



What Is Your Diagnosis?

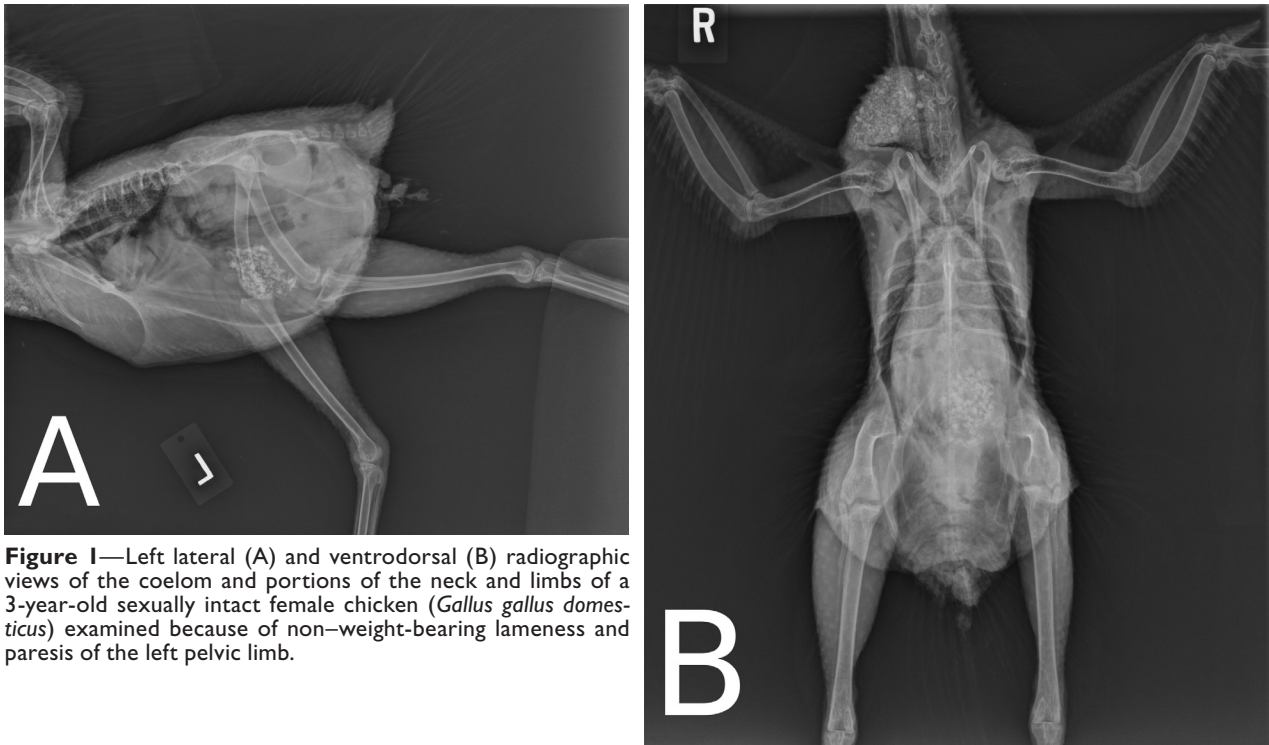


Figure 1—Left lateral (A) and ventrodorsal (B) radiographic views of the coelom and portions of the neck and limbs of a 3-year-old sexually intact female chicken (*Gallus gallus domesticus*) examined because of non-weight-bearing lameness and paresis of the left pelvic limb.

History

A 3-year-old domestic hen (*Gallus gallus domesticus*) was evaluated for acute onset, nonprogressive, non-weight-bearing lameness and paresis of the left pelvic limb. The patient was kept as part of a backyard flock of 7 chickens. There was no history of trauma, and examination by the attending veterinarian prior to referral revealed no external signs of trauma. The owner reported that no abnormalities were observed in terms of the chicken's appetite or defecation.

At the time of referral and hospital admission, the patient had a non-weight-bearing lameness of the left pelvic limb, with minimal motor function, a weak withdrawal reflex, and a questionable deep pain response in the limb. The patient had an overall muscle mass score of 3/3, but with severe muscle atrophy in the left pelvic limb. The coelom was soft on external palpation. A mass near the left kidney was detected by digital cloacal palpation. No abnormalities were detected on CBC or serum biochemical analysis. Radiography of the coelom that included the proximal aspect of the pelvic limbs was performed (**Figure 1**).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page →

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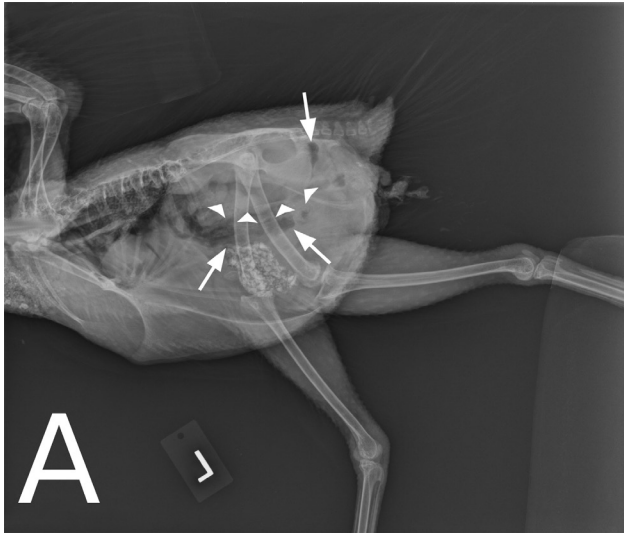


Figure 2—Same radiographic images as in Figure 1. A—Ventral to the synsacrum, a poorly defined and slightly lobulated soft tissue mass is present (arrowheads), compressing the caudal abdominal air sac as well as ventrally displacing the intestines (long arrows). B—The soft tissues surrounding the pelvic limbs are asymmetric in size, with the left pelvic limb being approximately half the size of the right pelvic limb, indicating muscle atrophy (thin double arrows). The hepatic silhouette is mildly wide (wide double arrow).

Diagnostic Imaging Findings and Interpretation

Soft tissues surrounding the left pelvic limb are severely decreased in size, compared with those surrounding the right pelvic limb. Within the caudodorsal aspect of the coelom, ventral to the synsacrum in the location of the renogonadal silhouette, a slightly lobulated, soft tissue opaque mass is present resulting in ventral displacement of the intestines and compression of the caudal abdominal air sac. The hepatic silhouette is mildly wide, and there is poor serosal contrast in the caudoventral portion of the coelom. The lung has a normal reticular pattern. The crop and ventriculus contain a large volume of granular mineral opaque material (**Figure 2**).

On the basis of the radiographic findings, a renal or gonadal mass resulting in sciatic nerve compression, entrapment, or both with neurogenic muscle atrophy of the left pelvic limb was the primary differential diagnosis. The mild widening of the hepatic silhouette was suspected to be a normal variant on the basis of the lack of abnormalities detected on CBC and serum biochemical analysis; however, hyperplasia and displacement of adjacent viscera secondary to the renal-ovarian mass effect were other considerations.

Coelomic ultrasonography was performed to further characterize the coelomic mass. Within the left caudodorsal aspect of the coelom, immediately ventral to the synsacrum, a large (approx 4 X 3 cm), heterogeneously hypoechoic, lobulated mass was evident. Cranially, this mass extended to the level

of the proventriculus, nearly contacting the hepatic margin on the left. The ovary was not identified. The coelomic fat adjacent to the mass was hyperechoic (**Figure 3**). On the basis of ultrasonographic findings, renal neoplasia such as carcinoma was the primary differential diagnosis. Because the ovary was not definitively identified, an ovarian tumor could not be excluded.

Treatment and Outcome

Because of the poor prognosis for return to function of the left pelvic limb, the owner elected to have the chicken euthanized. Necropsy was performed, which confirmed a large (approx 9 X 3.5 X 3-cm) mass that largely effaced and replaced the left kidney. The mass was adherent to the left dorsolateral aspect of the body wall and filled approximately 50% of the coelom. Grossly, the mass was firm, with a mottled red-brown and white coloration. The ovary and oviduct were adjacent to the mass, but were easily separated with minimal dissection. Histologic examination of the renal mass identified a highly cellular neoplasm composed of densely packed sheets of neoplastic round cells with scant eosinophilic cytoplasm, discrete cell borders, round nuclei with a high nuclear-to-cytoplasmic ratio, and > 30 mitotic figures/hpf. Noneffaced portions of the left kidney had dilated tubules with intraluminal debris and increased fibrous connective tissue. Similar neoplastic cells were also identified in the right kidney and lung. The lung also contained aggregates of macrophages with granular intracytoplasmic pigment and particulates expanding the parabronchial walls.

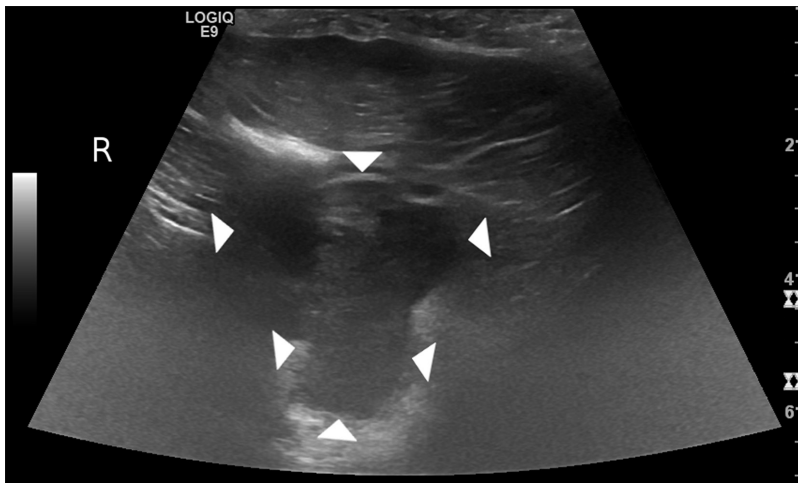


Figure 3—Transverse plane ultrasonographic image at the level of the renal mass of the chicken in Figure 1. A lobulated, hypoechoic mass (arrowheads) is visible with hyperechoic adjacent mesentery. Dorsal is at the top of the image. Image was obtained via a transcoelomic approach with a 15-MHz linear transducer.

The left sciatic nerve contained low numbers of individual and small clusters of mature small lymphocytes. The liver contained small clusters of extramedullary hematopoiesis. Findings on histologic evaluation confirmed lymphosarcoma of the left kidney with chronic interstitial fibrosis, right renal and pulmonary lymphosarcoma infiltration, mild left sciatic lymphocytic neuritis, and pulmonary pneumoconiosis. Immunohistochemical preparation to detect CD3 was performed on additional sections of the renal mass. All neoplastic lymphocytes had intense membranous to cytoplasmic labeling (T-cell phenotype). This constellation of findings was most consistent with a diagnosis of Marek disease secondary to gallid herpesvirus-2 infection with neuritis of peripheral C fibers.

Comments

In avian species, the sciatic nerve courses through the renal parenchyma, which is bordered cranially by the gonads. Because of this anatomic relationship, any disease resulting in renal or gonadal enlargement can result in sciatic nerve compression and subsequent pelvic limb paresis or paralysis.¹⁻³

Renal carcinomas are the most common avian renal neoplasm and can result in a similar presentation to the case reported here.⁴ Other causes of pelvic limb paresis in avian species include trauma, heavy metal toxicosis, and gonadal neoplasms (including ovarian adenocarcinomas and granulosa-theca cell tumors).¹ Prior reports^{2,3,5} include renal adenocarcinoma in a cockatiel with unilateral pelvic limb paralysis, ovarian adenocarcinoma in a budgerigar with unilateral pelvic limb paralysis, and vertebral compression fracture in a bald eagle resulting in bilateral pelvic limb paralysis. The patient in the present report had no history or external evidence of injury to indicate a traumatic cause.

Marek disease results from herpesvirus infection and is commonly associated with lymphoproliferative neoplasms in chickens. The disease is spread through direct, indirect, and airborne routes. The transmissible herpesvirus that causes Marek disease produces mononuclear cellular infiltrates within host tissues. Lymphoproliferation may develop in the iris, skin, and visceral organs. Secondary lesions can result from inflammation, degeneration, or concurrent immunosuppression. The mild lymphocytic sciatic neuritis in the case described in the present report is an example of such a secondary lesion. Marek disease is present in all regions of the world that produce poultry. There is no treatment, but vaccination is available and commonly used in commercial flocks.¹

On histologic examination, lymphosarcoma infiltration and pneumoconiosis were identified within the lungs of the chicken of the present report, lesions that were not identified by radiography. These findings highlight that a normal radiographic appearance of the lung in avian species may not rule out underlying pulmonary disease. It is uncertain whether these lesions would have been visible with cross-sectional imaging such as CT, but similar to other species, clinical staging with advanced imaging may be needed for complete tumor characterization.

The use of radiography in the patient of the present report allowed identification of a soft tissue mass effect in the region of the renogonadal silhouette, which in conjunction with left pelvic limb muscle atrophy and paresis made a renal or gonadal neoplasm likely. Although the air sacs in avian species can restrict ultrasonographic examination of some regions of the coelom, ultrasonography was useful in the patient of the present report to confirm the presence of a mass in the region of the left kidney. These noninvasive tests allowed localization of the cause of the paresis, with neoplasia the most likely differential diagnosis, allowing for an accurate prognosis to be offered to the owners.

References

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