

Malignant lymphoma characterized by proliferation in the spleen and co-expression of CD3 and CD79α in a young rat

-脾臓における増殖形態とCD3およびCD79αの共発現が特徴的な若齢ラットの悪性リンパ腫-

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Objective

• Malignant lymphoma in young rats is rare.

Table. Spontaneous tumors in SD rats at 10 to 32 weeks of age.

Type of neoplasm	Male	Female
Pituitary anterior adenoma	1/1699	4/1752
Oligodendroglioma	1/1765	2/1765
Mammary gland Adenocarcinoma	1/1765	6/1765
Malignant lymphoma	1/1699	0/1752

Excerpt from (Ikezaki, 2011)

This study reports malignant lymphoma with characteristic splenic proliferation and immunophenotype in a young rat.

Materials and Methods

Animal The animal is a female **20-week-old Crl: CD (SD) rat** in the **low-dose group** of a general toxicity study. This rat **died after showing decreased locomotor activity and dyspnea** during the study.

HE stain Conducted in systemic organs.

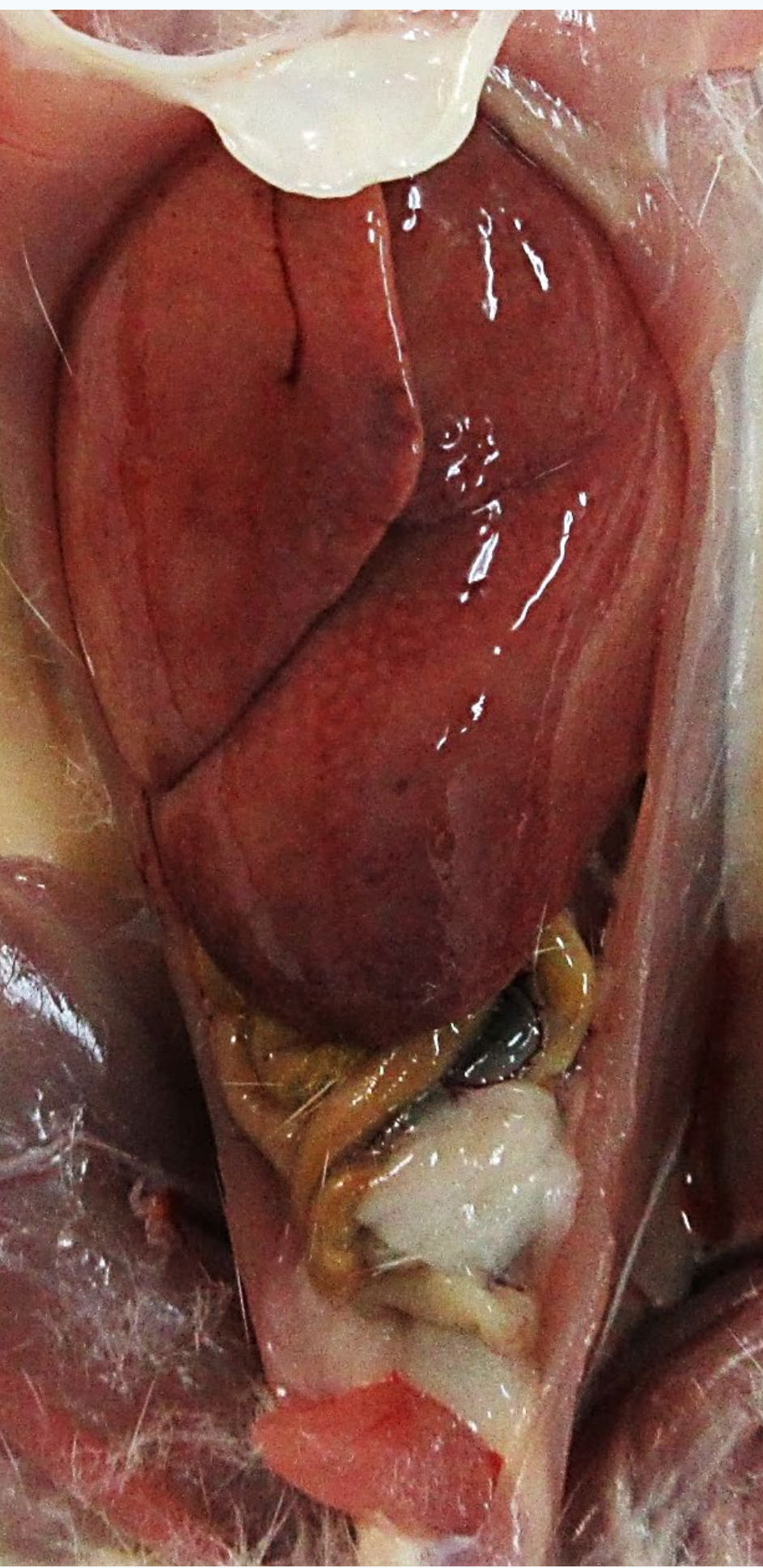
Immunohistochemistry (IHC) Conducted in the spleen and liver for **CD3, CD79α, CD20, CD68** and **Ki-67**.

Double immunofluorescence (IF) Conducted in the spleen for **CD3** and **CD79α**.

Antibody	Dilution	Supplier
CD3	×2	DAKO
CD79α	×200	LAB VISION
CD20	×200	SANTA CRUZ
CD68	×800	Abcam
Ki-67	×1600	Abcam

Results

Gross



- Enlarged spleen, liver and lymph nodes
- Dark reddish patch of the stomach, lung and brain
- A nodule in the abdominal cavity
- Whitish discoloration of the right ocular surface ※

Fig.1 Abdominal cavity: An enlarged liver and a nodule were observed.

※Incidental and unrelated to malignant lymphoma.

Histopathology

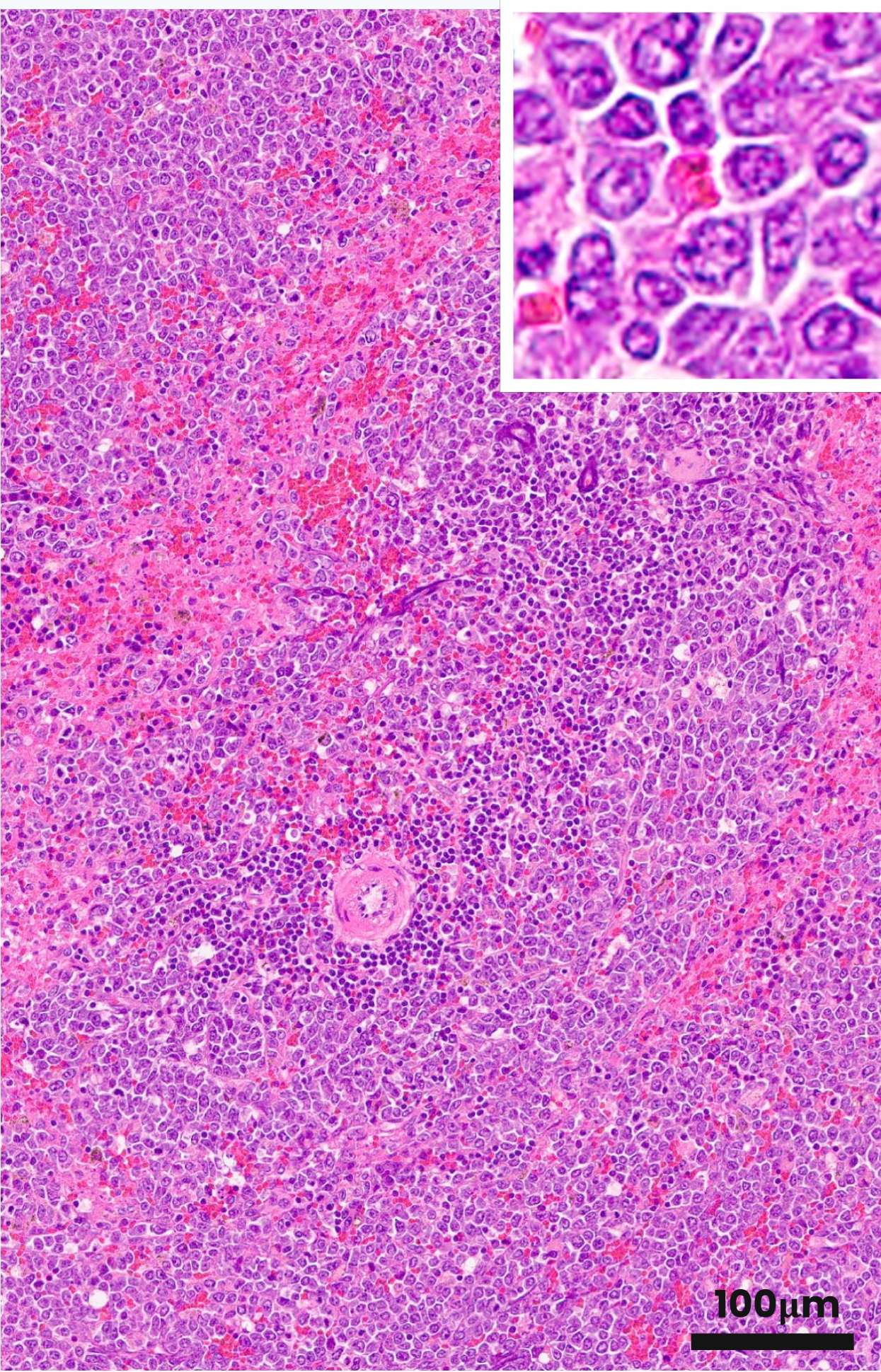


Fig.2 Spleen: Tumor cells mainly infiltrated the red pulp, with white pulp intact. Medium- to large-sized lymphoid cells had cleaved oval nuclei, distinct nucleoli and scant basophilic cytoplasm (inset).

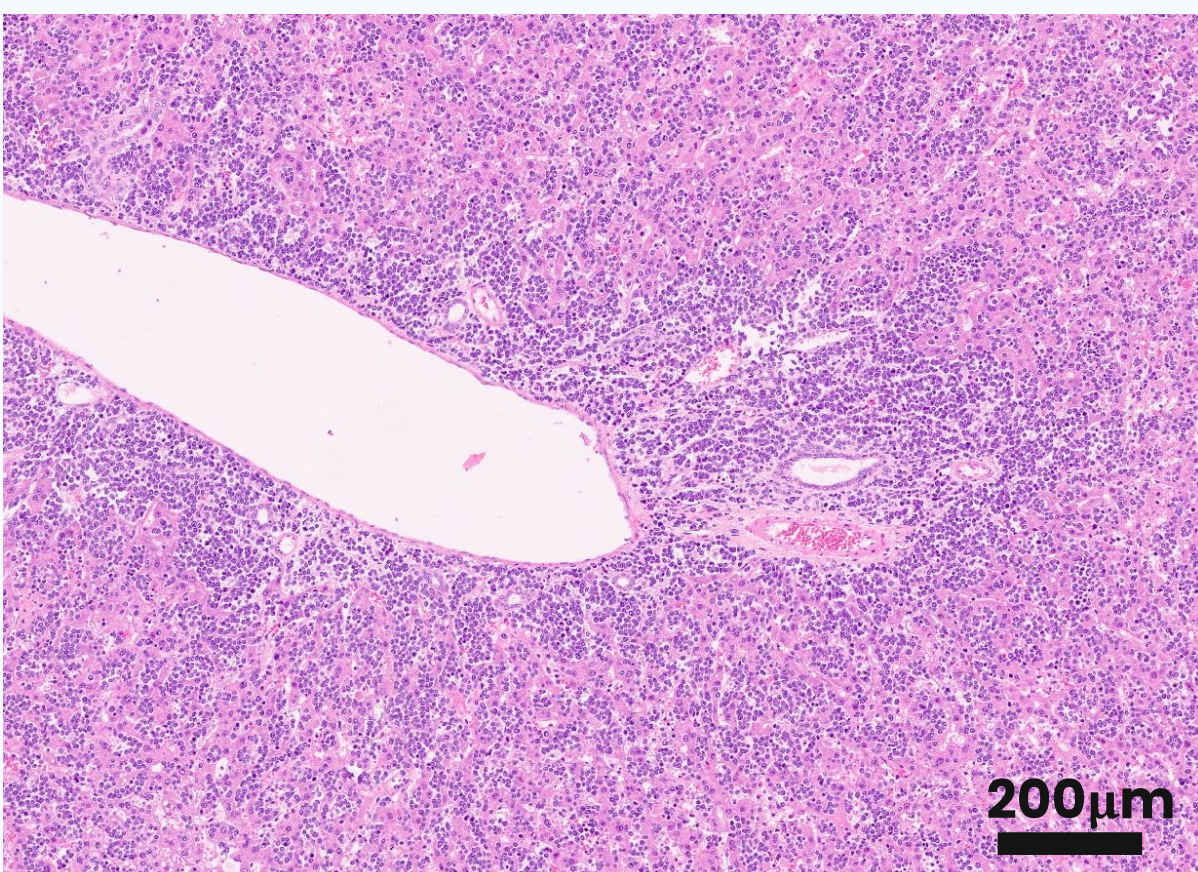


Fig.3 Liver: Tumor cells infiltrated Glisson's sheath to sinusoids.

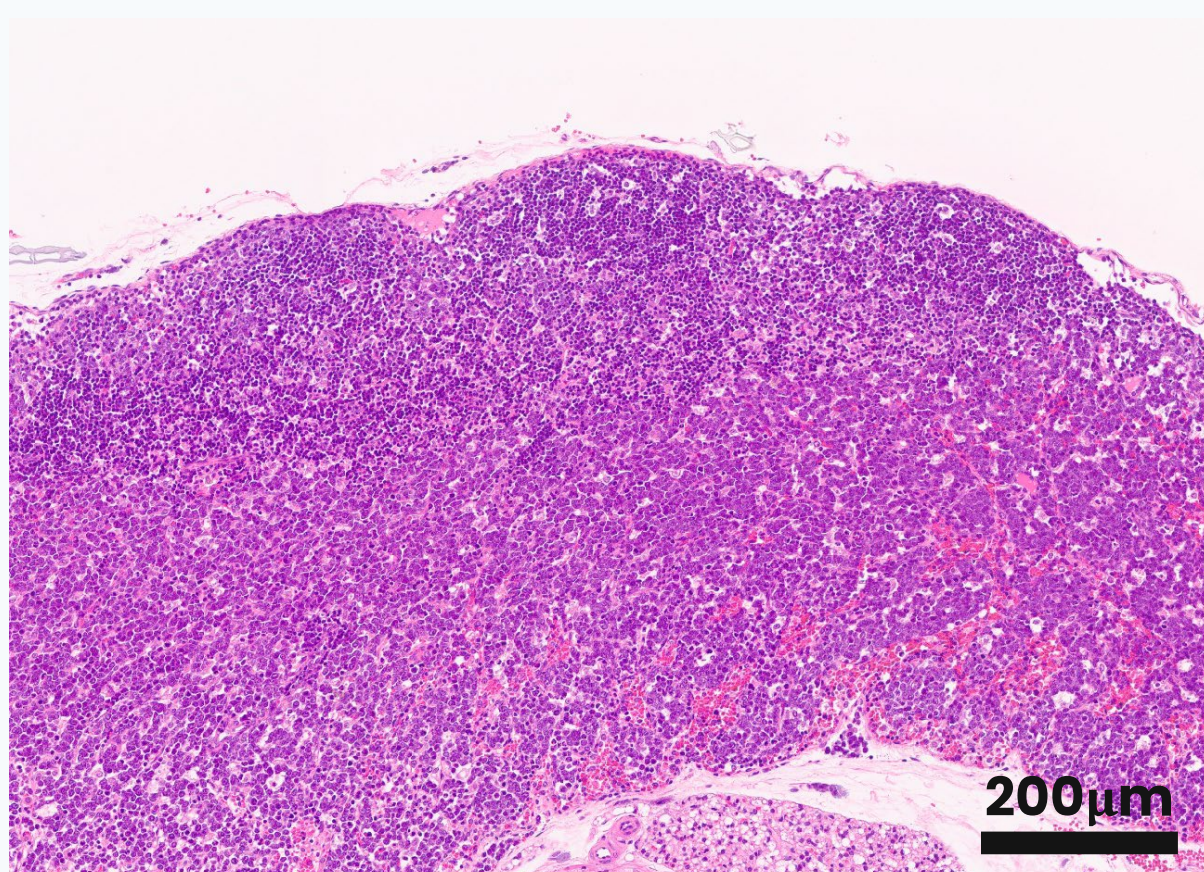


Fig.4 Lymph node: Tumor cells infiltrated the paracortex to medulla.

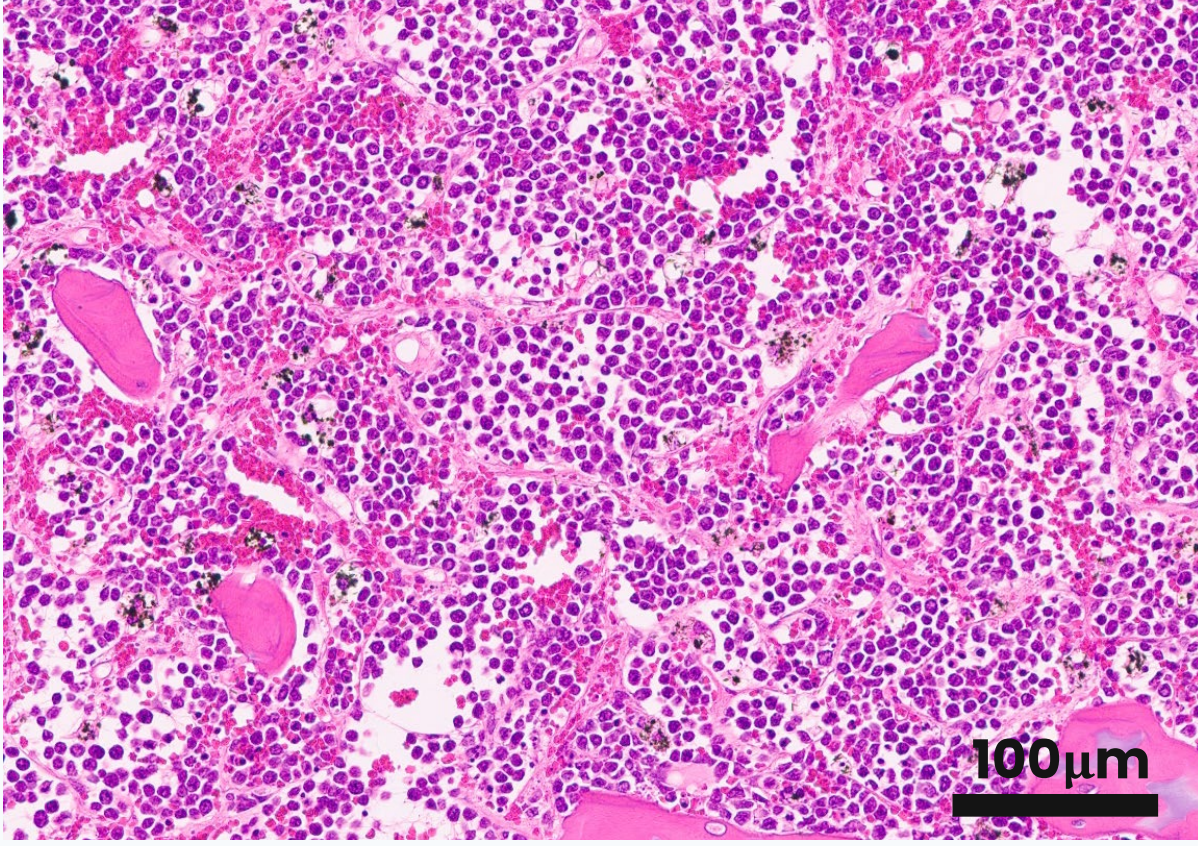


Fig.5 Femur medulla: Tumor cells infiltrated diffusely.

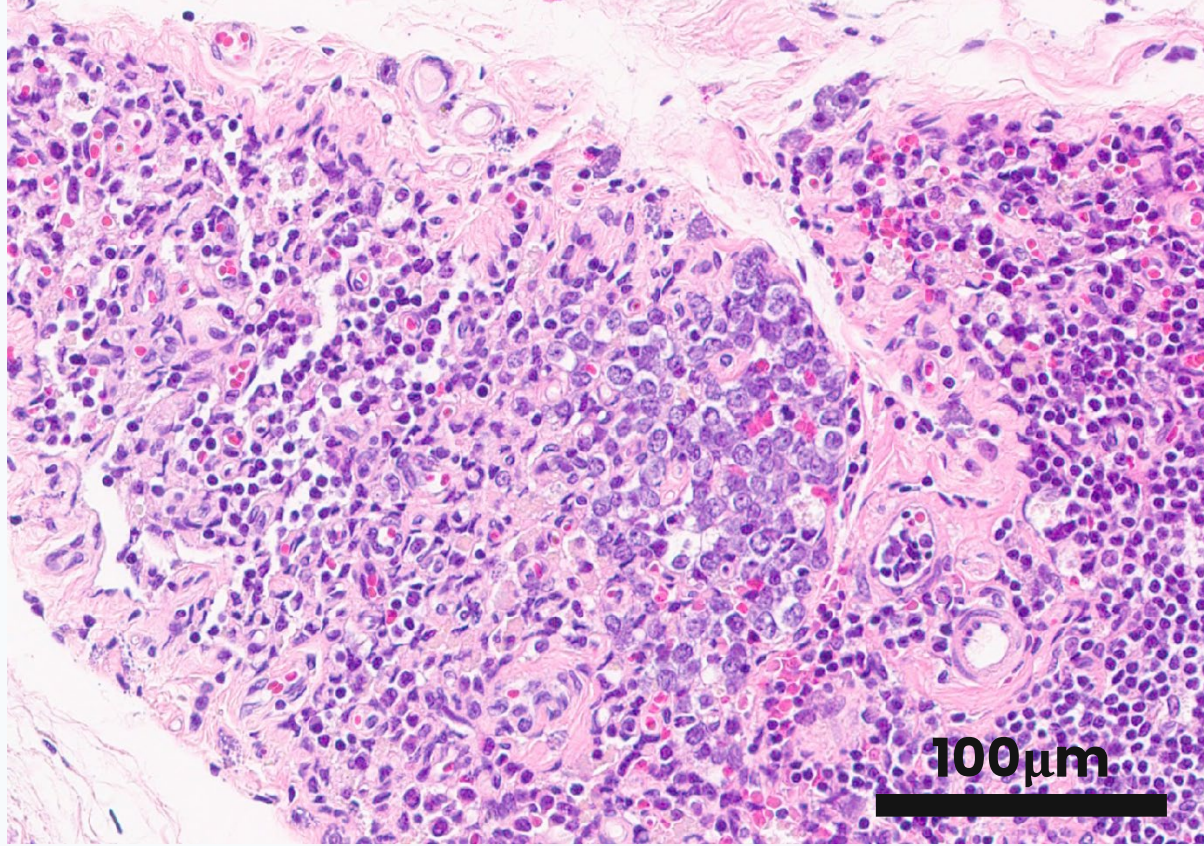


Fig.6 Thymus: Atrophy and infiltration of tumor cells

- ✓ Tumor cells infiltrated the stomach, lung, brain and other organs systemically.
- ✓ The abdominal mass was composed diffusely of tumor tissue.

IHC

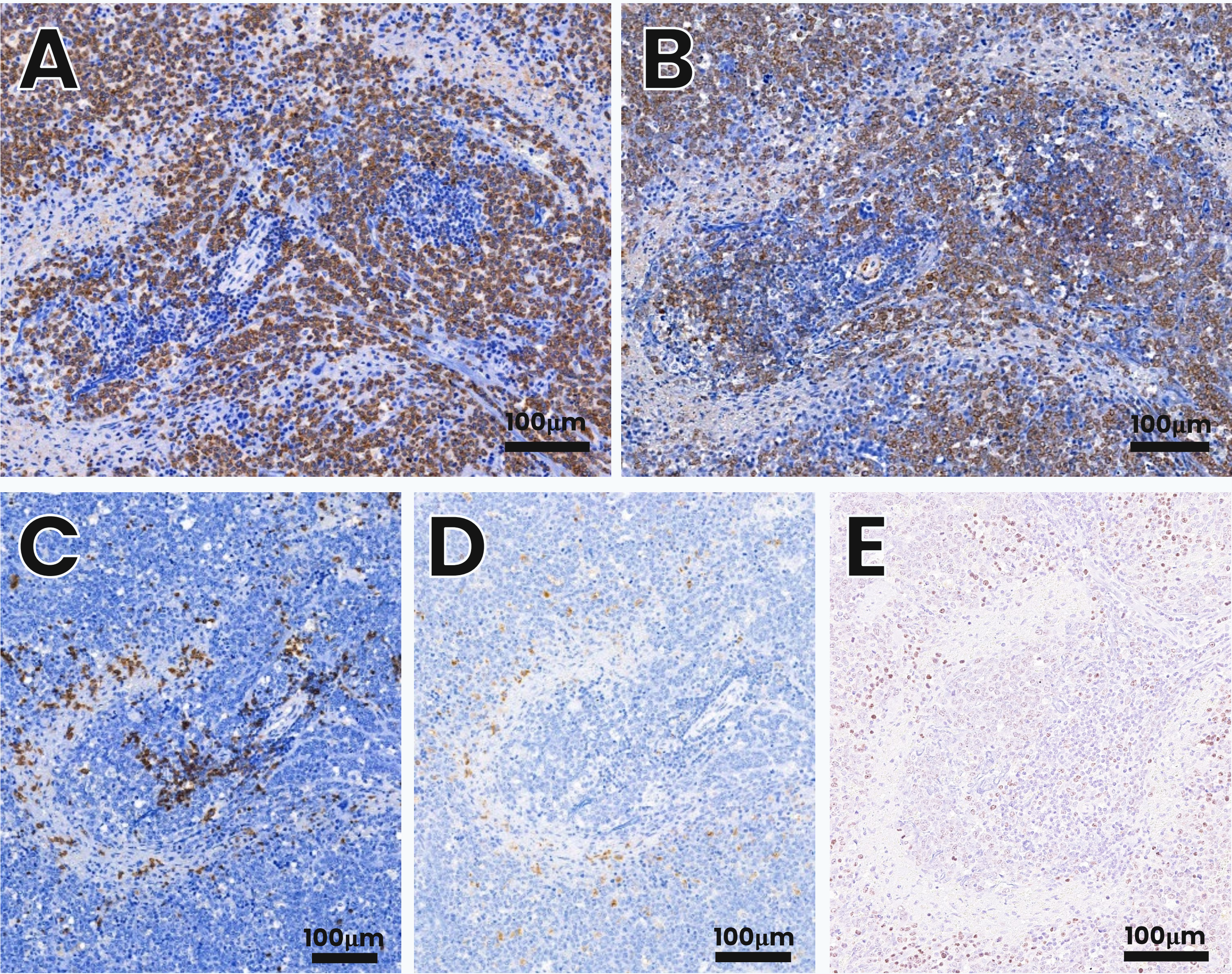


Fig.7 Tumor cells were positive for CD3 and CD79α, negative for CD20 and CD68, about 30% positive for Ki-67. (A: CD3, B: CD79α, C: CD20, D: CD68, E: Ki-67)

IF

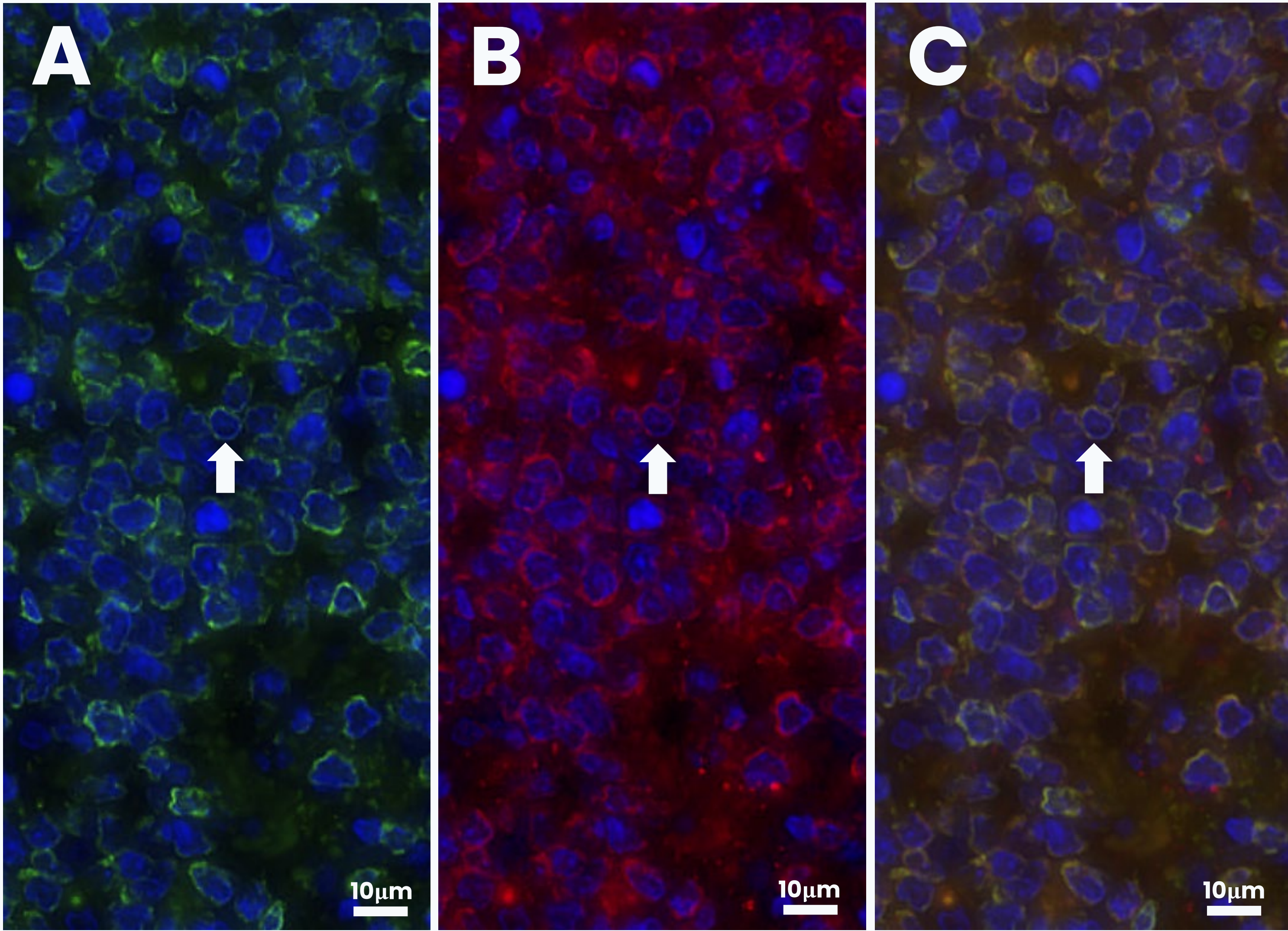


Fig.8 Almost all tumor cells were positive for CD3 and CD79α. (A: DAPI (blue), CD3 (green), B: DAPI, CD79α (red), C: DAPI, CD3 and CD79α (merge))

Discussion

- ✓ Tumor cells were positive for CD3 and CD79α.
 - Origin of this tumor is lymphocyte.
- ✓ In the spleen, proliferation was mainly in the red pulp. A similar case has been reported in a young rat (Matsushima, 2010).
- ✓ Tumor cells filled the femoral and sternal medulla, showing proliferation similar to myeloid leukemia in the spleen.
 - The bone marrow is suspected to be the primary site.

Conclusion

- ✓ This case was diagnosed as **malignant lymphoma** characterized by **red pulp proliferation** and **co-expression of CD3 and CD79α**.
- ✓ Malignant lymphoma with co-expression of T and B markers has been reported in humans and dogs, but not in rats (Mezzalira, 2025; Raymond, 2000).

This is the first report of malignant lymphoma with co-expression of T and B markers in rats.