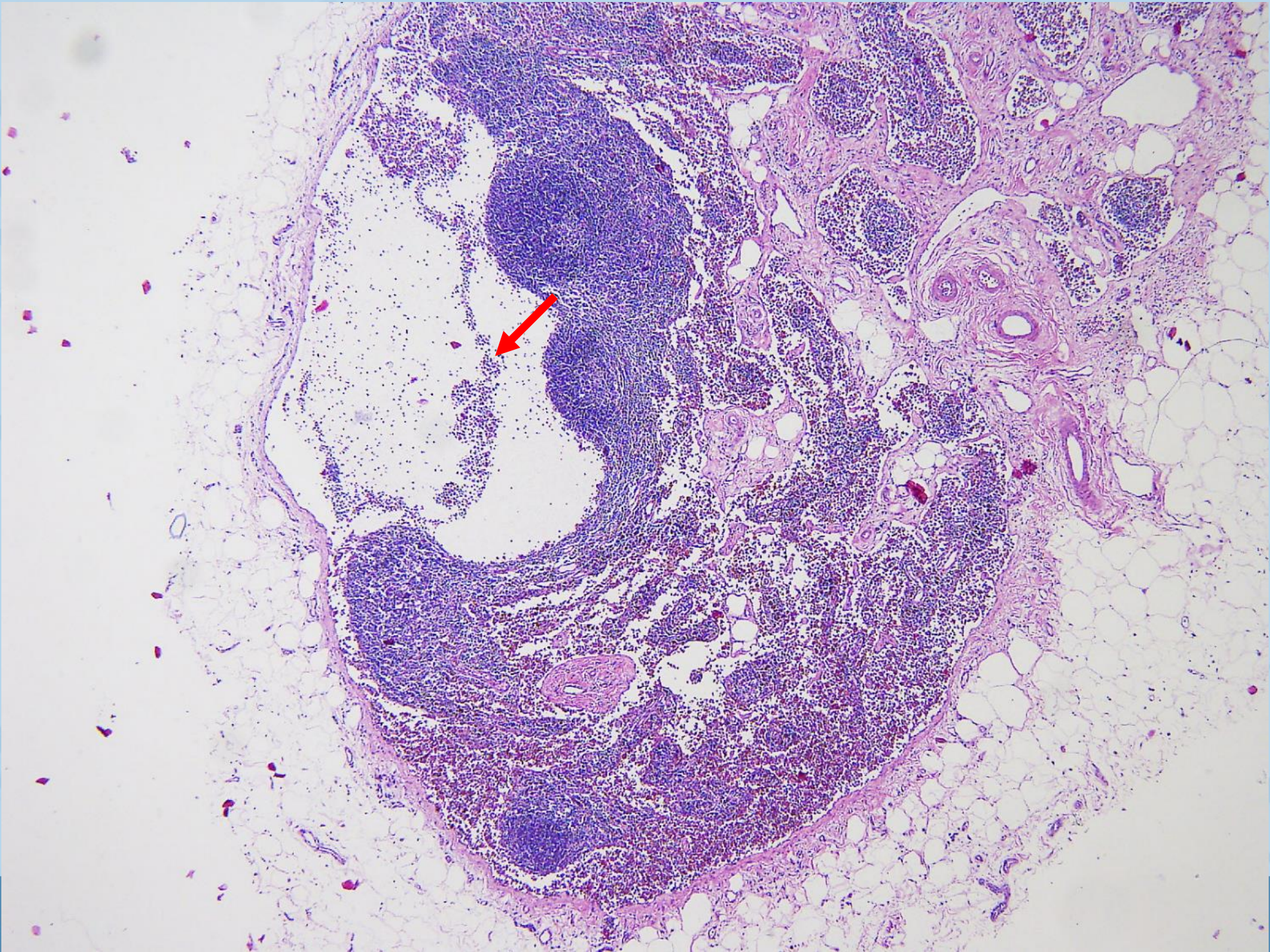
Case 2

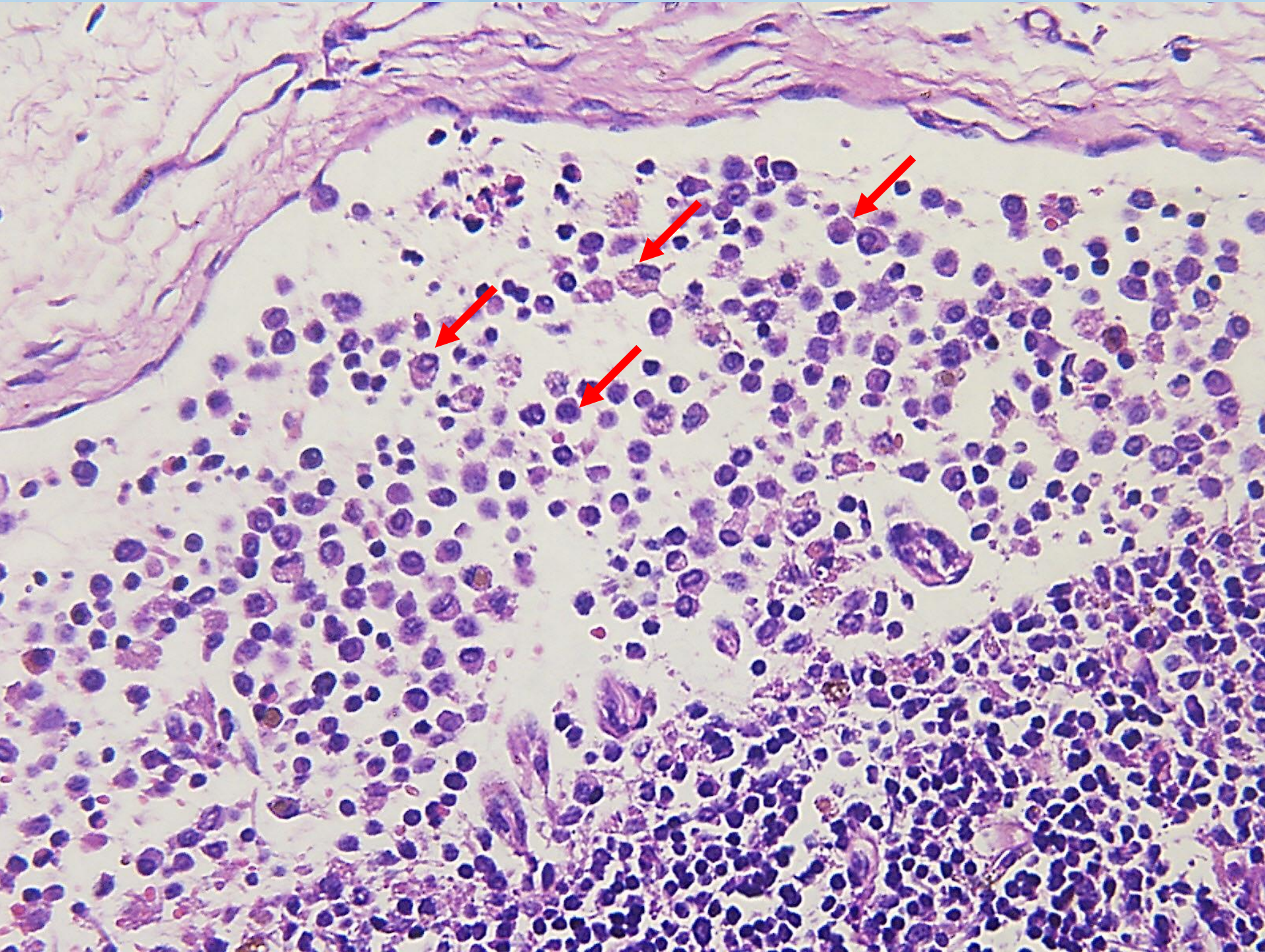
- **Canine**, breed unspecified
- Unknown age, neutered female
- Skin mass on mammary gland region
- FNA: anaplastic carcinoma







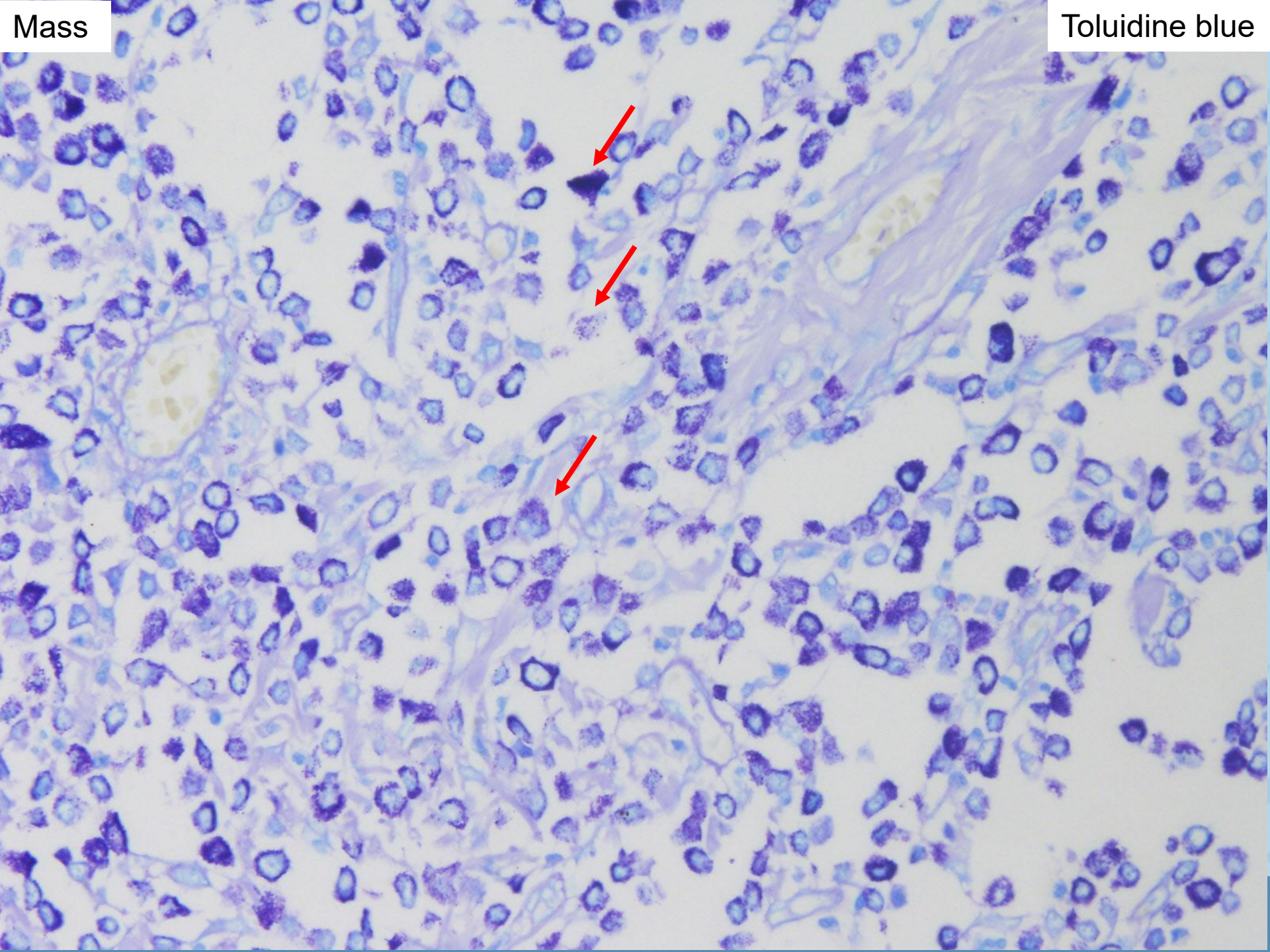




Clues

- Dermis to subcutis
- Infiltrative
- Round cells with pleomorphism
- Cytoplasmic **granules**
- Rare eosinophils
- Lymph node meta or reactive ?



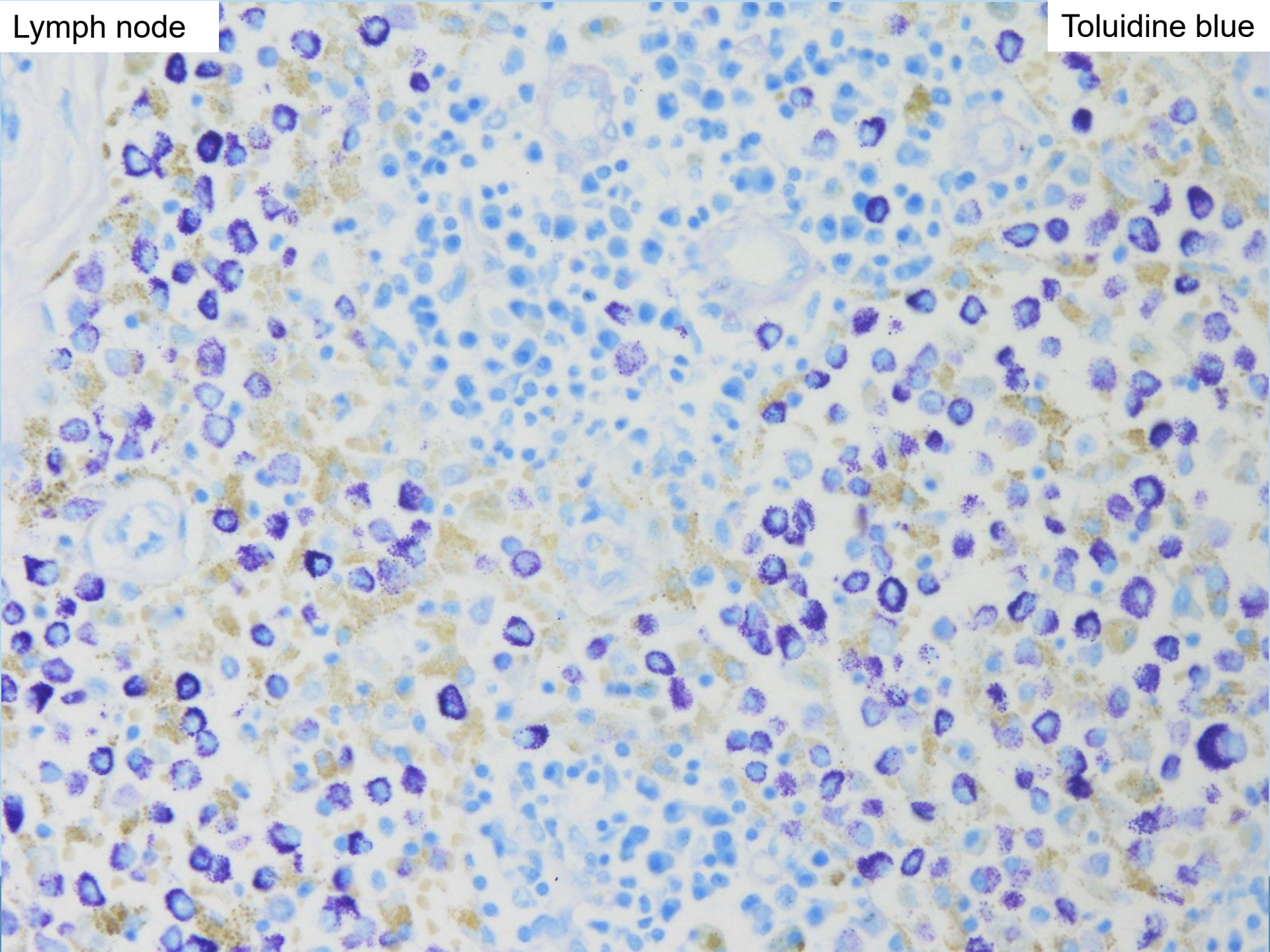


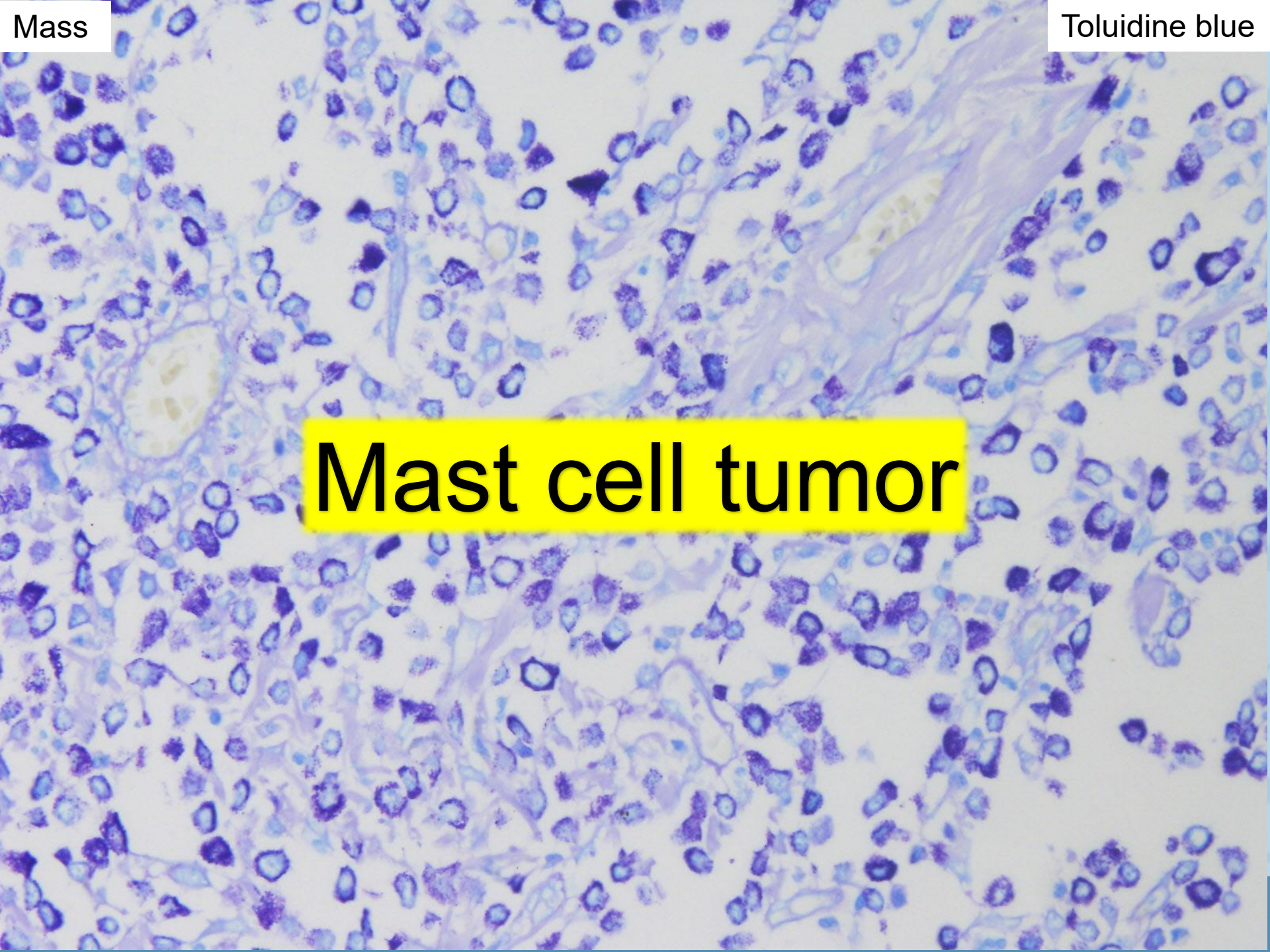
Mass

Toluidine blue

Lymph node

Toluidine blue





Mass

Toluidine blue

Mast cell tumor

Grading system for canine cutaneous MCT

- **3-tier** (Patnaik system, 1984)
Grade 1 (low), 2 (intermediate), 3 (high)
- **2-tier** (Kiupel system, 2010)
Low grade, High grade



Patnaik 3-tier system

	Grade 1	Grade 2	Grade 3
Differentiation	Well-differentiated; medium-sized; distinct granules	Moderate; fine, distinct granules	Poorly- differentiated; indistinct or no granules
Nuclei	Monomorphic; round, condensed chromatin; no nucleoli	Mild pleomorphism; round to indented scattered chromatin; occasional nucleoli; binucleated and giant cells	Large; pleomorphic; fine chromatin; 1 or more nucleoli; binucleated and multinucleated giant cells are common
Mitotic index average/hpf	0/hpf	0-2/hpf	3-6/hpf
Penetration	Superficial dermis→ interfollicular	Deep dermis to SQ	SQ to deeper tissues
Aggressive features	None	Occasional edema; necrosis	Edema; necrosis common

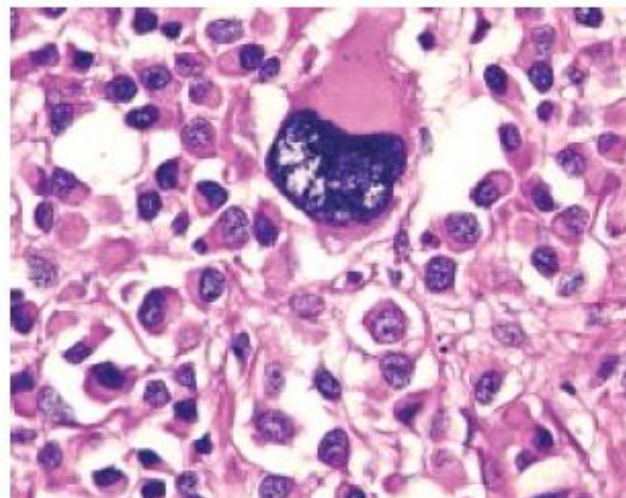
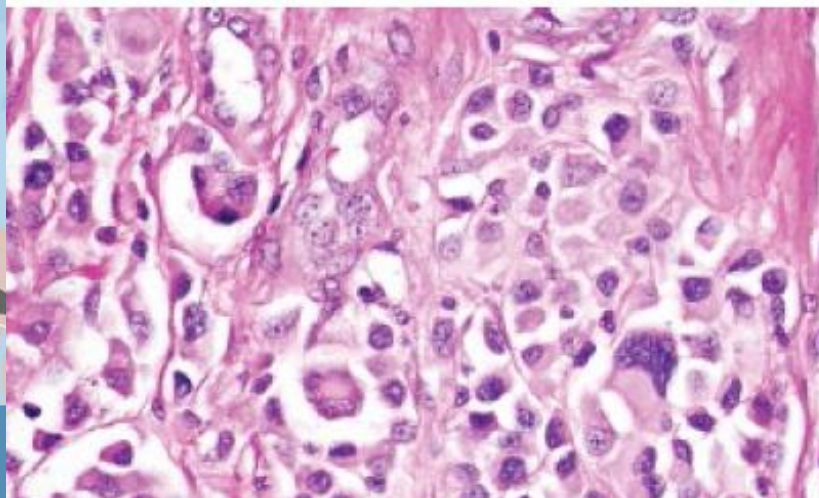
Patnaik 3-tier system

Grade 1	Grade 2	Grade 3
<ul style="list-style-type: none">• Survival rate: 90%	<ul style="list-style-type: none">• Low to moderate metastatic rate• 3.5 year survival rate: 55%	<ul style="list-style-type: none">• High metastatic rate• 3.5 year survival rate: 15%



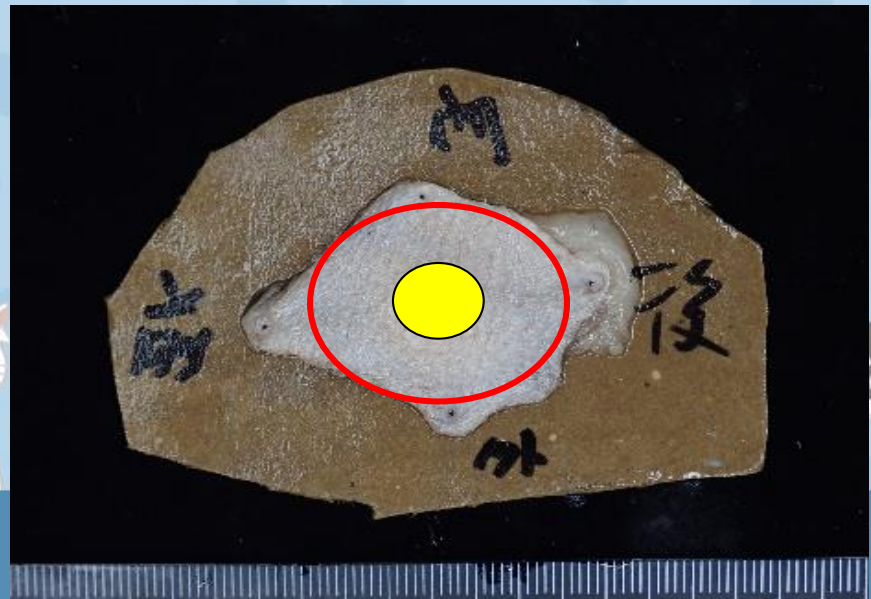
Kiupel 2-tier system

Low grade	High grade
	Presence of any one of the following: <ol style="list-style-type: none">1. At least 7 mitotic figures in 10 hpf2. At least 3 multinucleated (3 or more nuclei) cells in 10 hpf;3. At least 3 bizarre nuclei (indented, segmented) in 10 hpf;4. Karyomegaly (nuclear diameters of at least 10% of neoplastic cells vary by at least two-fold)
MST > 2 years	Median survival time < 4 months



Canine cutaneous MCT

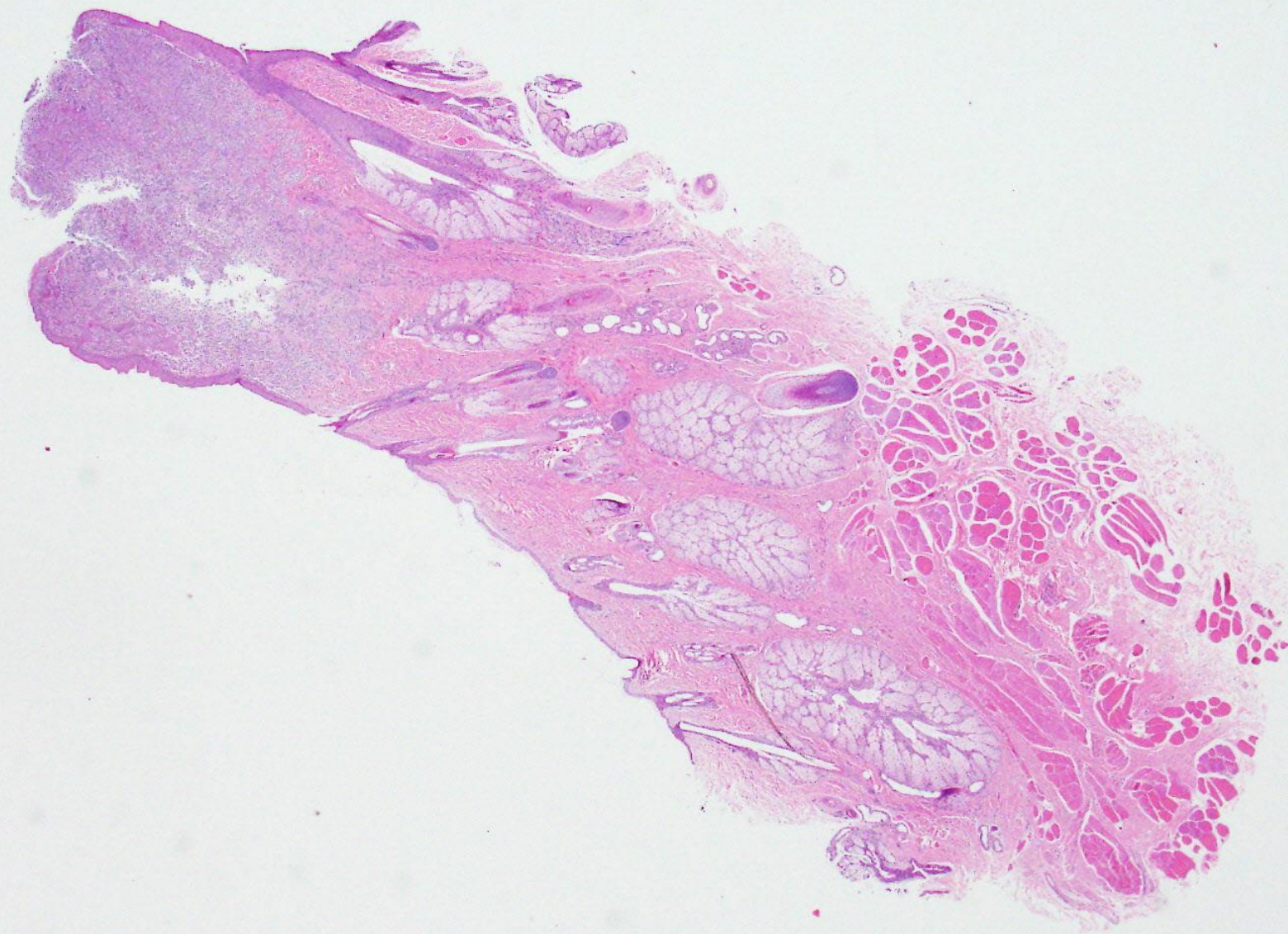
- **Surgery** is the first choice
- Grade II and III: 2-3 cm lateral +one fascial plane
- Modified surgical margins : widest diameter of the MCT

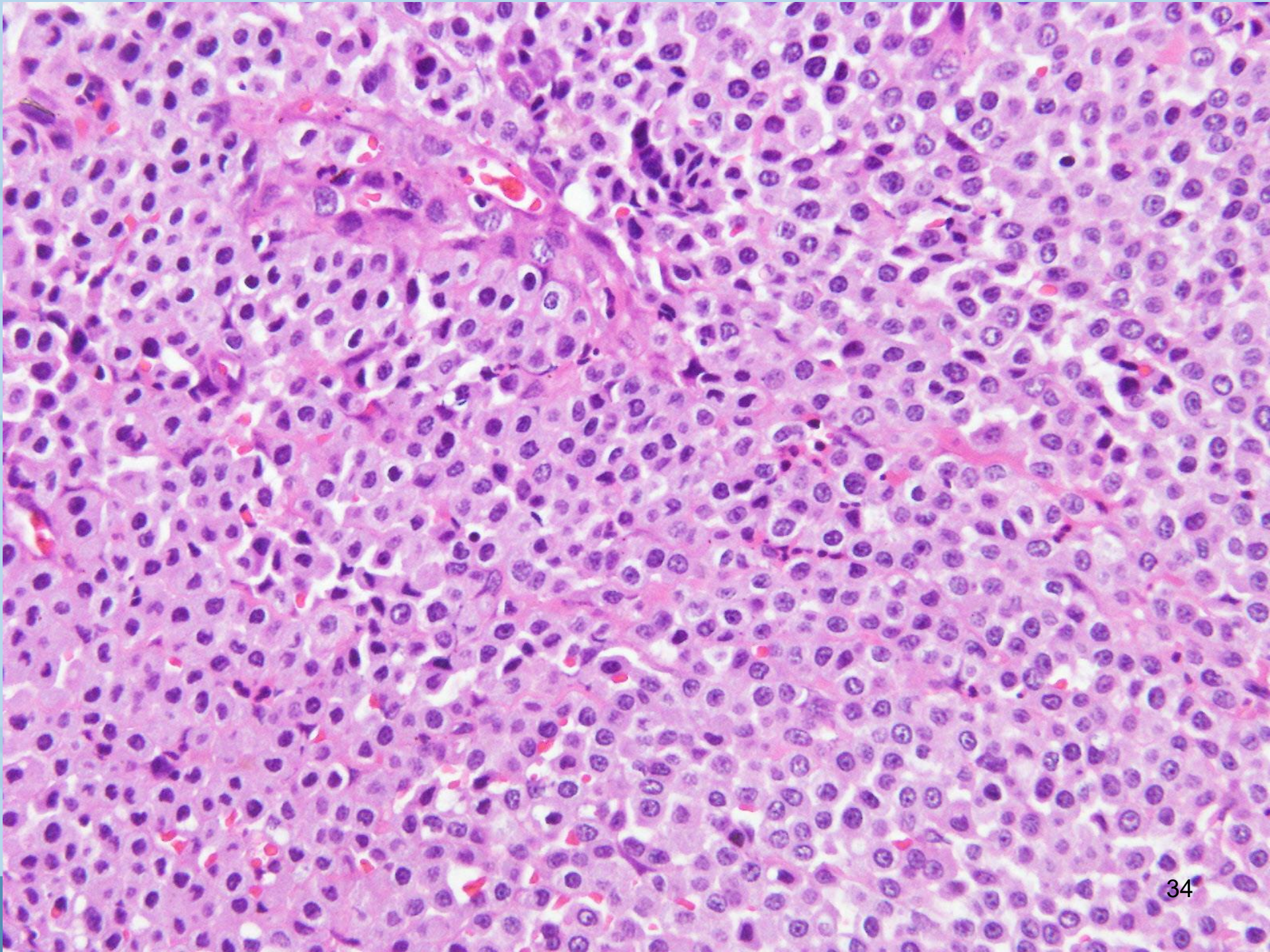


Case 3

- **Feline**, domestic shorthair
- 5-year old, castrated male
- Left mandibular haired skin mass
- 0.3 cm in diameter







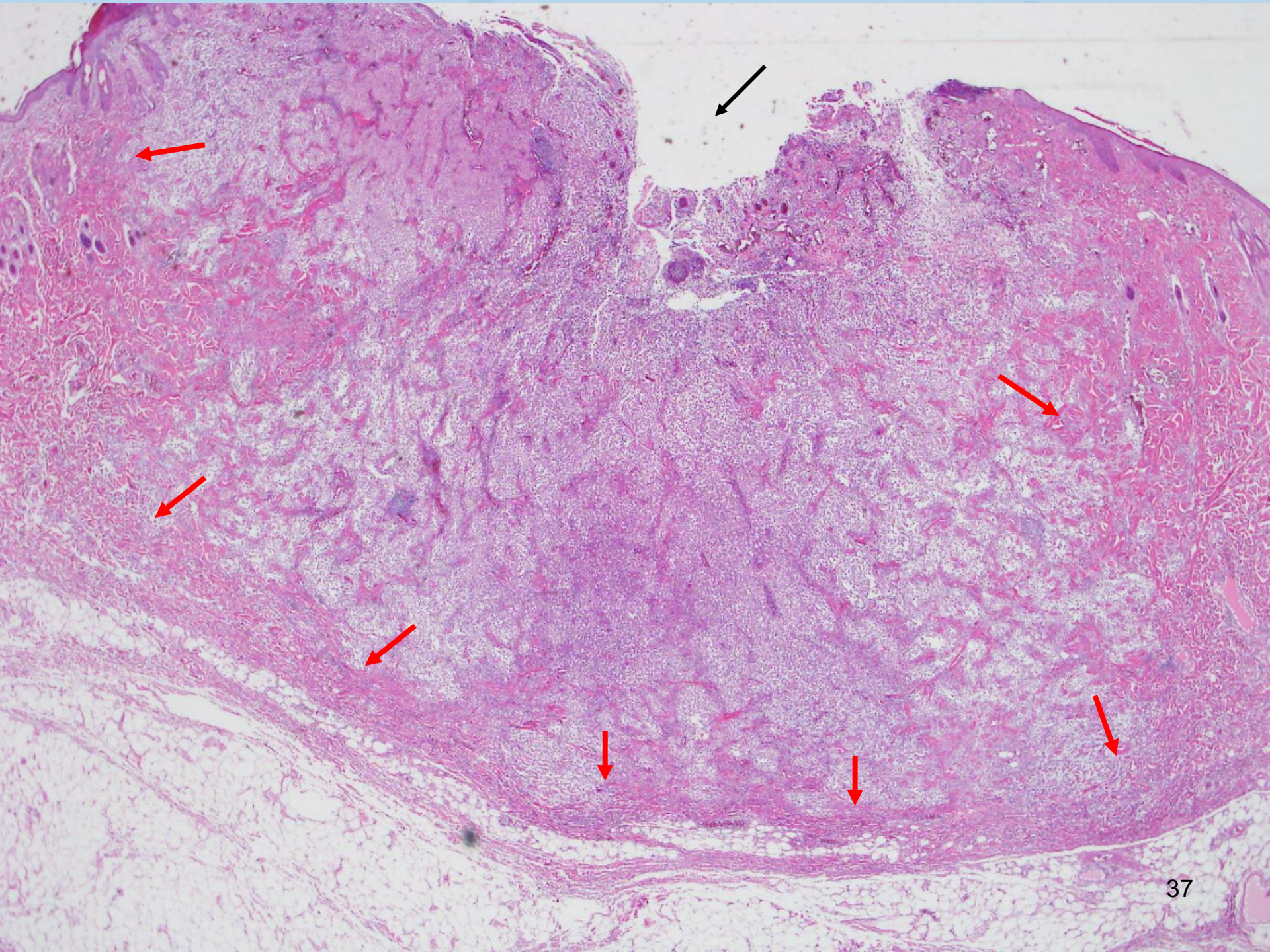
A high-magnification histological micrograph of a tissue section stained with hematoxylin and eosin (H&E). The image shows a dense population of cells with large, round, dark purple nuclei and pale pink cytoplasm. The cells are arranged in a somewhat disorganized pattern, with some areas showing more intense staining. A yellow rectangular box is superimposed over the center of the image, containing the text "Mast cell tumor".

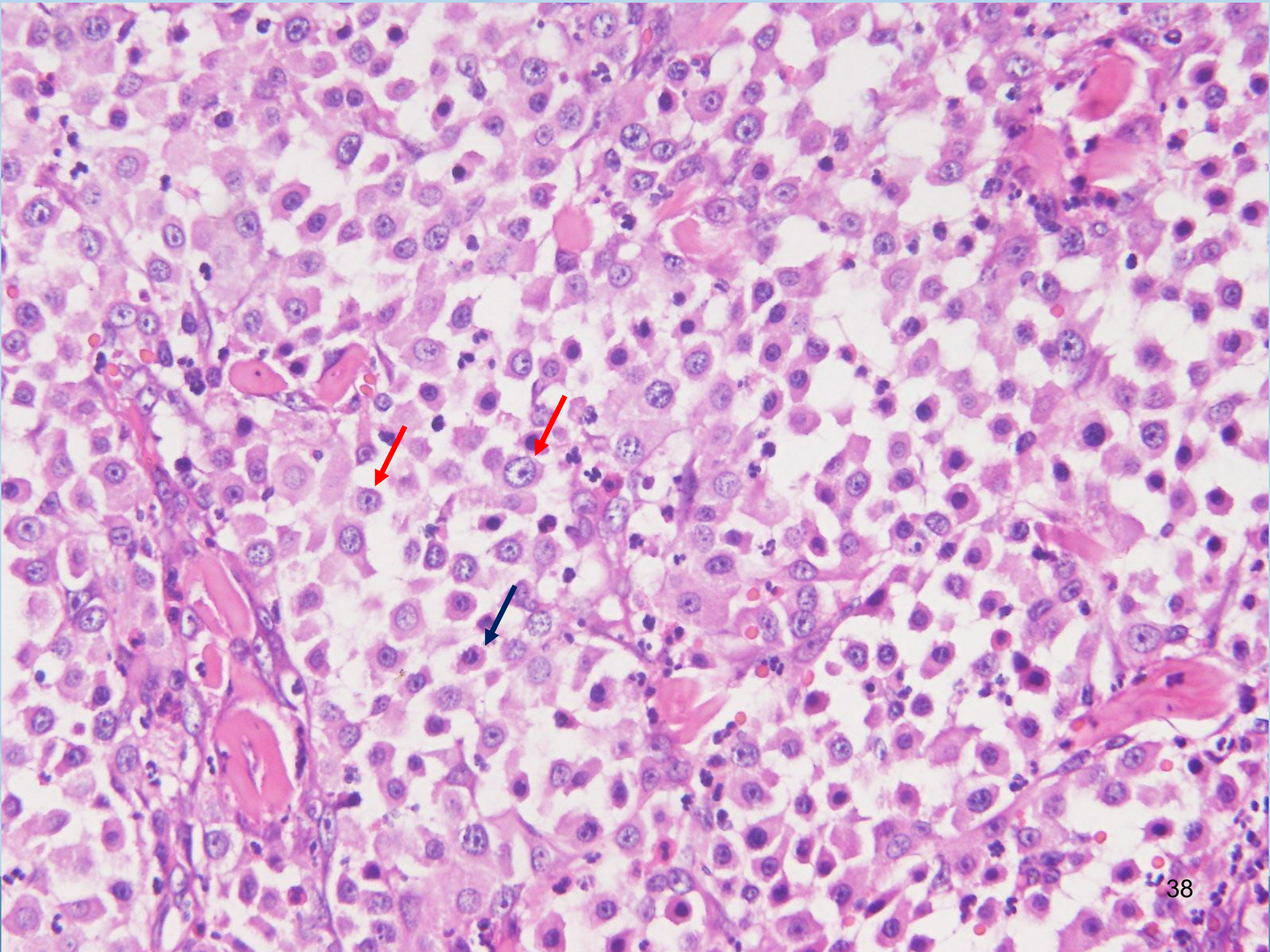
Mast cell tumor

Case 4

- **Feline**, domestic shorthair
- 5-year old, castrated male
- Haired skin of head, behind the left ear
- 1.2 cm in diameter







Clues

- Dermis, infiltrative
- Round cells
- Abundant cytoplasm
- Cellular pleomorphism
- Cytoplasmic **granules**
- No eosinophils



A high-magnification histological micrograph of a tissue section stained with hematoxylin and eosin (H&E). The image shows a dense population of cells with large, round to oval nuclei and prominent, dark purple granules (mast cell granules) that often obscure the nuclei. The cytoplasm is pale pink. The overall architecture is disorganized, typical of a neoplastic process. A yellow rectangular box is superimposed over the center of the image, containing the text 'Mast cell tumor'. A blue arrow points to a specific cell within the tumor mass, and a red line points to the yellow box.

Mast cell tumor

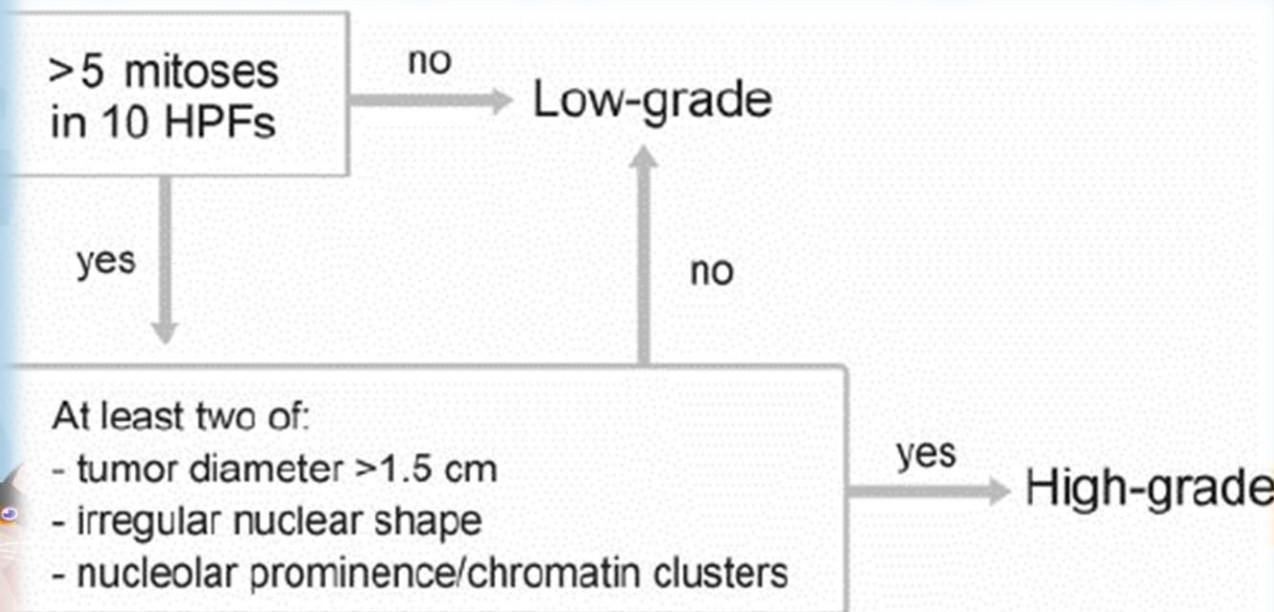
Feline cutaneous MCT

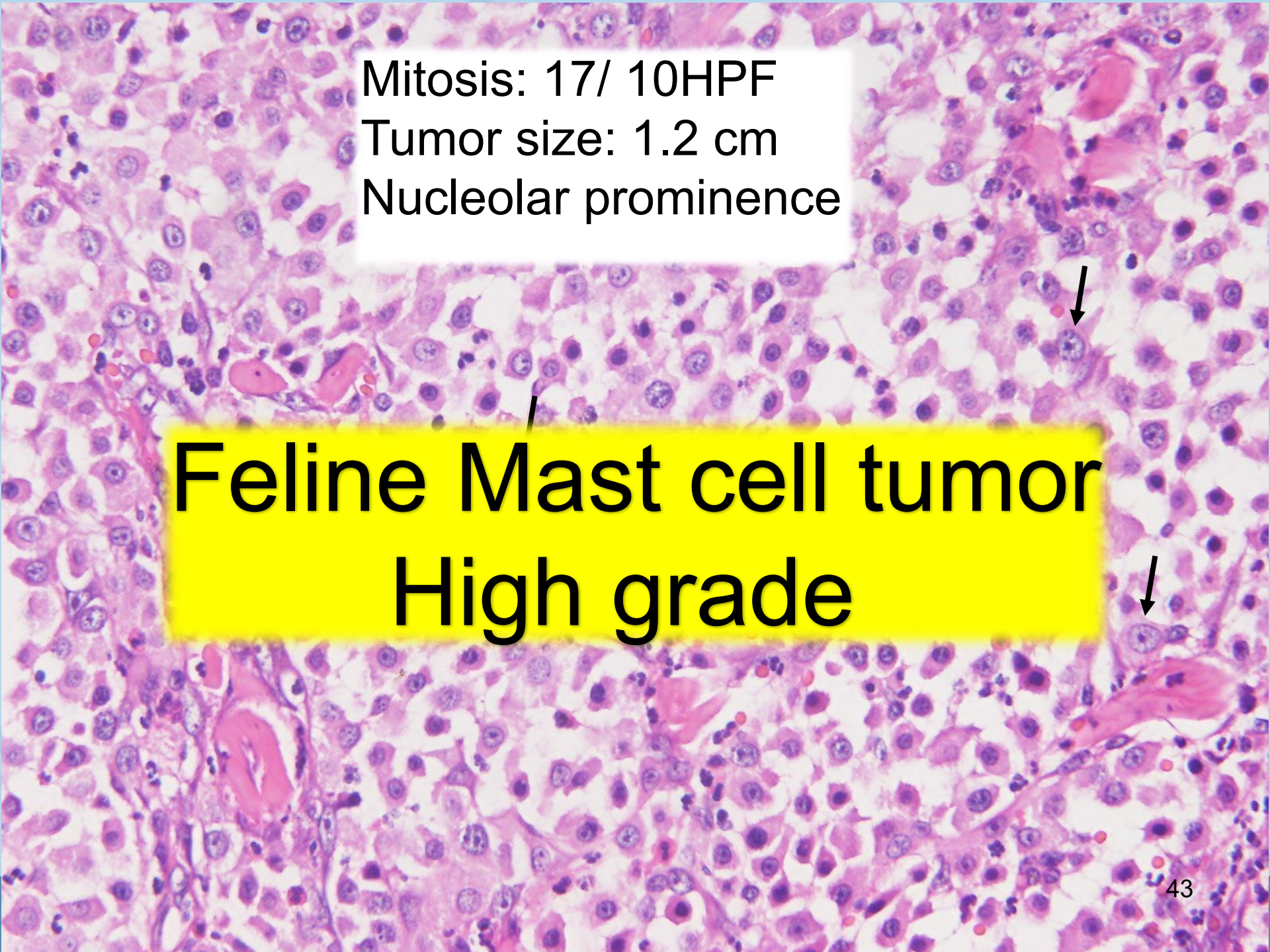
- Majority are benign
- No established histologic grading system
- Silvia Sabattini (2019) proposed an novel grading system
- Two major forms: mastocytic and atypical (histiocytic, poorly-granulated)
- No subcutaneous form in feline MCT



Novel grading system for feline cutaneous MCT

- 2-tier grading scale
- Low grade vs High grade





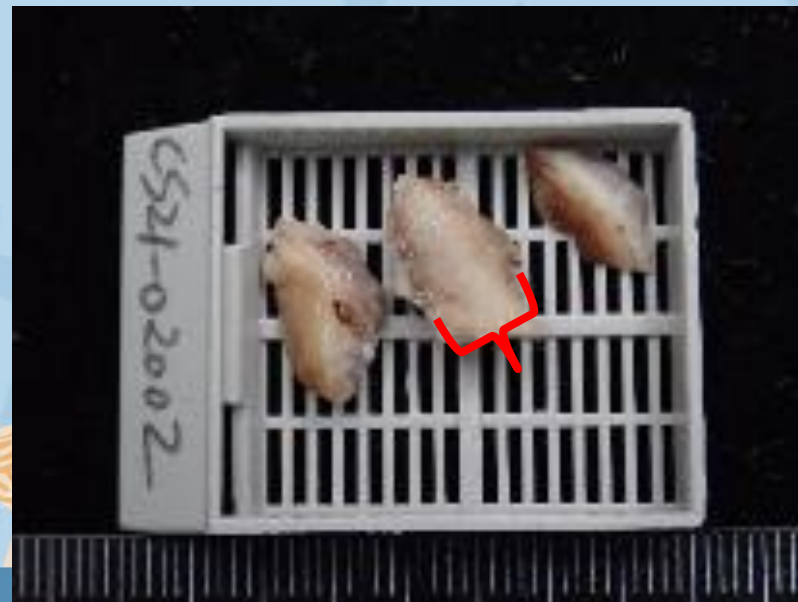
Mitosis: 17/ 10HPF
Tumor size: 1.2 cm
Nucleolar prominence

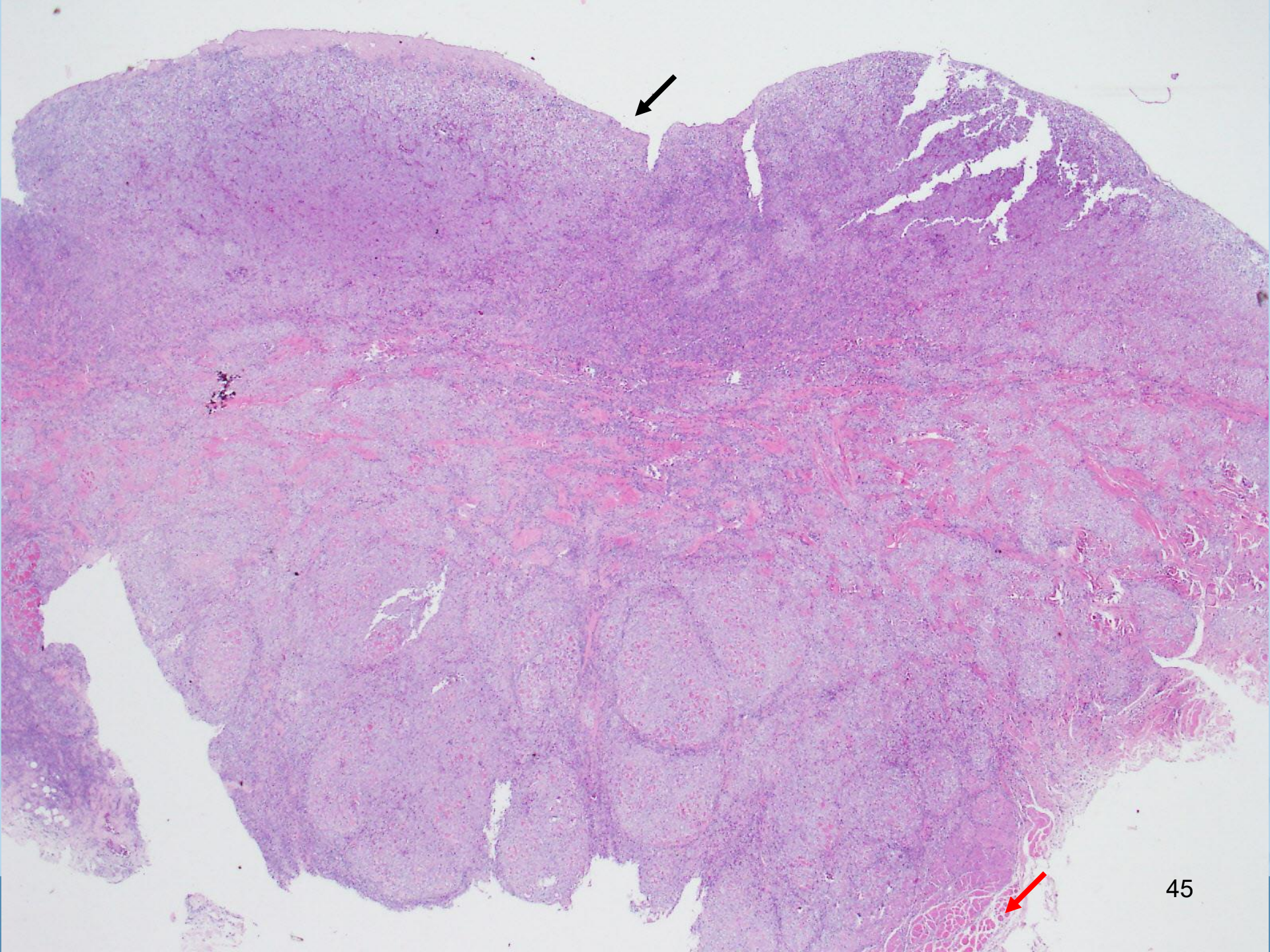
This histological slide shows a high-grade feline mast cell tumor. The tissue is stained with hematoxylin and eosin (H&E), revealing a dense population of large, pleomorphic cells with prominent, darkly stained nuclei and visible nucleoli. Two black arrows point to specific cells, likely highlighting mitotic figures or cells with prominent nucleoli. A yellow text box in the center of the slide reads 'Feline Mast cell tumor High grade'.

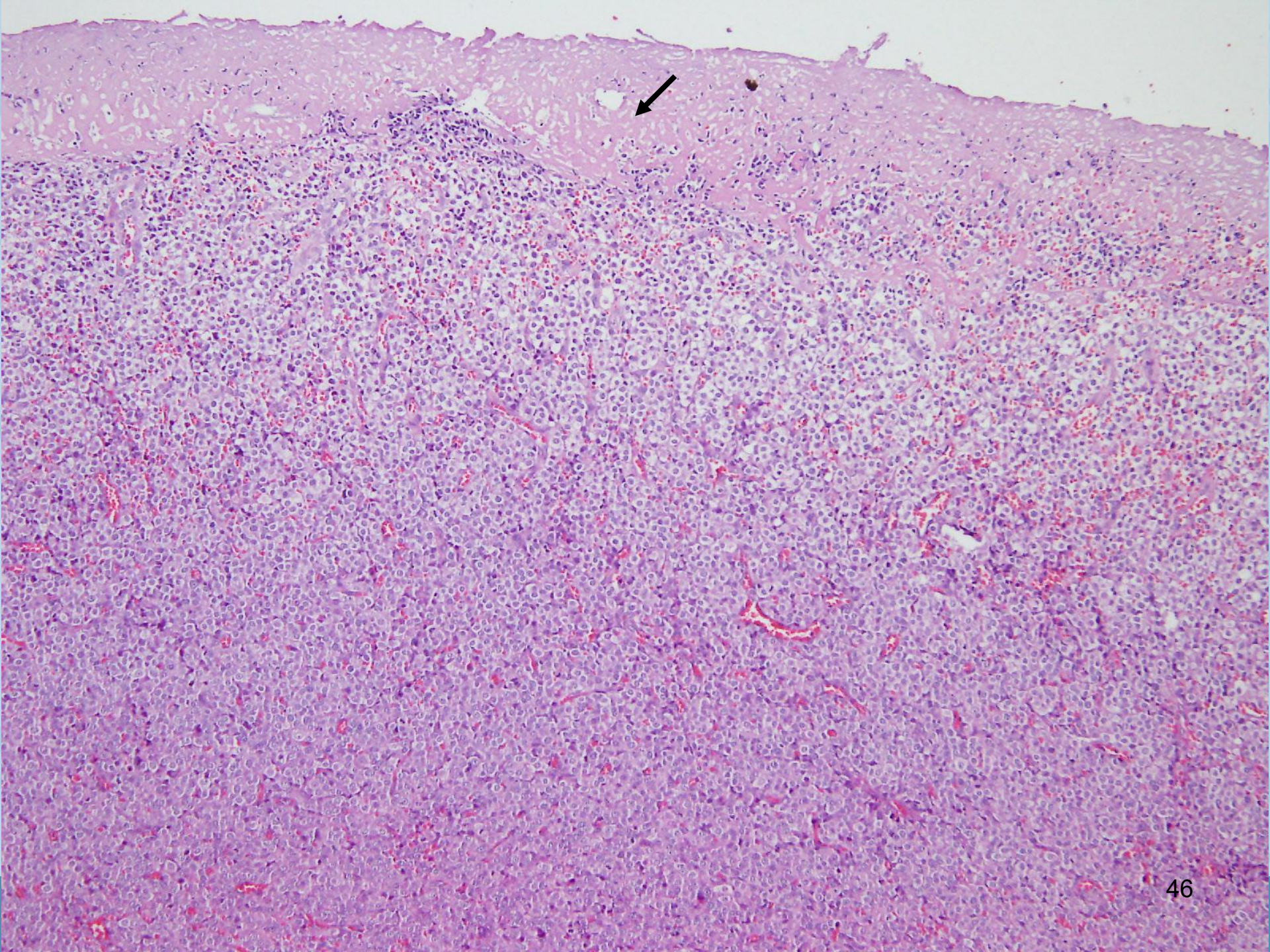
Feline Mast cell tumor High grade

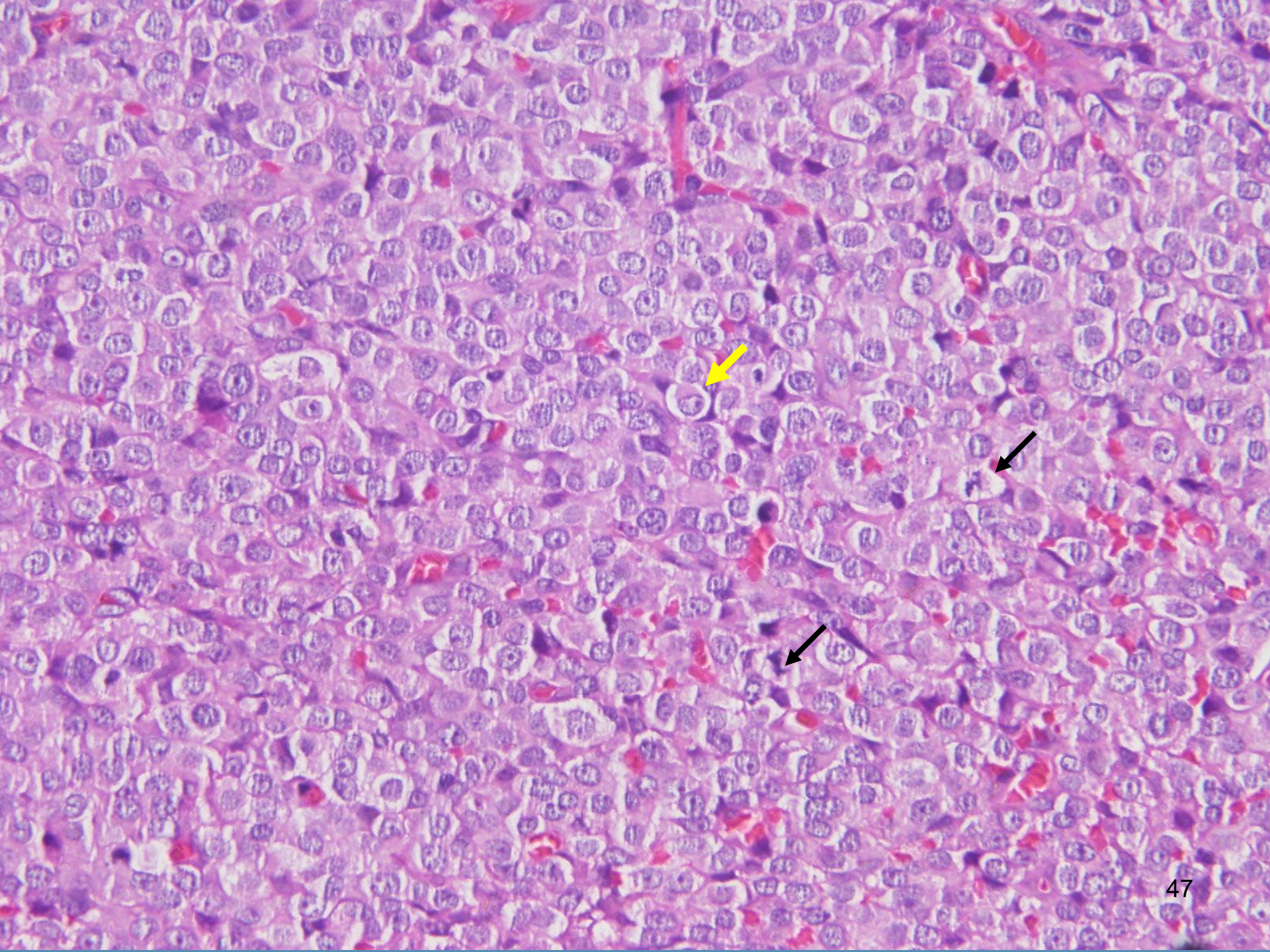
Case 5

- Canine, Beagle
- 13-year old, castrated male
- Mucosal mass on lip









Clues

- Mucocutaneous junction
- Ulcerated
- Uniform round cells
- Little to moderate amount of eosinophilic cytoplasm
- Frequent mitosis



Differential dx

- Round cell tumor
MCT
Lymphoma
Histiocytic-origin
TVT
- Amelanotic melanoma



Differential dx

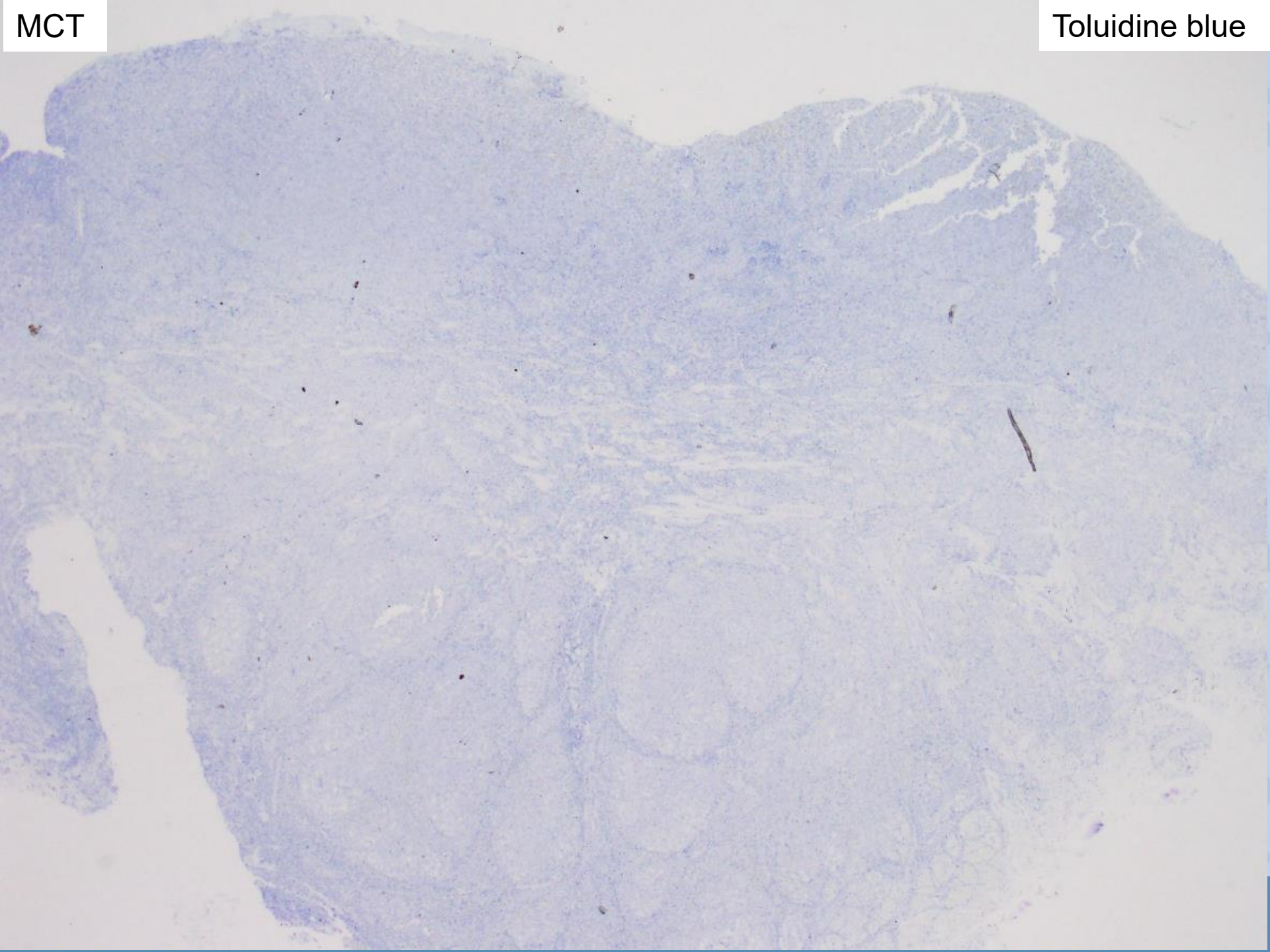
- Round cell tumor
MCT
Lymphoma
Histiocytic-origin
TVT
- Amelanotic melanoma

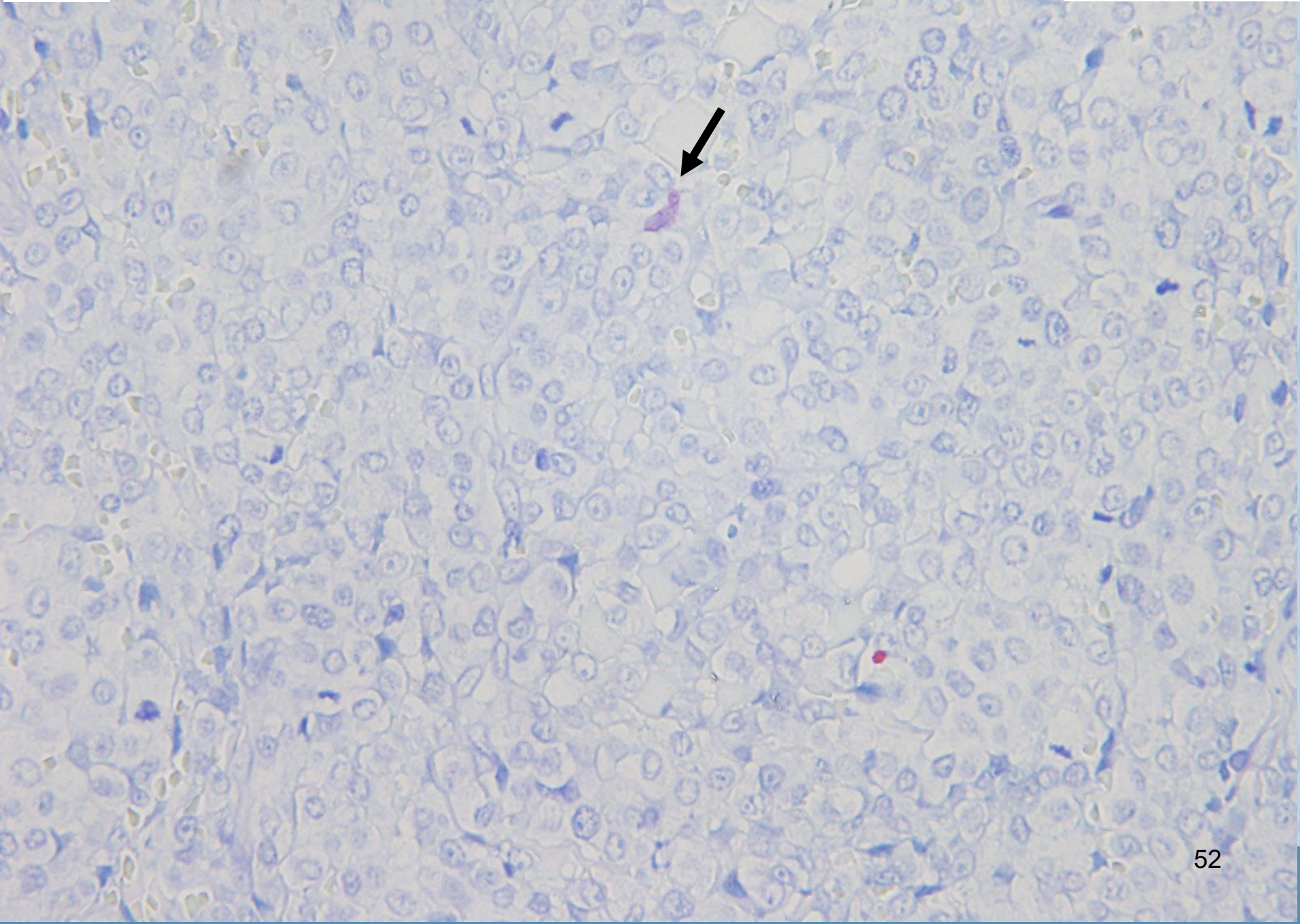
Toluidine blue
Melan-A
PAX5
CD3



MCT

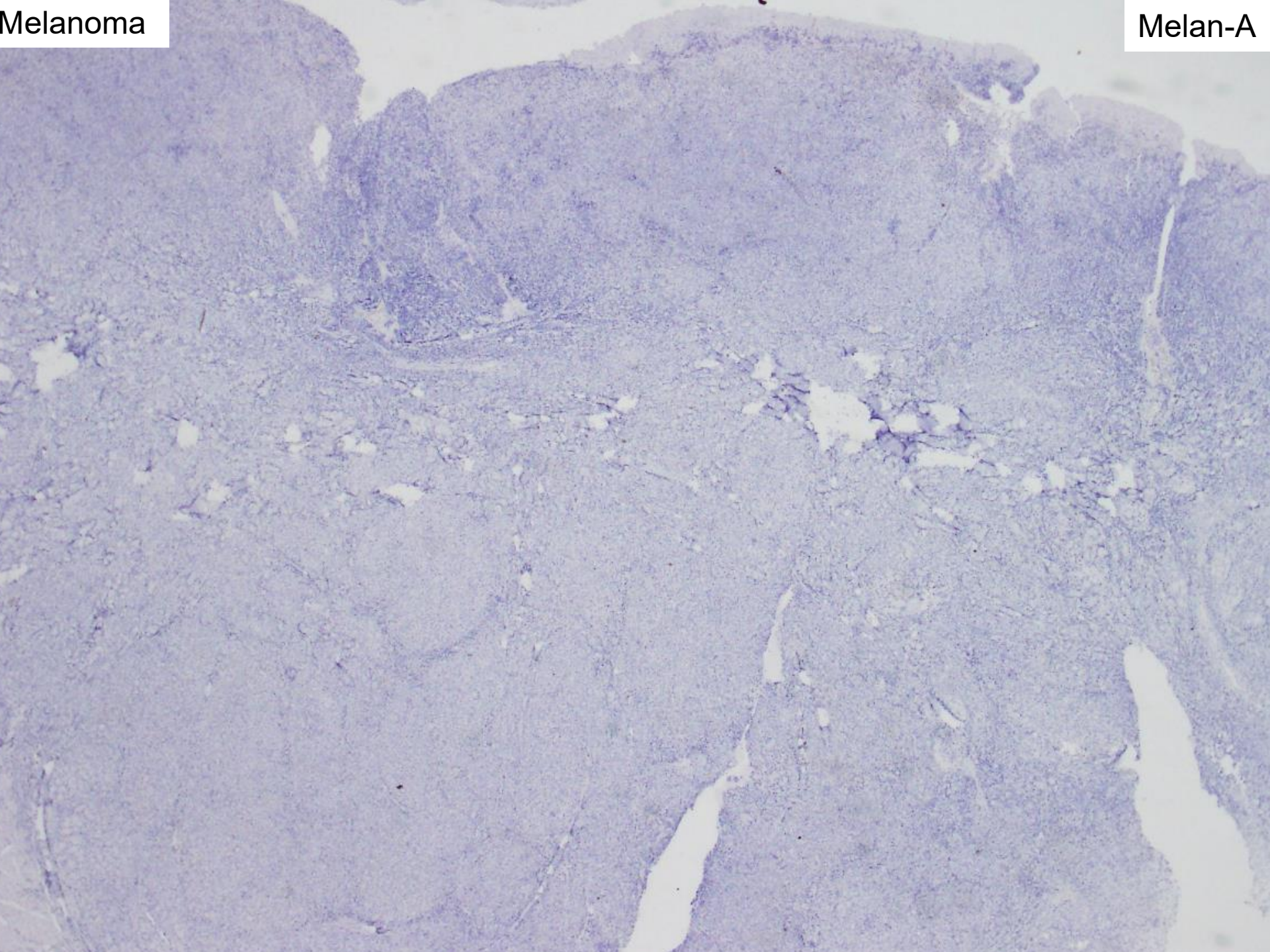
Toluidine blue

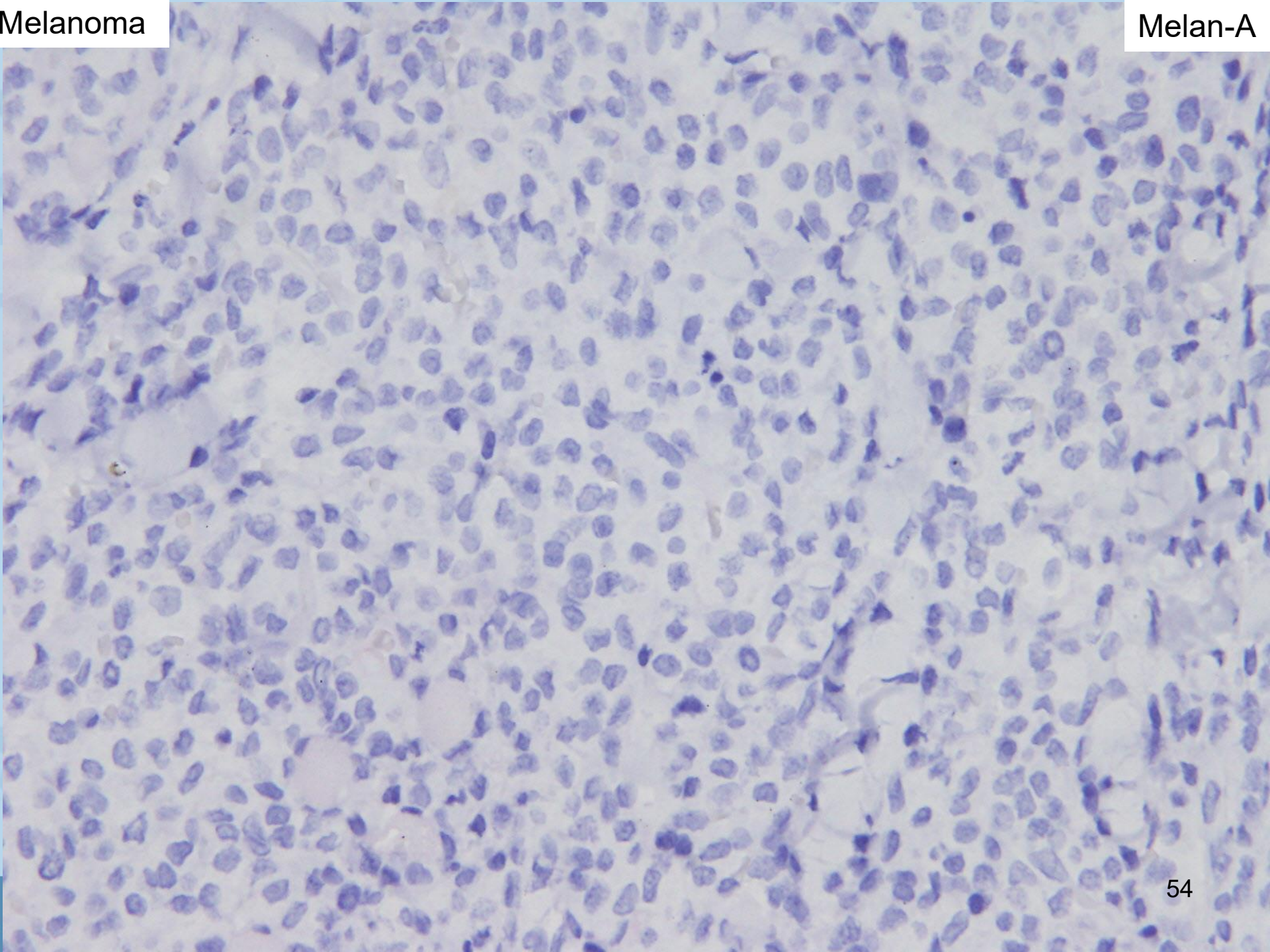




Melanoma

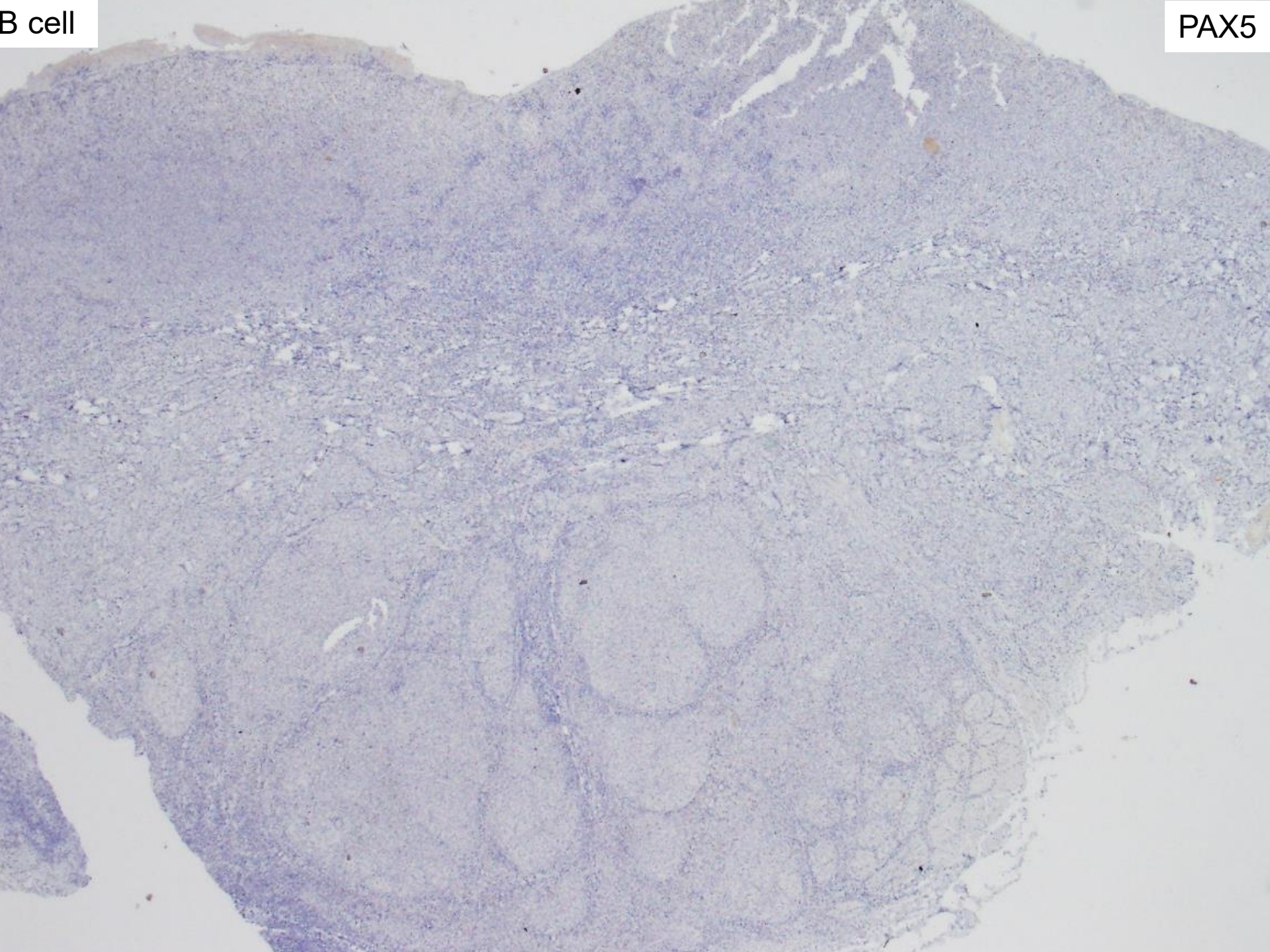
Melan-A





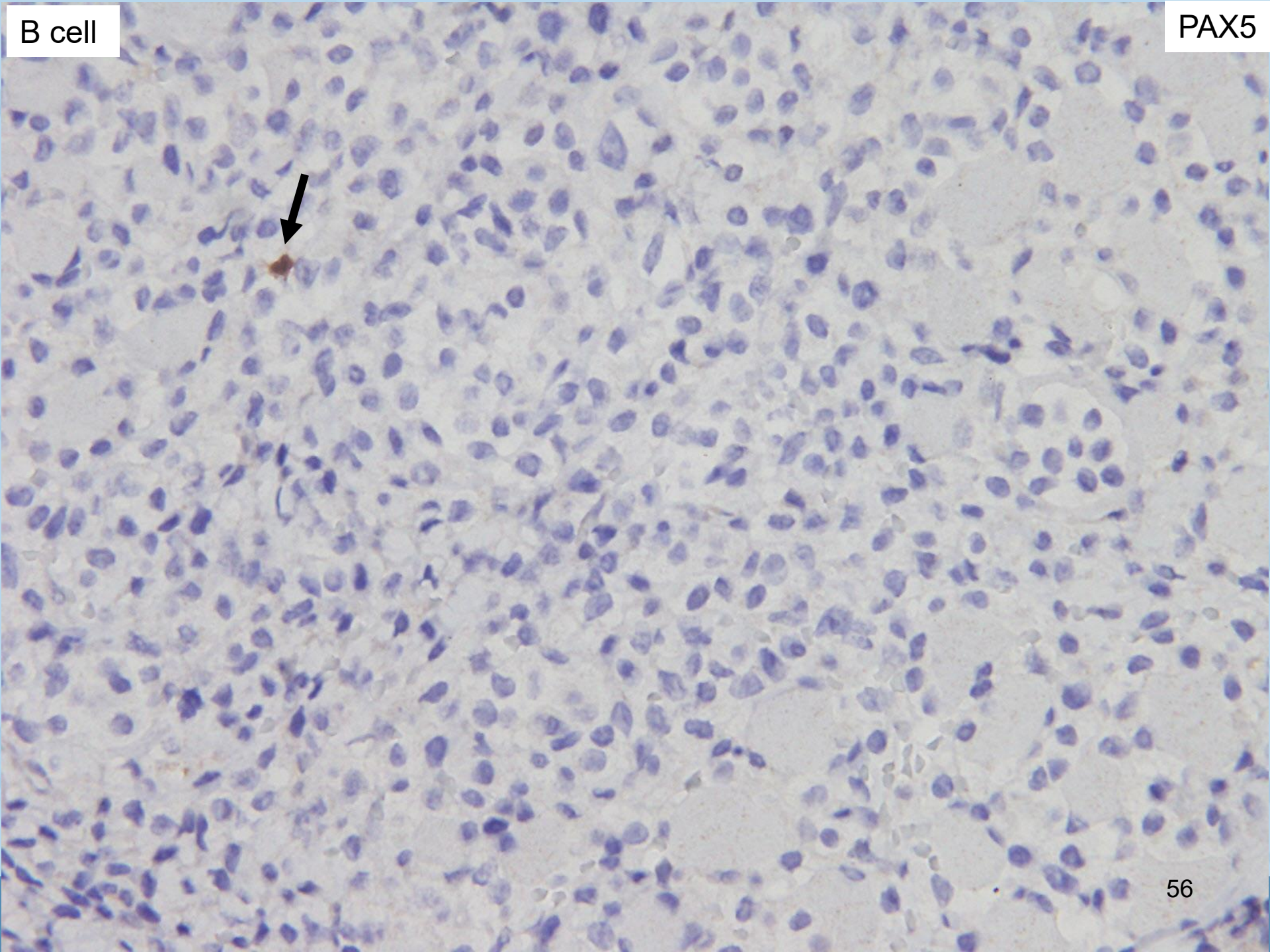
B cell

PAX5



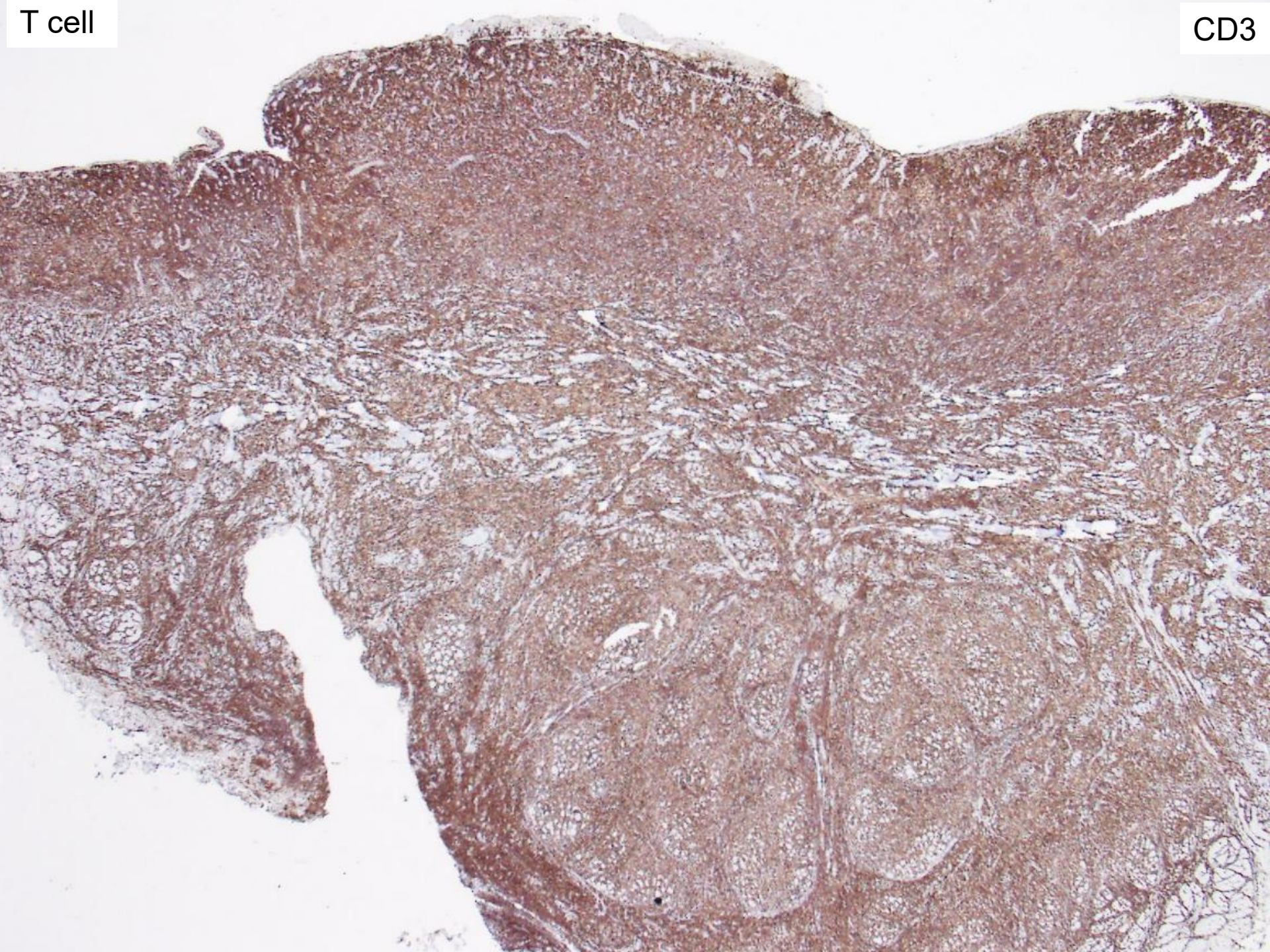
B cell

PAX5



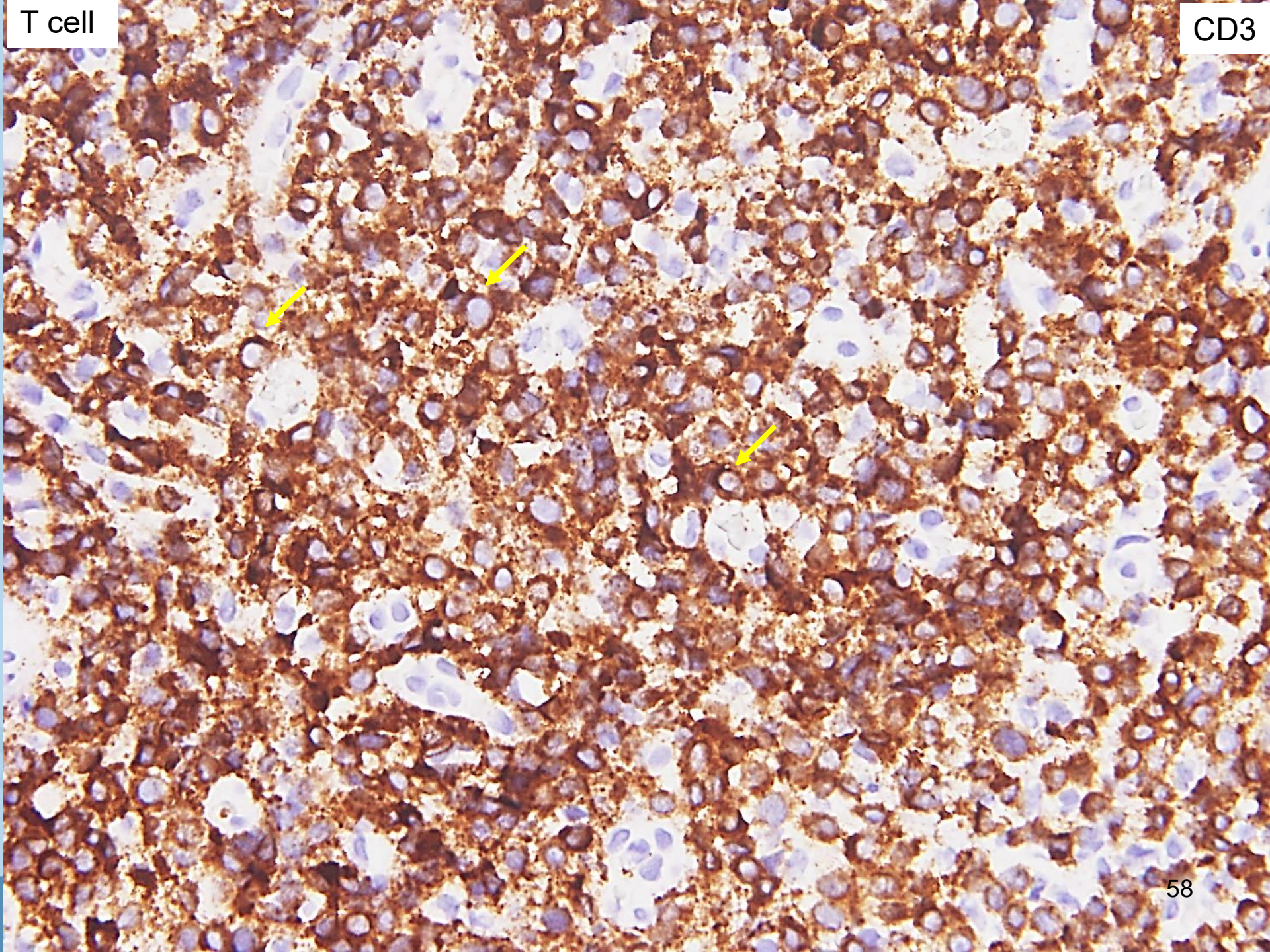
T cell

CD3



T cell

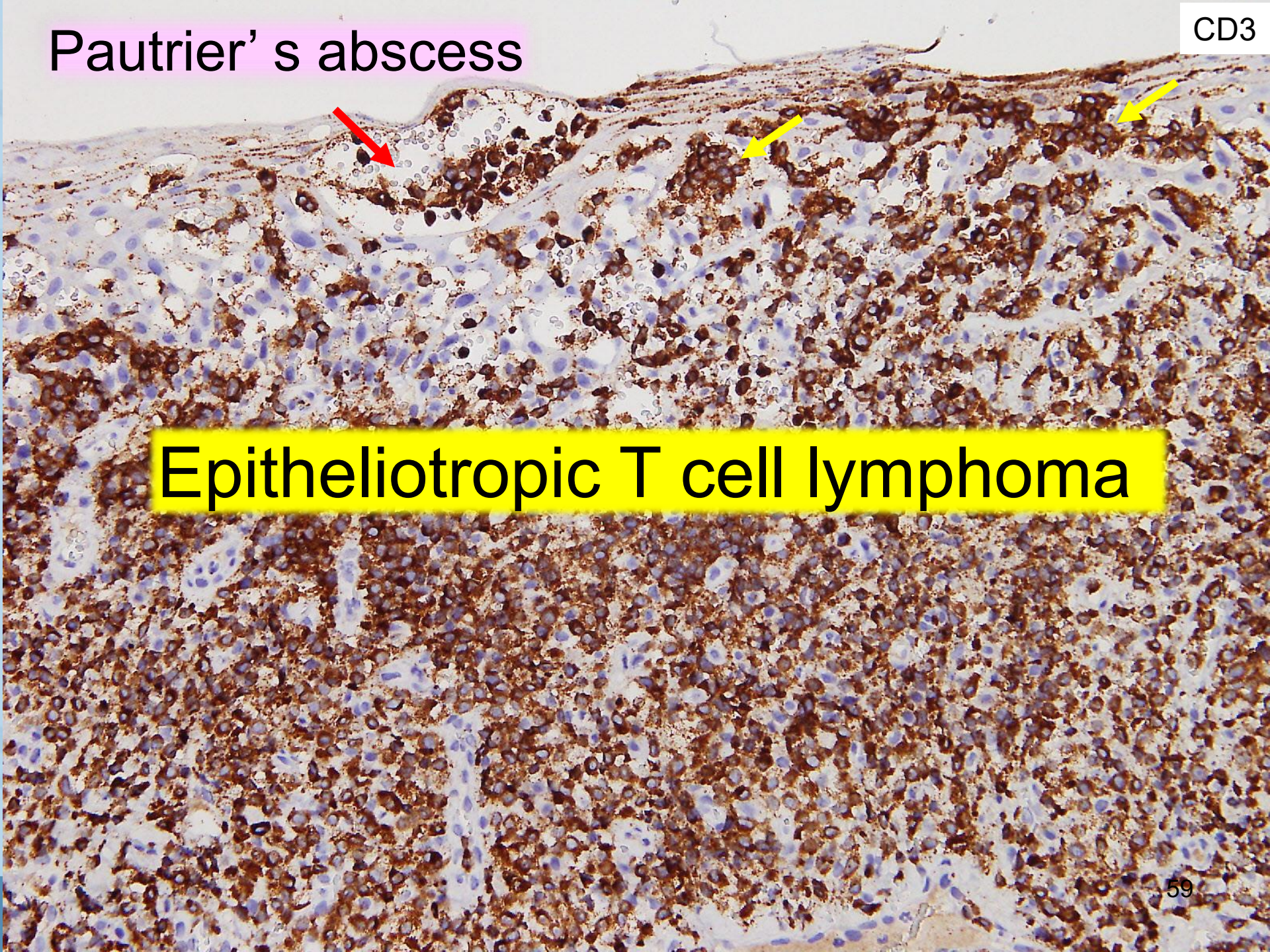
CD3



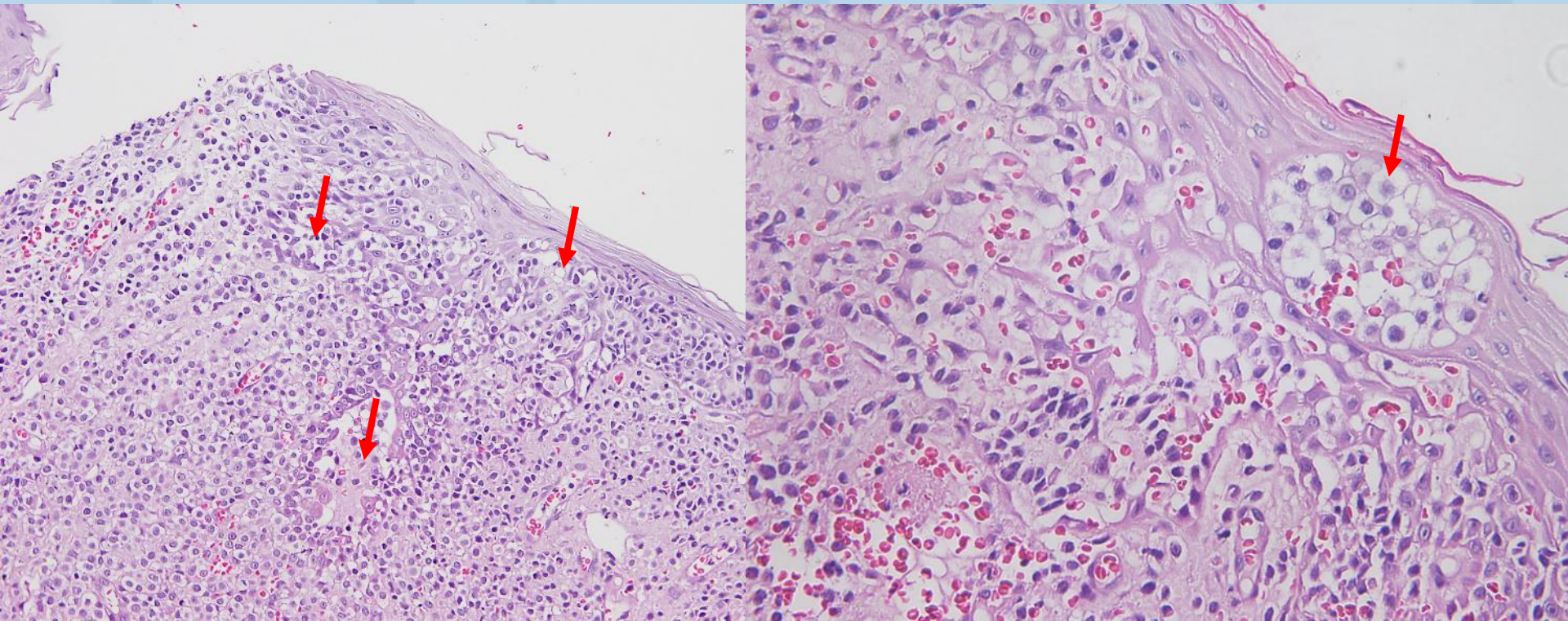
Pautrier's abscess

CD3

Epitheliotropic T cell lymphoma



Canine epitheliotropic lymphoma



Canine epitheliotropic lymphoma

- T cell immunophenotype
- Pautrier's abscess
- Epitheliotropism
- Round cells
- Small to large cells
- Few to abundant cytoplasm



Canine epitheliotropic lymphoma

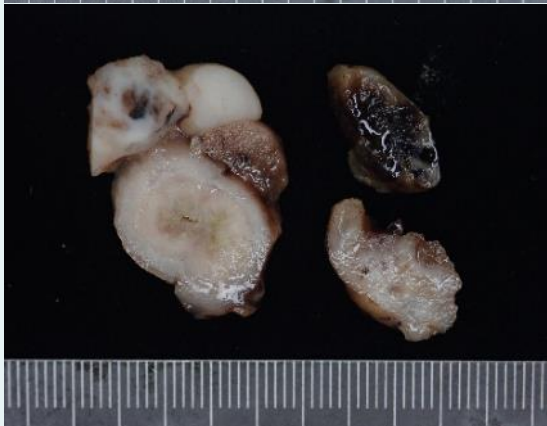
- Cutaneous/ mucocutaneous
- Solitary to multiple nodules or plaques
- Progressive disease ultimately involving regional lymph nodes and viscera
- Chemotherapy



Case 6, 7, 8

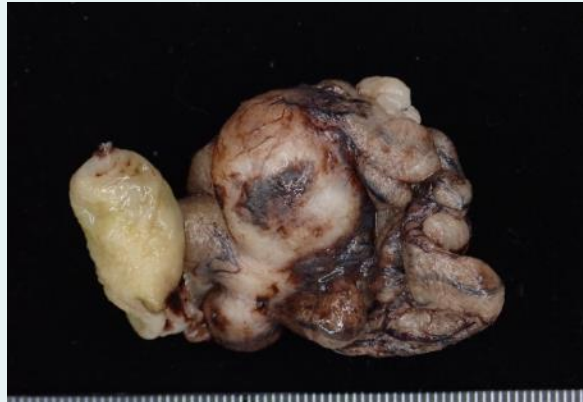
Case 6

Golden retriever
11-year old, castrated male
Mass on duodenum



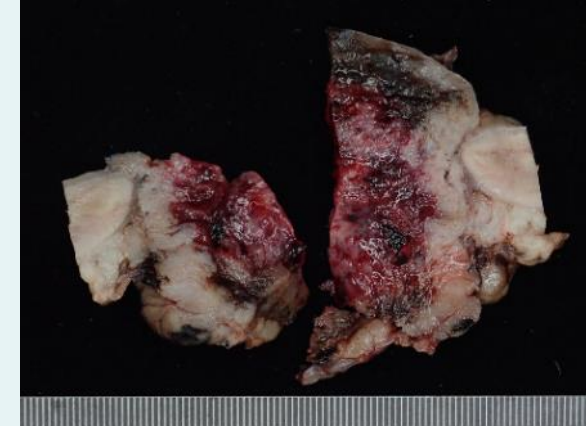
Case 7

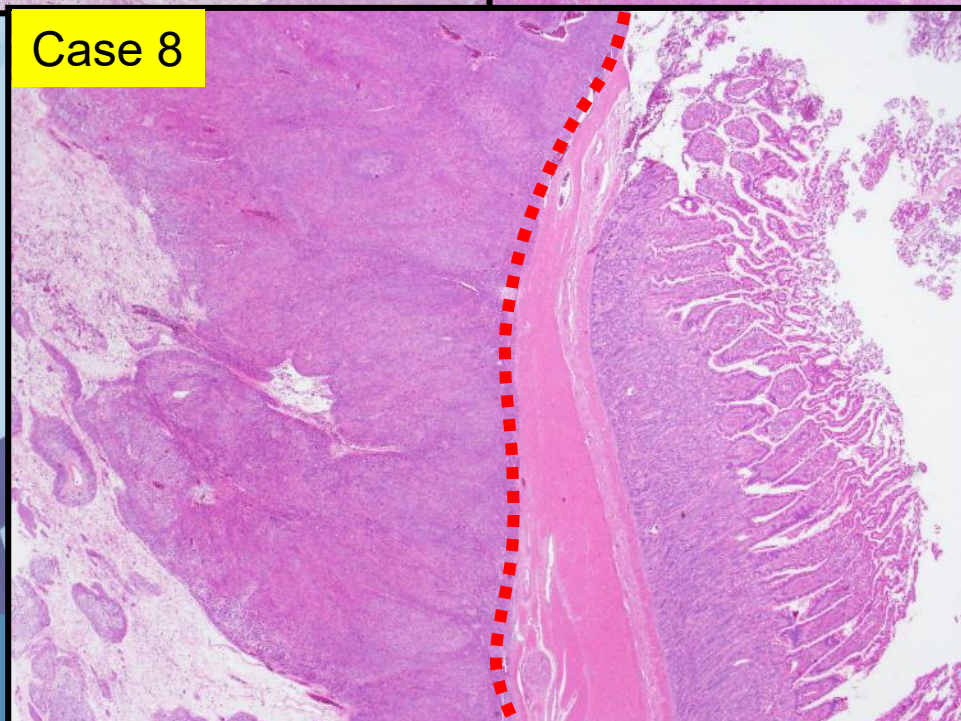
Dachshund, 10-year old,
neutered female
Mass on cecum

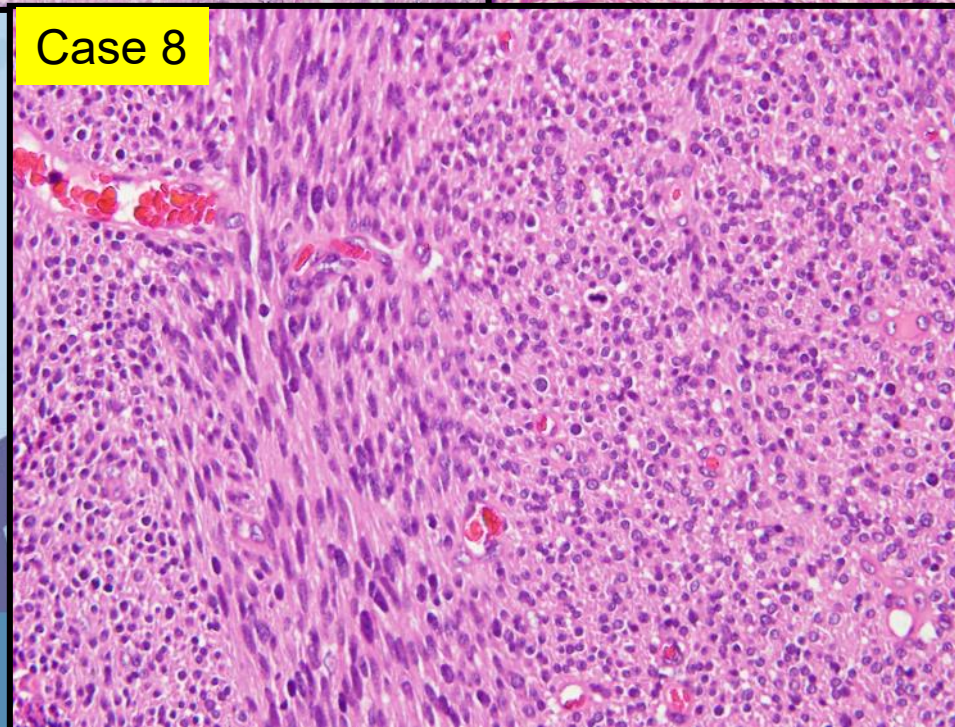
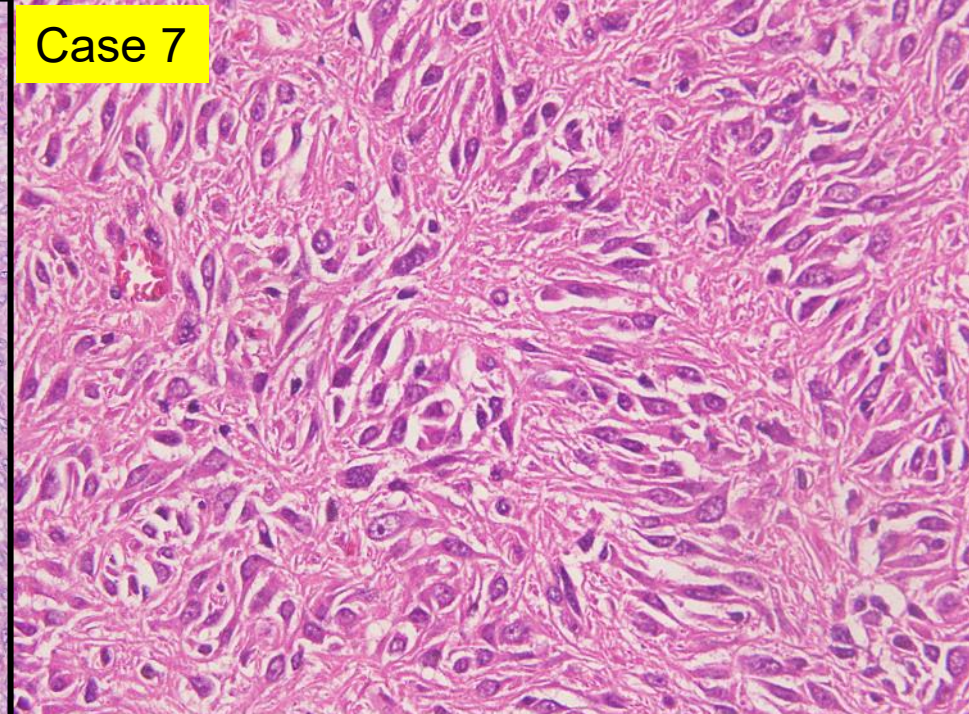
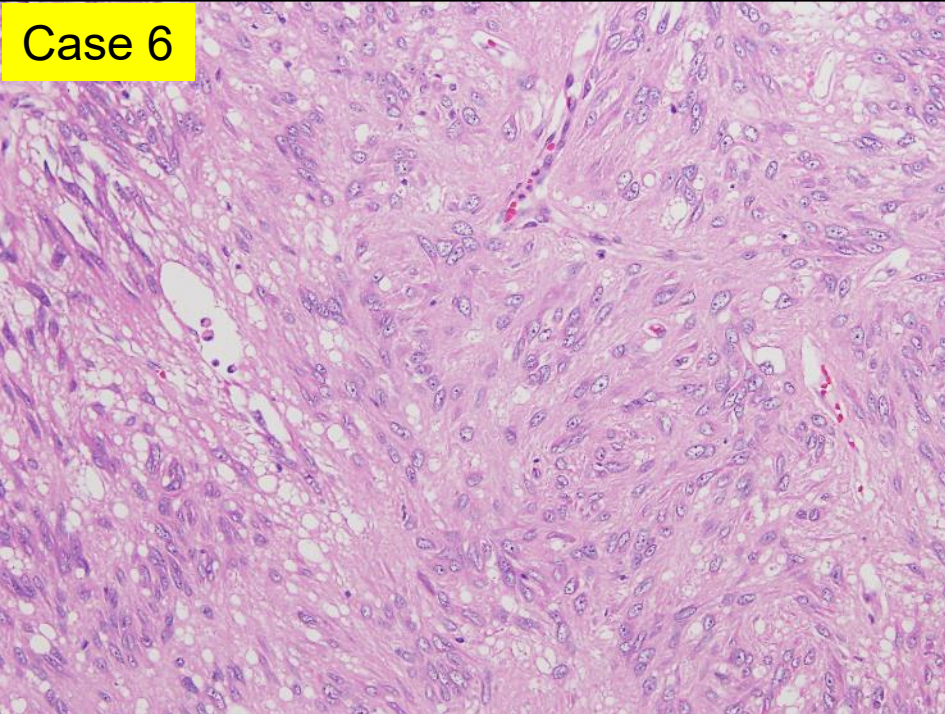


Case 8

Fox terrier
9-year old, intact male
Mass from jejunum







Differential dx

- SPINDLE cell tumor
- Leiomyosarcoma
- Gastrointestinal stromal tumor (GIST)
- (Peripheral) Nerve sheath tumor (NST)
- Fibrosarcoma (FSA)



Differential dx

- SPINDLE cell tumor
- Leiomyosarcoma
- Gastrointestinal stromal tumor (GIST)
- (Peripheral) Nerve sheath tumor (NST)
- Fibrosarcoma

α -SMA

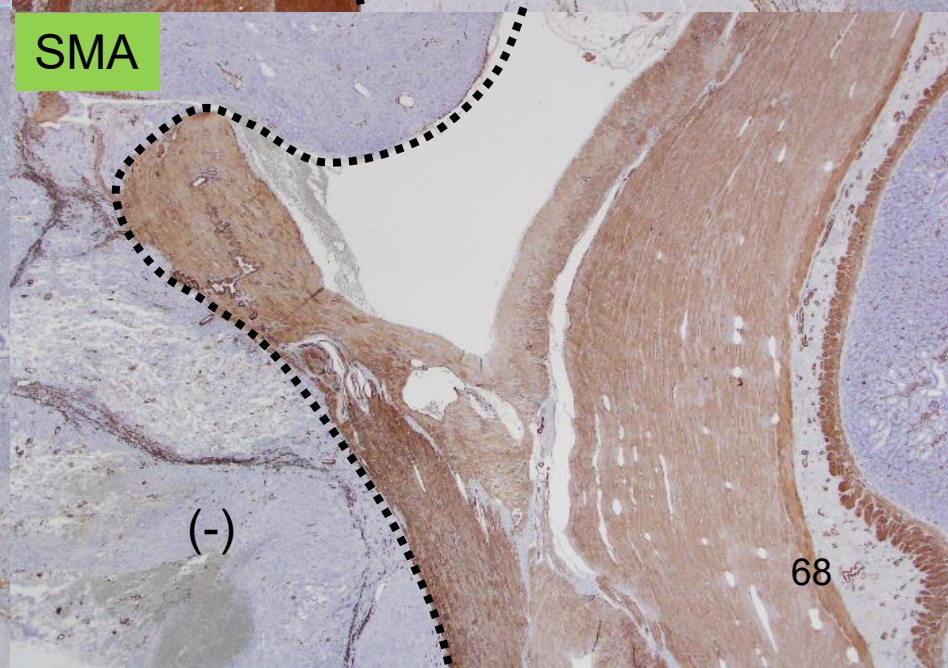
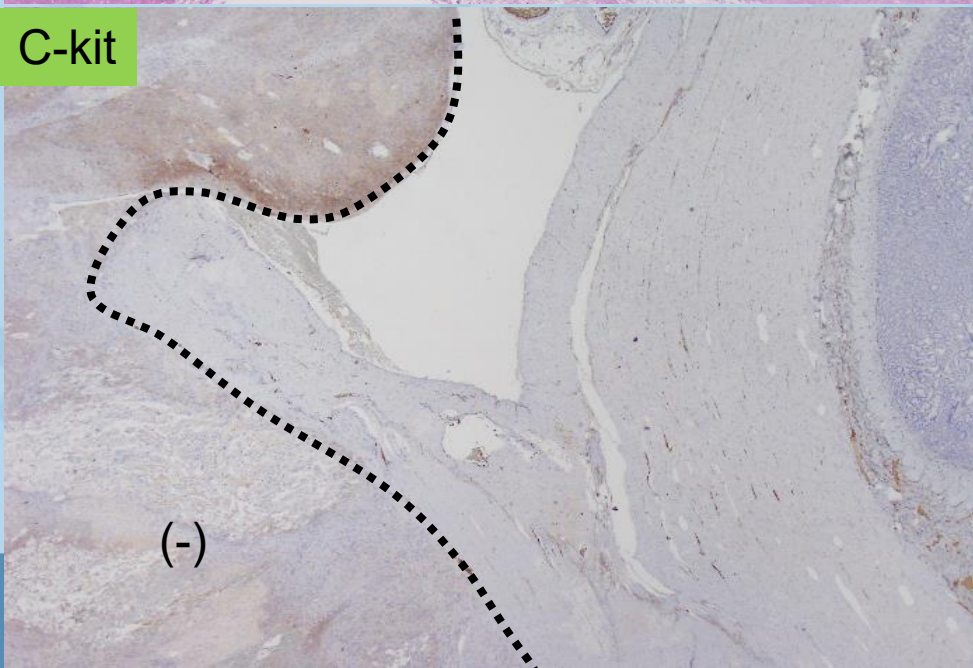
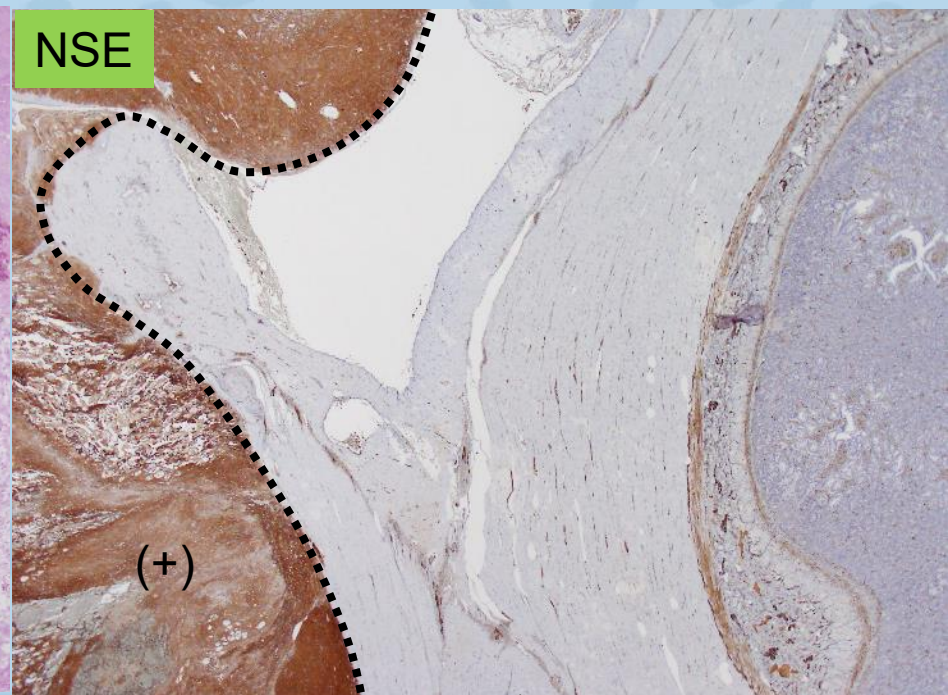
C-kit

NSE, NF

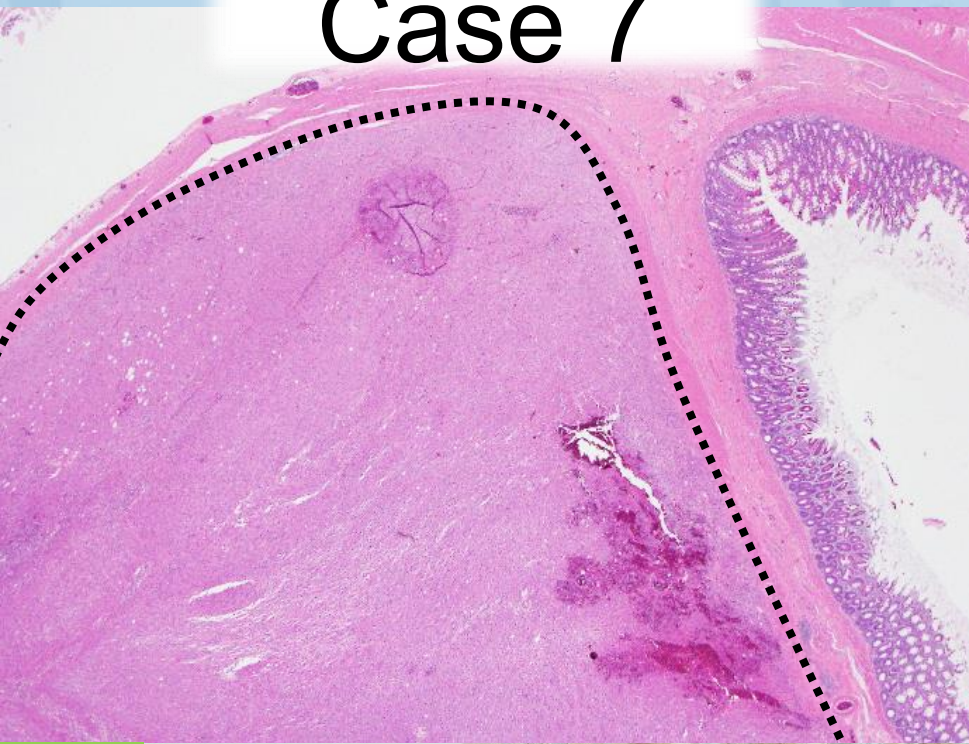
Masson's trichrome



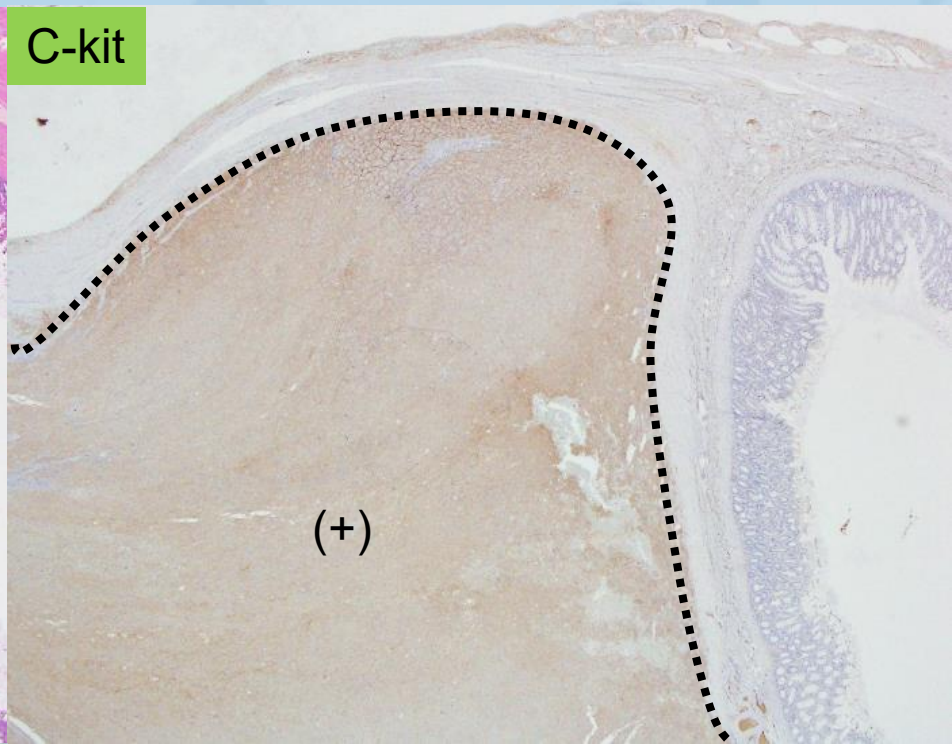
Case 6



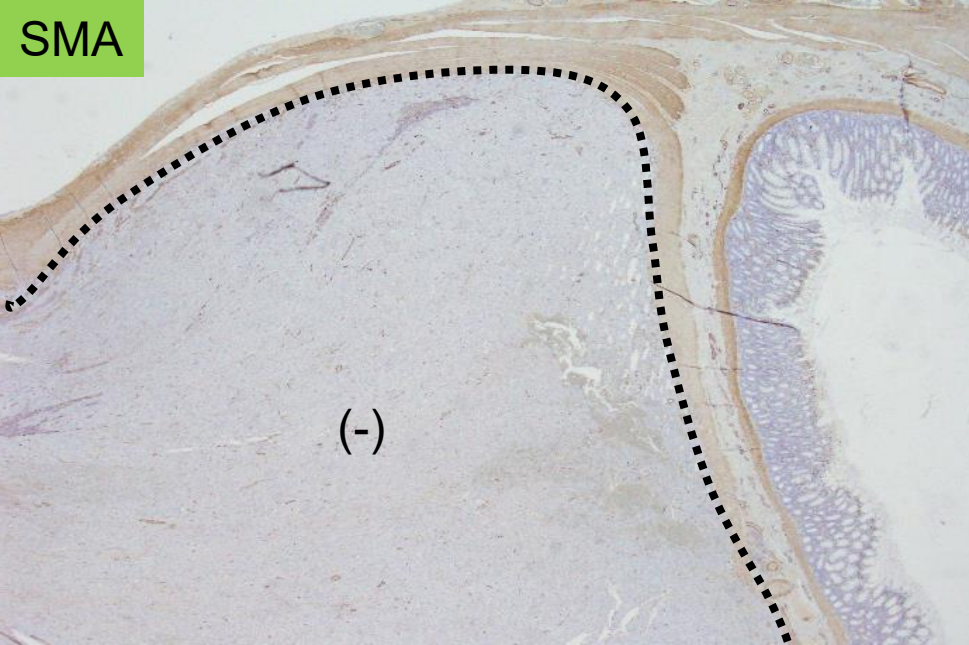
Case 7



C-kit

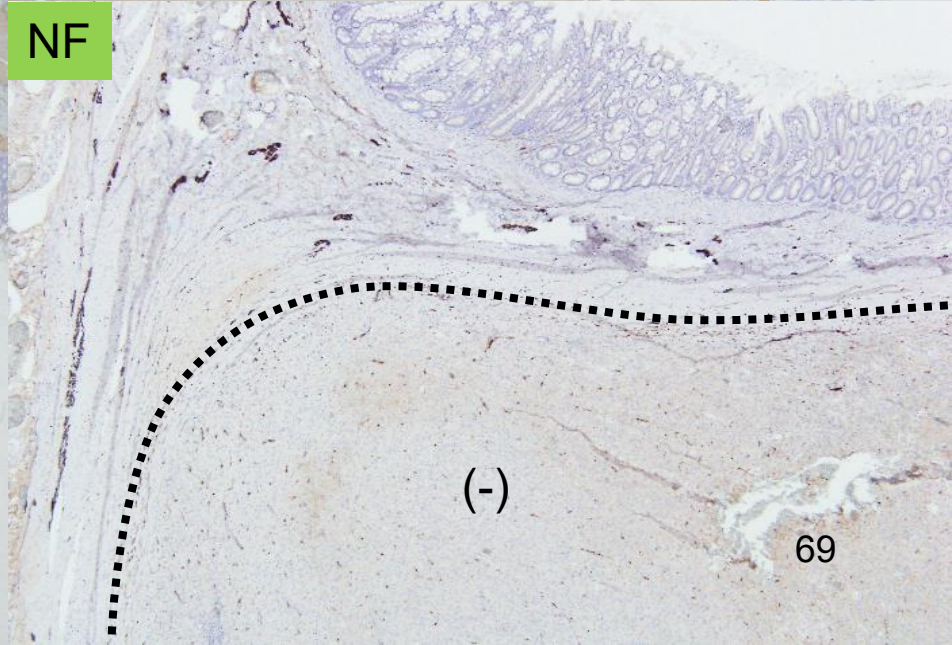


(+)



SMA

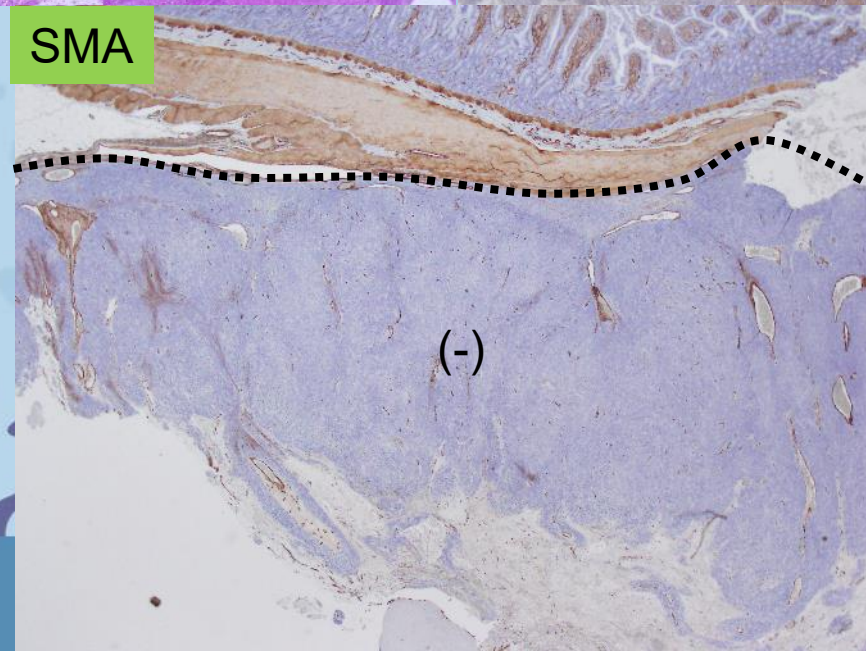
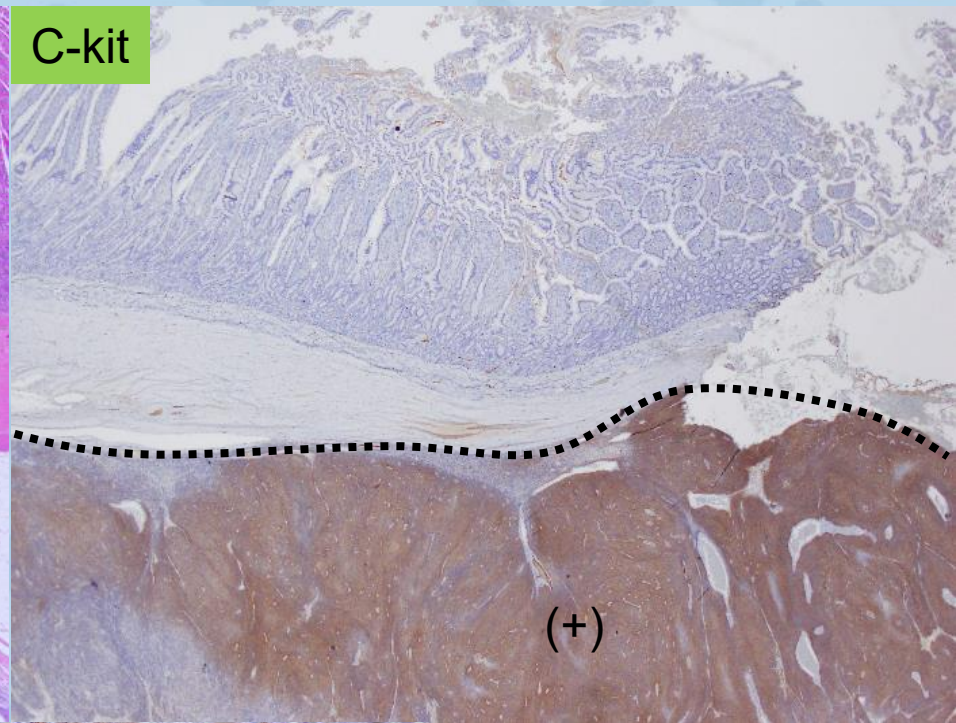
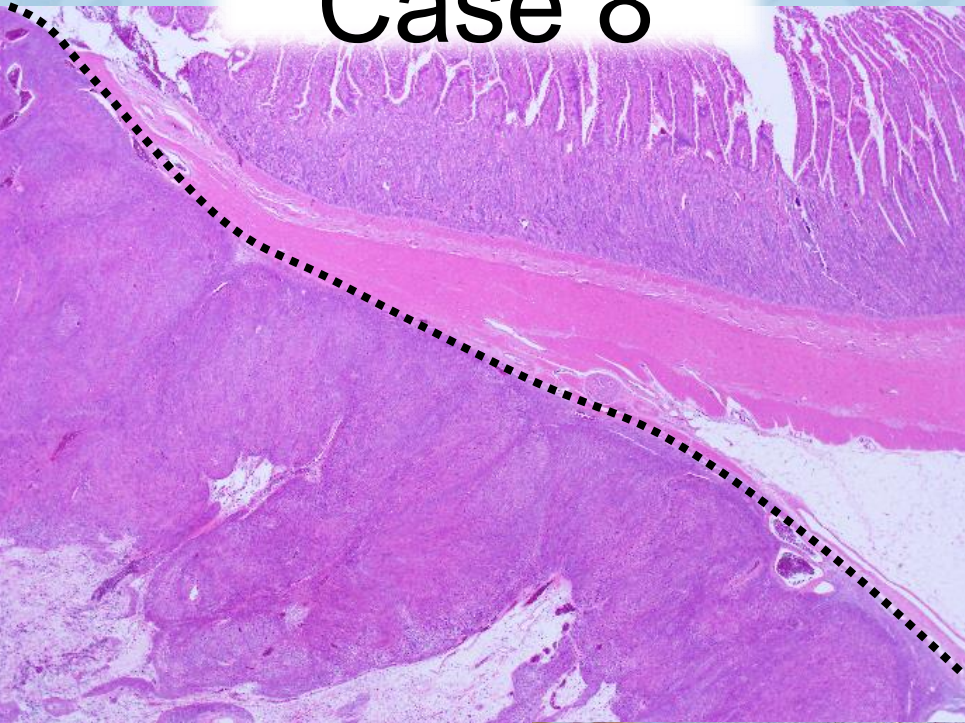
(-)



NF

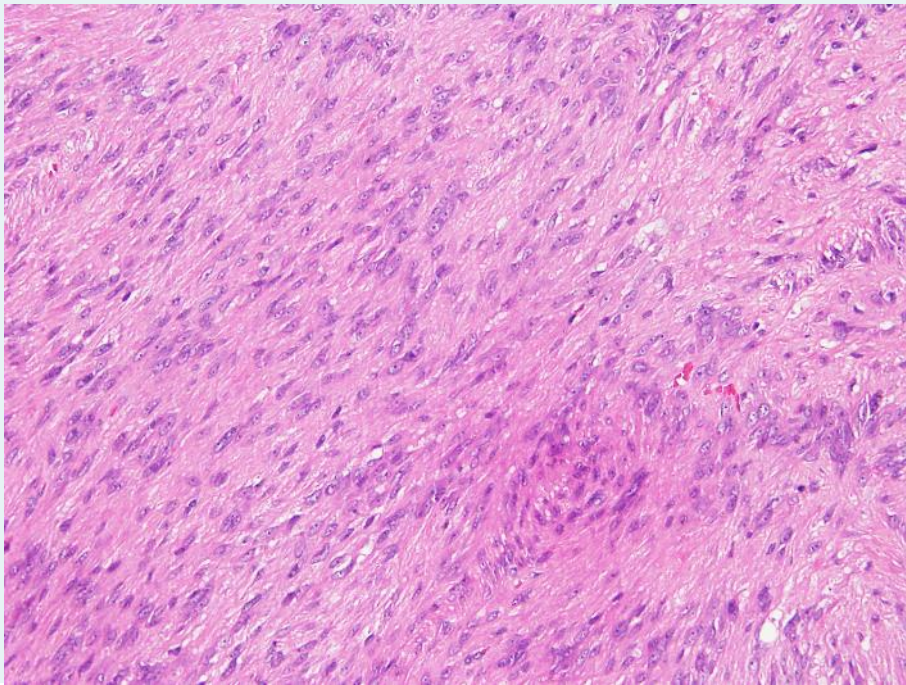
(-)

Case 8

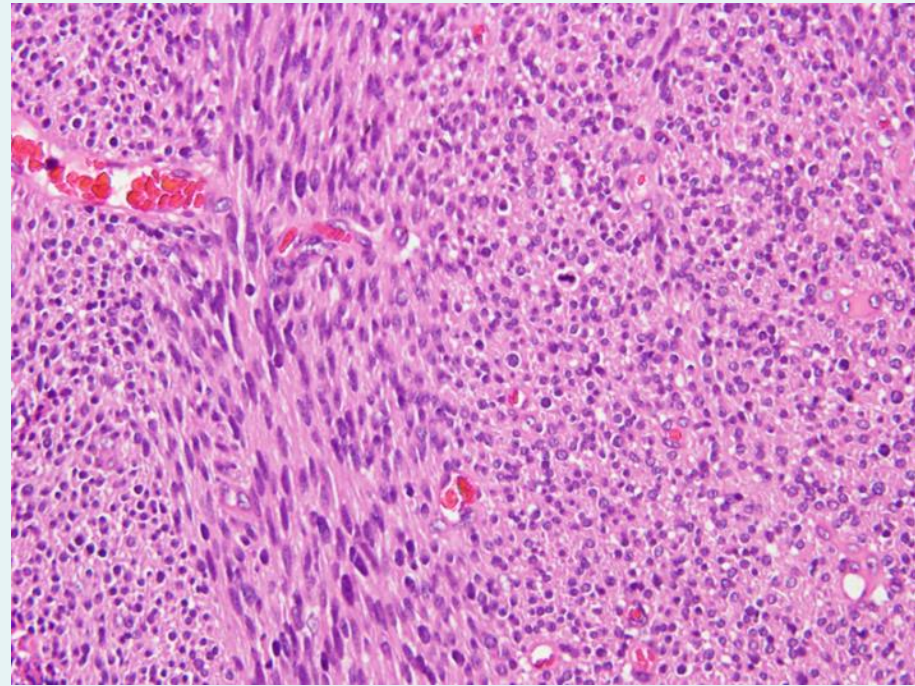


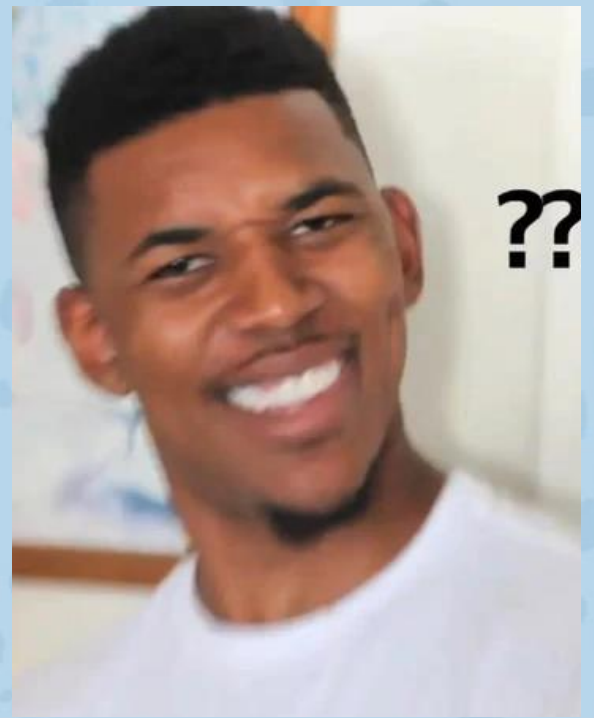
Case 7-8: GIST

Case 7
Dachshund, cecum



Case 8
Fox terrier, jejunum



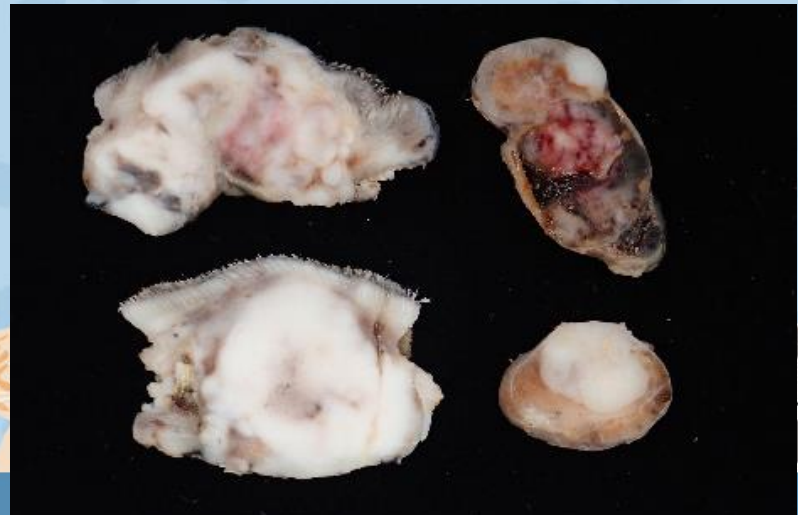


Seeing is not believing

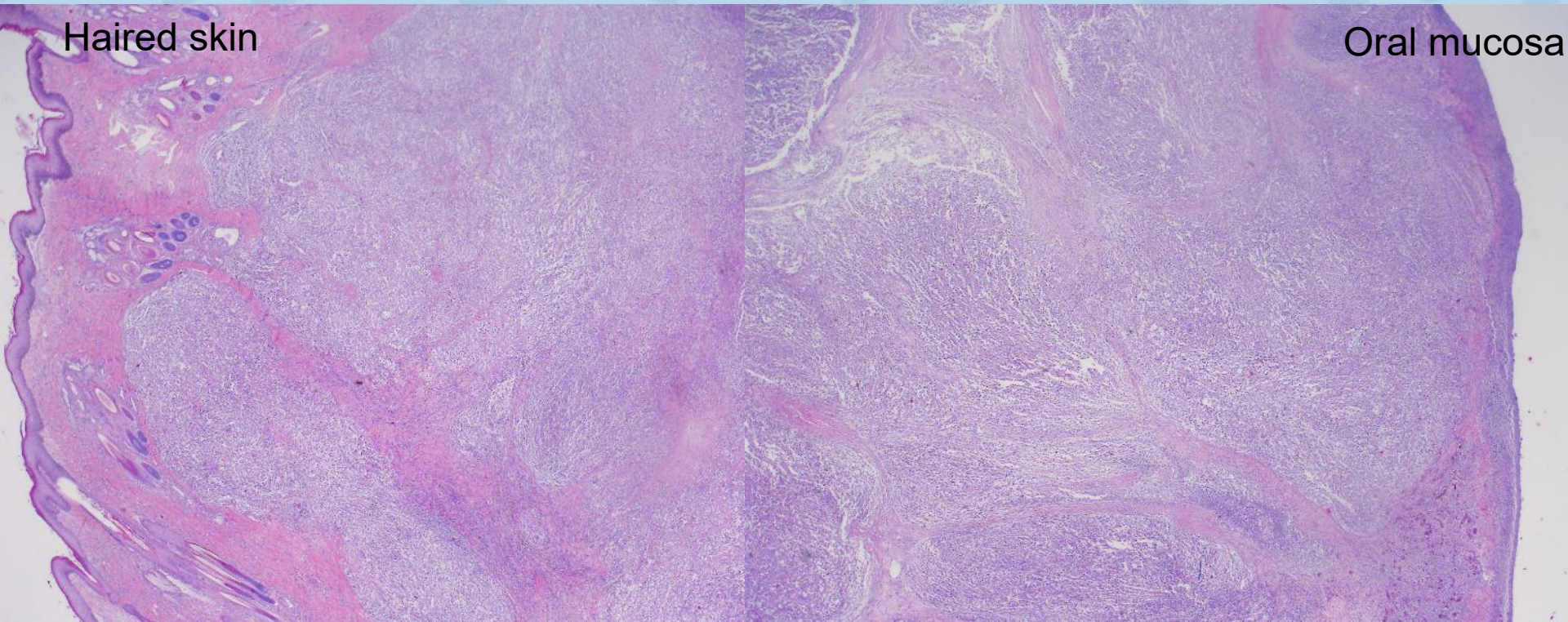


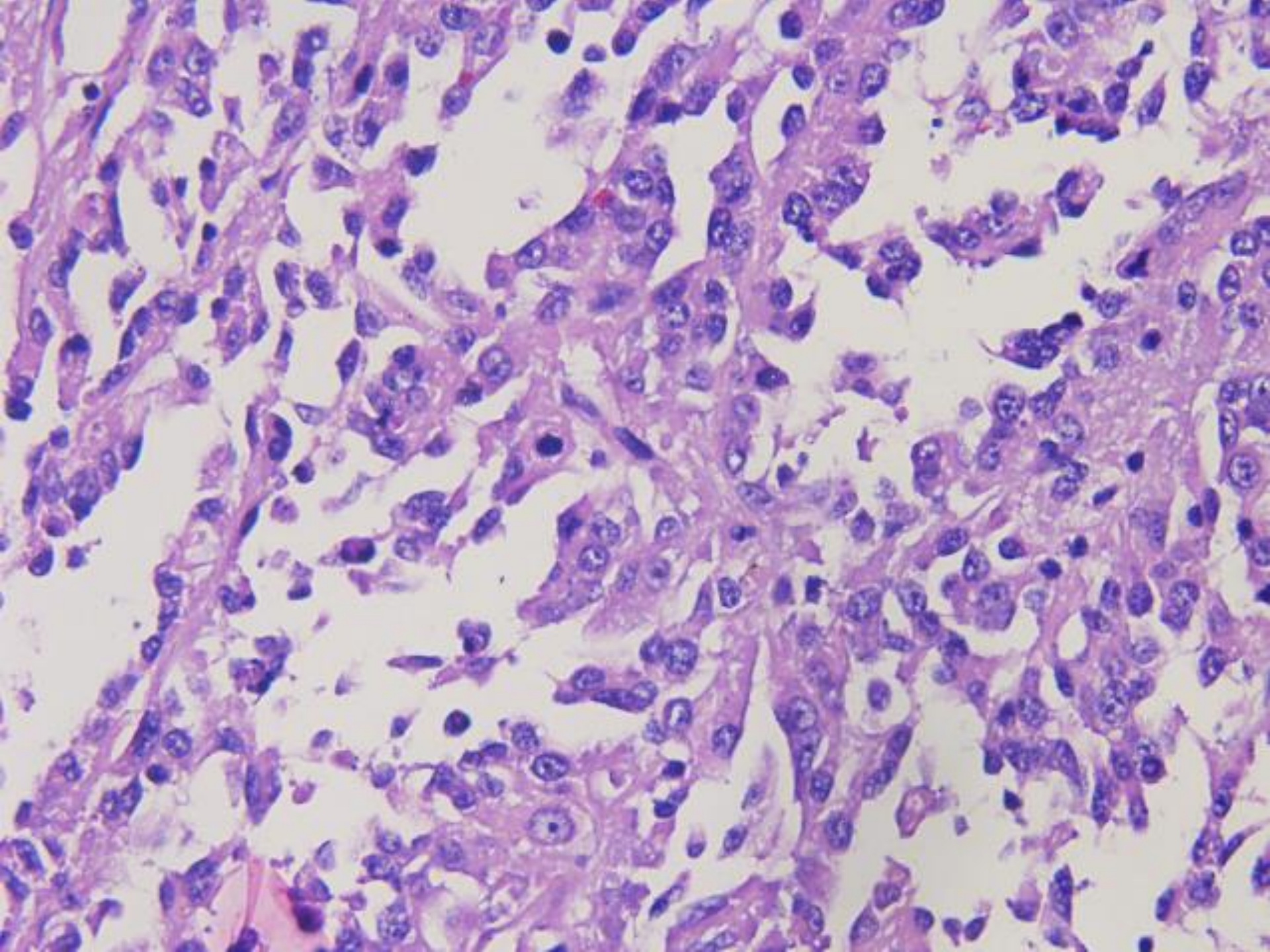
Case 9

- Canine, Dalmatian
- 12-year old, neutered female
- Lip mass on mucocutaneous junction
- Lymphadenopathy

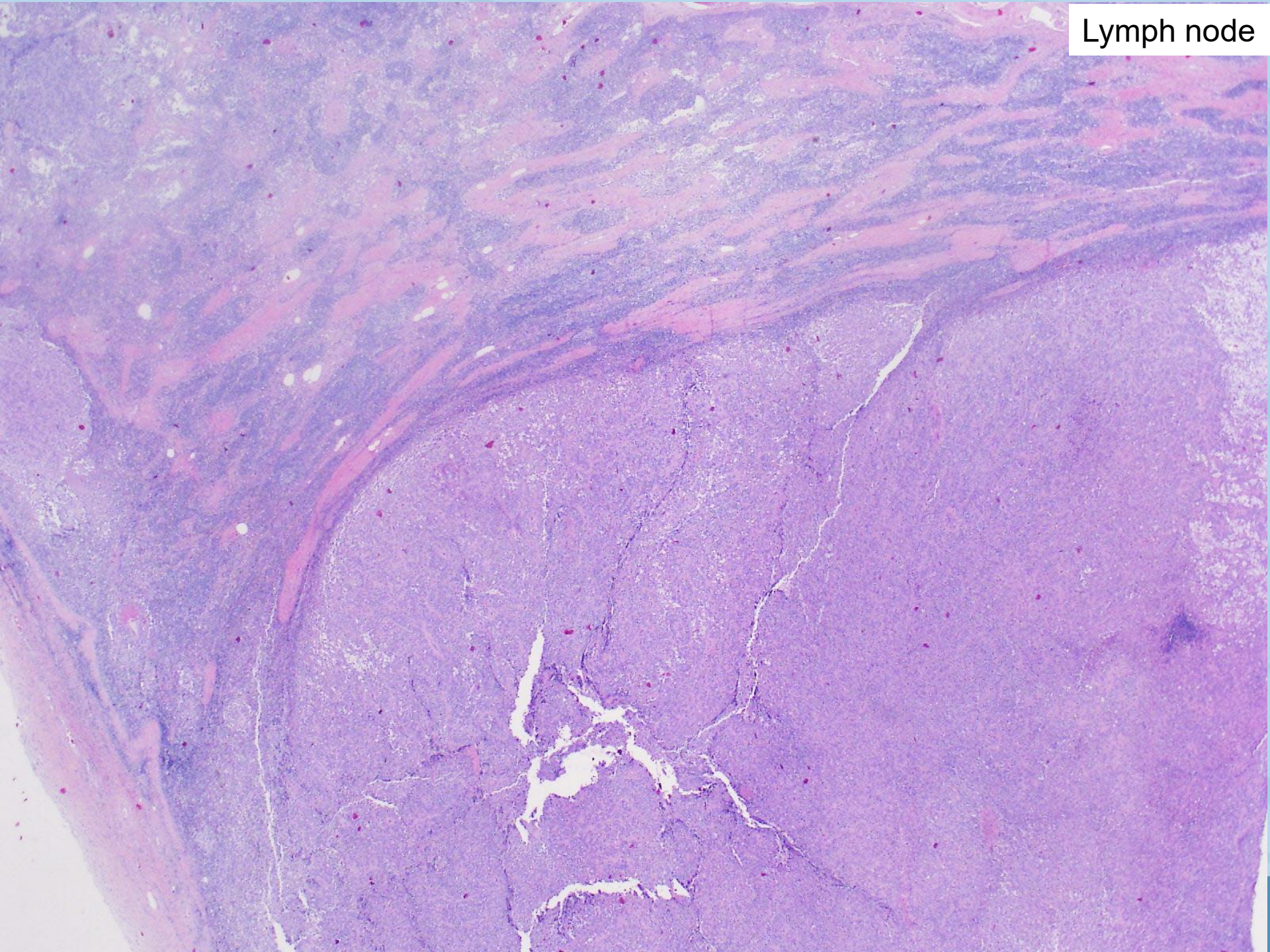


Case 9



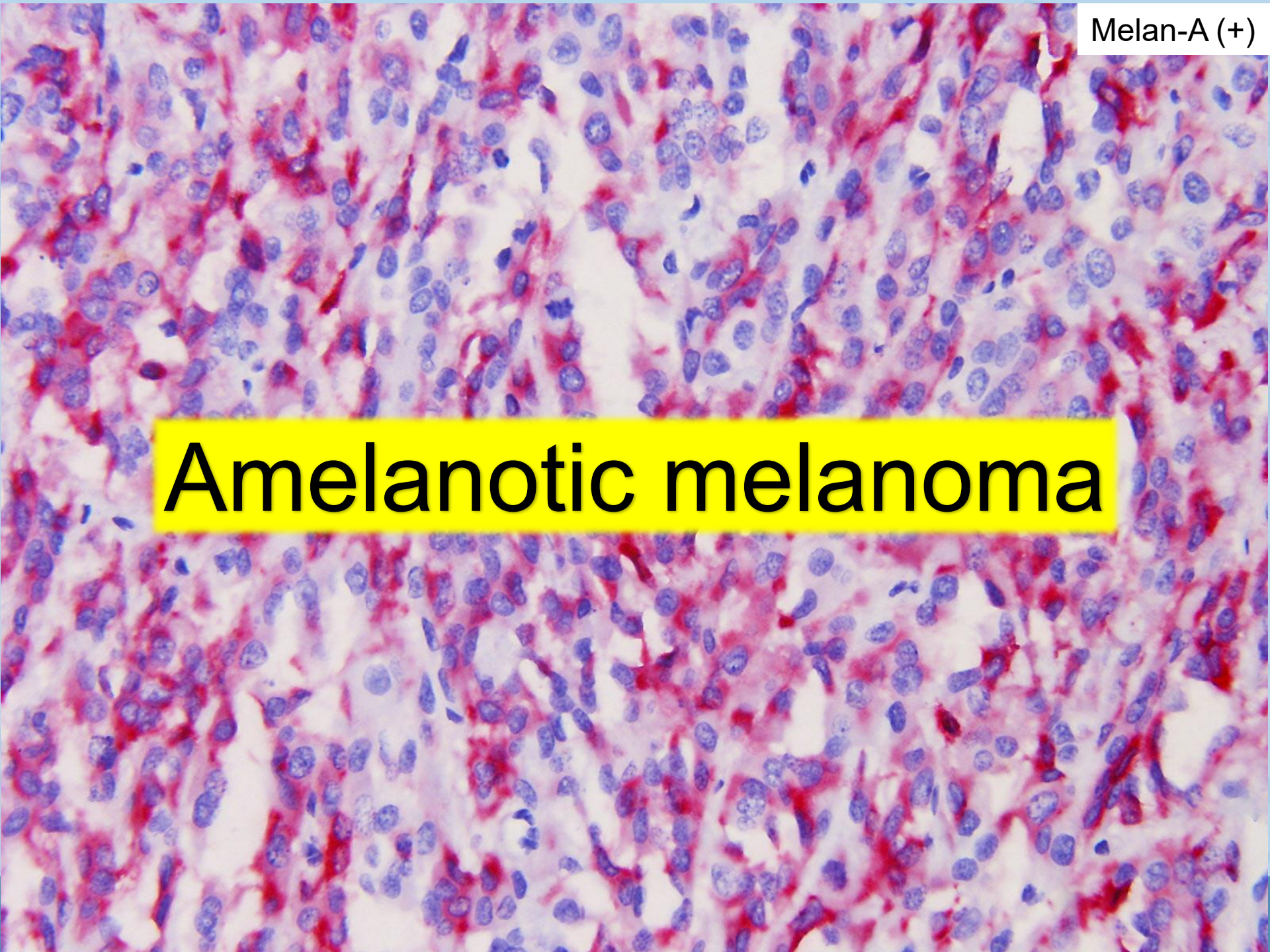


Lymph node



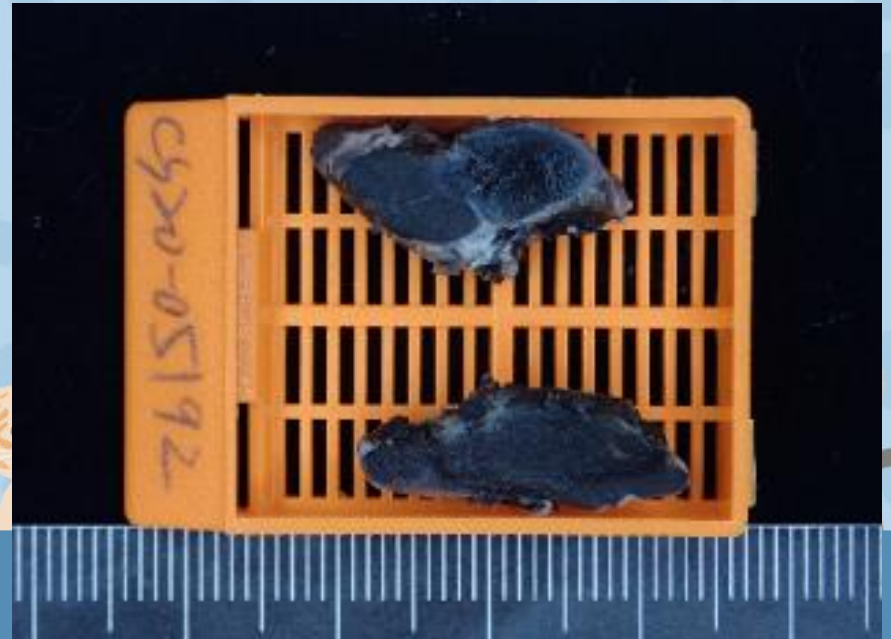
Melan-A (+)

Amelanotic melanoma

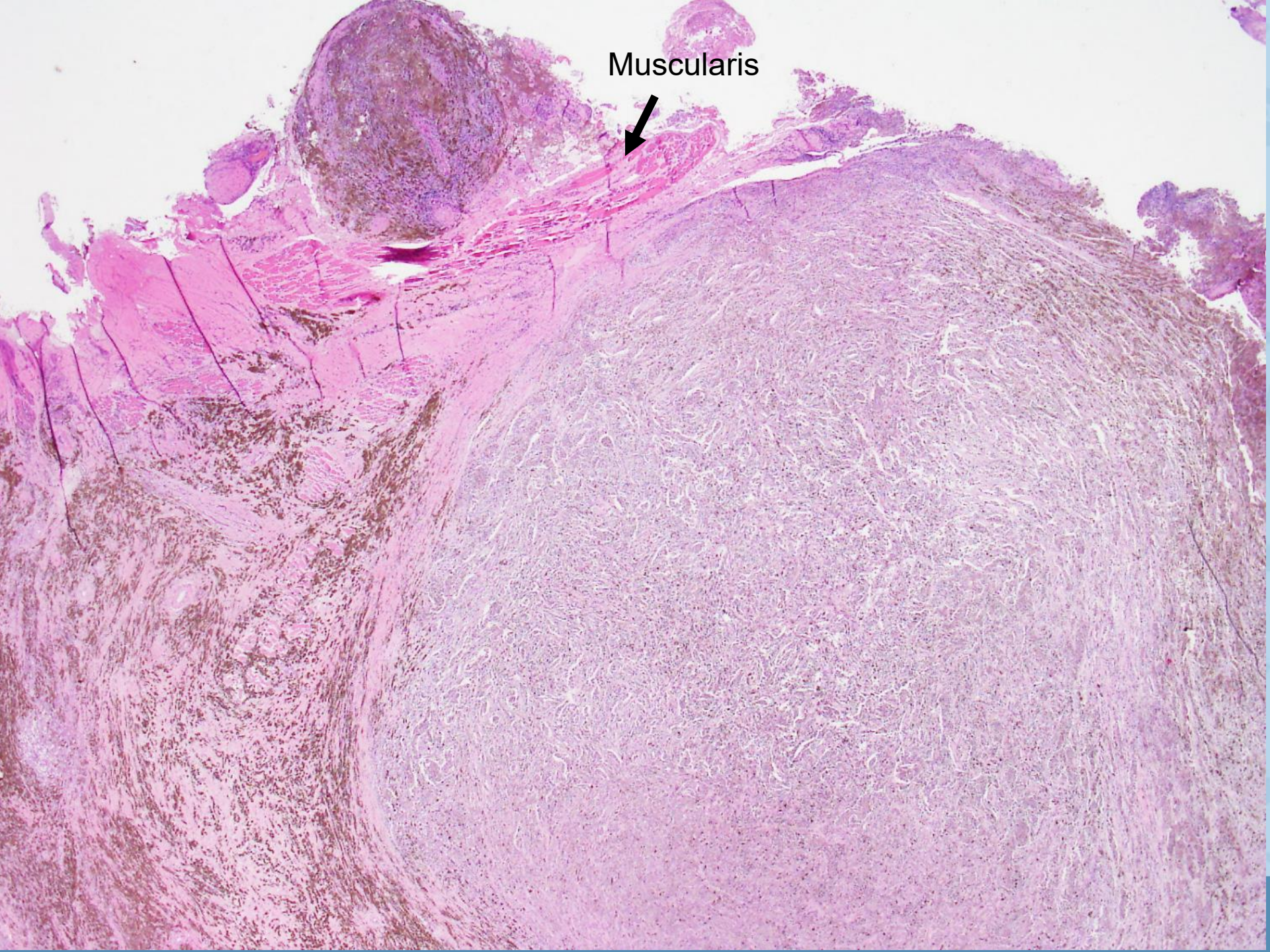


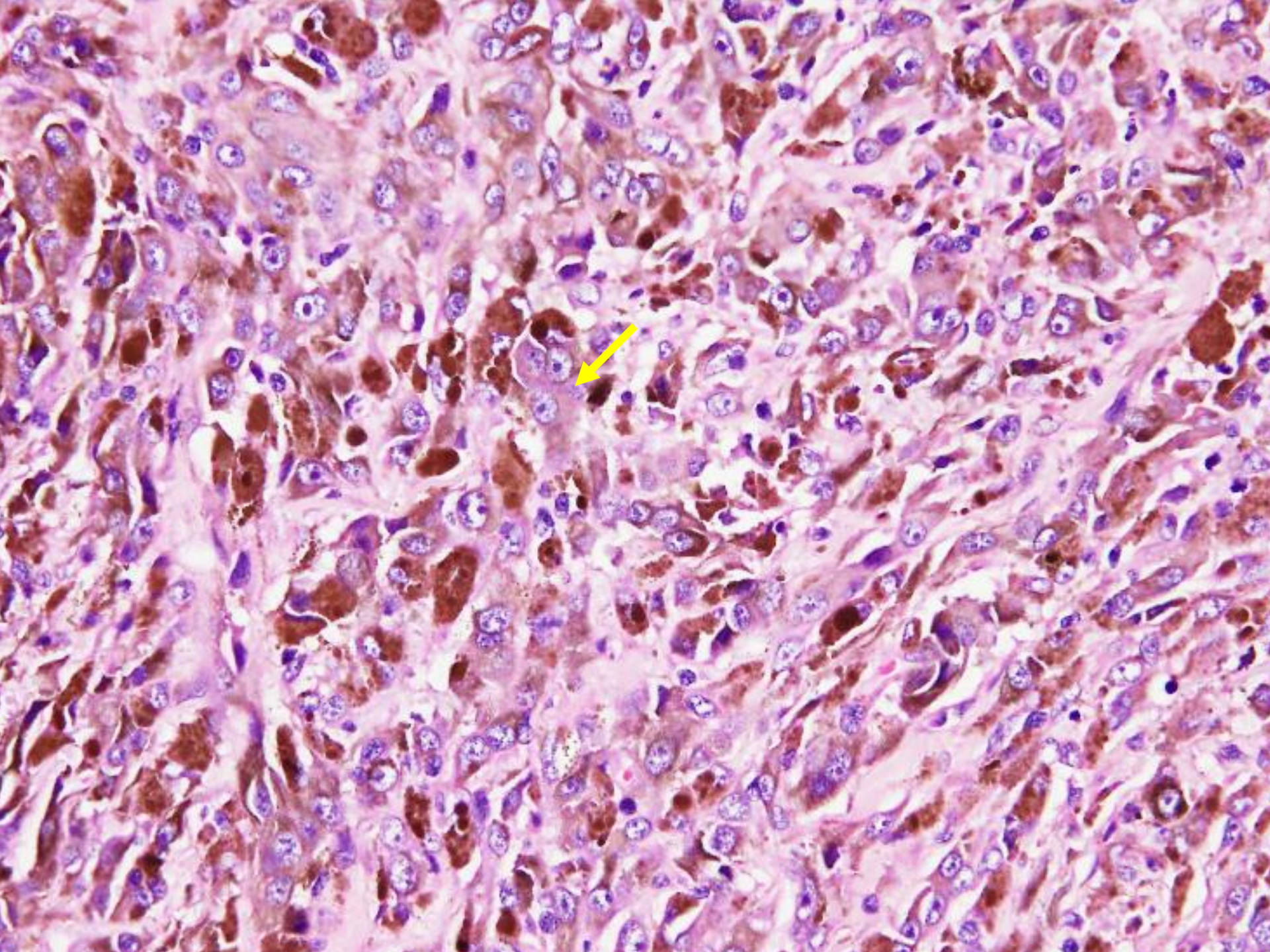
Case 10

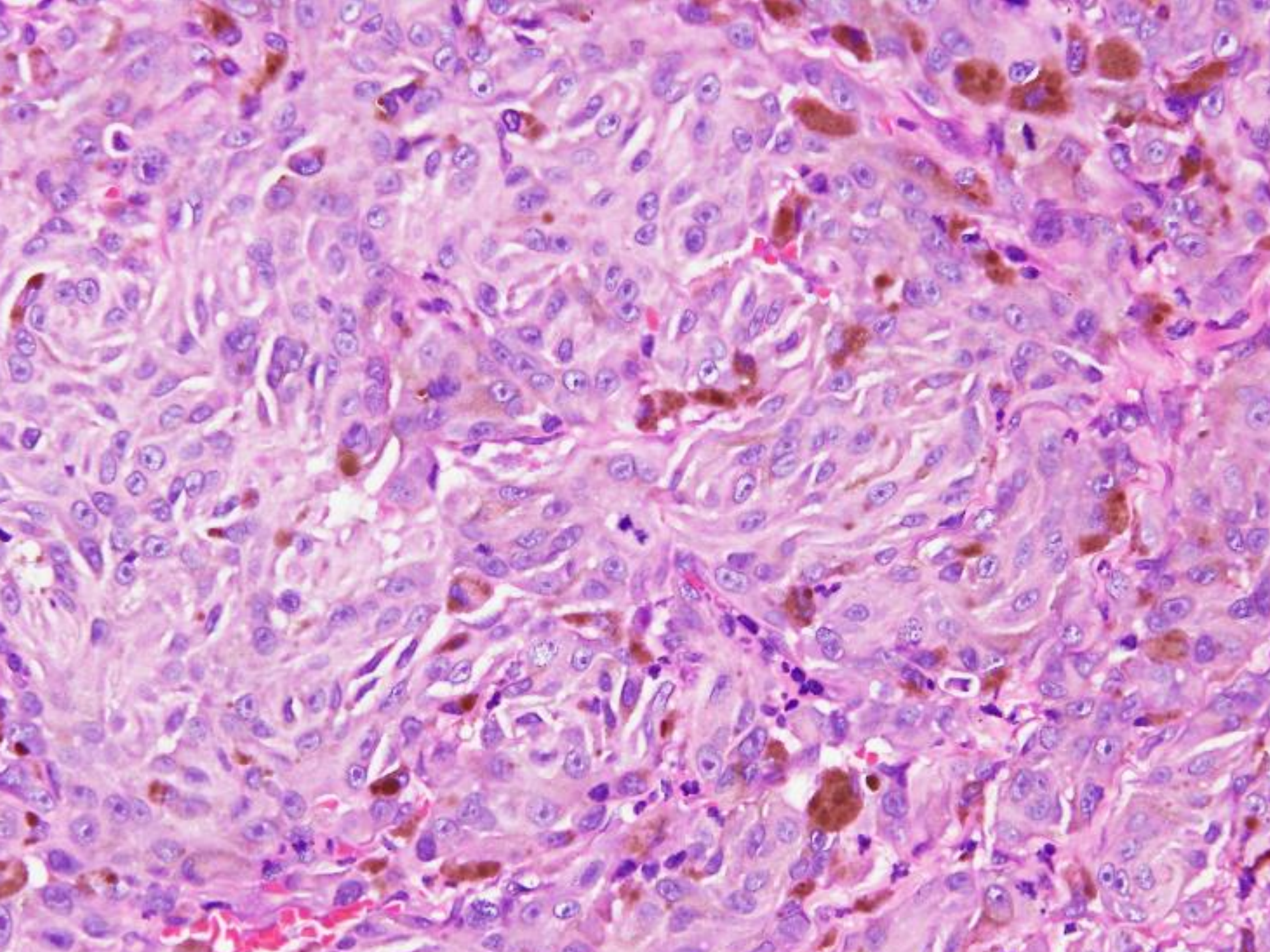
- **Canine**, golden retriever
- 10-year old, neutered male
- Oral mass on left buccal side



Muscularis



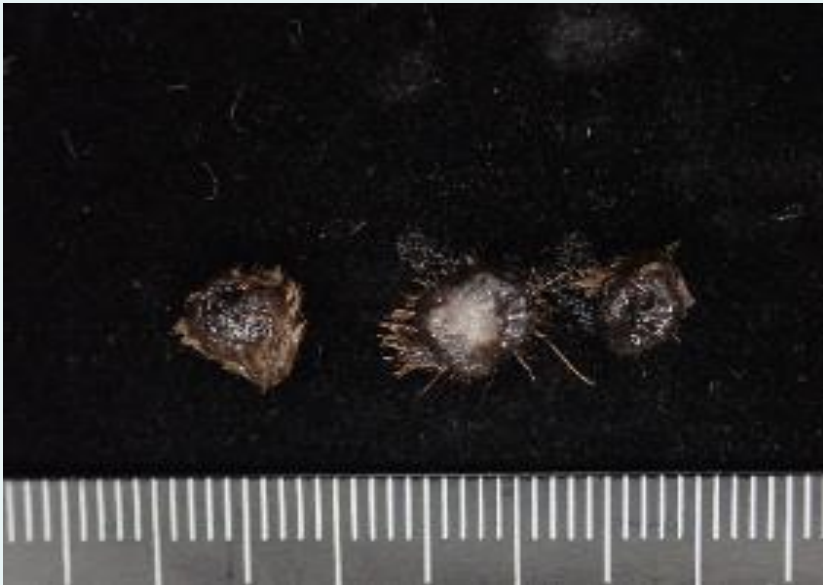




Case 11 - 12

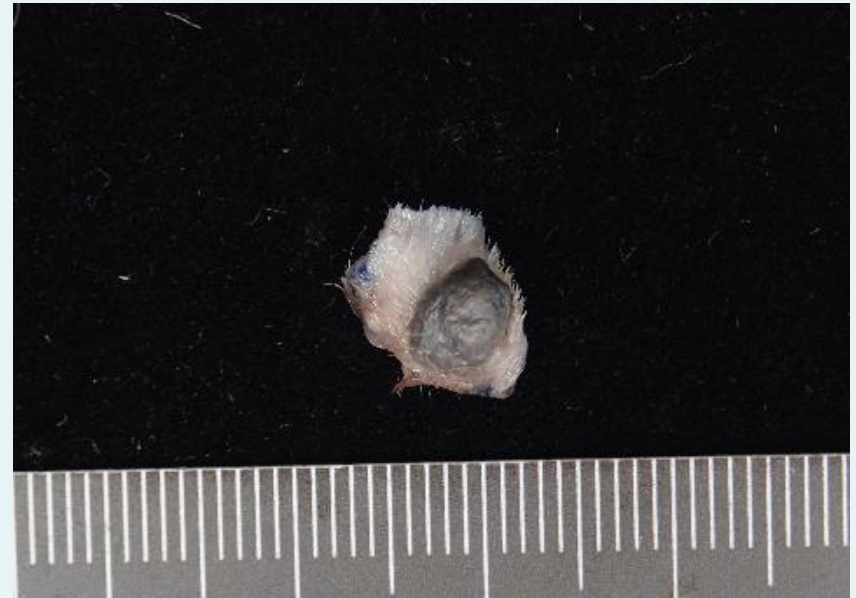
Case 11

Canine, Dachshund
12-year-old, neutered female
Haired skin (right flank)

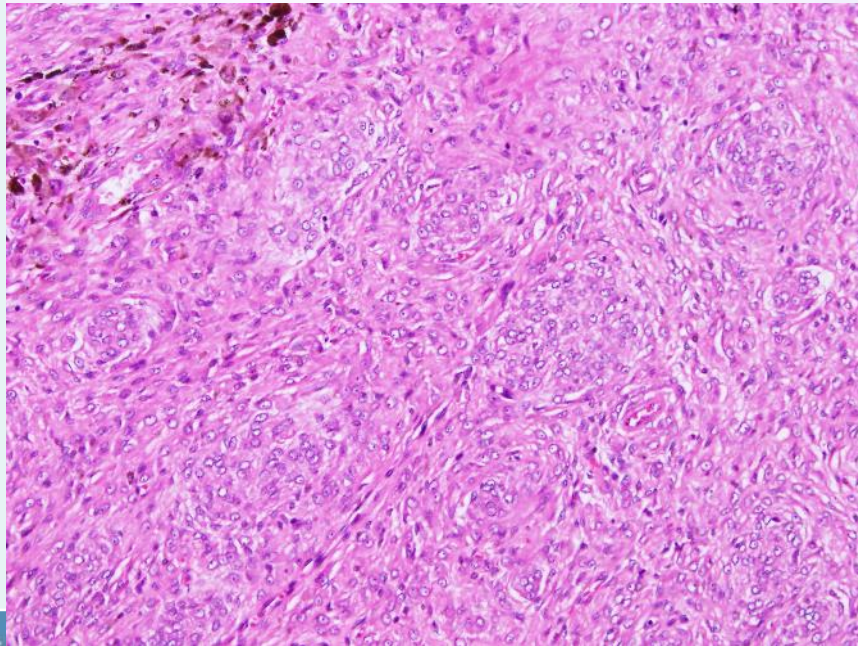
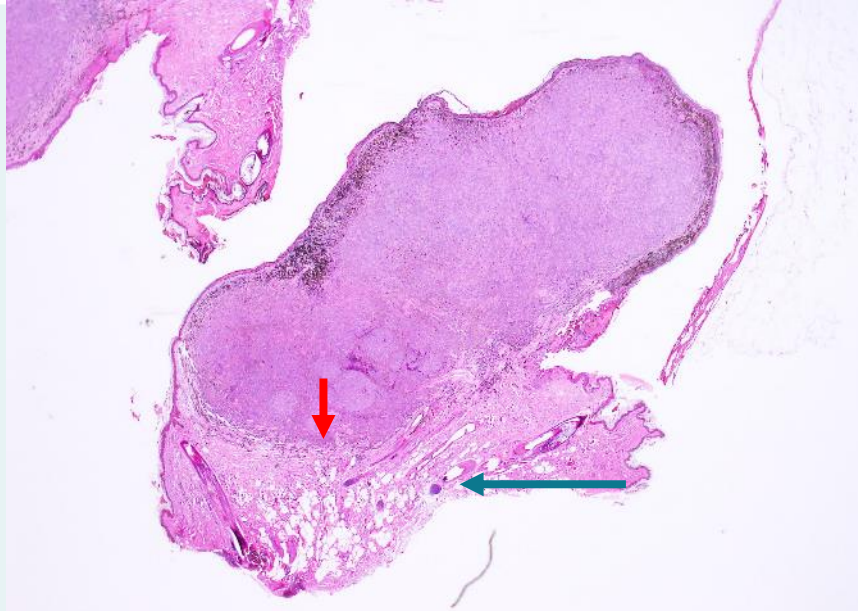


Case 12

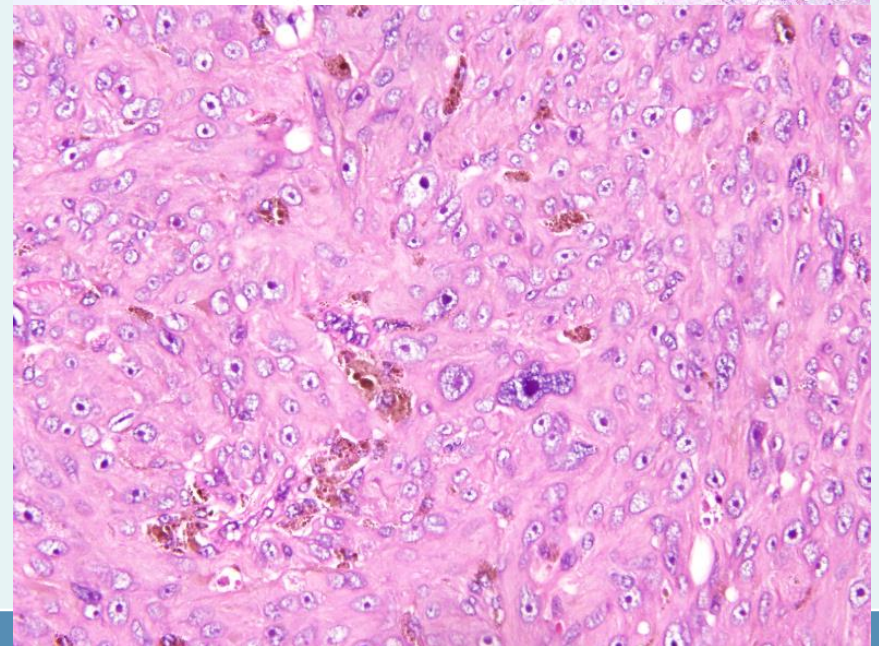
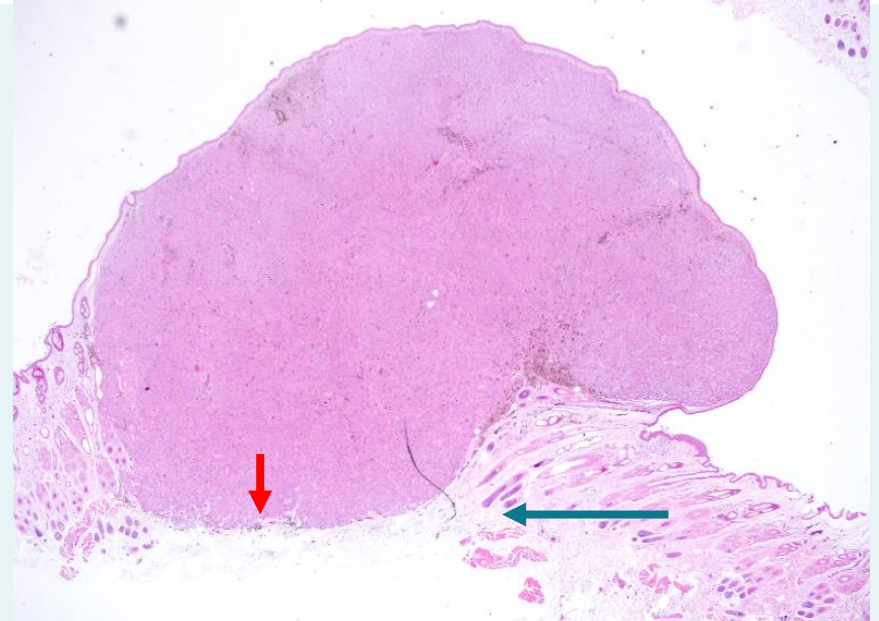
Canine, Poodle
14-year old, neutered female
Haired skin (face)



Case 11



Case 12



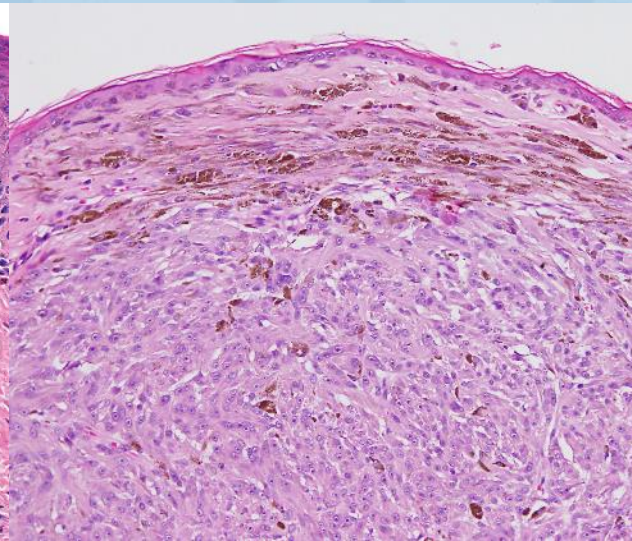
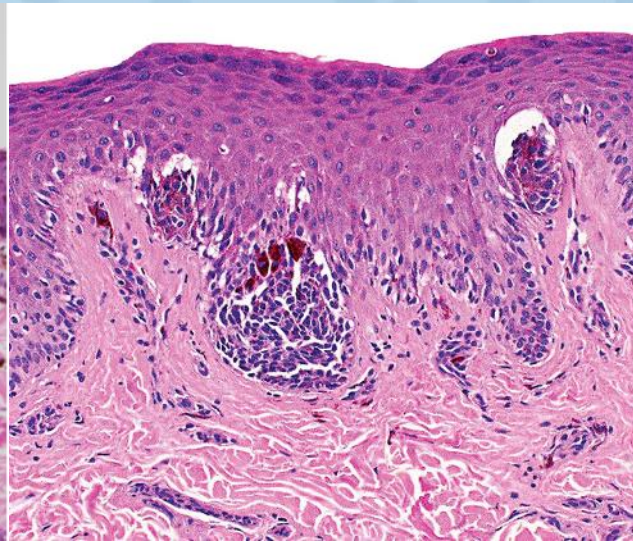
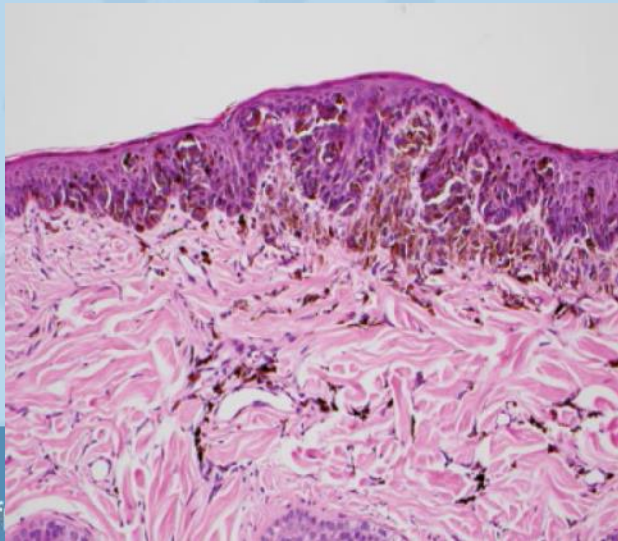
Canine melanocytic tumors

- Benign: melanocytoma
- Malignant: melanoma
- In general, haired skin: melanocytoma
- Mucocutaneous junction: melanoma
- < 3 mitoses in 10 HPF: benign



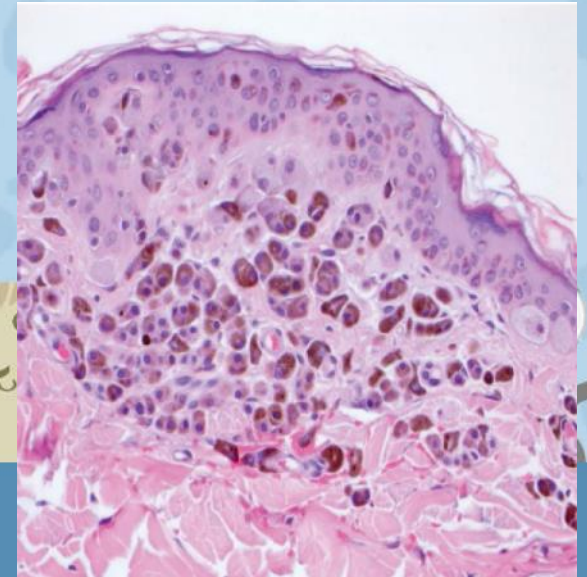
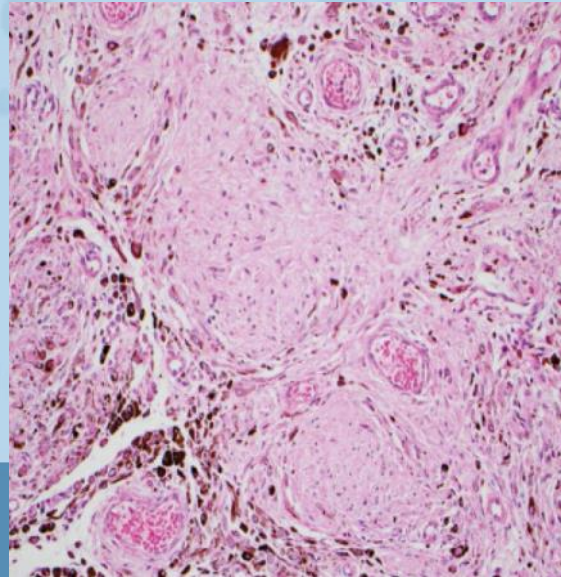
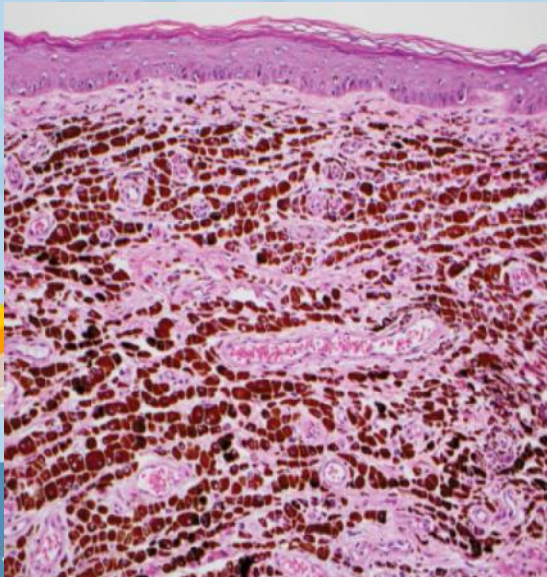
Canine melanocytic tumors

- Melanocytes in epidermis, adnexa, dermis
- Compound: intraepidermal and dermal component
- Junctional: dermal/epidermal or follicular/dermal junction
- Dermal: only dermal, no intraepidermal



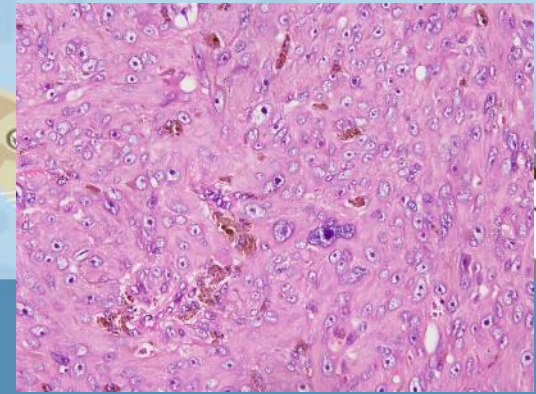
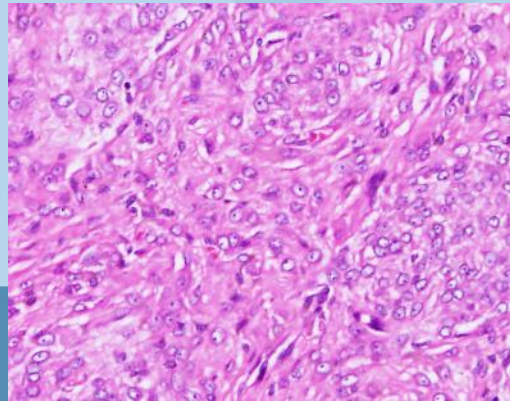
Canine melanocytic tumors

- Histologic subtypes: round cell, spindle cell (neuroidal differentiation), polygonal (epithelioid), mixed, balloon cell
- No prognostic significance



Benign VS malignant

- Well-differentiated melanocytes:
- Small nucleus
- Single centrally-located nucleolus
- Minimal clumping of chromatin
- Cells that lack a nucleolus have fine and evenly dispersed chromatin at the periphery
- Mitosis < 3 per 10 HPF

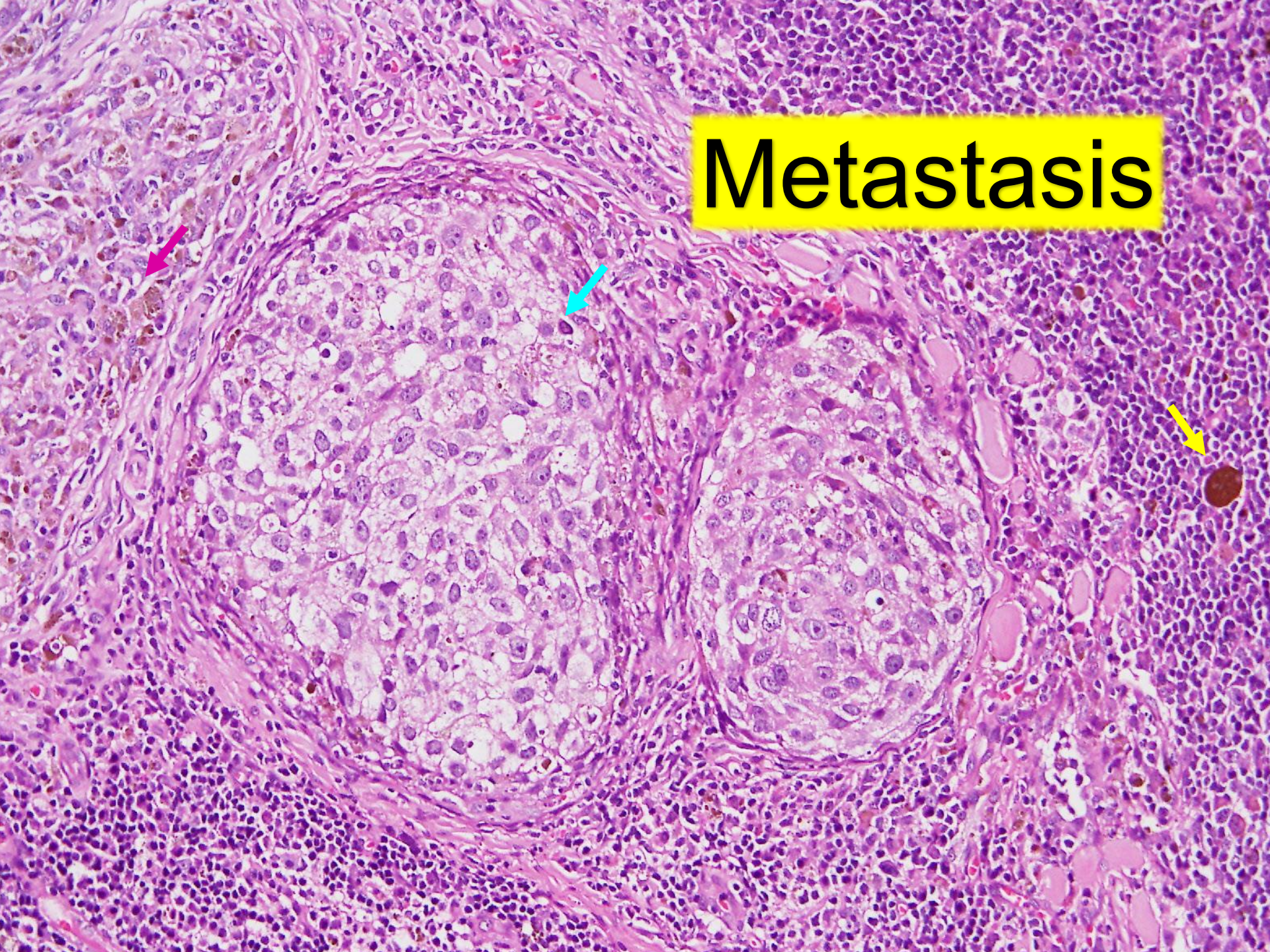


Metastasis of melanoma

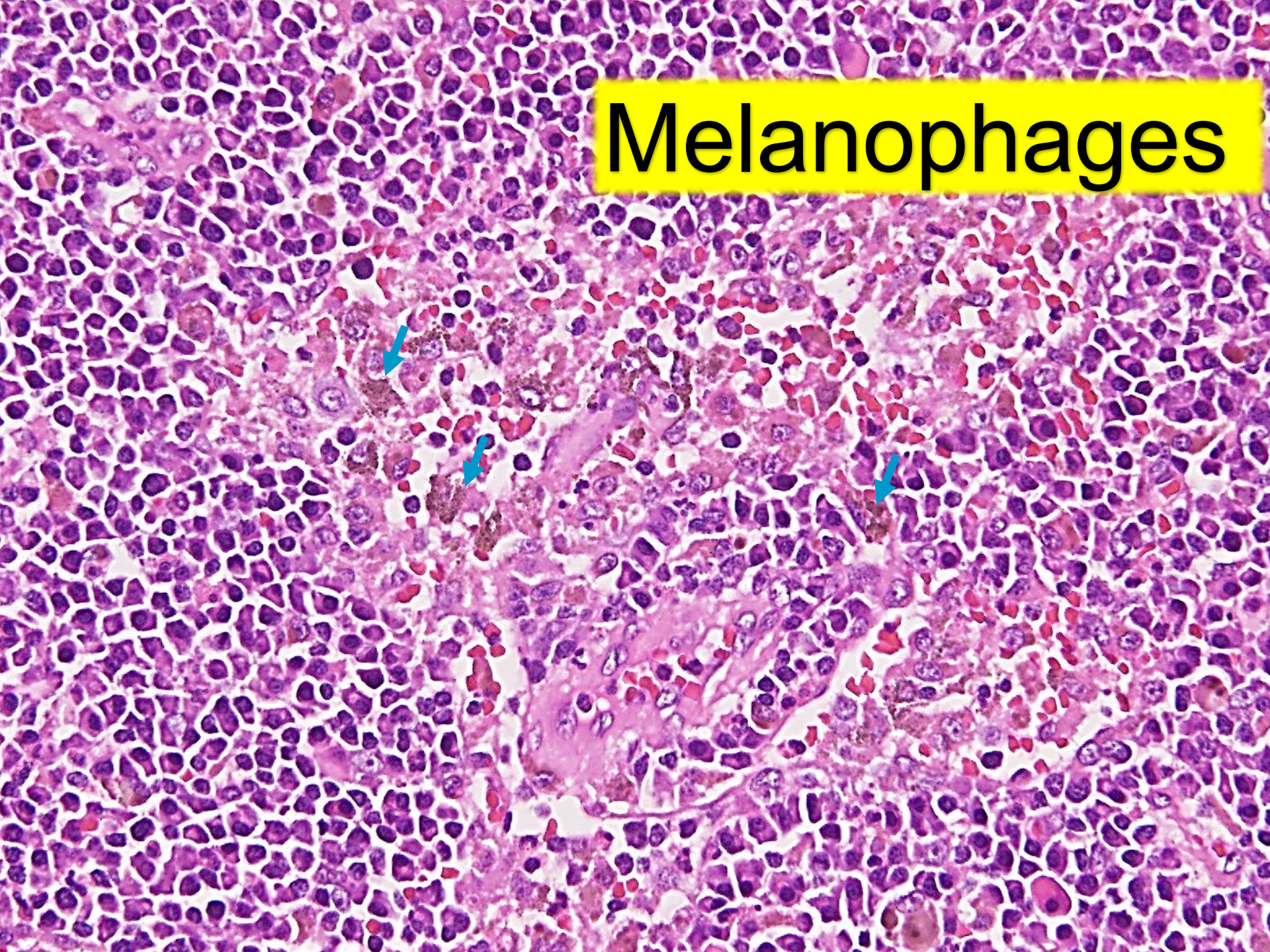
- Lymphatics to regional lymph nodes and lungs
- Melanophages (medullary sinus)
- Neoplastic melanocytes: both cortex and medulla, small nests not a single cell
- Iba-1: pan-histiocytic markers



Metastasis



Melanophages



Immunohistochemistry



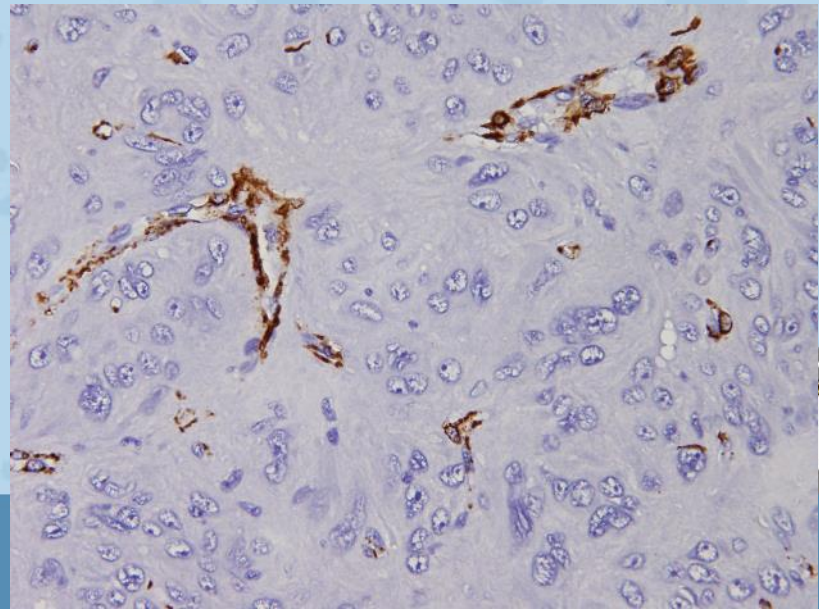
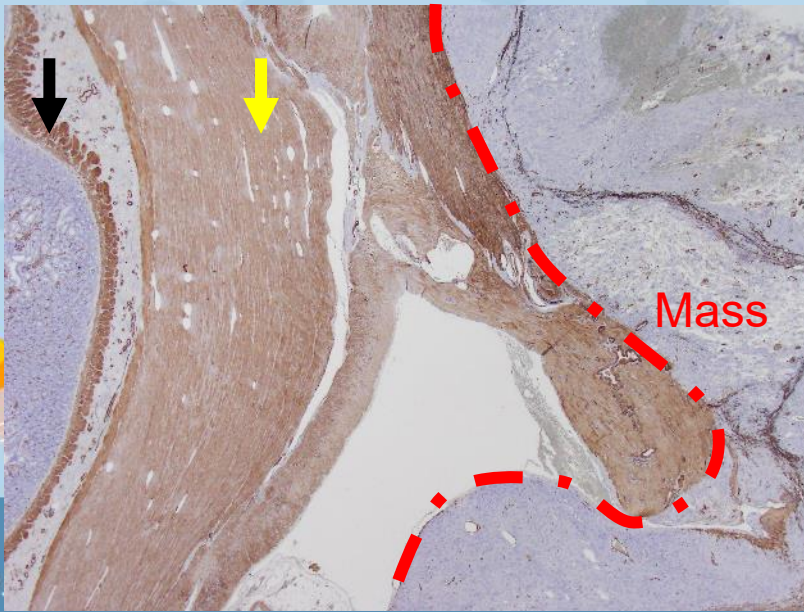
Caution for IHC

- Internal control (positive, negative)
- Target staining (nucleus, membranous, cytoplasmic)
- Non-specific staining
- Background staining



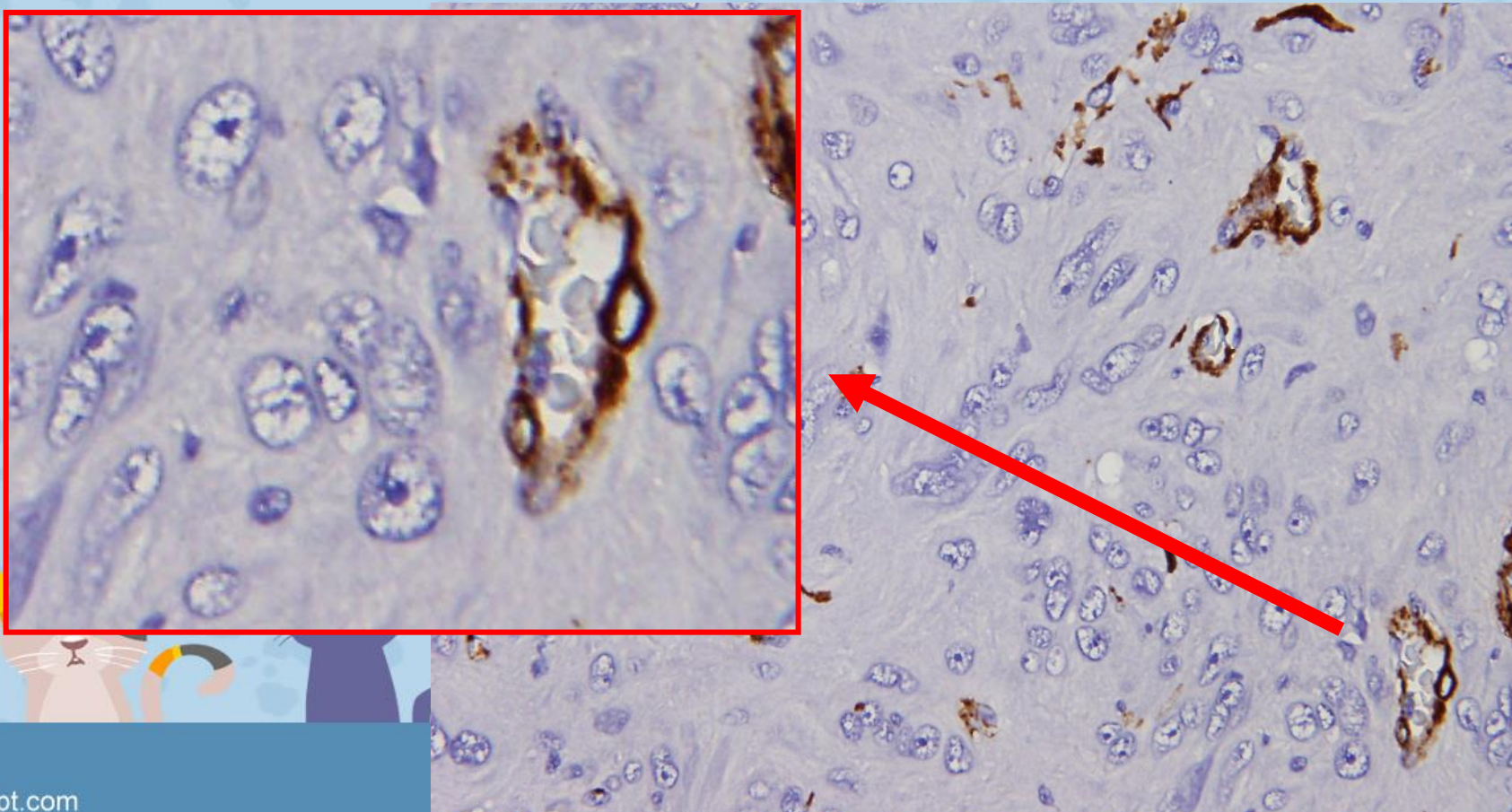
Internal control

- SMA
- POSITIVE control: smooth muscle (vessels, muscular layer, et al)
- Negative control



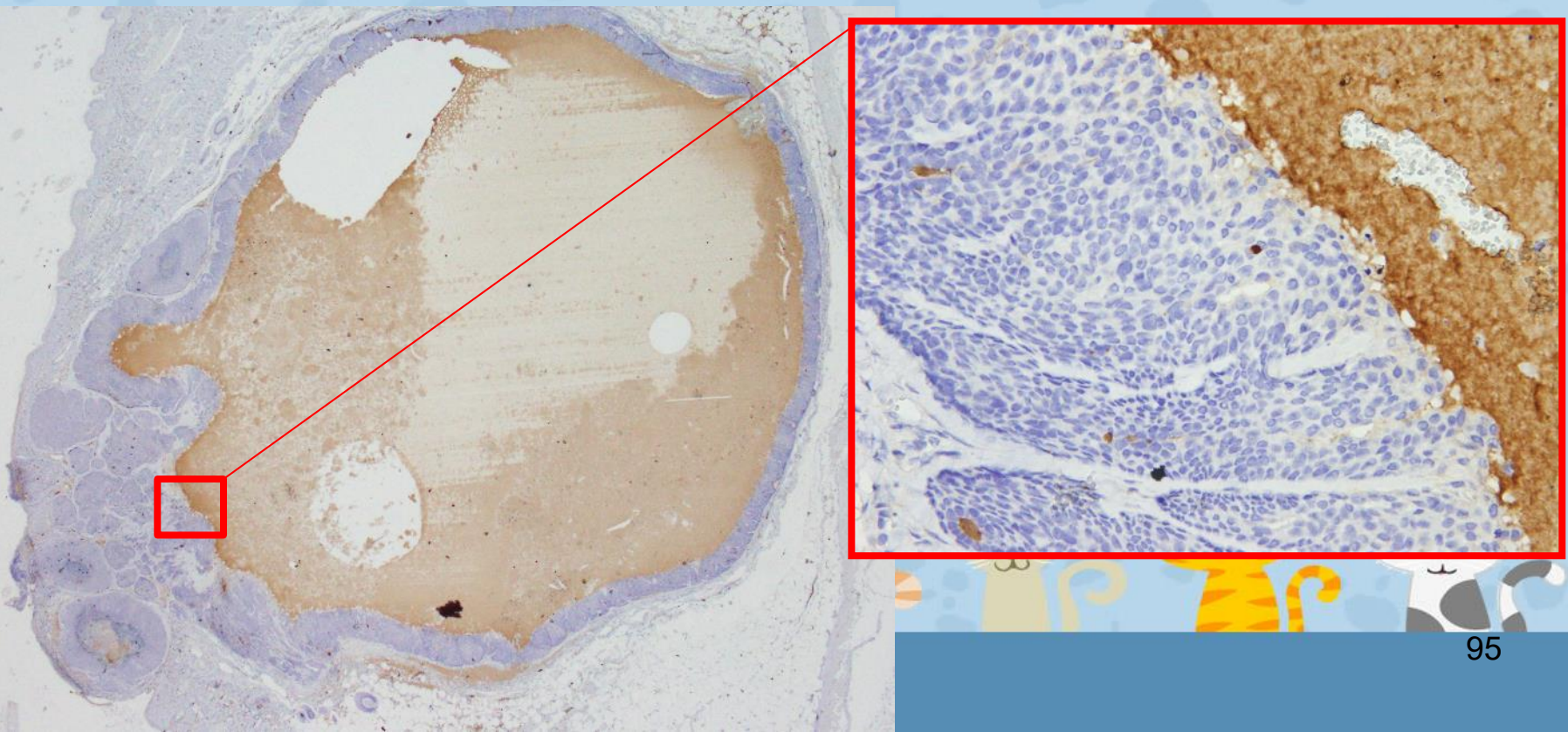
Target staining

- SMA: cytoplasmic staining



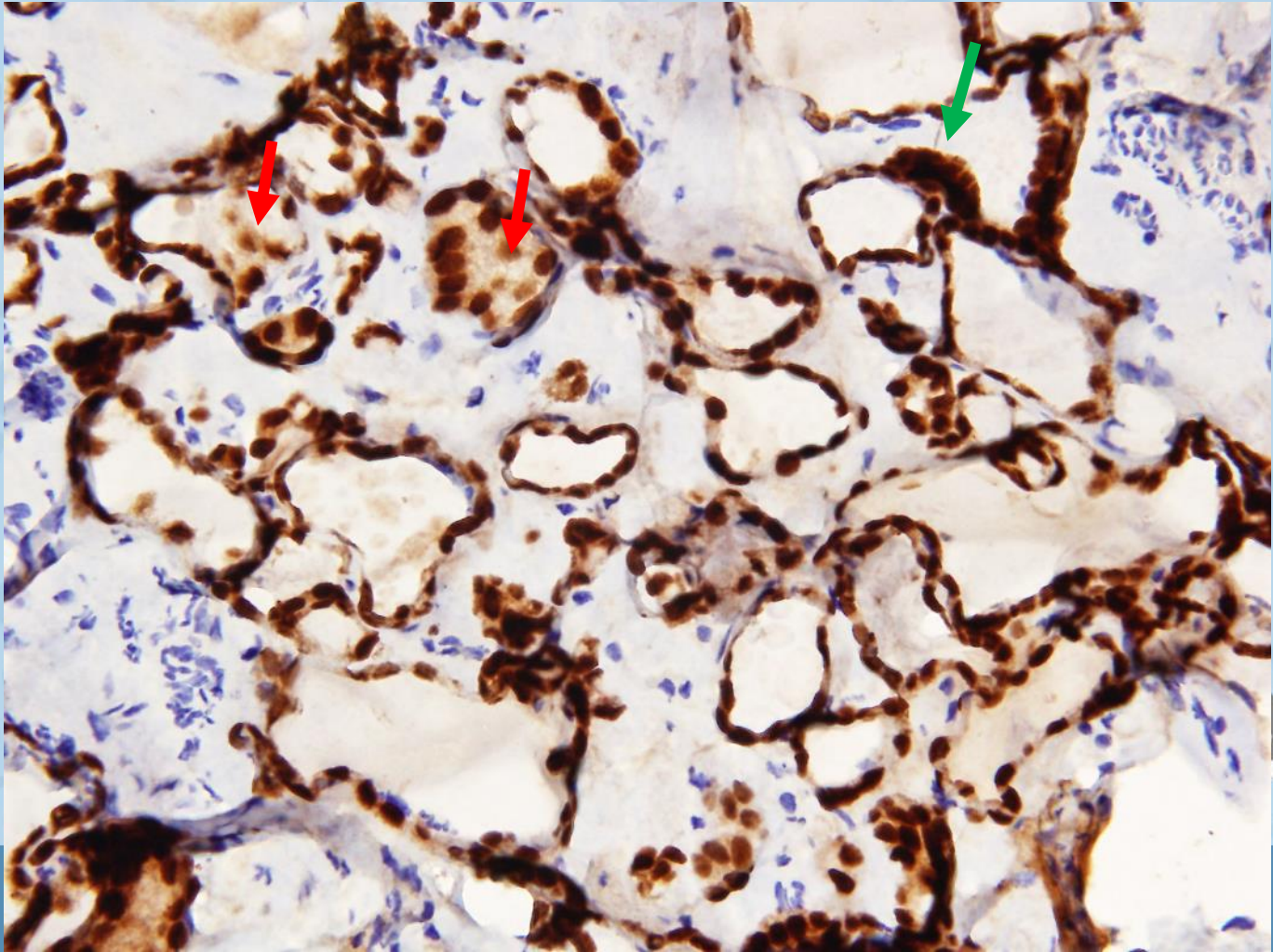
Non-specific staining

- CAM 5.2: low molecular weight cytokeratin
- Cytoplasmic staining



Background staining

- TTF1: nuclear staining



愛注意喔



划重点啦~

Promotion !





關於本會 最新消息 組織研討會 歷屆圖譜 活動花絮 切片影像 相關連結 聯絡我們

沿革與宗旨

組織章程

理監事成員

加入學會

繳交會費

台灣獸醫病理史初稿

病理專科獸醫師名單

病理專科甄審辦法



Articles

108年度

豬病

反芻獸疾病

禽病

其他動物

109年度

豬病

反芻獸疾病

禽病

其他動物

「病理專科獸醫師甄審辦法」

94年6月10日中華民國獸醫病理學會第三屆第十次理監事聯席會通過
104年6月5日中華民國獸醫病理學會第七屆第二次理監事聯席會修訂
105年5月13日中華民國獸醫病理學會第七屆第四次理監事聯席會修訂

第一條、中華民國獸醫病理學會為辦理病理專科獸醫師甄審，依專科獸醫師甄審原則特訂定本辦法，修正時亦同。

第二條、申請參加病理專科獸醫師甄審者，應符合下列前三款資格：

- 一、中華民國獸醫病理學會會員。
- 二、領有中華民國獸醫師證書。
- 三、在中華民國獸醫病理學會認可之病理專科獸醫師訓練機構，經病理專科獸醫師之指導，累計二年（含）以上之病理實務訓練，經病理專科獸醫師簽署推薦者，得參加甄審。
- 四、領有國外病理專科獸醫師證書參加本甄審者，其辦法另定之。

第三條、病理專科獸醫師甄審採筆試，筆試及格者為合格。筆試以中文命題（專有名詞部分得用英文），考試科目如下：

- 一、一般病理學。
 - 二、系統病理學。
 - 三、肉眼病理學。
 - 四、組織病理學。
- 考試範圍另定之。





關於本會

最新消息

組織研討會

歷屆圖譜

活動花絮

切片影像

相關連結

聯絡我們



組織研討會 — Seminar

2020.12.05 CSVP 378 diagnosis

2020.11.23 CSVP 377 diagnosis

2020.11.23 CSVP 376 diagnosis

2020.05.20 CSVP 375 diagnosis

Date: Oct 16, 2020

Time: 12:00~16:00

Place: AHRI

專題演講(12:00~13:00)：組織化學染色及免疫組織化學染色應用及常見問題(張皓凱 病理獸醫師)

本次會議組織病理切片資訊：

<http://www.ivp.nchu.edu.tw/slidecenter.php?id=481>

Case 1. CSVP 2020-3080 (NTU2019-3105A, NTU GIMCP, F.H. Yang, C.L. Hsiou, Y.C. Chien, and C.R. Jeng)

Canine, Maltese, 10-year-old, spayed female. Surgical excision of bilateral mandibular mass with lymph nodes was performed.

Morphological diagnosis:

1. Round cell tumor, most likely lymphoma, with vascular invasion, the left and right mandibular lymph nodes
2. Round cell tumor, most likely lymphoma, focal metastatic, the left mandibular salivary gland

Laboratory examinations:

IHC: CD3 (+); CD20 (-)

Etiological Dx. 切片名稱：Case 1. NTU319-3105A

Bilateral mandibular **Case 1. CSVP 2020-3080 (NTU2019-3105A, NTU GIMCP, F.H. Yang, C.L. Hsiou, Y.C. Chang, and C.R. Jeng)**

Canine, Maltese, 10-year-old, spayed female. Surgical excision of bilateral mandibular mass with lymph nodes was performed.



Happy 牛 YEAR

