

## INTRODUCTION

- The spleen is the **largest of the lymphoid organs**.
- Is located found within the **greater omentum** closely attached to the **greater curvature of the stomach**.
- It is a **dark red haemopoietic organ** that is **not essential** for life.
- The spleen has several functions: **storage of blood, destruction of worn-out red blood cells, removal of particulate matter and production of lymphocytes** (V., & Cappello, M. 2009)

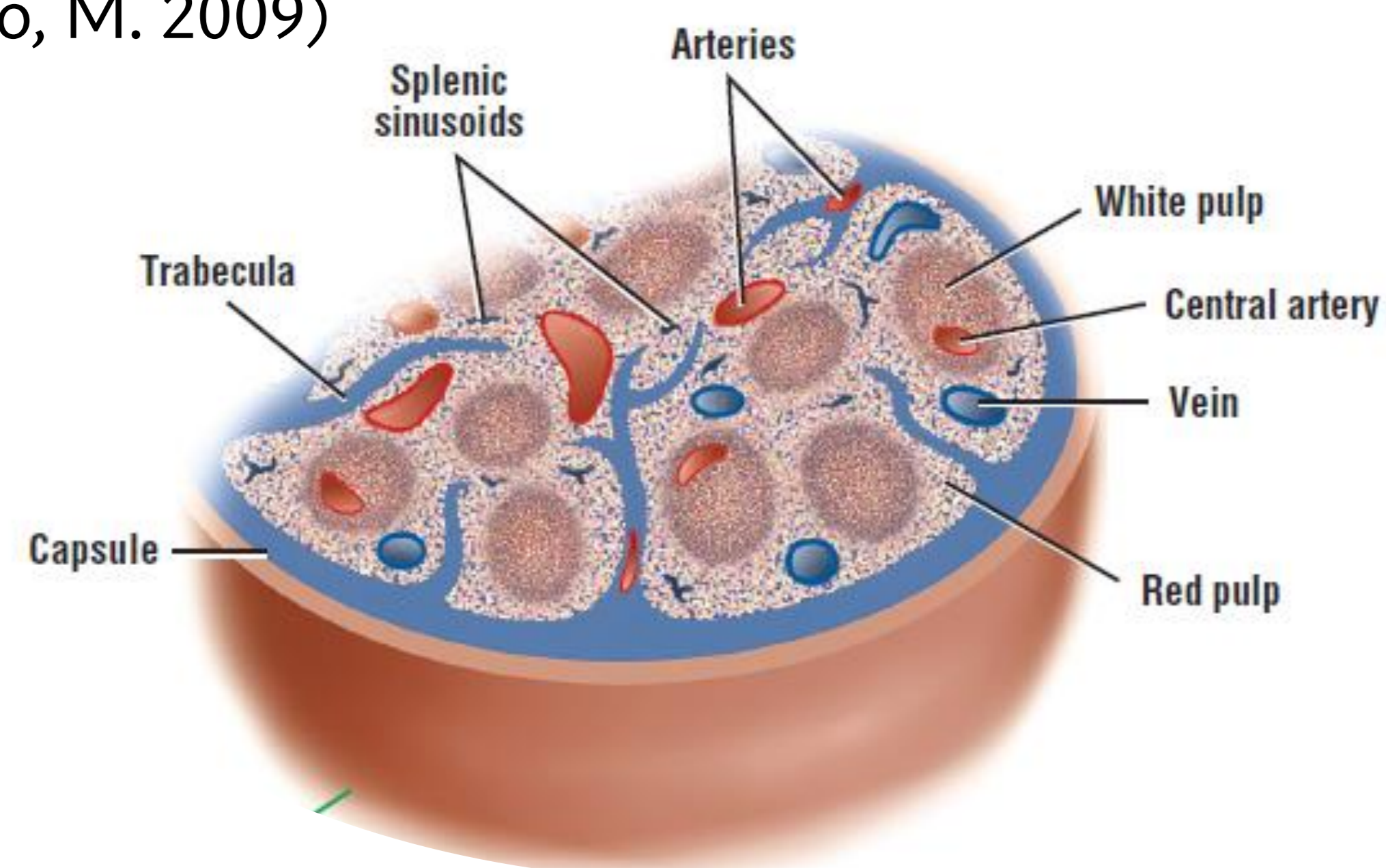


Image extracted from Aspinall, V., & Cappello, M. 2009.

## ETIOLOGY AND PREDISPOSITION

- It has an **unknown etiology**. The primary location is the **spleen**, also secondarily in the **heart, skin/subcutaneous tissue** and **liver**.
- Main affectation in **large or middle-aged breeds** (>10 years) with **breed** predisposition in: **German Shepherd, Setter, Boxer, Golden and Labrador Retriever**.
- Associated risk factors:
  - Hormonal status: **castration**.
  - Genetics: overexpression of **pRB, cyclin D1, Bcl2** and **survivin**, highest expression of **VEGF, PDGF, endothelin-1** in blood and inactivation of the **PTEN** gene.

The biological behavior is **very aggressive, with high metastatic potential and great tissue invasion**; predominant in the omentum, lungs, liver, peritoneum, lymph nodes, adrenal gland, diaphragm and brain, being the **most common secondary intracranial tumor**.

## CLINICAL SIGNS

The symptomatology shown is **wide and variable**, ranging from non-specific signs, such as **apathy, decay and weight loss**, to a picture of **hypovolemic shock** due to **abdominal hemorrhage**. Frequently, due to the state in which they arrive at the emergency room, they require prior stabilization.

## ANALYTICAL CHANGES

### Biomarkers:

- **Serum collagen peptide XXVII**: ↑ in the presence of high metastatic loads.
- **Thymidine kinase**: ↑ in patients with HSA.

<b>Anemia</b>	63-67%
<b>Thrombocytopenia</b>	75%
<b>CID</b>	50%

## FINDINGS IN DIAGNOSTIC IMAGE TECHNIQUES

The most frequent tests that allow staging the tumor are:

- **Chest x-ray**
- **Abdominal ultrasound**
- **Cardiac ultrasound**
- **Electrocardiogram**
- Computed tomography (CT) \*
- Magnetic resonance imaging (MRI) \*
- **Harmonic contrast ultrasound**.\*

\* Rarely used

The classification used is **TNM** and from that exists **3 stages**.

Primary Tumor (T)	
T0	No evidence of tumor
T1	Tumor less than 5 cm diameter and confined to primary tissues
T2	Tumor 5 cm or greater or ruptured, invading subcutaneous tissues
T3	Tumor invading adjacent structures, including muscle
Regional Lymph Nodes (N)	
N0	No regional lymph node involvement
N1	Regional lymph node involvement
N2	Distant lymph node involvement
Distant Metastasis (M)	
M0	No evidence of distant metastasis
M1	Distant metastasis
Stages	
I	T0 or T1, N0, M0
II	T1 or T2, N0 or N1, M0
III	T2 or T3, N0, N1 or N2, M1

Table extracted from Vail et al. 2020.

## ANATOMOPATHOLOGICAL DIAGNOSIS

- **Macroscopical**: poorly defined, not encapsulated and mostly adhered or infiltrated to adjacent structures. They are masses normally filled with blood and/or necrotic tissue.
- **Microscopical**: Use of cytological study with 60% diagnostic certainty. Histologically, many cells with areas of hemorrhage and necrosis ranging from moderate to extensive.

For the **definitive diagnosis**, the **anatomopathological study will be necessary**.

## PARANEOPLASIC SYNDROMES

- **Anemia**
- Erythrocytosis
- **Thrombocytopenia**
- Ventricular arrhythmia
- Tumoral cachexia
- Hypoglycemia
- Fever

## TREATMENT

- **SURGICAL**: splenectomy. Factors to consider: Age, sex, species and breed, weight and body condition.
- **CONVENTIONAL CHEMOTHERAPY**: VAC, VAC-modified, AC, AIDC and Metronomic Therapy protocols
- **TARGETED THERAPY**: Toceranin phosphate and eBAT.
- **IMMUNOTHERAPY**: liposomal muramyl tripeptide phosphatidylethanolamine
- **ALTERNATIVE TREATMENTS**: Chinese medicinal herb, Yunanan Baiyao. polysaccharopeptide.

## PROGNOSIS

**Unfavorable**. There are early metastases, and in most cases micrometastases at the time of primary diagnosis.

	Esplenectomia	Esplenectomia+ quimioterapia
Dobson y Duncan 2014	19 a 86 días	
Story et al. 2019	1 a 3 meses	4 a 6 meses

## CONCLUSIONS

- Potential **object of study**
- **Increasingly wide range of drugs available but with low effectiveness**
- Need for inclusion in the **differential diagnosis** list
- Importance of **early detection**