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Unilateral seminoma with multiple visceral metastases in a duck (*Anas platyrhynchos*)

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Unilateral seminoma with multiple visceral metastases in a duck (*Anas platyrhynchos*)

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Summary

A case of unilateral seminoma with visceral metastases in a Mallard duck (*Anas platyrhynchos*) is reported. The right testis was markedly enlarged. The liver surface showed multifocal to coalescent regular circular umbilicated greyish-white spots. In addition, multiple rough whitish nodules were evident on pancreas and visceral peritoneum lining the intestine. Histologically, the right testicular parenchyma was diffusely affected and replaced by neoplastic growth, consisting of sheets of large round to polyhedral cells with conspicuous vesicular nuclei having distinctly granular chromatin and prominent nucleoli. Sheets of cells with similar features were observed also in the other affected organs. Multiple lung metastases were detected on histology. This is the first known report of seminoma with hepatic, pancreatic, pulmonary and peritoneal metastases in a Mallard duck.

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Introduction

Seminoma is a primary testicular tumour, originating from the germ cells. It usually occurs as large unilateral tumour with a well-defined capsule and is composed of loose sheets or compact cords of neoplastic cells interspersed with a delicate stroma (Reece, 2003).

Seminomas have been reported in fowl (Campbell, 1951), ducks, quail and budgerigars (Reece, 2003). Metastasis is not common but has been reported to occur to the liver (Petrak & Gilmore, 1982). A case of unilateral seminoma with metastases to multiple organs is reported in a Mallard duck (*Anas platyrhynchos*).

Results

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Case report. A 3-year-old male Mallard duck (*Anas platyrhynchos*) was reported to be dull and depressed for some days before it was presented for clinical examination. The duck belonged to a flock of 31 free-living Mallard ducks on the banks of the town's canal. No other clinical signs were observed and the bird was euthanatised. On opening the coelomic cavity, the surface of the liver had multifocal to coalescent regular circular umbilicated greyish-white spots. The visceral peritoneum lining the intestine from duodenum to rectum presented multiple rough, greyish-white, 0.5 to 2.5 cm nodular masses. The pancreas appeared similarly affected. The right testis was diffusely enlarged, with the shape retained, measuring 3.5 by 6.0 cm (Figure 1) and weighing 120 g. The testis was firm, smooth and delimited by a distinct capsule, derived from the tunica albuginea. On the cut surface, it had a homogeneous glistening grey/white appearance with scattered areas of discoloration reflecting haemorrhage and necrosis. The left testis was atrophic. No other organs appeared macroscopically affected.

Histological examination. Representative samples from testis, liver, intestine, lung, heart, spleen and kidney were collected, immediately fixed in 10% neutral buffered formalin and routinely processed for histopathology. Paraffin-embedded sections were cut at 4 µm and stained with haematoxylin and eosin.

Histologically, the right testis parenchyma was diffusely affected by sheets of large round to polyhedral neoplastic cells, with conspicuous vesicular nuclei having distinctly granular chromatin and prominent nucleoli (Figure 2). The cytoplasm was scant and palely acidophilic. No multinucleated cells were evident, while mitotic figures were frequent (1-3 per high power field). Multiple necrotic foci were also present. Individual cell necrosis and vacuolated histiocytes scattered in the parenchyma produced a 'starry-sky' appearance. The tubular structure of the parenchyma was completely replaced by the tumour growth with the exception of few marginal zones, where the tubules still retained their normal features. Spermatocytes were not evident in the tubular lumen. The stroma was characterised by delicate fibrillar structure originating from the capsule and contained scattered aggregates of lymphocytes. Neoplastic emboli were observed in the blood vessels of the tunica albuginea, while lamination of neoplastic cells along the external surface of the testicular capsule was indicative of local invasiveness (Figure 3). A similar histopathological picture was observed in tissue sections taken from various locations in the testis.

The liver parenchyma was extensively replaced by multiple well circumscribed nodular infiltrates of neoplastic cells with the same features as described in the testis. Both the subcapsular and the inner part of the organ were affected. Areas of vacuolar degeneration were also present. Scattered nodular neoplastic infiltration of the visceral peritoneum at the level of the duodenal loop left only a small portion of the pancreas unaltered. Most of the pancreas was replaced by neoplastic cell aggregates accompanied by reactive connective tissue proliferation (desmoplasia). The nodules present on the visceral peritoneum lining the

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intestine were composed of neoplastic cells arranged on a delicate fibrillar structure showing the same features already described in the primary tumour. The blood vessels of the muscular tunica and peritoneum of the intestine contained emboli of neoplastic cells. In addition, neoplastic cell proliferation in the form of individual foci or extensive infiltration of the intestine peritoneum was observed (Figure 4).

Neoplastic infiltrates with similar features to those of the primary tumour and of the metastases were microscopically detected in the lung (Figure 5). Multiple small to discrete nodular aggregates of neoplastic cells were scattered throughout the lung lobules. Neoplastic emboli were observed in the lumen of blood vessels. No other organs revealed neoplastic changes on histology.

Based on the histological findings, the cause of the enlarged testis and of the nodular growths on liver, pancreas and visceral peritoneum was diagnosed as seminoma with hepatic, pancreatic, pulmonary and peritoneal metastasis.

Discussion

Seminoma has been previously observed in duck (Ganorkar & Kurkure, 1998), pigeon (Turk *et al.*, 1981), cockerel (Campbell, 1969), budgerigar (Arnall, 1958; Frost, 1961; Beach, 1962), Jardine babbler (Lombard & Witte, 1959), Amazon green parrot (Blackmore, 1965) and collared turtle dove (Rewell, 1948). Bilateral occurrence in black swan (Goto *et al.*, 1986) was also reported. Seminomas have occurred most commonly in birds over 5 years of age and were, therefore, seen more commonly in pet birds (Petrak & Gilmore, 1982). Incidence and importance of neoplasms in poultry can be generally estimated only. The incidence of the neoplasms other than lymphoid tumours appears to be low and of questionable economic significance (Fadly, 2003). In fact, the life span of commercially raised chickens and turkeys

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is generally short and may be less than that required for development of some non-virally induced tumours (Reece, 2003).

Among mammals, seminomas are most common in the dog, in which they are relatively common, but seminoma has also been reported in the stallion, ram, bull, goat, and cat (MacLachlan & Kennedy, 2002).

Seminoma is a malignant neoplasia composed of large uniform cells that resemble primordial germ cells. In spite of its malignant histological appearance, it is usually difficult to judge the malignant potential of this tumour based solely on histological evaluation of the primary neoplasm. The infiltration of tumour cells into vessels or tissues adjacent to the testicle, such as tunica albuginea, epididymis, or spermatic cord is evidence of malignancy (MacLachlan & Kennedy, 2002). In birds, metastasis is not common but has been reported to occur to the liver (Petrak & Gilmore, 1982). In mammals, metastasis often occurs to the regional lymph nodes, but widespread dissemination to internal organs also can occur (MacLachlan & Kennedy, 2002).

This is the first known report of unilateral seminoma with multiple metastases to liver, pancreas, peritoneum and lung, in a Mallard duck (*Anas platyrhynchos*).

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Figure 1. *Neoplastic testis of duck, with liver and visceral peritoneum showing multiple nodular metastases.*

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Figure 2: *Right testis parenchyma was diffusely affected by sheets of large round to polyhedral neoplastic cells, with conspicuous vesicular nuclei having distinctly granular chromatin and prominent nucleoli. Mitotic figures were frequently observed. H&E stain. Bar = 25 μ m.*

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Figure 3. *Neoplastic emboli were observed in the blood vessels of the tunica albuginea, while lamination of neoplastic cells along the external surface of the testicular capsule was indicative of local invasiveness. H&E stain. Bar = 50 μ m.*

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Figure 4. *Neoplastic cell emboli in blood vessels, individual foci in the muscular tunica and extensive infiltration of the peritoneum were observed in the intestine wall. H&E stain. Bar = 50 μ m.*

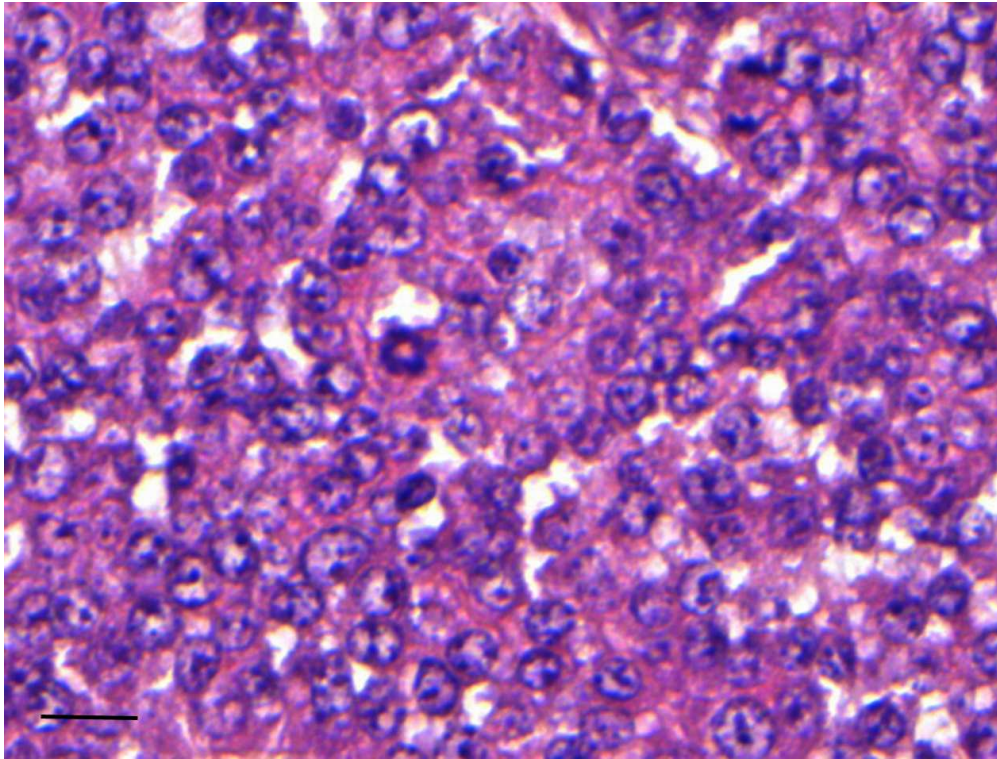
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Figure 5. *Nodular aggregate of neoplastic cells in the lung parenchyma. H&E stain. Bar = 200 μ m.*

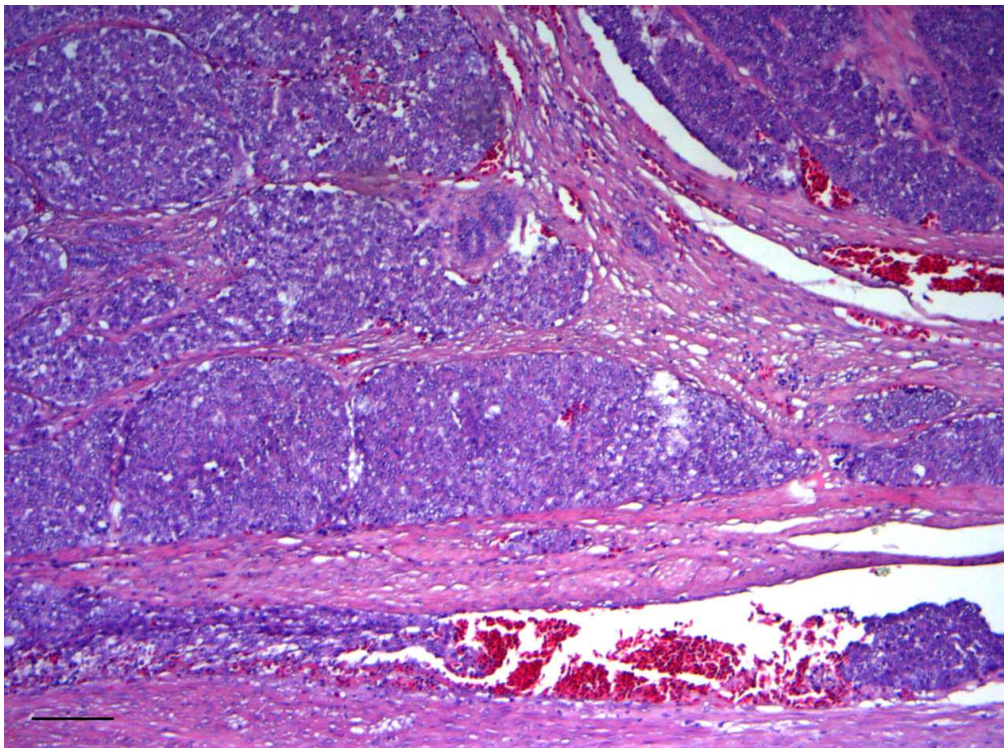
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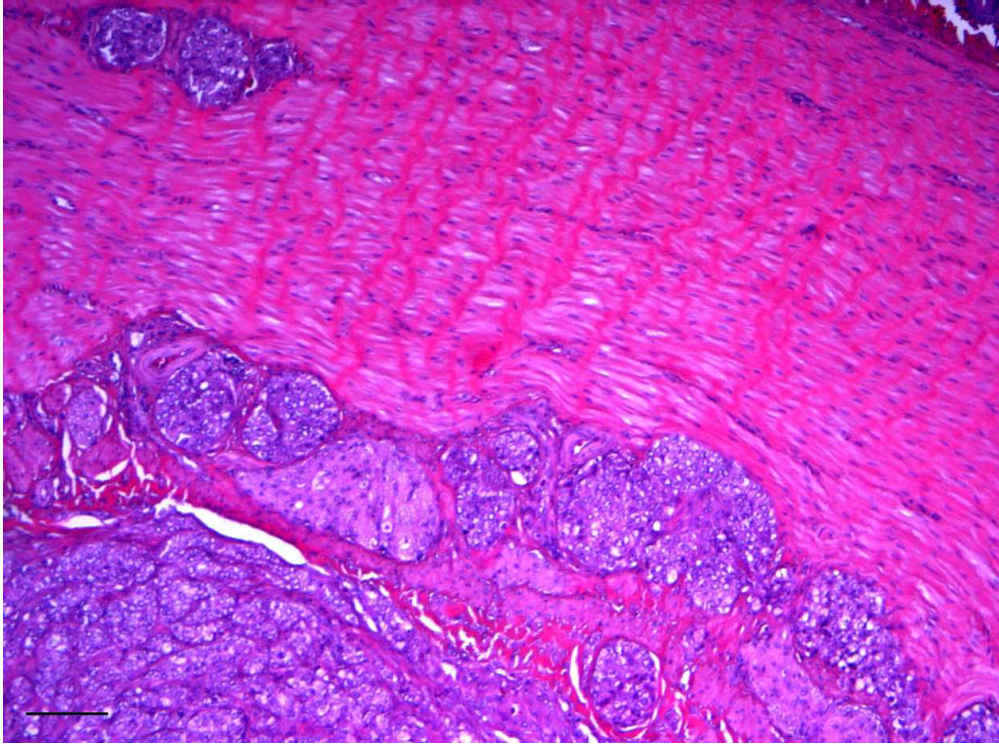
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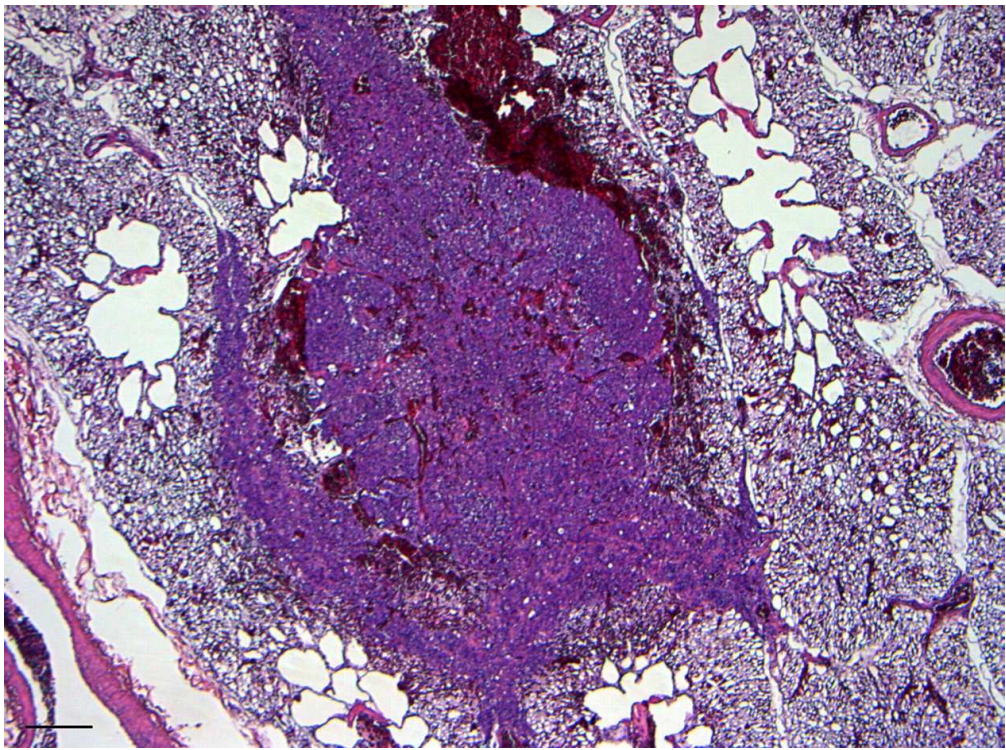
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