Diagnostic Exercise

From The Davis-Thompson Foundation*

Case #**254**; Month: **February**; Year:**2025**

Answer sheet

Title: Ectopic thyroid carcinoma in a dog

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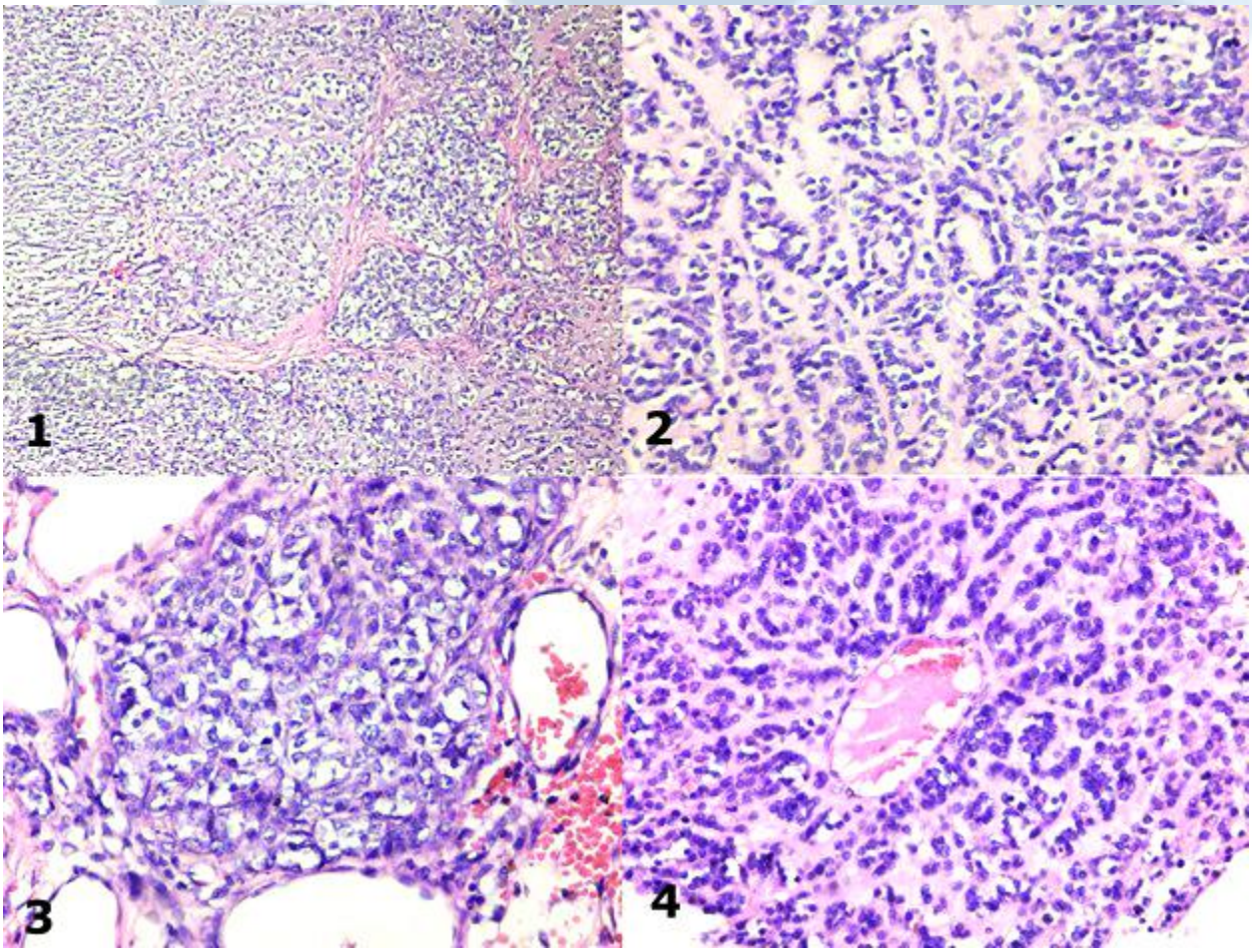
History: An 8-year-old female mixed-breed dog with pericardial effusion was diagnosed with a tumor at the base of the heart. Grossly, the mass was firm, white, and irregular. A sample of the mass (Figs. 1-4) was submitted to histopathology.

Histopathology:



Histologic description:
Microscopic examination revealed an epithelial malignant neoplasia. The mass was poorly demarcated, infiltrative, and multilobulated with cells arranged in solid cellular sheets. The lobules were subdivided by multiple small packets, each surrounded by a scant amount of fine fibrous stroma and capillaries. Sporadic follicular structures with eosinophilic proteinaceous material were observed. Cells were rounded, with a moderate amount of cytoplasm with distinct borders, and centrally located small nuclei with granular chromatin. The mitotic count was 25 in 2.37 mm^2. There were numerous foci of hemorrhage and necrosis. No lymphovascular invasion was observed, but infiltration of the wall of large vessels was noted.

Morphologic diagnosis:
Ectopic thyroid carcinoma

Differential diagnosis:
C-cell carcinoma
Malignant chemodectoma
Mesothelioma

Immunohistochemistry:
Staining for vimentin and chromogranin was negative, ruling out a possible neuroendocrine tumor. Neoplastic cells stained positive for thyroglobulin, consistent with a tumor of thyroid origin.

Comments:
Ectopic thyroid tissue is relatively common in dogs and may occur anywhere from the larynx to the diaphragm. The aberrant tissue can result from failure to descend from the floor of the pharynx to the normal cervical location or from tissue descending beyond its normal adult location. The thyroid is intimately related to the aortic sac in its development, and this explains the frequent finding of accessory thyroid tissue in mediastinal structures. Tumors arising from ectopic thyroid tissue are considered relatively rare. They are often located in the base of the heart or the cranial mediastinum. Distinguishing these tumors from aortic body tumors, which are more commonly found in this location, is crucial. Diagnosis relies on the presence of follicles in the neoplastic tissue and immunohistochemistry analysis. In cats and horses, thyroid carcinoma is rare, whereas in guinea pigs, up to half of thyroid tumors are carcinomas, although they rarely die from this cause. In this species, there is a case report of ectopic carcinoma.

References:

1. Bracha S, Caron I, Holmberg DL, O'Grady MR, O'Sullivan LM, Brisson BA, Stalker MJ. Ectopic thyroid carcinoma causing right ventricular outflow tract obstruction in a dog. J Am Anim Hosp Assoc. 2009; 45:138-41.

2. Campos M, Ducatelle R, Rutteman G, Kooistra HS, Duchateau L, de Rooster H, Peremans K, Daminet S. Clinical, pathologic, and immunohistochemical prognostic factors in dogs with thyroid carcinoma. J Vet Intern Med 2014; 28:1805-13.

3. Kang MH, Kim DY, Park HM. Ectopic thyroid carcinoma infiltrating the right atrium of the heart in a dog. Can Vet J 2012;53: 177-81.

4. Meuten. Tumors of domestic animals, 5th ed, Wiley-Blackwell; 2017. p. 791-799.

*The Diagnostic Exercises are an initiative of the Latin Comparative Pathology Group (LCPG), the Latin American subdivision of The Davis-Thompson Foundation (DTF). These exercises are contributed by members and non-members from any country of residence. Consider submitting an exercise! A final document containing this material with answers and a brief discussion will be posted on the DTF website.

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