

Gastric Extramedullary Plasmacytoma in a Dog

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Abstract : An eight-year-old, spayed female Shih-tzu, weighing 3.2 kg with a history of chronic intermittent vomiting and unknown pain for four months was referred. In ultrasonography, a small round hypoechoic mass was identified in the gastric wall. Gastric endoscopy showed a solitary raised mass with smooth surface in the pyloric antrum. Surgical resection was performed. Histopathologic findings with immunohistochemical studies showed extramedullary plasmacytoma in the gastric submucosal and muscle wall layer. The patient recovered normally without any complications. The tumor has not been re-occurred after surgical removal, to date.

Key words : dog, endoscopy, gastric, plasmacytoma, ultraonography.

Introduction

Plasmacytoma is a malignant plasma cell tumor. There are two subtypes of solitary plasmacytoma. Solitary plasmacytoma can originate in bone or soft tissues and is referred to as solitary osseous plasmacytoma (SOP) and extramedullary plasmacytoma (EMP), respectively. EMPs are uncommon tumors in dogs (24,26). Gastrointestinal EMPs have been reported to involve the esophagus, stomach, small intestine, and large intestine in dogs (5,11,12,13,18,23). This case was an uncommon report in gastric plasmacytoma. This study may help the diagnosis and treatment of a gastrointestinal extramedullary plasmacytoma in the veterinary medicine.

Case

An eight-year-old, spayed female Shih-tzu, weighing 3.2 kg, was admitted with a four-month history of intermittent vomiting and unknown pain. On abdominal palpation, the patient showed mild pain in the cranial abdomen. All hematological and chemistry test results were within normal range. There were no remarkable findings in the plain abdominal radiographs. There was also no evidence of osteolytic bone lesions as a sign of multiple myeloma.

On the ultrasonography, a round hypoechoic mass was found in the gastric wall. The mass was small (about 1 cm) in diameter and identified as a well circumscribed submucosal nodule. The color Doppler imaging (CDI) study found no abnormal blood profiles around the mass (Fig 1). The rest of gastric wall was intact without wall thickening or loss of wall layering. Other abdominal organs had no typical abnormali-

ties on the ultrasonographic exam. To further evaluate the origin and the exact location of this mass and for surgical plan, gastric endoscopy was performed. A solitary round mass with smooth margin was found in the pyloric antrum and this mass was bulged into the lumen without obstruction (Fig 2). The luminal surface around the mass was intact grossly without any inflammatory signs. Abdominal surgery was performed under general anesthesia. Similarly to the endoscopic results, there was a solitary mass in the pyloric antrum without any necrotic and ulcerated lesions. The tumor was resected with 1 to 2 cm surgical margin. And the wide Y-U advancement pyloroplasty was performed to prevent the pyloric outflow obstruction after surgery. The resected gastric mass was examined histopathologically. Imprint cytology revealed a dense cellularity of round cell tumor morphologically. Histopathology showed round cell infiltration in the submucosal and muscle layer of gastric wall. Immunohistochemistry results were negative for CD3 (T cell marker) and positive for CD79a (B cell marker), consistent with extramedullary plasmacytoma (Fig 3). Furthermore, immunohistochemical staining result using MUM-1 as an immunomarker for cells of plasma cell origin was positive. These results supported a diagnosis of gastric extramedullary plasmacytoma. The patient recovered from surgery without any complications. After surgery, the clinical signs were improved. The patient still maintained good health without evidences of recurrence or metastasis in two years.

Discussion

Plasmacytoma refers to a malignant plasma cell tumor. Plasmacytoma is uncommon in dogs (24,26). Plasmacytoma occurs commonly in older dogs, with a mean age between 9 and 10 years (2,20). Generally there has been no gender and

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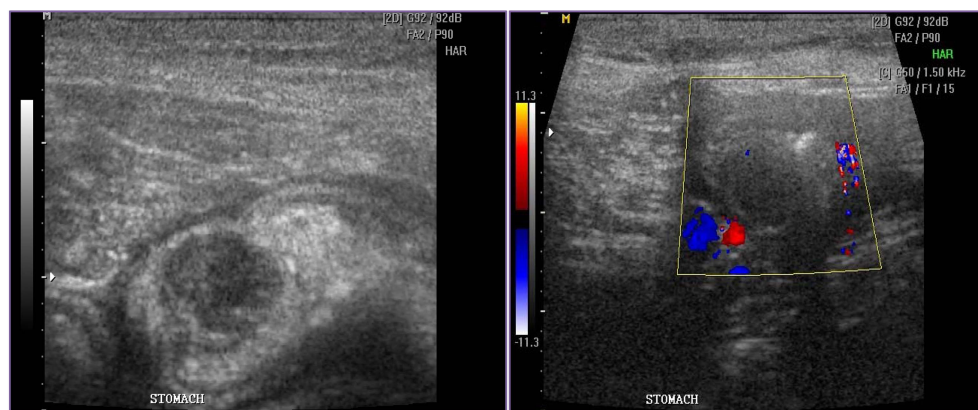


Fig 1. Abdominal ultrasonography. (A) A small round hypoechoic round mass is identified in the gastric wall. (B) The color Doppler imaging (CDI) study found no abnormal blood profiles around the mass.

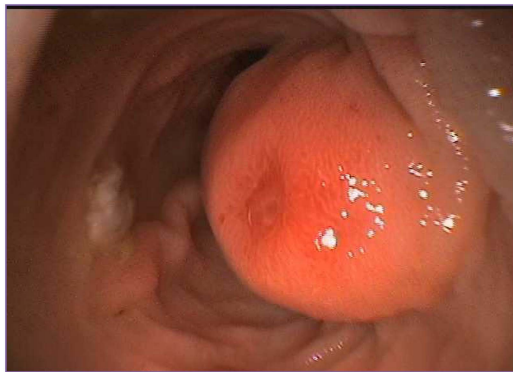


Fig 2. Gastric endoscopy. A solitary small round mass is bulging into the lumen in the pyloric antrum. There is no obstruction. There is no remarkable inflammatory sign in other part of the stomach.

breed predilection, although studies showed that Cocker Spaniels, West highland white terrier, Yorkshire terriers, boxers, German shepherds, and Airedale terriers were more commonly affected (20). Solitary plasmacytoma is divided into two groups according to location. Solitary osseous plasmacytoma (SOP)

and extramedullary plasmacytoma (EMP) involve bones and soft tissues without any signs of systemic spread, respectively. SOP has been reported in zygomatic arch and the ribs in dogs (17). SOP usually progress to systemic multiple myeloma over the course of many months to years. (17). If signs of generalized illness are present concurrently, the possibility of multiple myeloma should be considered (9,20). The most common location of EMP is the skin or mucous membranes, especially the lip, oral cavity, ears, digits, and rectum (2,6,14,16,20,22,27). Noncutaneous EMP may be occurred in the esophagus, stomach, small intestine, large intestine, spleen, genitalia, eyes, uterus, and liver. Stomach, spleen, genitalia, eyes, uterus, and liver are less common sites for plasmacytoma and have been reported in 1% of all plasmacytoma cases (1,5,7-9,11-13,18,23,24,26). EMP rarely develops to multiple myeloma (15).

The clinical signs associated with SOP are pain, lameness, or neurologic signs, depending on the location and transition of lesion (24). EMP is generally small, solitary, smooth, and well-circumscribed, raised pink nodules and often overlooked (24,26). Cutaneous EMP including oral EMP is typically a benign disorder in dogs and is rarely showing clinical signs

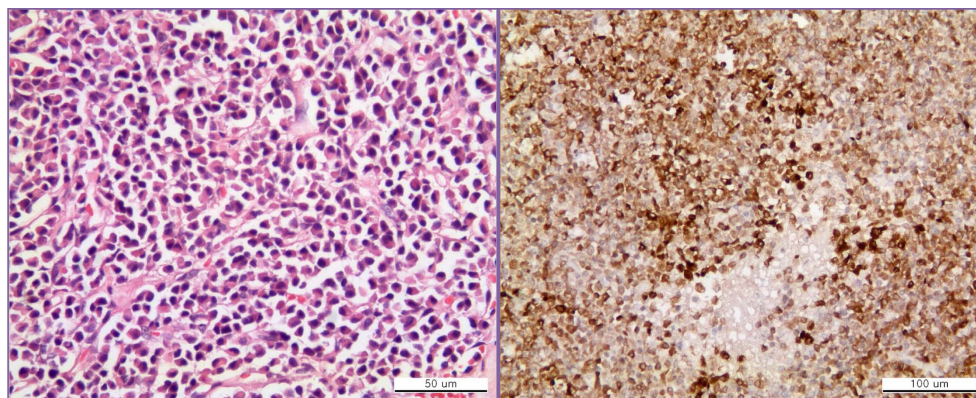


Fig 3. Immunohistochemistry. (A) Neoplastic cells show characteristic appearances such as eccentric located nuclei and basophilic abundant cytoplasm as plasma cell morphology. (B) These neoplastic cells with eccentric located nuclei were mostly positive for B-cell marker.

(2,6,9,19,20,22,27). It can be also common for a dog to develop more than one cutaneous EMP, either at the same time or over a period of time. These tumors are almost always separate primary tumors, rather than spread of a single primary tumor to multiple sites (24,26). Noncutaneous EMP appears to be much more aggressive (24). Noncutaneous EMP shows more common metastasis to related lymph nodes (5,11-13,23). Gastrointestinal EMP produces nonspecific clinical signs including gagging, vomiting, bleeding, hematochezia, tenesmus, and rectal prolapse, depending on the location of the mass (5,11-13,18,23). This patient showed intermittent vomiting and unknown pain for about four months. This dog was examined for these clinical signs; however, there were no remarkable findings in screening tests including hematological and chemistry test and plain abdominal radiography in the referring veterinary clinic. Therefore, this dog was referred in this hospital; a well circumscribed small raised submucosal mass in the pyloric wall was identified on the abdominal ultrasonography. Clinical signs in this dog may be resulted from the location of mass and motility disturbance, although this mass is not large enough to cause the luminal obstruction. In this patient, ultrasonography was important to identify gastric wall mass. The mass was hypoechoic, smooth, and round without any abnormal blood profiles on the CDI. The rest of gastric wall and surrounding lymph nodes were within normal appearance. Ultrasonography is the preferred method of diagnosis of gastrointestinal wall mass because of the ability of evaluation for gastrointestinal wall layering and thickening.

The diagnosis of plasmacytoma requires tissue biopsy. Plasmacytomas are uncommon tumors in dogs, but it is also thought that they may be overlooked and poorly differentiated plasmacytomas may be underrepresented due to misclassification as different tumor types (2,20). Therefore, immunohistochemical studies directed at detecting immunoglobulin light and heavy chains, thioflavin-T, or multiple myeloma 1/interferon regulatory factor 4 (MUM1/IRF-4) are helpful for differentiating the plasmacytoma from other round cell tumors and confirming a diagnosis (3,4,21). Also, PCR techniques can be used to determine the clonality of the immunoglobulin heavy-chain variable region gene (10,24,26). The behavior of plasmacytoma in dogs has no relationship to the degree of histologic atypia or pleomorphism (6,14,16, 19). In the case of this patient, first histopathologic results from two histopathologic laboratories were controversial. Possible lymphoma and plasmacytoma were discussed. Consequently, immunohistochemical analysis for CD3, CD 79a, and MUM-1 was performed. The results were negative for CD3 (T cell marker) and positive for CD79a (B cell marker), and positive for MUM-1. These results were consistent with plasmacytoma. The possibility of multiple myeloma was ruled out through normal plain radiographs and bone marrow evaluation. The diagnosis of plasmacytoma might need bone marrow aspiration, serum electrophoresis, and skeletal survey radiographs prior to initiation of therapy to rule out the possibility of sys-

temic spread, multiple myeloma (24, 26).

Basically, both SOP and EMP are treated with wide surgical resection with good prognosis. No further treatment is necessary if the tumor can be completely removed with clean margins (9). Generally, surgical margin is considered narrow if less than 1 cm of normal tissue is present around the malignant tumor. Wide surgical margin means that 1 to 3 cm of normal tissue is present around the tumor, and radical surgical margin means that more than 3 cm of normal tissue is present around the tumor (25). In the case of this dog, the tumor was resected with 1 to 2 cm surgical margin and wide Y-U advancement pyloroplasty was applied. More than 3 cm surgical margin was impossible because the tumor was located in the small pyloric antrum. If the tumor involves the smaller pyloric canal or pylorus, pyloric resection and gastroduodenostomy may be recommended. Systemic chemotherapy is not initiated unless subsequent systemic spread is identified, although it is controversy among veterinary oncologists as to whether systemic chemotherapy should be initiated at the time of local therapy. Radiation therapy can be used to eradicate the residual cells in the case of incompletely resected tumor or nonsurgical tumor, as these tumors are radiation sensitive. Both cutaneous and noncutaneous EMPs have an excellent prognosis with long tumor-free intervals after surgical excision. Local recurrence or distant metastasis is uncommon. Local recurrence is associated with incomplete margins. Most SOP can develop systemic multiple myeloma, however, disease-free periods is usually long (24,26,27). Long-term follow-up is indicated to detect both local recurrence and systemic spread. In this dog, clinical signs were improved after surgical excision. And this dog is monitored for the possibility of regional recurrence or developing multiple myeloma with plain radiographs and abdominal ultrasonography. The dog shows a good prognosis in two years. This case was a good opportunity to evaluate the uncommon EMP originated in pyloric antrum clinically.

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개의 위에서 발생한 골수외 형질세포종

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요 약 : 암컷, 8년령, 3.2 kg의 시츄견이 간헐적인 구토를 주증으로 내원하였다. 기본 혈액검사 및 방사선 검사에서 특별한 이상 소견은 관찰되지 않았다. 복부 초음파 검사에서 위벽에서 유래한 것으로 생각되는 저에코의 등근 종괴가 관찰되었다. 위 내시경 검사에서 등근 종괴가 유문동 벽에서 내강으로 돌출되어 있고, 종괴 및 주변 점막의 비정상적인 소견은 관찰되지 않았다. 이에 위 종괴 절제술을 실시하였고, 면역 염색을 포함한 조직학적 검사에서 extramedullary plasmacytoma로 진단되었다. 환자는 임상 증상이 개선되었으며, 약 2년 동안 재발 및 전이 소견 없이 건강한 상태이다.

주요어 : 개, 내시경, 위, 형질세포종, 초음파