

Case Report

Mixed thymic tumor in a rooster: gross and histological features

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Abstract

A 2-year-old rooster local breed suffered from anorexia, emaciation with an abnormal large mass in the lateral side in the cervical region was attended to Veterinary Teaching Hospital belong to College of Veterinary Medicine, Mosul University. After physical examination a movable and friable mass was recognized in the cervical region, the case sends for surgical intervention. Gross examination of the removed mass showed a friable, pale, will capsulated with hemorrhagic areas. Microscopically, the mass included three types of tumors. Squamous cell thymic carcinoma characterized by the presence of keratin pearl. Lymphoma that characterized by atypical polymorphic lymphocytes, vesicular nucleus, and pyknotic nucleoli, while cytoplasm appears eosinophilic to granular with ill-define borders. Lipoma which appears as irregular shape of adipocytes that lack their nucleus, with scattered infiltration of pyknotic lymphocytes. This is the first pathological report of mixed tumor of the thymus gland in rooster that composed from squamous cell thymic carcinoma, lymphoma and lipoma.

Keywords: Rooster, Squamous Cell Thymic Carcinoma, Lymphoma, Lipoma, Thymoma.

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ورم توتحي مختلط في ديك: الخصائص العيانية والنسجية

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الخلاصة

ديك محلي بعمر سنتان اظهر انخفاض في الشهية والوزن مع وجود كتلة غير طبيعية كبيرة الحجم في الجزء الوحشي من المنطقة العنقية، ادخل إلى المستشفى التعليمي البيطري التابع لكلية الطب البيطري بجامعة الموصل. بعد إجراء الفحص الخارجي تم ملاحظة كتلة متحركة هشة في المنطقة العنقية. تم إرسال الحالة من أجل إجراء التدخل الجراحي بإزالتها. اظهر الفحص العياني للكتلة بعد إزالتها أنها عبارة عن كتلة هشة، شاحبة اللون، مع محفظة ومناطق نزفية. أظهرت النتائج ان هذه الكتلة تتكون من ثلاثة أنواع من الأورام. سرطانة الخلايا الحرشفية التي تميزت بوجود الألي الكرياتينية. ورم الخلايا اللمفية الحميد تميز بوجود حالة عدم التماثل وتعدد أشكال الخلايا اللمفية، نواة حويصلية، مع نوية مغلظة، أما هيولي الخلايا فظهر بمظهر حمضي إلى حبيبي مع حدود هيولية خارجية غير قابلة للتمييز. ورم الخلايا الدهنية الحميد ظهر بشكل خلايا دهنية غير منتظمة الشكل فاقدة للنواة، مع ارتشاحات متفرقة لخلايا لمفية مغلظة الأنوية. إن هذا هو التقرير الامراضي الأول لورم مختلط في الغدة التوتحية في ديك والذي يتكون من سرطانة الخلايا الحرشفية، ورم الخلايا اللمفية الحميد وورم الخلايا الدهنية الحميد.

Case History

A 2-year-old rooster weight 3.1 kg of the local breed was referred to the Veterinary Teaching Hospital belong to College of Veterinary Medicine / Mosul University with two months history of upgrowing solid, movable mass at a

lateral position of the left side of the neck associated with anorexia and emaciation. The attended veterinarian had a full physiological examination to the rooster. The veterinarian described a 7 - 8 cm size of friable, freely moving mass, that represented thymus gland at a lateral position of the left side of the cervical region. The

veterinary pathologist sends this case to a veterinary surgeon in the same hospital for surgical excision. The veterinary surgeons anesthetized the rooster then applied complete excision of this mass (Figure 1). Later, the excised mass sends to a veterinary pathologist for more identification of gross and cellular features of this mass, which fixed in 10% neutral buffered formalin (1).

Some represented samples from thymic mass have been taken for histopathological examination. The samples dehydrated in alcohol, cleared in chloroform, infiltrated and embedded in paraffin, sliced by rotary microtome at thickness 5 μ m, uploaded on a glass slide (1). Later, slides were stained with routine Harris hematoxylin and alcoholic eosin (2).



Figure 1: Site of surgical intervention where the thymic mass was excised.

Gross and histopathological findings

The gross examination showed pale to white, well circumscribed, friable, capsulated nodular mass, which was easily divided into smaller pieces when handling with hand. The mass length of about 4 – 5 cm and weight 176 gram (Figure 2).

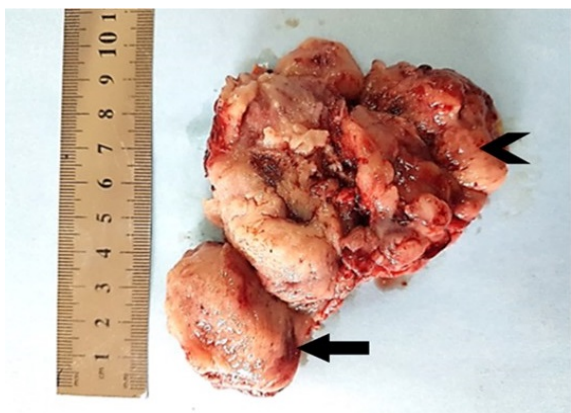


Figure 2: Thymic Mass: a pale thymic mass about 4-5 cm in diameter (arrow), with capsule (arrowhead).

Under the light of the microscope, the tumor mass surrounded by fibrous connective tissue that represented capsule, the corticomedullary junction was absent with area of extensive hemorrhage (Figure 3).

This fibrous tissue extended into thymus lead to thickening in thymic septa (Figure 4), also macrophages laden hemosiderin pigment was recorded (Figure 5).

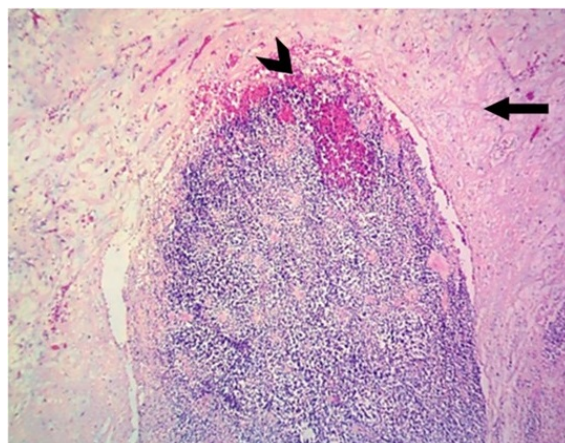


Figure 3: Thymic Mass: surrounded by a thick fibrous capsule (arrow), with an area of extensive hemorrhage (arrowhead). H&E, x100.

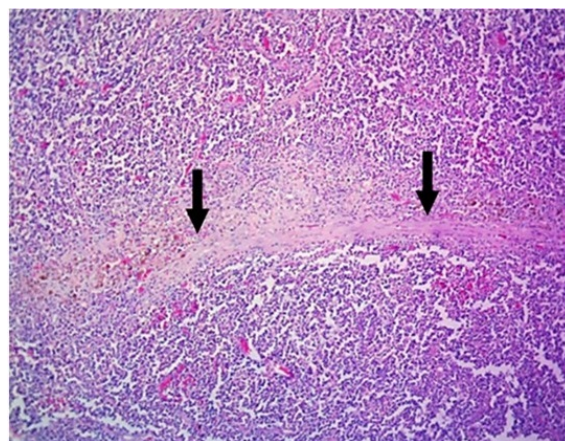


Figure 4: Thymic Mass: thickening of thymic septa (arrow). H&E, x100.

The neoplastic features composed from the wide separation of keratin pearls that described as keratinized elements produced extracellularly by neoplastic epithelial cells (keratinocyte), these keratinized materials were deposited in concentric layer arrangement have an eosinophilic hyaline appearance surrounded by hyperplasia

of keratinocytes, that characterized by a vesicular nucleus with ovoid nuclei (Figure 6).

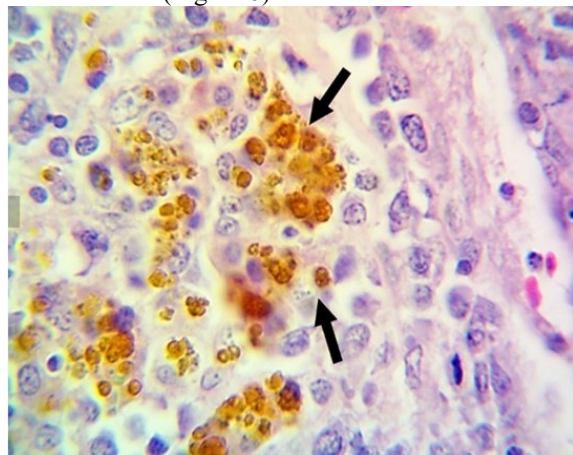


Figure 5: Thymic Mass: hemosiderin pigment (arrow) that engulfed by macrophages. H&E, x1000.

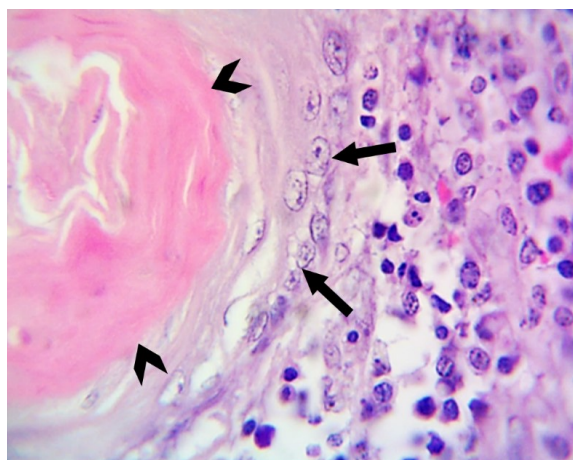


Figure 6: Squamous Cell Thymic Carcinoma: the presence of keratin pearls as concentric layers of keratin deposition of eosinophilic hyaline appearance (arrowhead), with hyperplasia of keratinocytes (arrow). H&E, x1000.

Other type of neoplastic cell that was observed characterized by atypical polymorphic lymphocytes that either oval to spindle in shape, with increased in mitotic figures and karyopyknotic eccentric vesicular nucleus, and prominent one or two pyknotic nucleoli, while the cytoplasm of these neoplastic lymphocytes was abundant eosinophilic to granular with ill- define borders, these neoplastic cells were present scattered into fine fibrous stroma (Figure 7).

Another area of this neoplastic mass showed the irregular shape of adipocytes that lack their nucleus, this feature can consider a benign tumor of adipocyte that

known as lipoma, this type of tumor showed with scattered infiltration of pyknotic lymphocytes (Figure 8).

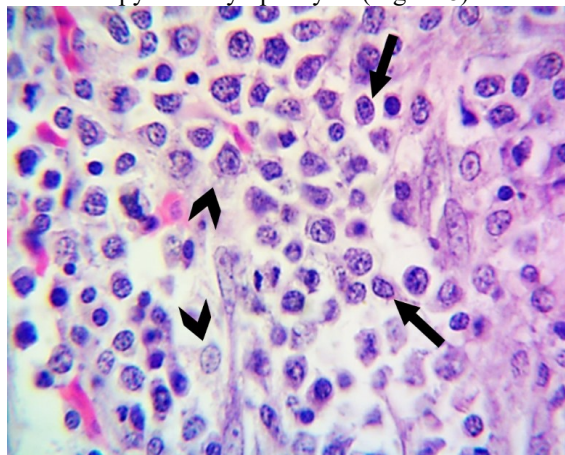


Figure 7: Thymic Lymphoma: atypical polymorphic lymphocytes characterized by karyopyknotic eccentric vesicular nucleus (arrow), with ill- define cell border (arrowhead). H&E, x1000.

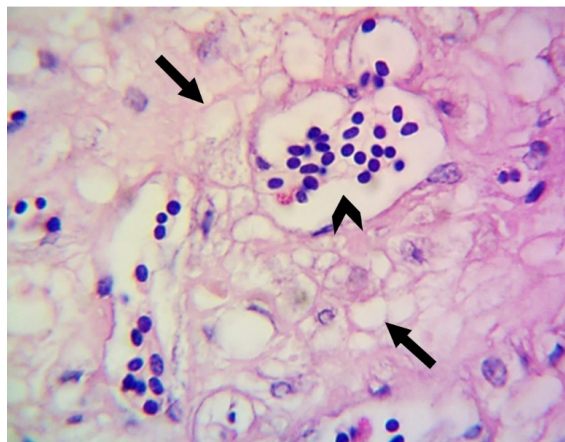


Figure 8: Thymic Lipoma: the adipocytes appear irregular in shape with absent of nucleus (arrow), with scattered infiltrating lymphocytes (arrowhead). H&E, x1000.

This mixed type of tumor in the thymus of both lymphatic and epithelial tissue can be considered as non-invasive poorly differentiated squamous cell thymic carcinoma with lymphoma in association with lipoma. This definitive diagnosis depends upon the presence of characteristic histopathological lesions of squamous cell carcinoma (keratin pearls) with polymorphism of lymphocytes and adipocytes.

Discussion

Thymus in aviary species consist from two lobes at each lateral side of the cervical region, histologically each thymus lobe covered with thin capsule composed from connective tissue, thymus mainly subdivided into cortex and medulla (3). The thymus cortex composed mainly from lymphocytes with less dominant epithelial reticular cells and macrophages (4). While the medullary part of thymus consisted of the epithelial reticular cell more than lymphocytes with the presence of Hassall's corpuscle (5-6).

Thymus tumor reported rarely in ration less than 1.5% in both human and animal species (7). To the author's knowledge, this is the first case report of mixed tumor in the thymus of rooster composed from squamous cell thymic carcinoma, lymphoma, and lipoma.

Other cases of thymic tumor in aviary species were reported previously included; A thymoma in Barred Rock breed rooster (8). An epithelial thymoma was reported in budgerigar (*Melopsittacus undulatus*) (9). Another case of thymoma was reported in female Java sparrow (*Padda oryzivora*) (10). Another case of thymoma was reported in five chickens associated with thymoma caused by Marek's diseases virus infection (11). A thymoma in unspecific species of finch (12). A thymoma in a Burrowing owl (*Athene cunicularia*) (13). A case report of metastatic thymoma reported in the female of Scarlet maca (*Ara macao*) (14).

The only case report of similar types of this tumor mass was reported in Labrador Retriever dog that diagnosed with thymofibrolipoma present in the collagenous stroma (15).

Conclusion

In summary, the characteristic feature of keratin pearls of squamous cell thymic carcinoma was reported in this case are a pathognomic lesion of this type of tumor, in association with characteristic neoplastic changes in both lymphocytes and adipocytes.

Due to the rarity of this type of tumor in thymus in aviary species, a more investigation to suspected thymus masses and advance immunohistochemistry techniques

should be applying to better understand the nature of cellular lesions and neoplastic cell behaviors with emphasizing on the viral causes especially epithelial lymphocytic proliferative viruses as in case of Marek's diseases virus or lymphoid leukosis virus that could associate in initiating and promoting thymus' tumors.

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