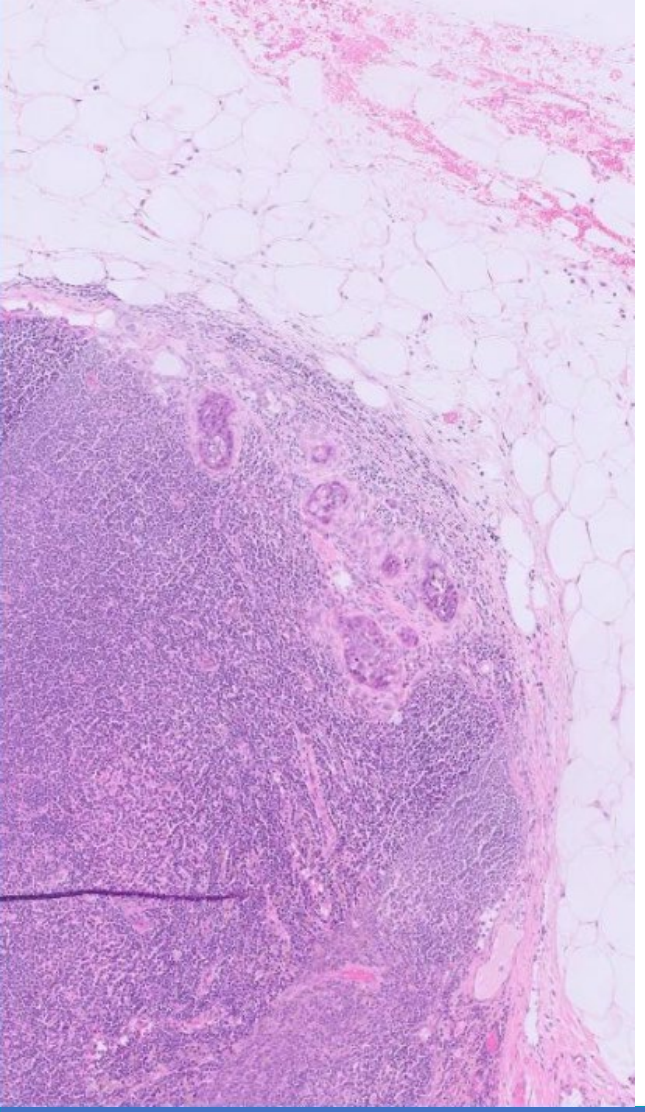

# One lump or two? Clinical approach to mammary tumours in canines

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# Disclosure

- I am an IDEXX employee
- Legal disclaimer: The information contained herein is intended to provide general guidance only. As with any diagnosis or treatment, you should use clinical discretion with each patient based on a complete evaluation of the patient, including history, physical presentation, and complete laboratory data. With respect to any drug therapy or monitoring program, you should refer to product inserts for a complete description of dosages, indications, interactions, and cautions. Diagnosis and treatment decisions are the ultimate responsibility of the primary care veterinarian.

# Purpose

- Answer common questions received from vets about histology reports with a diagnosis of canine **malignant** mammary tumor
- Provide  practical information to plan approach to dogs with mammary tumors prior to surgical removal

# Outline

- Clinical features
- Prognostic factors
- Diagnosis
  - Cytology
  - Histology & risk of recurrence/metastasis
    - Histological grading
    - Specific tumor types
- Surgical approach / recurrence
- Metastasis:  LN removal / chemotherapy
- Prognostic role of spaying after diagnosis

# Clinical features

Can I guess if a mammary tumor is malignant or benign prior to surgery?

- History: intact/neutered, timing of lesions
- Clinical features
  - **Size (>3cm),** growth speed and invasiveness
  - Draining lymph node status
  - Appearance of surrounding skin
  - Multiple lesions?
- Staging if suspected malignant
  - Lungs / draining lymph node(s) assessment

(Gunnes et al. 2017; Gedon et al. 2021)

(Pictures courtesy of Juan Borrego, DACVIM Oncology)

# CLINICAL PRONOSTIC FACTORS

- Age - high prevalence of malignant neoplasia
- Tissular invasiveness, diffuse growth, skin involvement
- Ulceration, rapid growth
- Size >3 cm. (T)
- Lymph node metastasis (N)
- Distant metastasis (M)

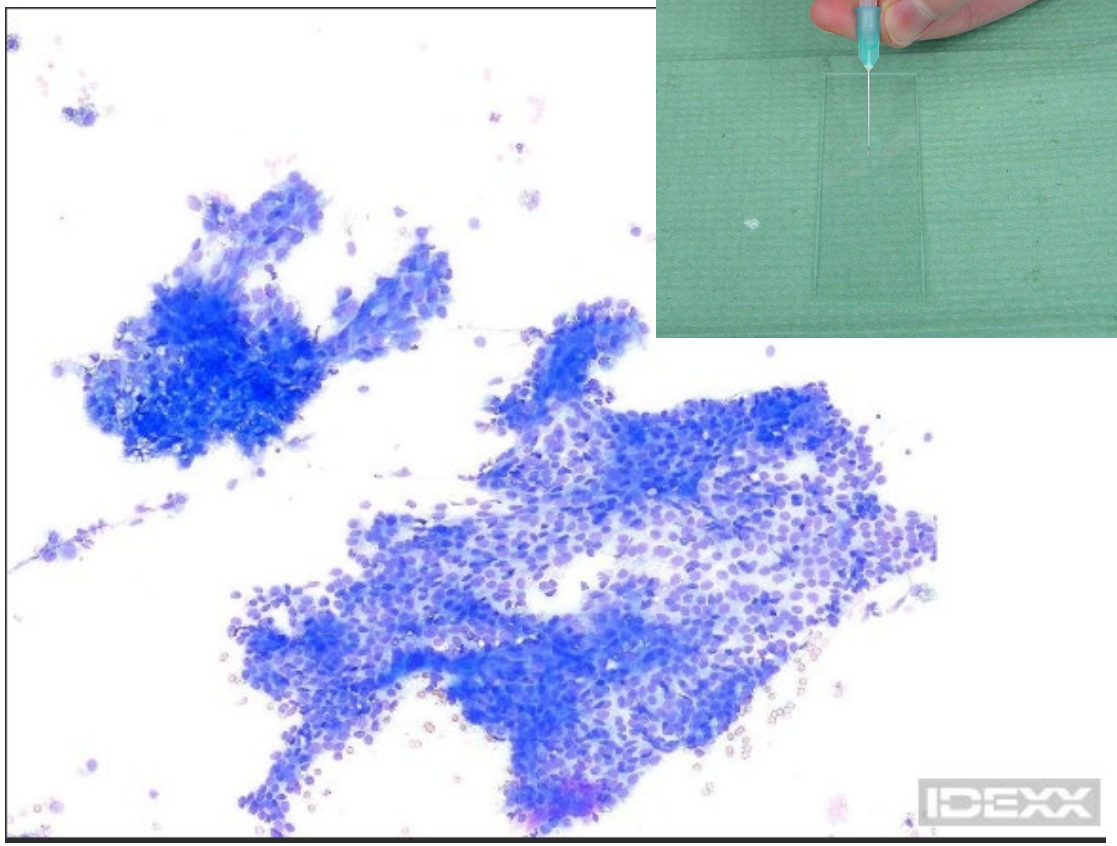
TNM Staging system

(Sorenmo et al. 2020)

(Picture courtesy of Juan Borrego, DACVIM Oncology)

# Diagnosis: Is cytology of a mammary mass useful?

- Rule in/out:
  - Inflammatory aetiology
  - Malignant mammary tumours (only rule in)
  - Non-mammary neoplasias:
    - lipomas, mast cell tumours,
    - melanomas, subcut. hemangiosarcomas
- Histology needed for definitive diagnosis and prognosis




(Picture courtesy of Dr Juan Borrego DACVIM Oncology; cytology provided by IDEXX Laboratories)

(Simon et al. 2009; Sontas et al. 2012)

# Surgery

- Surgical removal -> histology -> definitive diagnosis
  - Multiple masses ≠ not same diagnosis (66%) => remove them all = analyse them all
- General surgical approach guidelines:
  - Lumpectomy or mastectomy based on size <3 cm
  - Partial strip:  >3cm / between mammary glands
  - Full strip only when too many lesions
- For masses >3 cm aim for 2 cm margins
  - (formaline fixed tissue ↓30%)
- Mastectomy - deep margins down to fascia
  - if recurrent /very infiltrative >>remove fascia too

(Picture courtesy of Juan Borrego, DACVIM Oncology)

(Litterine-Kaufman et al. 2019; Sorenmo et al. 2020)

# Surgery: draining lymph node resection

- Double check lymphatic drainage anatomy prior to LN removal

| Location of mammary Gland | Neoplastic Lymphatic Drainage |
|---|---|
| M1 - cranial thoracic | Axillary LN or sternal LN |
| M2 - caudal thoracic | Axillary LN or sternal LN |
| M3 - cranial abdominal | Axillary LN, superficial inguinal LN << medial iliac LN |
| M4 - caudal abdominal | Superficial inguinal LN << axillary LN |
| M5 - inguinal | Superficial inguinal LN <<popliteal LN |

- Anatomical approach described for axillary LNs removal
  - Consider methilene blue to ease visualization
- If mastectomy of 5th or 4th+5th … inguinal LN removal!

(Sorenmo et al. 2011; De Souza et al. 2023)

(Pictures courtesy of Dr. Manuel Jimenez DECVS)

# Surgery

- Malignant mammary neoplasia based negative prognostic factors:
  - Wide margins (partial strip)+ lymph node (s) removal
  - No difference in survival for full strip / more postoperative complications
- When to biopsy:
  - Inflammatory mammary carcinoma suspected
  - Spread of localised mammary tumor to skin

(Horta et al. 2015, Evans et al. 2021)

# Diagnosis: histology

- Is it needed? – YES!!!
- 50% of canine mammary masses are benign
- For malignant mammary neoplasia:
  - Histologic grading = estimate of recurrence / metastasis risk
  - Some specific tumor types associated with malignant behaviour

(Sorenmo et al. 2020)

# what's important in the histology report?

Grading & prognosis: Goldschmidt adapted WHO classification

- Applies to epithelial mammary neoplasia
- Grade I and II: risk of metastasis 19-30%, recurrence with narrow margins 9-12%
- Grade III: risk of metastasis 87%, recurrence 32%

- Lymphatic invasion – present / absent
- Margin assessment – incomplete /very narrow margins = recurrence risk
- Lymph node status

(Goldschmidt et al. 2011; Tran et al. 2016; Rasotto et al. 2017)

# Diagnosis: histology

Canine mammary tumours

- Specific tumor types associated to agressive malignant behaviour: local and metastatic
- Comedocarcinoma, solid/anaplastic carcinoma
- Carcinosarcoma, osteosarcoma
- Inflammatory mammary carcinoma*
  - Diffuse skin lymphatic extension
  - Surgery contraindicated

(Langenbach et al. 1998; Peña et al. 2003; Rasotto et al. 2017)

(Pictures courtesy of Chiara Leo DACVIM Oncology and Juan Borrego, DACVIM Oncology)

# Risk of metastasis: what to do?

- Target organs are lungs and draining lymph nodes (LNs)
- Action plan depends on estimated risk (tumor size, grade, stage)
- Periodic staging - always for high met. risk / already present
- Staging:
  - Diagnostic imaging lungs
  - Locating draining LN(s) (might require imaging):
    - **REMOVAL** when high risk  of metastasis after staging
    - If monitoring, initial FNA/size recording

# Risk of metastasis: Chemotherapy, Radiotherapy

- Weak evidence of survival improvement in metastatic mammary neoplasia or inflammatory carcinomas
- No documented % decrease in metastatic rate compared to sx alone
  - Lack of optimally designed studies
- Doxorubicin, mitoxantrone, carboplatin, toceranib, COX-2 inhibitors,…
  - If used – after complete wide resection /removal of regional LNs

Radiotherapy:

- Inflammatory mammary carcinoma
- Extensive skin involvement/nonresectable carcinomas
  - Improves survival compared to medical therapy alone

(Tran et al. 2016; Arenas et al. 2016; Rossi et al. 2018; Sorenmo et al. 2020)

# Benefits of spaying in dogs after diagnosis of mammary tumors?

- 50% of intact bitches will develop at least one mammary tumor
- Mammary tumors in spayed bitches are more frequently malignant
- Spaying at diagnosis of benign tumor will decrease by 50% risk of further mammary tumors
- OVHE does not change survival after diagnosis of malignant neoplasia
  - Exception adenocarcinomas  grade II or high estradiol preoperative levels

(Sorenmo et al. 2000; Kristiansen et a. 2013; Kristiansen et al. 2016; Gedon et al. 2022)

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IDEXX

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# Questions?