Splenic Hemangiosarcoma in a Cat Treated with Monocyte-Derived Dendritic Cells

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Background & Objective

Spleen disorders in cats are rarely diagnosed, and their prevalence is estimated at 5%; causes include primary and metastatic neoplasms, nodular hyperplasia, hematomas, ischemic obstruction, and splenitis[1]. Interestingly hemangiosarcoma originating from the vascular endothelium is the most common splenic tumor reported in dogs. It appears to be less common in cats with a reported prevalence of 2% - 21%, and accounting for 60% of all feline neoplasms presenting with spontaneous hemoperitoneum[1, 2]. We report on the case of a 13-year-old European Shorthair cat that suffered from a ruptured splenic hemangiosarcoma. We describe the clinical course following immunotherapy based on autologous dendritic cells.

[1]Rossanese, M., de la Puerta, B., Chanoit G., 2023. Prevalence of malignancy and factors affecting outcome of cats undergoing splenectomy. JAVMA 261 (11) 1646-1652. https://doi.org/10.2460/javma.23.05.0258. [2]Culp, W.T., Weisse, C., Kellog, M.E., et al. 2010. Spontaneous hemoperitoneum in cats: 65 cases (1994-2006). J. Am. Vet Med Assoc. 236 (9), 978-982. doi:10.2460/javma.236.9.978

Anamnesis & Pathological Report

Anamnesis

- Date of receipt 07/02/2025, breed: European Shorthair, sex: female, neutered, date of birth: 01/04/2012, body weight: 3,6 kg.
- In early January 2025, the cat was initially treated for leukocytosis and monocytosis but no cause for the condition could be identified.
- On January 16, 2025, the patient was admitted as an emergency case due to abdominal discomfort and underwent immediate surgery. During laparotomy, adhesions of the greater omentum to the tumor were removed and a splenectomy was performed. Subsequent pathological-histological examination revealed a multinodular, partially ruptured hemangiosarcoma of the spleen with extensive bleeding.
- The wound healed without complications.

Pathological Report

Macroscopic Examination

- A section of the spleen (9 cm in length) with a moderately wrinkled, brown surface and four protrusions, each no larger than a chicken egg and partially covered by the omentum.
- Upon sectioning, the cut surface is mottled light gray-brown or uniformly reddish-brown.

Histological Examination

- Extensive areas of necrosis infiltrated by large clusters of red blood cells.
- Interspersed among these, clusters of cells form gaps and lacunae and exhibit varying degrees of anisonucleosis and nuclear polymorphism.
- Nuclear fragments, mitoses, and a few inflammatory cells.

Diagnosis

- Multinodular, partially ruptured hemangiosarcoma (formerly malignant hemangioendothelioma) in the spleen with extensive hemorrhage.

Critical Report / Prognosis

- Highly malignant vascular tumor that can both recur and metastasize.
- Relatively frequently occurring in the spleen.
- Can easily rupture and lead to severe blood loss into the abdomen with tendency to metastasize, particularly within the abdominal cavity.

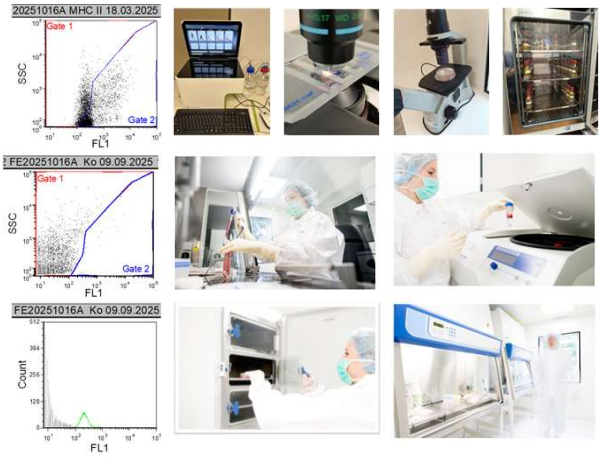
Autologous Dendritic Cells

Dendritic Cells

- Derived from peripheral blood monocytes of the feline patient.
- ≥ 4 x 10^6 cells required for *in-vitro* culture in RPMI 1640, recombinant feline GM-CSF and recombinant feline IL-4, six days.
- Adherence to GMP compliance.

Cell Suspension	Release	PBMCs (day 0)		DCs (day 6)		FACS (%)		Sterility
		Number (x 10^6)	Viability (%)	Number (x 10^6)	Viability (%)	Ko FITC	MHC II FITC	
FE20260130B	2026-02-05	21.525	100	0.990	100	0.92	14.88	passed
FE20251016A	2025-10-22	13.650	100	0.990	100	0.59	70.08	passed
FE20250625A	2025-07-01	7.175	100	0.520	100	0.37	94.19	passed
FE20250402A	2025-04-08	7.175	100	1.305	100	0.18	63.35	passed
FE20250305B	2025-03-11	16.275	100	2.100	100	0.48	28.81	passed
FE20250207A	2025-02-13	8.550	100	0.650	100	0.35	43.34	passed

PBMCs = Peripheral blood mononuclear cells, DCs = Dendritic cells, FACS = Fluorescence-activated cell sorter, FITC = Fluorescein-5-isothiocyanat, Ko = Control, MHC II = Major histocompatibility complex class II.



Acceptance criteria for release based on cell methods and FACS analysis:

- Dose ≥ 1.5 x 10^5 / 2,0 ml, cell viability ≥ 90 %, phenotype ≥ 10 % of MHC-II positive cells, sterility

Immunotherapy Based on Dendritic Cells

Treatment Period (February 2025 to February 2026)

- Dose: dendritic cells 0,520 - 2,100 x 10^6/2,0 ml of isotonic sodium chloride solution (0.9 %).
- One dose (2 ml), intradermal injection within 24 h upon release.
- Date of Vaccination (V):
  V 6) 2026-02-06
  V 5) 2025-10-23
  V 4) 2025-07-02
  V 3) 2025-04-09
  V 2) 2025-03-12
  V 1) 2025-02-14

Course of the Disease

Observation Period (January 16, 2025 to May 15, 2026)

- So far, ultrasound follow-up examinations have shown no signs of recurrence of the disease or metastases.
- Blood test performed before the first treatment (January 4, 2025) and after the third treatment (June 24, 2025) showed no signs of anemia (PCV 31,4% and 28,2%, respectively).
- After six intradermal treatments with dendritic cell suspensions, the owner reported that the cat was still in good condition.

Discussion & Conclusion

- In January 2025, a 13-year-old European Shorthair cat underwent surgery to remove a splenic hemangiosarcoma. For follow-up treatment, the owner opted for immunotherapy based on dendritic cells derived from autologous blood monocytes. Over the course of a year, the cat was treated with a series of six intradermal injections, beginning at monthly intervals in February, March, and April, followed by July, October 2025, and February 2026.
- The cat is reported to still be alive approximately 16 months after splenectomy. This contrasts with the findings in 16 cats with splenic hemangiosarcoma; all died as a result of the splenic hemangiosarcoma due to clinical deterioration or disease progression. The overall median survival time was reported as 94 days (interquartile range 52–146 days).[1]
- The good health of our cat may also be supported by the finding that no anemia was detected that had a negative impact on survival. Preoperative anemia with a hematocrit level < 24% was observed in over 80% of cats with visceral hemangiosarcoma, including splenic hemangiosarcoma.[1]

➢ To conclude: Given the treatment recommendation from the Veterinary Society of Surgical Oncology (VSSO)[3] for wide-margin surgical excision - since these tumors traditionally do not respond to chemotherapy and are relatively resistant to radiation - the case study provides evidence that autologous dendritic cell suspensions may represent a promising new option for the (post-)treatment of resected splenic tumors. Further clinical cases of splenic hemangiosarcomas in cats are needed to substantiate this immunological approach.

[3]https://vsso.org/skin-hsa-feline