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Clinical Report

Renal Adenocarcinoma in a Sheep: Surgical and Histopathological Findings

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Abstract

Case Description- On 23 July 2007, a four-years-old ewe, was referred to Veterinary Clinic of Tabriz Islamic Azad University. The clinical examination revealed lethargy, weight loss and hematuria in clinical examination. Left kidney in external palpation was painful, enlarged and abnormal.
Treatment and Outcome- Laparotomy was done for exploratory diagnosis. In laparotomy the left kidney was obviously tumoral. Inspection of abdominal viscera revealed no abnormality. Unilateral nephrectomy was carried out on this animal by local anesthesia after sedation. Histologically, we diagnosed a renal cell carcinoma.
Clinical Relevance- As clinical signs of renal cell carcinomas described in humans may or may not be present in domestic and laboratory animal species the only way to find out if a mass is a tumor, could be by doing an exploratory laparatomy, with a biopsy and histological examination. This is an easy procedure that can be performed on a sedated sheep with the help of local anesthesia. We propose radical nephrectomy to the treatment of choice for nonmetstatic renal cell carcinoma.
Key Words- Adenocarcinoma, Kidney, Nephrectomy, Sheep.

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Case Description

On 23 July 2007, a four-year-old ewe with clinical signs of emaciation, lethargy, severe weight loss, anorexia, clinically hematuria along with unsuccessful previous medical treatment, was presented to Veterinary Clinic of Tabriz Islamic Azad University. Its total weight was 39 kilograms as well as temperature and respiratory rate were not clinically abnormal, but heart rate was slightly increased (104 pulse in minute). Anemia characterized based on clinical examinations. Left kidney in external palpation was painful and appeared to be enlarged and abnormal. The ewe was subjected for exploratory laparatomy to confirm the tentative early diagnosis.

Treatment and Outcome

Surgery was performed in position of right recumbency, Xylazine hydrochloride (Xylazine 2%, Alfasan, Worden-Holland, 0.2 mg/kg, IM) used for sedation and Lidocaine hydrochloride (Lidocaine-HCL 2% with adrenaline, Alfasan, Netherland) used for local anesthesia. The left flank was prepared for surgical procedure and paralumbar fossa approach was used1. In laparatomy the left kidney obviously was enlarged. Inspection of abdominal viscera revealed no abnormality. Unilateral nephrectomy was carried out on this animal. Surgical incision was sutured routinely and post operative treatment was carried out with Penicillin Streptomycin (1000000 Penicillin G Procaine + 1 gr Streptomycin, Nasr, Iran, 20000 IU/kg, IM) for five days after operation. Following the nephroctomy, tumoral kidney was bisected. On cut surface, tumoral mass had occupied one pole of kidney with dark areas of hemorrhage. The general appearance of neoplastic mass was pale yellow, and its diameter was recorded (D1: 43mm & D2: 28mm) (fig. 1).

For identification of this tumor histopathologically, representative sections of the tumor were fixed immediately in 10% neutral buffered formalin, processed routinely, and embedded in paraffin. Tissue sections were cut to 4 µm thickness and stained with hematoxylin and eosin.

On histological examination, we saw replacement of the normal renal tissue by a population of cuboidal, columnar to polyhedral epithelial cells arranged in tubules, papillary projections and occasional sheets (Fig 2). The cells had round, oval to pleomorphic vesicular nuclei. Occasionally some of these cell possessed hyperchromatic nuclei. Mitotic figures were numerous (Fig 3). There was a fibrovascular stroma and scattered hemorrhage within the left kidney although. There was no evidence of vascular or lymphatic invasion. These findings suggested a renal cell carcinoma tumor.

Two months after surgical treatment, ultrasonograghic examinations of abdominal and thorasic cavity were carried out on treated animal and no abnormality was detected. Clinically, the animal was also in normal situation.

Figure 1: Tumoral kidney, a pale yellow mass is seen on one pole of the kidney.

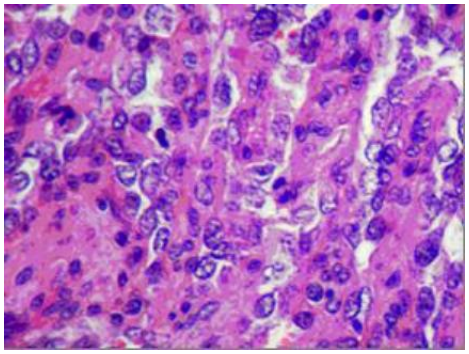

Figure 2: Microscopice appearance of renal cell adenocarcinoma. Neoplstic epithelial cells arranged in tubules, papillary projections and occasional sheets (H&E, ×100).

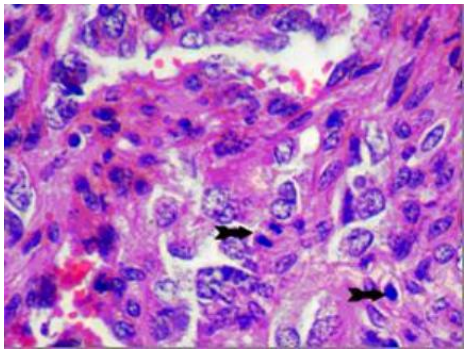

Figure 3: Microscopice appearance of renal cell adenocarcinoma. Mitotic figures (arrows) are numerous (H&E, ×120).

Discussion

The prevalence of primary renal neoplasm in domestic animals is less than one percent of total neoplasm reported. They are usually unilateral and can be of epithelial, mesenchymal, or embryonic origin.[2,3] Adenocarcinoma of the kidney arises from renal tubular epithelium.[4] Renal carcinomas are the most common primary renal neoplasm and occur most frequently in older dogs.[2,5] Primary carcinoma of the kidney can be found occasionally in sheep and must be distinguished from metastatic tumor nodules.[4,6] Interestingly, the etiologies of renal cell carcinoma vary in domestic and laboratory animal species.[3] In domestic animals and some laboratory animal species, the development is spontaneous and age-related. However, in many laboratory animal species there are cases in which toxins or oncogenic viral agents, as well as prolonged estrogen administration have been implicated as etiologic agents. The Ecker rat is a useful model for hereditary renal cell carcinoma.[7-9] The neoplasm is usually large (up to 20 cm in diameter), spherical to oval, nodular or lobulated and may completely replace the normal renal tissue. The masses often are pale yellow; contain dark areas of hemorrhage and necrosis.[2,4] Neoplastic cells form solid sheets, tubules, or papillary growth patterns, but these tumor cells are more atypical and anaplastic. Cells vary in shape from cuboidal, columnar, to polyhedral, vary in size and have clear or granular eosinophilic cytoplasm. Nuclei range from small, round, granular,

and uniform to large, oval, vesicular and pleomorphic. Mitotic figures are numerous. These neoplasms have a moderate fibrovascular stroma.[2]

Based on this study, early diagnosis of renal cell carcinoma is essential to prevent metastasis and development of some other clinical manifestations. In this way, clinical signs of renal cell carcinomas described in humans may not be present in domestic and laboratory animals, and may be vague and nonspecific for kidney disease.[10] It seems that the only practical way to find out if the mass is a tumor, especially in large animals, is performing the exploratory laparatomy along with a biopsy and histological examination to define of tumor and determination of prognosis. This is a begnin procedure that can be performed on a sedated sheep with the help of local anesthesia. However, the radical nephrectomy as a treatment of choice for nonmetstatic renal cell carcinoma is suggested.

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چکیده

آدنوکارسینوم کلیه در یک راس گوسفند: یافته‌های جراحی و هیستوپاتولوژی

داریوش مهاجری[1]، غفور موسوی[2]، یوسف دوستار[1]، علی رضایی[2]، غلامرضا اسدنسب[2]

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توصیف بیمار- در تیرماه ۱۳۸۶ میش ۴ ساله‌ای با علائم بالینی ضعف، کاهش وزن و خون‌شاشی به درمانگاه دامپزشکی دانشگاه آزاد اسلامی تبریز ارجاع داده شد. کلیه چپ حیوان در ملامسه از بیرون دردناک، بزرگ و غیر طبیعی بود. به‌منظور تشخیص عمل لاپاراتومی اکتشافی بر روی حیوان انجام شد.

درمان و نتیجه آن- در لاپاراتومی اکتشافی کلیه چپ مشخصاً توموری بود. بافت‌ها و اندام‌های مجاور کلیه مبتلا از لحاظ متاستاز در معاینه محوطه شکمی سالم بودند. نفرکتومی یکطرفه بعد از ایجاد تسکین و بیحسی موضعی بر روی حیوان انجام شد. در آسیب شناسی بافتی آدنوکارسینوم کلیه مورد تأیید قرار گرفت.

کاربرد بالینی- از آنجائیکه علائم بالینی که در موارد کارسینوم کلیه انسان مطرح است، ممکن در حیوانات اهلی و آزمایشگاهی قابل مشاهده نباشد، لذا لاپاراتومی اکتشافی، بیوپسی و آسیب‌شناسی بافتی تنها راه تشخیصی در اینگونه موارد هستند. لاپاراتومی اکتشافی ساده‌ترین و عملی‌ترین روشی است‌که می توان با بیحسی موضعی انجام داد. بنابراین انجام نفرکتومی رادیکال به‌عنوان راهکار انتخابی در موارد آدنوکارسینوم غیر متاستاتیک کلیه توصیه می‌شود.

کلید واژگان- آدنوکارسینوم، کلیه، نفرکتومی رادیکال، گوسفند.