UNILATERAL URETERONEPHRECTOMY FOR THE SURGICAL MANAGEMENT OF RENAL CARCINOMA IN DOG

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A twelve-year-old male Labrador retriever dog was presented with history of dullness, inappetence and progressive abdominal distension over a period of six days. On physical examination, a large hard mass was palpated in the abdomen. Hematobiochemical examination revealed anemia, leukocytosis, increased creatinine, blood urea nitrogen level and hypoalbuminemia. Ultrasonographic examination revealed a large hyperechoic mass with multiple anechoic to hyperechoic pockets in the left side of the abdomen leading to presumptive diagnosis of cystic tumor of kidney. The right kidney appeared to be normal and thoracic radiograph showed no signs of lung metastasis; therefore, exploratory laparotomy was planned. Under general anesthesia, midventral laparotomy was performed. Unilateral ureteronephrectomy of the massive mass, weighing about 1.3 Kg of left kidney was performed. Postoperatative treatment included fluid therapy, supportive medications and renal diet was recommended. Histopathology results confirmed that tumor was renal carcinoma. The animal showed good recovery immediately and survived only for two months.

Keywords: Labrador retriever, Renal carcinoma, Renal tumor, Unilateral ureteronephrectomy.

In dogs, renal neoplasia, severe trauma, renal or ureteral calculi, infections, ureteral anomalies, and severe hydronephrosis are the most typical causes requiring nephrectomy (MacPhail and Fossum, 2019). Renal neoplasia can be either primary or secondary tumor, metastasis from primary site to other parts of the body. In domestic animals, renal carcinoma is a rare tumor, but it is the most common primary renal tumor in dogs, cats and horses, with incidence ranging from 0.3-1.5 per cent in canines. It is mostly reported in middle to old age male dogs with mean age of 8 years (Meuten and Meuten, 2016). Physical examination may reveal palpable mass in the abdomen. Animals often show non-specific systemic clinical signs such as inappetence and weight loss. Urinalysis may show proteinuria and haematuria. Ultrasonography and radiography are useful imaging modalities for diagnosis that may reveal presence of mass in the renal field (Chung *et al*., 2014). Definitive diagnosis can be made with histopathogical identification of neoplastic cells and to determine the type of tumor. The present paper describes the surgical management of the renal carcinoma by unilateral ureteronephrectomy.

Case history and Observations

A twelve-year-old male Labrador retriever dog weighing about 35kg was presented with the history of dullness, inappetence and progressive abdominal distension. On physical examination, a large hard mass was palpated in the abdomen and animal evinced no pain on palpation. All the physiological parameters were found to be normal. Haemato-biochemical analysis revealed decrease in total erythrocyte count (4.8 million cells/cumm), haemoglobin (9g/dL), PCV (28%) and increase in total leukocyte count (30900 cells/cumm) with mild lymphopenia (15%), increased creatinine (2.8mg/dL) and blood urea nitrogen levels (56mg/dL). Ultrasonographic examination revealed a large hyperechoic mass with multiple anechoic to hyperechoic

pockets having district demarcations in the left side of the abdomen (Fig.1). Right kidney, spleen and liver appeared to have their normal echogenicity. The case was tentatively diagnosed as mixed echogenic mass involving left kidney which included differentials like renal tumor or renal abscess. Thoracic radiograph revealed no significant finding. Hence, it was decided for exploratory laparotomy to explore the abdominal cavity.

Surgical Treatment

The animal was kept off feed for 12 hours prior to surgery. The ventral abdomen starting from xiphoid to the pubis was prepared aseptically for surgery. Thirty minutes prior to the surgery, the animal was given antibiotic (Ceftriaxone sodium at 25mg/kg body weight intravenously) and analgesic (Meloxicam at 0.2mg/kg body weight subcutaneously). The dog was premedicated with Atropine sulphate at 0.04mg/kg body weight (S/C) and Xylazine hydrochloride at 1mg/kg body weight given intramuscularly. The anaesthesia was induced with Propofol at 4mg/kg body weight intravenously which was maintained with isoflurane 2% with oxygen during the entire procedure. A linear midventral incision on skin was made at the aseptically prepared surgical site (xiphoid to pubis). The subcutaneous tissue was bluntly dissected and abdomen was entered via incision to Linea alba and peritoneum. A huge mass, involving the left kidney was noticed on exploration of the abdominal cavity (Fig.2.). Left ureteronephrectomy was performed after careful double ligation of renal vessel and ureter close to the bladder using absorbable suture material polyglactin 910 (Vicryl No.1-0). (Fig.3.). A large mass weighing about 1.3kg was removed (Fig.4.). The laparotomy wound was closed as per the routine procedure using absorbable suture material polyglactin 910 (Vicryl No.1-0). Skin was apposed using non-absorbable suture material Polyamide (Trulon No.2/0) in horizontal mattress pattern. The surgical wound was dressed and bandaged. Post-operatively, the animal was maintained on aggressive intravenous fluid therapy to counter azotaemia and compromised renal function and antibiotics (Ceftriaxone sodium at 25mg/kg body weight intravenously for 5 days) and analgesic (Meloxicam at 0.2mg/Kg body weight subcutaneously for 3 days). The owner was advised to follow aggressive fluid therapy, diuretics (Tab Lasilactone 50mg), renal diet and supportive medications like haematinic syrup (aRBC pet syrup). Skin sutures were removed 10th day postoperatively.

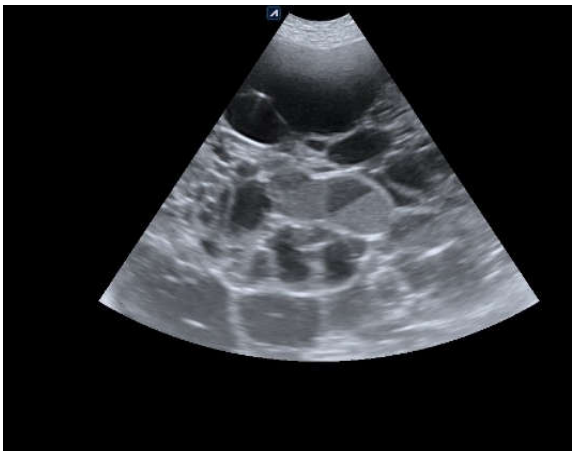
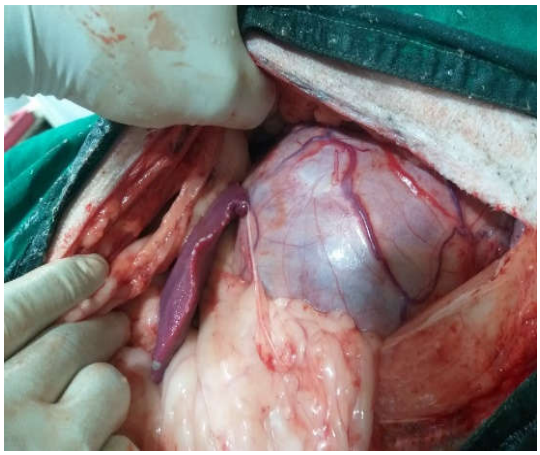


Fig.1. Ultrasonographic Image Showing a Large Hyperechoic Mass with Multiple Anechoic to Hyperechoic Pockets



Fg. 2. A Large Mass Noted on Exploration of Abdomen

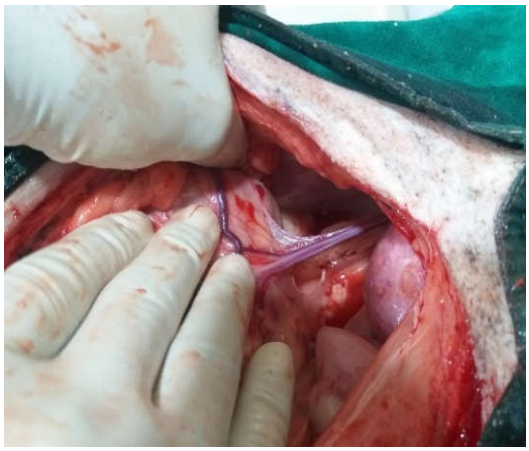


Fig.3. Renal Vessels and Ureter

Fig. 4. Excised Left Renal Mass

Results and Discussion

On histopathological examination (Fig. 5) of the sample, it was found to be a renal carcinoma where the stroma showed areas of necrosis, karyorrhectic debris and mixed inflammatory cells. The neoplastic cells were intermediate to large sized having vacuolated accompanied by brisk mitotic activity. Hematobiochemical analysis performed 7th day post-surgery revealed improvement in complete blood count values but creatinine and blood urea nitrogen values did not show much improvement (2.4mg/dl and 42.9mg/dL respectively). By one month postoperative, creatinine and blood urea nitrogen values showed significant improvement but still were on higher side (1.8mg/dl and 33mg/dL respectively).

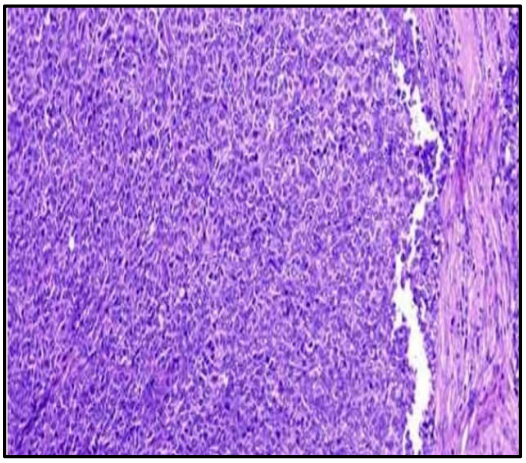


Fig.5. Histopathological Features of the Excised Renal Mass (Renal)

On routine monitoring of the animal, an improvement in its appetite was observed and was regaining its normal activities. The animal showed good recovery until 60th post-operative day. Subsequently, there was deterioration of animal's health which could be due to chronic kidney failure and animal passed away by 120th post-operative day.

Renal carcinoma was a malignant tumor speculated to originate from the epithelium of proximal convoluted tubules as also mentioned by Meuten and Meuten, 2016. Vague signs such as anorexia, depression and

weight loss are generally the first reported symptoms as also reported by Chung *et al*., 2014. Similar signs were reported in the present case. Dogs with renal tumour show several paraneoplastic signs like fever, haematological abnormalities like polycythaemia vera, paraneoplastic leucocytosis, hypertrophic osteopathy, hypercalcemia and hypoglycaemia which often improve within few days to weeks once the complete neoplasm resection is performed as also recorded by Meuten and Meuten, 2016. The cause of polycythaemia is unknown. However, most dogs may not be having polycythaemia but rather have anaemia as also elicited by Chung *et al*., 2014; as seen in the present case.

Ureteronephrectomy was performed in present study where the contralateral kidney was functional and absence of metastasis, which are the criteria to be considered as reported by MacPhail and Fossum (2019). Routine monitoring of the patient and appropriate medical therapy is essential post-surgery for any complications associated with chronic renal insufficiency.

Conclusion

The present communication reports a unilateral renal carcinoma in a dog and its surgical management by unilateral ureteronephrectomy. However, animal showed deterioration in its health condition and passed away four months post-surgery possibly due to chronic renal insufficiency. Therefore, routine monitoring and appropriate medical therapy is essential post-surgery.

References

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