MALIGNANCY – ASPECTS TO CONSIDER IN HISTOPATHOLOGICAL DIAGNOSIS

S. PAȘCA*, Ozana-Maria HRIȚCU
Ion Ionescu de la Brad University, Faculty of Veterinary Medicine,
8, Mihail Sadoveanu Alley, 700489, Iași, Romania
*corresponding author: email: passorin@yahoo.com

Abstract
The histopathological exam is the most important tool when formulating a diagnosis in tumoral diseases. When we consider the examination of a tumor, the prognosis of the disease often depends of the character of that neoplasia (benign or malignant). To properly evaluate the future behavior of a neoplasia means to carefully observe and characterize several specific features. An abnormal differentiation degree of the cells can sometimes determine the presence of abnormal, monstruous cells, with little homogeneity between tumoral cells and a high rate of anisocytosis, anisokaryosis, anisonucleoliosis, multiple nuclei and various types of indentations or expansions of the structures of the cells. The mitotic index is another factor to take into consideration. A high mitotic index will always indicate a malignancy, and if it is associated with abnormal mitotic figures, the severity of the disease is even worse. Along with a multitude of other factors that need to be evaluated when establishing a diagnosis, from a histopathological point of view, the two mentioned criteria are the ones that need the most attention.
Key words: *tumor, differentiation degree, mitotic index*

Introduction

A tumor is a newly formed tissular mass (Coțofan, 1992). The influence that it has both locally, on the surrounding tissues and organs, as well as generally, on the entire organism, depends mostly on its benign or malignant character. This characteristic can only be determined based on a histopathological examination (Meuten, 2017).

The growth pattern of the tumor can be a first criteria for differentiation. Malignant tumors tend to be more infiltrative, whilst benign ones are better delimited, either through an actual fibrous capsule, or a pseudo-capsule created by the compressed surrounding tissue (Grant, 2016).

The invasion of the circulatory or lymphatic system is another characteristic of malignant cells and this derives from their lack of cohesion and also form their ability to synthesize substances that will create breaches in the blood vessels or lymphatic vessels walls. The result of any type of tumoral dissemination is usually metastasis (Morris, 2001; North, 2009).

Affecting local, regional or distal lymphnodes is another consequence of lymphatic dissemination and interferes severely with the intensity of the immune response (Kumar, 2015).

To establish a correct diagnosis and evaluate the future behavior of a tumor we need to evaluate the differentiation degree of the tumoral cells and the mitotic index. The first criteria shows us how much the mutations have transformed the initial cells so that they not resemble the cells of origin anymore, but also sometimes they do not resemble one another (Klopfeisch, 2016; Meuten, 2017).

The second criteria helps us understand how much that tumor will grow in the nearest future and if the mitosis that already exist will result in normal or abnormal cells (Klopfeisch, 2016; Meuten, 2017).

Materials and Methods

We examined several tumors received at the Laboratory of Anatomic pathology of the Faculty of Veterinary Medicine of Iași. The tumors were fixated in 10% formaldehyde solution, processed using the paraffin inclusion method, sectioned at 5 µm and stained using Masson

trichromic method. The microscopical examination was done using a Leica DM750 optical microscope with included camera.

Results and Discussions

It is clear that as tumoral cells become less differentiated, their ability to behave in an abnormal manner increases. Tumoral cells of epithelial origin may proliferate following more or less the pattern that the original cells would have (Withrow, 2013). For example, this cholangiocarcinoma still has a tendency to respect the arrangement of cells into canals, but already we can see a deviation from that standard, as well as anisocytosis, anisokaryosis, multiple mitotic figures and a variable chromatin pattern (Fig. 1).

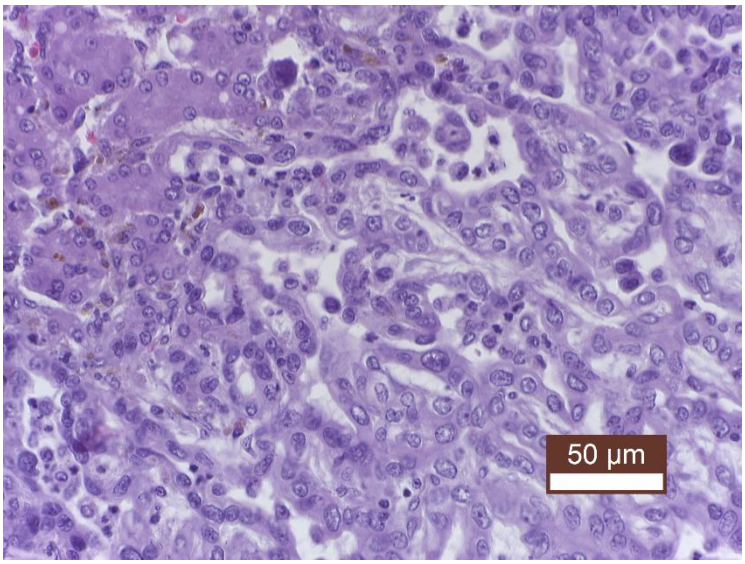

Fig. 1 Anaplasia, dysplasia and multiple mitotic figures. Cholangiocarcinoma. Dog. Masson trichrome stain

The variations between cells within the same tumor may also target the shape of the cells, as well as the size (Baba, 2002). In this image of a fibrosarcoma we can see that neoplastic fibroblasts have both round and spindle shapes (Fig. 2), along with other variations in cellular size, nuclear to cytoplasm ratio and nuclear shape.

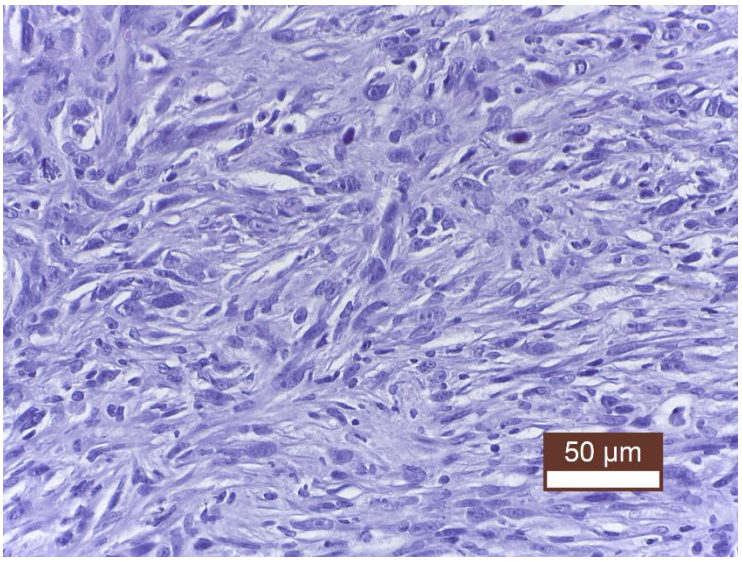

Fig. 2. Variations in cellular size and shape. Fibrosarcoma. Masson trichrome stain

The number, size and shape of the nucleoli can also vary between tumoral cells, along with anisokaryosis and inconsistant chromatin pattern (Fig. 3).

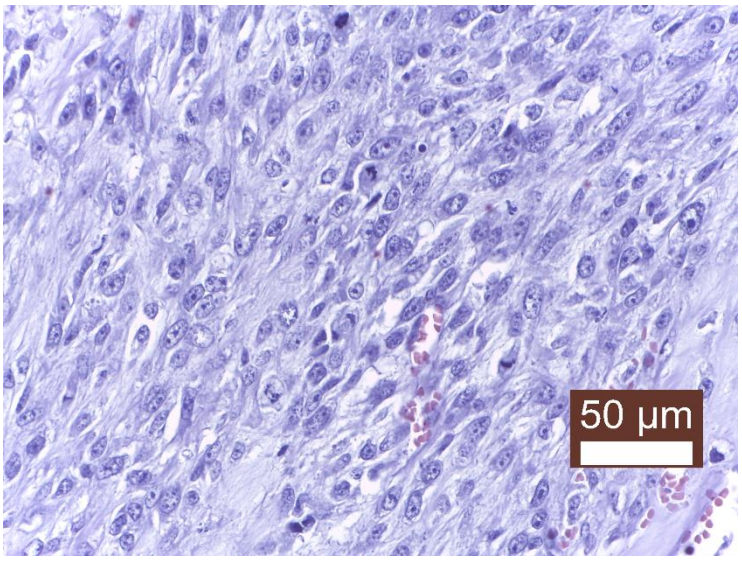

Fig. 3. Cells with variable number of nucleoli, of various shape and size. Fibrosarcoma. Dog. Masson trichrome stain

Another criterion that is almost specific for malignant tumors is the presence of metaplasia (Zachary, 2012; Meuten, 2017). Most of the times we will observe myxoid, cartilaginous or osseous metaplasia in tumors of mesenchymal origin, or corneous metaplasia in those of epithelial origin (Fig. 4, 5).

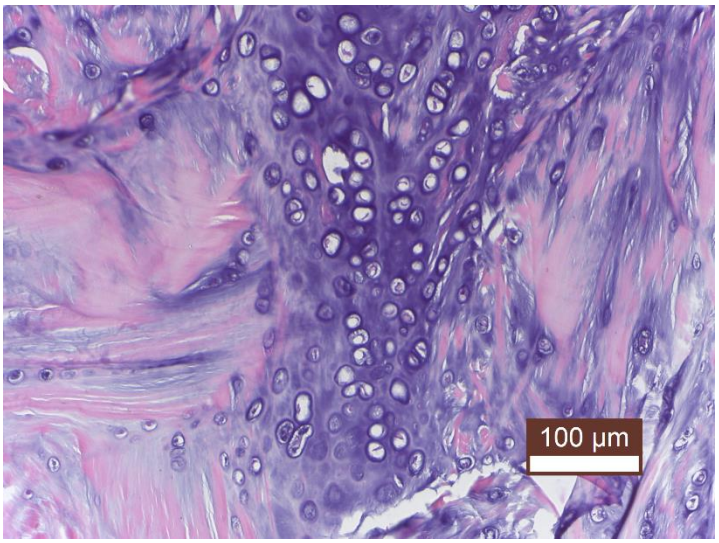

Fig. 4. Fibrosarcoma. Cartilaginous metaplasia. Dog. Masson trichrome stain

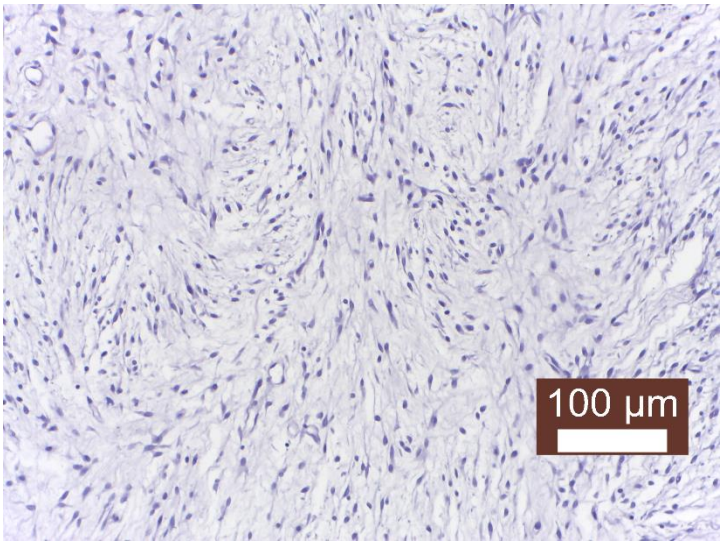

Fig. 5. Myxoid metaplasia. Sarcoma. Dog. Masson trichrome stain

Because of their rapid evolution, malignant tumors can sometimes fail to offer an optimal level of nutrients and oxygen to all their cells, which is why it is not uncommon to find within their structure necrotic areas (Fig. 6) or even mineralized necrotic debris (dystrophic mineralization – Fig. 7).

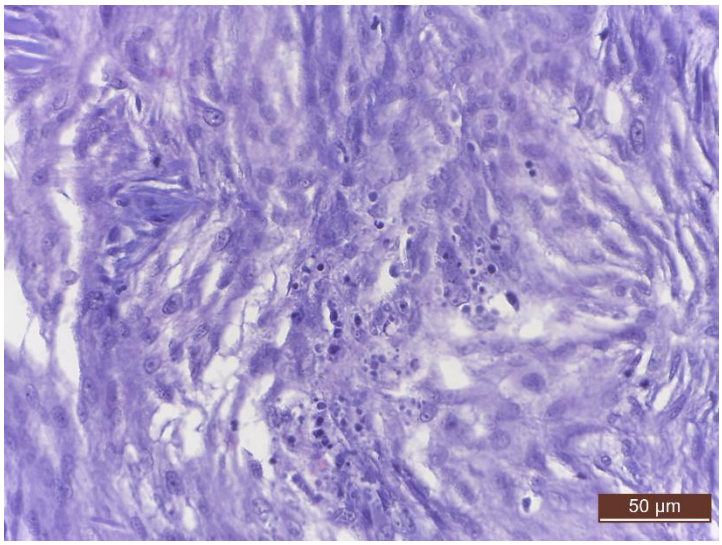

Fig. 6. Mineralization area inside a fibrosarcoma. Dog. Masson trichrome stain

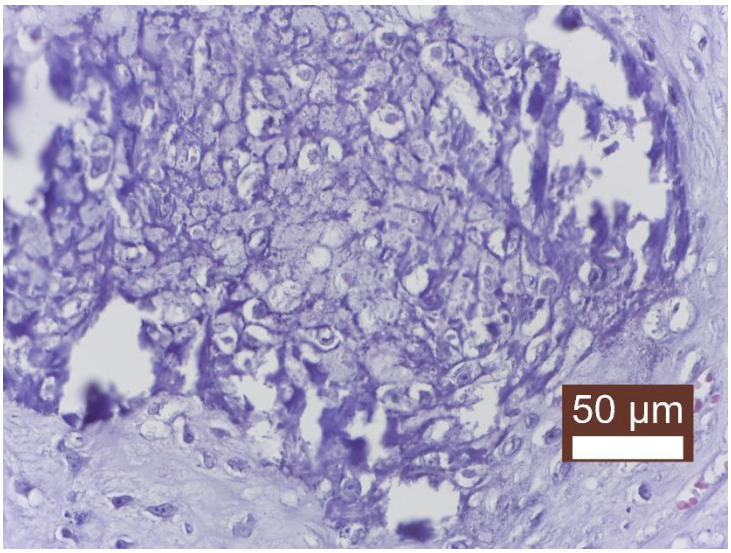

Fig. 7 Mineralization area. Fibrosarcoma. Masson trichrome stain

Conclusions

Although these are not the only criteria that need to be considered when establishing the malignancy of a tumor, the histopathological diagnosis should always evaluate the presence of anaplasia, dysplasia, mitotic figures or metaplasia.

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