

# Fatal rhabdomyosarcoma in a one-year-old dog

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## Introduction

- Rhabdomyosarcomas (RMSs) are malignant mesenchymal neoplasms of skeletal myocytes.
- They are characterized by variable locally aggressive behaviour and metastatic rate.
- Canine RMSs occur particularly in young animals and are most frequently documented in the larynx.
- **This case report describes an aggressive and uncommonly localized subcutaneous RMS in a young dog with widespread metastases.**



**8-months old Leonberger**  
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## Material & Methods

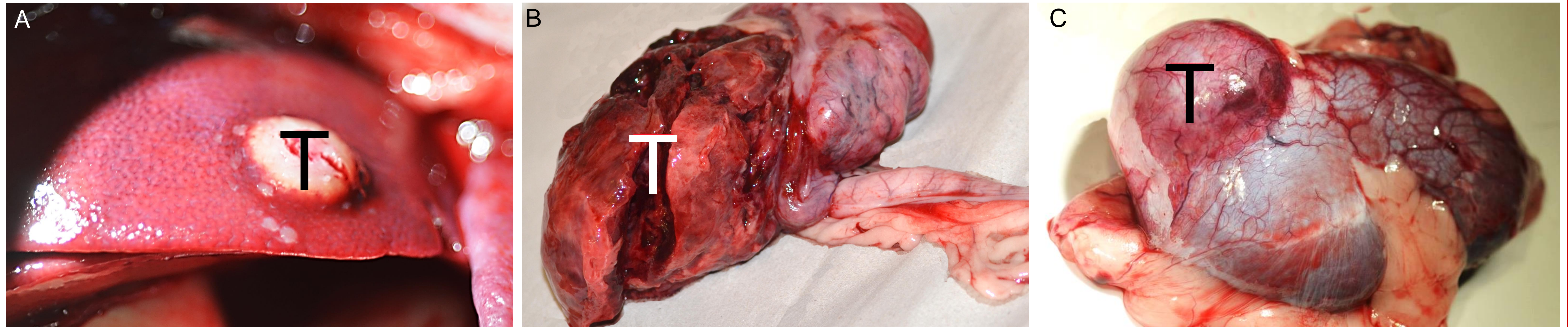
- An 8-month-old female Leonberger dog was presented at the clinic with a mass on the forehead.
- Advanced imaging and complete surgical excision were realized.
- Two months later, the dog developed hepatic, ovarian, and renal masses.
- Histopathology and immunohistochemistry were performed of all the masses.
- Finally the dog was euthanized.

## Results

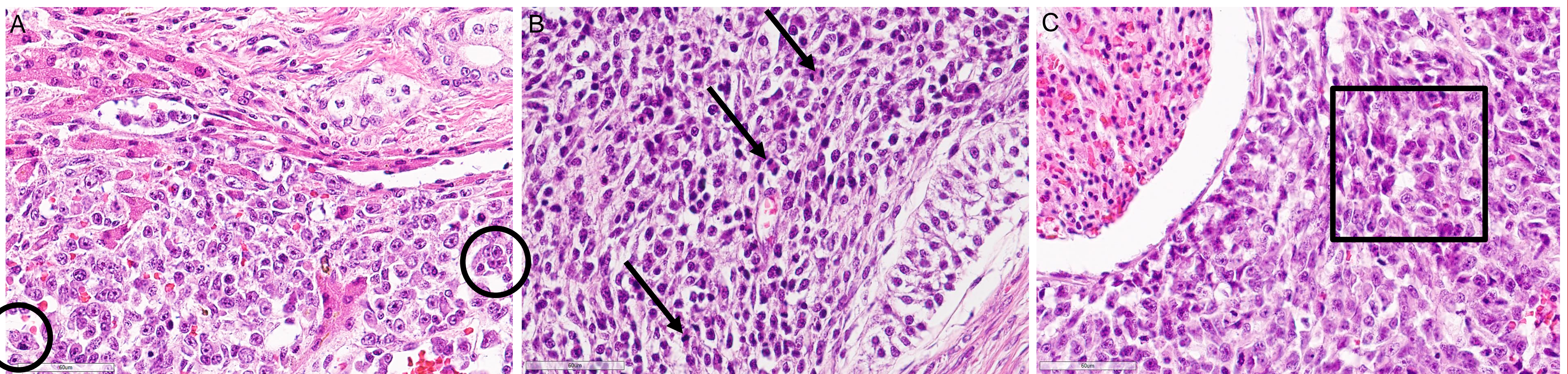
- **Imaging** revealed a 5 cm in diameter osteolytic mass on the forehead (Fig.1);
- **Macroscopically**, the hepatic, ovarian, and renal lesions were composed by well delimited, white nodules protruding from the parenchyma (Fig. 2).
- **Microscopically**, infiltrative neoplasms composed of spindle-shaped to round cells arranged in streams and sheets, associated with areas of necrosis were found at the forehead and in the organs. Marked anisocytosis and anisokaryosis, multinucleated neoplastic cells, and more than 20 mitoses/10 HPF were seen (Fig. 3).
- **Immunohistochemically**, the neoplastic cells were strongly positive for desmin but smooth-muscle-actin and pan-cytokeratin negative (Fig. 4).
- The **diagnosis** was: embryonal RMS with widespread metastases.



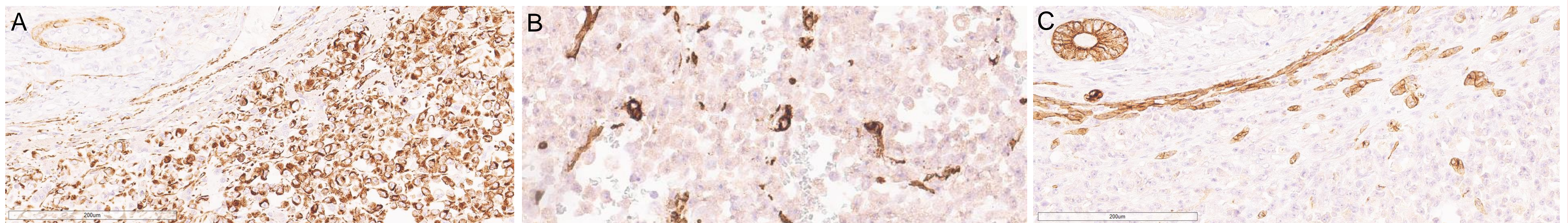
**Fig. 1:** CT scan of the head of an 8-months-old Leonberger. A 5 cm in diameter osteolytic mass is present on the forehead (circle). © Dres. Staudacher, AniCura Aachen



**Fig. 2: Macroscopical findings:** Multifocal nodules (T) bulging from the hepatic (A), ovarian (B), and renal parenchyma (C).



**Fig. 3: Microscopical findings:** The masses on the forehead, liver (A), ovary (B) and kidney (C) were composed by infiltrative neoplasms represented by spindle-shaped to round cells arranged in streams and sheets. Marked anisocytosis and anisokaryosis (square), multinucleated neoplastic cells (circles), and more than 20 mitoses/10 HPF were seen (arrows). HE stain, 40x.



**Fig. 4: Immunohistochemistry:** The neoplastic cells were strongly positive for desmin (A) but smooth-muscle-actin (B) and pan-cytokeratin (C) negative.

## Conclusions

- This case represents a very uncommon, aggressive subcutaneous RMS with a poor outcome.
- The visceral masses were noticed after the subcutaneous lesion and were interpreted as metastases. Nevertheless, a multicentric RMS cannot be ruled out.
- RMS should be included in the differential diagnoses for subcutaneous masses in young dogs.
- Given the unfavorable prognosis and metastatic potential of RMSs, a thorough clinical examination associated with histology and immunohistochemistry is necessary, to reach an accurate morphological diagnosis.
- After a complete surgical excision, evaluation of lymph node and distant organ in search for metastatic sites is recommended after a diagnosis of RMSs.