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Case report

PATHOMORPHOLOGICAL AND IMMUNOHISTOCHEMICAL FINDINGS IN AN EXTRAMEDULLARY PLASMA CELL TUMOUR IN DOG'S RECTUM

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Summary

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The pathomorphological and immunohistochemical findings of a malignant plasma cell tumour in the rectum of a 12-years old, male Terrier dog are described. Microscopically, neoplastic plasma cells and plasmablasts were detected with hematoxylin-eosin and methyl green pyronin staining methods for nuclear activity. Immunohistochemically, mild positiveness in nuclei was obtained with *p53* and *p63* markers. Plasma cell tumour was considered to be highly malignant according to obtained results from different pathological methods.

Key words: dog, immunohistochemistry, pathomorphology, plasma cell tumor, rectum

Extramedullary plasma cell tumours (EMPT), also called plasmacytomas, are more common in dogs than in cats (Rakich *et al.,* 1989; Head *et al.,* 2002; Rannau *et al.,* 2009). They account for 2.4 % from all tumours in dogs (Trevor *et al.,* 1993; Caruso *et al.,* 2003; Kupanoff et al., 2006) and are often encountered in dogs over 3 years of age (Head *et al.,* 2002). Most commonly affected breeds are the American Cocker, the Spanish Cocker, and Terriers (Vail, 2007). EMPT is localized in the alimentary system, especially in the stomach and guts in humans. The tumour is found as single or multiple masses commonly seen in the large intestine in dogs (Ramos-Vara *et al*., 1998). The neoplastic cells are large, round and ovoid in shape. Nuclei are eccentrically placed, with "clockface" appearance (Arai *et al.*, 1983). Plasmacytomas can be found in skin, mucosa besides at brain stem, spinal cords, lymph nodes and abdominal viscera (Jacobs *et al.,* 2002; Vail, 2007).

The dog, 12-year-old, male Terrier, was referred to the clinic with swelling and impaired defecation complaints. The mass with a part of rectum was surgically removed. The biopsy was submitted to the Department of Pathology, Faculty of Veterinary Medicine in Ankara University for diagnosis. Macroscopical findings were noted. The samples were fixed in 10%

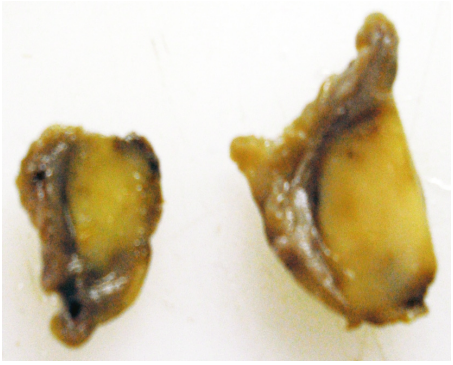

Fig. 1. Macroscopical appearance of cut section of the removed rectal mass.

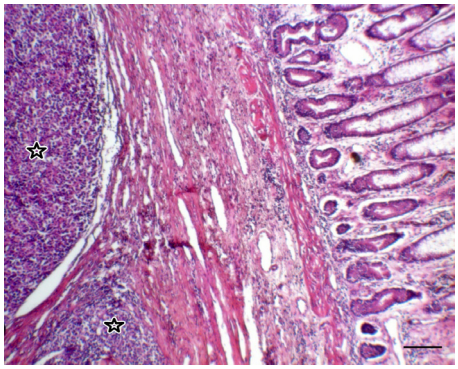

Fig. 2. Anaplastic plasma cells evaded from propria mucosa to tunica muscularis (stars), H/E, bar= 80 µm.

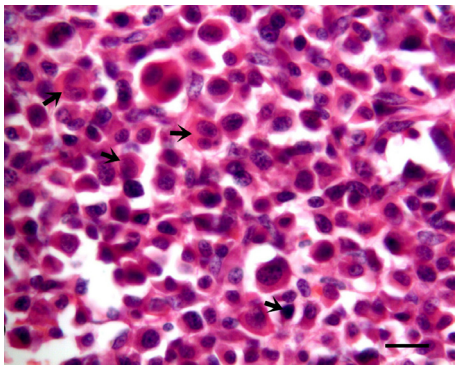

Fig. 3. Plasma cells showing anaplastic features – mitosis, nuclear and cellular pleomorphism (arrows), H/E, bar= 85 µm.

formalin and embedded in paraffin. Sections were cut at 5 µm thickness and stained routinely with haematoxylin-eosin (H&E). Then, methyl green pyronin (MGP) was applied for plasma cell staining. Immunohistochemically, positiveness in avidin-biotin complex peroxidase method (ABC-P) was obtained by using primary antibodies (monoclonal mouse anti targeted *p53* and monoclonal rabbit anti human *p63*) and ABC kit (Dako, Carpinteria, USA). For revealing reaction, aminoethyl carbazole (AEC, Dako) was used as chromogen. The Mayer's haematoxylin was preferred for counterstaining. Sections were mounted with permounting medium and were evaluated under light microscope (Leica, DM 4000 B).

Macroscopically, the mass weighed 1 g and its diameter was 1.5 cm. It had a firm consistency and yellowish colour. Cut section was no excessive (Fig. 1).

Microscopically, numerous anaplastic plasma cells and plasmablasts were observed from propria mucosa into muscle bundles of tunica muscularis and serosa (Fig. 2). The anaplastic cells were round to oval in shape, with prominent cytoplasm and nuclei, because of mitotic activity (Fig. 3). The cells were separated by fine fibrous trabeculae in some areas. Also, mononuclear cell infiltrations composed of macrophages amd lymphocytes were seen multifocally in mucosal propria. In MGP staining, the nuclear activity of anaplastic cells was clearly seen. The nuclei were stained in light green in spite of pink in cytoplasms (Fig. 4). Immunohistochemically, a mild positiveness was detected in most nuclei of plasma cells and plasmablasts with anti *p53* primer sera compared to anti *p63* primer sera (Fig. 5 and 6).

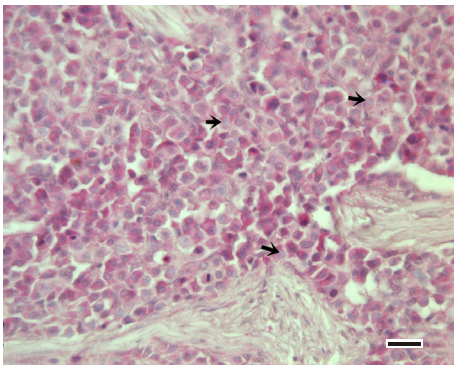

Fig. 4. Nuclear activity of neoplastic cells with light green and pale pink cytoplasms (arrows), MGP, bar=10 μm.

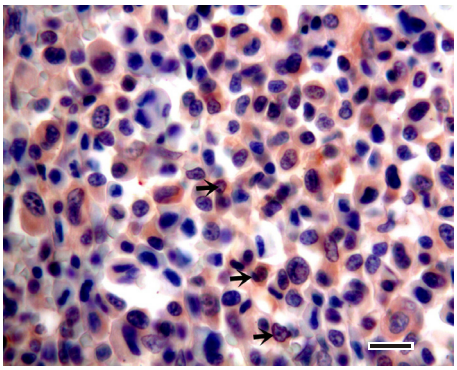

Fig. 5. Moderate positive staining in some nuclei by anti-*p53* sera (arrows), ABC-P, bar= 80 μm.

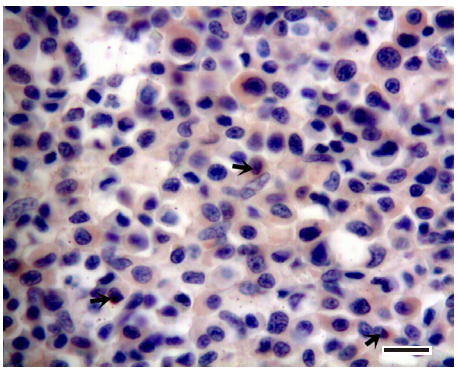

Fig. 6. Mild positive staining in a few nuclei by anti-*p63* sera, (arrows), ABC-P, bar= 80 μm.

In this clinical case, only one mass originating from rectum was observed in the dog. Histopathologically, cytoplasmic granules, haemosiderin, amyloid deposits and hyalinosis are sometimes reported to be found in plasma cell tumours (Arai *et al.*, 1983; Ramos-Vara *et al.*, 1998; Caruso *et al.*, 2003; Rannau *et al.*, 2009). However, such findings were not present in this case. The neoplastic cells were generally composed of eccentrically localized, large, round to ovally shaped, clock face patterned nuclei, some of which with binucleated and highly mitotic figures (Arai *et al.*, 1983). The other histological features of this neoplasm were described as separate to small groups of pleomorphic neoplastic cells by thin fibrous tissue (Caruso *et al.*, 2003). The findings in this case were similar to other reported findings and invaded the rectal muscle bundles. Ramos-Vara *et al.*, (1998) mentioned plasmacytoid giant cells 13–40 μm in diameter with one or multiple nuclei scattered in a common cytoplasm. Similar giant cells were present in some areas in this case. Arai *et al.*, (1983) did not report inflammatory cells including lymphocytes, macrophages and granulocytes. However, contrary to what is documented in previous reports, in this case mononuclear cell infiltrations were encountered in mucosal propria.

Anaplastic features, especially nuclear activity, were evaluated in both H&E and MGP staining. The obtained findings suggested that the EMP tumour was possibly highly malignant. Morever, immunohistochemistry confirmed the malignant potential of the tumour. We believe that immunohistochemistry is of great importance for better understanding of anaplastic traits of plasma cells. It could provide clinicians with information about the prognosis and treatment of the patient.

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