

Short Communication / Kısa Bilimsel Çalışma

Oviduct adenocarcinoma with a possible magnal area origin in a budgerigar (*Melopsittacus undulates*)*

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Summary: A female 8-year-old budgerigar was presented a slowly progressive growth at abdominal region. The bird died during surgery. On necropsy, the tumoral mass composed of vesicular/cystic soap bubble-like polypoid masses were seen on the abdominal cavity. The abdominal cavity was completely filled by the mass. The growth, which originated from the oviduct, was histopathologically confirmed as adenocarcinoma. Metastases were not seen in other organs. The oviduct adenocarcinoma in budgerigar has not been reported earlier in Turkey.

Key words: Avian, budgerigar, neoplasm, oviduct adenocarcinoma.

Bir muhabbet kuşunda (*Melopsittacus undulates*) olası magnum bölgesi orijinli ovidukt adenokarsinomu *

Özet: Olguyu karın bölgesinde yavaş olarak devamlı şekilde büyüme görülen sekiz yaşlı, dişi muhabbet kuşu oluşturdu. Kuş operasyon sırasında öldü. Nekropside karın boşluğunda veziküler/kistik sabun köpüğü gibi polipoid kitle görüldü. Karın boşluğu bu kitle ile tamamen doluydu. Ovidukt bölgesinden köken alan kitle histopatolojik olarak adenokarsinom olarak tanımlandı. Diğer organlarda metastazlar gözlenmedi. Muhabbet kuşunda ovidukt adenokarsinomu Türkiye’de daha önce rapor edilmemiştir.

Anahtar sözcükler: Kanatlı, ovidukt adenokarsinomu, muhabbet kuşu, tümör.

Most adenocarcinomas of oviduct of birds originate in the magnal portion of the oviduct, with occasional cases occurring in the uterus and infundibulum (16). Oviduct adenocarcinomas can metastasize via implantation in the abdominal cavity. Metastatic nodules were seen on serosal surface of abdominal organs (6,17). Histopathologically, tumor composed of sheets of anaplastic epithelial-like cells, well formed epithelial tubule or large epithelial lined cyst (17). Adenoma and adenocarcinoma originated from the magnal region of the oviduct are commonly found and well documented in domestic fowls (2, 3, 5, 7, 10,15,17) and turkeys (4), great tit (12), but not in other birds (14). To the best of our knowledge, there is no report of oviduct adenocarcinoma in budgerigar in Turkey. The present study describes oviduct adenocarcinoma of a budgerigar.

A female 8-year-old budgerigar was presented with a six-month history of a slowly progressive growth at abdominal region (Fig.1). The bird died during the exploratory laparotomy was necropsied.

The tumoral mass and tissue samples from the bird were fixed in neutral buffered 10% formalin, embedded in paraffin and stained with hematoxylin and eosin (HE) and Periodic acid-Schiff (PAS). Additional sections were stained by the streptavidin biotin peroxidase technique (SABP; DAKO, Carpinteria, California, USA) using monoclonal antibodies. Monoclonal antibodies included mouse anti-human pancytokeratin (AE1/AE3), mouse anti-vimentin, mouse anti-human desmin, mouse antihuman alpha-smooth muscle actin (ASMA) and mouse anti-cow S100 protein. In addition, immunohistochemistry was conducted to localize estrogen receptor (Clon SP1, NeoMarkers, USA) and progesterone receptor (Clon 1A6, Novocastra, UK). For inactivation of endogenous peroxidase, sections were incubated in 0.3% H₂O₂/methanol for 10 min and rinsed with phosphatebuffered saline (PBS), pH 7.4, at room temperature. All sections were then preincubated in 10% normal goat serum for 30 min at room temperature to block nonspecific binding of the second-step antibody. Sections were reacted with

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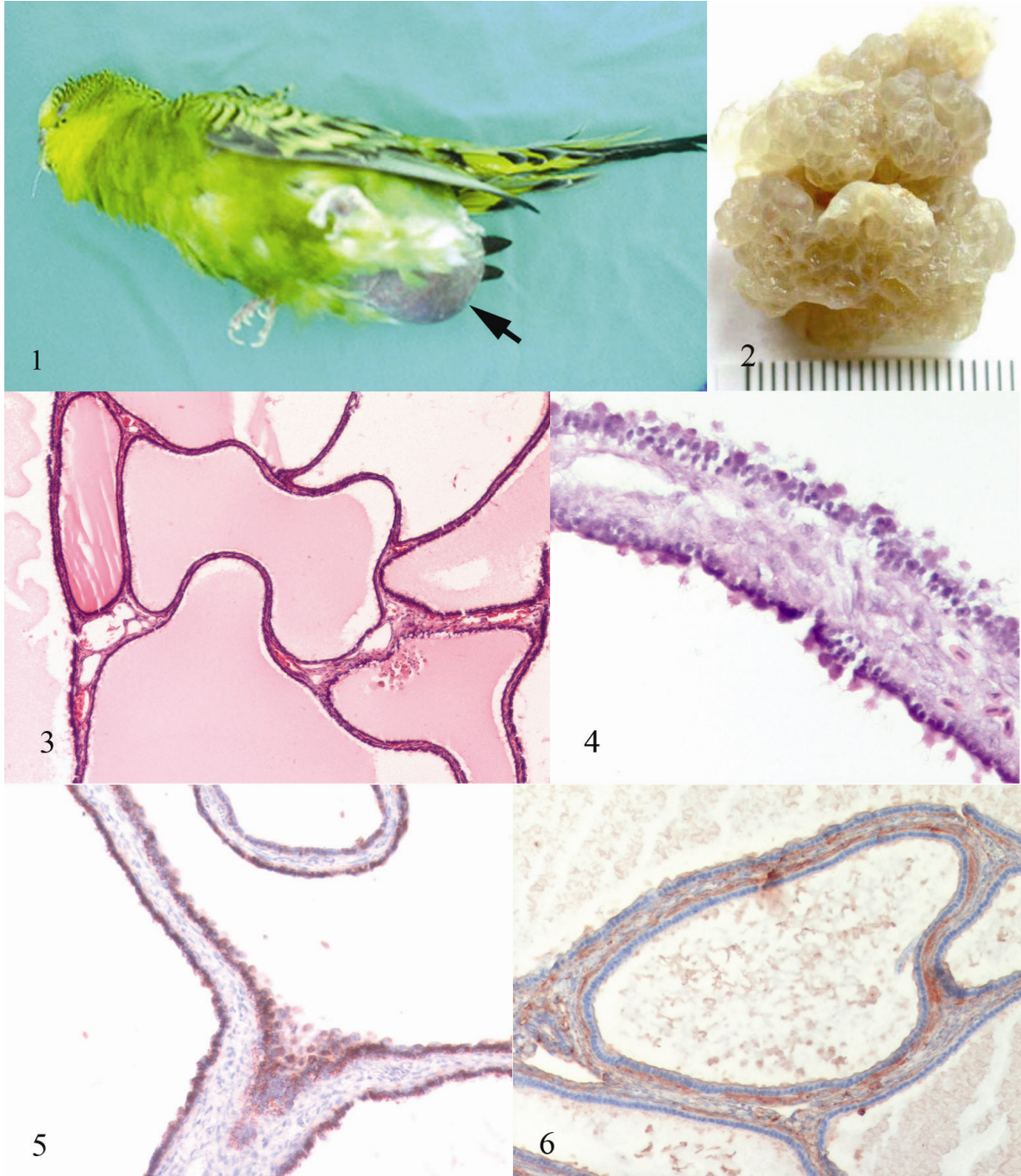


Figure 1. Growth at abdominal region of budgerigar (arrow).

Şekil 1. Muhabbet kuşunun karın bölgesindeki büyüme (ok).

Figure 2. The tumoral mass composed of vesicular/cystic soap bubble-like polypoid masses.

Şekil 2. Veziküler/kistik sabun köpüğü görünümündeki tümöral kitle.

Figure 3. Multiple foci of cystic adenomatoid tissue seen in the tumorous tissue. HE, x80.

Şekil 3. Mikroskopik olarak tümöral dokuda çok sayıda kistik adenomatoid doku görülmekte. HE, x80.

Figure 4. Cystic adenomatoid tissue contained closely packed columnar or cuboidal cells with pale nuclei, including secretory granules in the apical surface. HE, x320.

Şekil 4. Apikal yüzeyinde salgı granülleri içeren soluk çekirdekli prizmatik ya da kübik hücrelerle kaplı kistik adenomatoid doku, HE, x320.

Figure 5. Pancytokeratin immunoreactivity seen in the majority of the glandular epithelial cells which covered cystic structure. SABP method, Mayer's haematoxylin counterstain. x160.

Şekil 5. Kistik yapıyı kaplayan bez epitel hücrelerin çoğunda pansitokeratin immunoreaktivitesi görülmekte. SABP metod, Mayer's Hematoksilen karşıt boyama, x160.

Figure 6. ASMA immunoreactivity seen just beneath the glandular epithelial cells which covered cystic structure. SABP method, Mayer's haematoxylin counterstain. x160.

Şekil 6. Kistik yapıyı kaplayan bez epitel hücrelerinin hemen altında ASMA immunoreaktivitesi görülmekte. SABP metod, Mayer's Hematoksilen karşıt boyama, x160.

primary antibodies overnight at 4 °C and rinsed with PBS. The sections were reacted with biotin-conjugated second-step antibody (DAKO) for 10 min at room temperature and then rinsed in PBS. The sections were then rinsed with PBS at room temperature and reacted with streptavidin-biotin-peroxidase complex (DAKO) for 10 min at room temperature. After another washing with PBS, sections were incubated with diaminobenzidine (DAKO) for 10 min and then counterstained with Mayer's haematoxylin. Negative controls included tissues were incubated with an unrelated monoclonal antibody or normal rabbit serum and second-step antibodies.

The abdominal cavity was completely filled by the tumoral mass composed of vesicular/cystic soap bubble-like polypoid masses. The serosa of the oviduct had only one large tumor. The ovaries were unaffected. All viscera and peritoneum apparently unaffected (Fig. 2). The metastatic foci were not seen in other organs.

Microscopically, tumor masses consisted of multiple foci of cystic adenomatoid tissue contained closely packed columnar or cuboidal cells with pale nuclei, including eosinophilic secretory granules in the apical surface. There were intraluminal pinkish material in the adenomatoid tissue. Adenomatoid structures were surrounded by smooth muscle proliferation and little fibrous tissue (Fig. 3, 4). The secreted material in the lumen of the tumoral acini was PAS negative.

Immunohistochemically, tumor cells were intensely positive for pan-cytokeratin (Fig.5). Immunostaining for pan-cytokeratin were intense, whereas immunostaining for Alfa Smooth Muscle Actin (ASMA) was present in fusiform cells that were scattered between the tumour cells and around the blood vessels (Fig.6). Immunohistochemical stains confirmed the cell of origin as the epithelial cells. Immunohistochemistry was performed to localize estrogen and progesterone receptors, but no reaction was observed.

Neoplasia is a frequent cause of death in pet budgerigars (*Melopsittacus undulatus*), affecting more than 15 % of birds that are examined at necropsy. The most common neoplasms in budgerigars are carcinomas of the kidney, ovary, and testis. In contrast, there is no report on magnal adenocarcinoma in budgerigars (11).

If the organ of origin is not determined, it would be preferable to refer to them as metastatic abdominal adenocarcinomas of unknown origin (16). However, metastatic abdominal adenocarcinomas, probably of oviductal origin, have been reported from any other avian species (14).

Anjum et al. (3) stated a significant association between the presence of magnum tumors and laying in fowls. Moreover, magnum tumor cells possess estrogen

and progesterone receptors and likely to be under hormonal influence (2).

Oviduct adenocarcinomas generally originate from the magnum of the oviduct (5,7,8) and rarely from infundibulum and uterus (6,15). Based on literature (10,15,18,19), presence of secretory granules in the tumor cells, which is not the feature of ovarium adenocarcinomas, and presence of PAS negative secreted material in the lumen of the acinus indicated that the tumor was oviduct originated.

Oviduct adenocarcinomas exhibit strong malignancy. The tumor cells can reach the abdominal cavity invading through the musculature even if the primary foci are very small (6). Spreading by implantation, the tumor can cause multiple metastatic nodules on the serosa of the abdominal organs as a consequence of such an invasion capacity (6,15,19). In the present case, it was seen that the tumoral mass filled in almost the entire abdominal cavity; however, no metastatic nodules were observed on the abdominal serosa.

It is known that magnal adenocarcinomas are originated from the albumin secreting glandular epithelia located in the lamina propria at the oviduct (8,10,18). In this study determined as glandular epithelia originated as they exhibited intracytoplasmic eosinophilic granules, the tumor cells found in the present study often exhibited features of glandular acinus and invaded in all layers of the oviduct.

Our microscopic evaluation of the primary foci of the tumor indicated that smooth muscle proliferation and little fibrous tissue was seen in the stroma. Such microscopic findings are compatible with those of the literature (6,15,18,19). Fredericson and Helmboldt (1991) reported that hyperplasia of smooth muscle cells develop as a consequence of penetration and invasion of tumors into the tunica muscularis of the oviduct (6).

Immunohistochemical studies showed that adenocarcinomas of the oviduct contained ovalbumin (9) and retained their receptors for estrogen and progesterone (1,13). Oviduct adenocarcinomas were estrogen responsive; their growth was maintained by potent estrogens and suppressed by anti-estrogens (4). The immunohistochemistry for various hormone receptors including the estrogen and progesterone receptors in the present tumor was applied, but there was no positive signal for the estrogen and progesterone receptors. Negative immunostaining for the estrogen and progesterone receptors may have resulted from a lack of reactivity to the avian species of antibodies used in this study.

The present case was diagnosed as oviduct adenocarcinoma with possible magnal area origin because of the fact that it was originated from oviduct, literarily compatible with cystic adenomatoid tissue, PAS negative secreted material in the lumen of the tumoral

acinus, immunohistochemically pancytokeratin immunoreactivity in the majority of the luminal epithelial cells and ASMA immunoreactivity in stroma just beneath the glandular epithelial cells covered cystic structure coherent with oviduct adenocarcinoma. Also, it was concluded that it might be originated of magnum as it contains secretory granules in the apical surface of glandular epithelial cells. On the other hand, the fact that there was no positive immunoreactivity for estrogen and progesteron receptor was found to be suspicious.

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