



Letter to the editor

Nephroblastoma in an 11-week-old male Wistar rat with unaltered haematological and plasma biochemical parameters

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Dear Editor,

An eleven-week-old male Wistar rat (CrI:WI) from a 28-day repeated dose toxicity study subjected to scheduled sacrifice after over night fasting. Rat did not reveal any untoward clinical signs, changes in food consumption, body weight and gain throughout the experimental period. Blood sample was drawn from left retro-orbital plexus of the fasted rat under light ether anaesthesia. Haematological parameters were within the limits for this age and strain of rat viz, red blood cell count ($8.38 \times 10^6/\text{mm}^3$), haemoglobin (15.2 g/dl), absolute ($6.9 \times 10^3/\text{mm}^3$) and differential (lymphocytes - 82%, neutrophils - 13%, eosinophils - 4%, basophils - 0%, monocytes - 1%) leucocyte counts, haematocrit (42.0%), platelet count ($678 \times 10^3/\text{mm}^3$), reticulocyte count (0.81%), prothrombin time (9.2 s) and activated partial thromboplastin time (14.1 s).

The various plasma biochemical parameters such as glucose (85 mg/dl), total protein (6.6 g/dl), cholesterol (57 mg/dl), triglycerides (46 mg/dl), total (0.22 mg/dl) and direct bilirubin (0.05 mg/dl), blood urea nitrogen (18.7 mg/dl), creatinine (0.64 mg/dl), alanine transaminase (37.7 iu/l), aspartate transaminase (82 iu/l), alkaline phosphatase (70 iu/l), gamma glutamyl transferase (4 iu/l), creatinine kinase (148 iu/l), lactate dehydrogenase (96 iu/l), calcium (10.2 mg/dl), phosphorus (6.46 mg/dl), sodium (142.6 mmol/l), potassium (3.02 mmol/l) and chlorides (101.9 mmol/l) were within the normal limits.

After blood collection, the animal was sacrificed by carbon dioxide asphyxiation followed by complete exsanguination and subjected for detailed necropsy. Grossly, the animal showed an encapsulated grayish white mass protruded in the cranial pole of the right kidney (Fig. 1). Upon incision the lesion was extending in to the renal parenchyma and devoid of any cysts or haemorrhages. Cut surface of the mass was soft in consistency. All other organs including left kidney appeared normal. Kidneys along with other protocol organs were fixed in 10% neutral buffered formalin and were processed and sectioned at 3-5 μ thickness and stained with routine hematoxylin and eosin (HE).

Microscopically, right kidney revealed partially encapsulated neoplasm completely replacing the preexisting renal parenchyma in the cranial pole and occupied almost one fourth of the renal parenchyma. This nodular pattern of nephroblastoma was observed in the entire corticomedullary area. Neoplasm comprised of blastemal, epithelial and mesenchymal elements (Fig. 2). Hallmarks exhibited by the blastemal cells were anisocytosis, intense basophilia and higher degree of undifferentiation with scant cytoplasm and very high nucleus to cytoplasmic ratio. Varying degree of blastemal cells differentiation resulted in the formation of rosettes, clusters and irregular masses or sheets. The nuclei appeared irregular, sometimes vesicular, and hyperchromatic containing finely granular chromatin with multiple nucleoli and mitotic figures. Glomeruloid structures contained eosinophilic material surrounded by

cuboidal to flattened epithelial cells having basophilic nuclei (Fig. 3). Moderate coagulative necrosis was observed in the lobulated blastemal cells. Stromal mesenchymal cells were polyhedral, round to oval shaped found between lobules. Moderate invasion of blastemal cells into adjacent renal parenchyma was noticed (Fig. 4). Remaining renal parenchyma, left kidney and other protocol organs did not reveal any evidence of metastasis.

Characteristic triphasic (blastemal, epithelial and stromal) growth pattern of nephroblastoma observed in the present case is closely resembled Wilm's tumor of human.

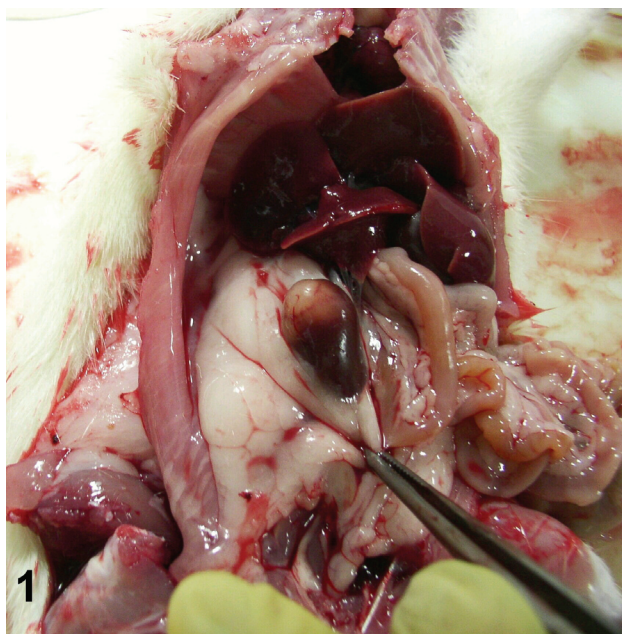


Figure 1 – Wistar rat; An encapsulated grayish white mass on the cranial pole of the right kidney.

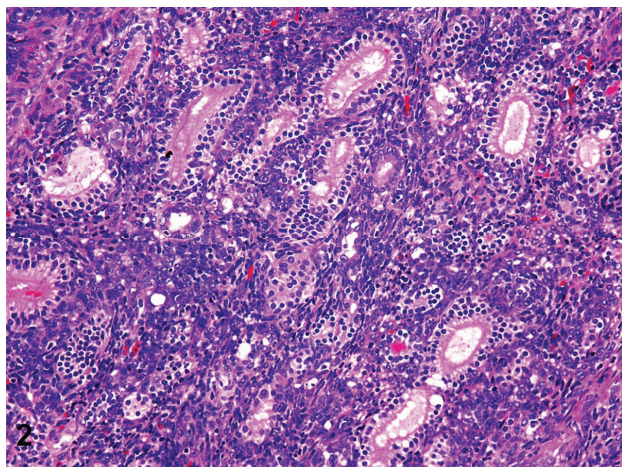


Figure 2 – Wistar rat; Histological section of the kidney revealed nephroblastoma comprised of blastemal, epithelial and mesenchymal elements. HE. 200x.

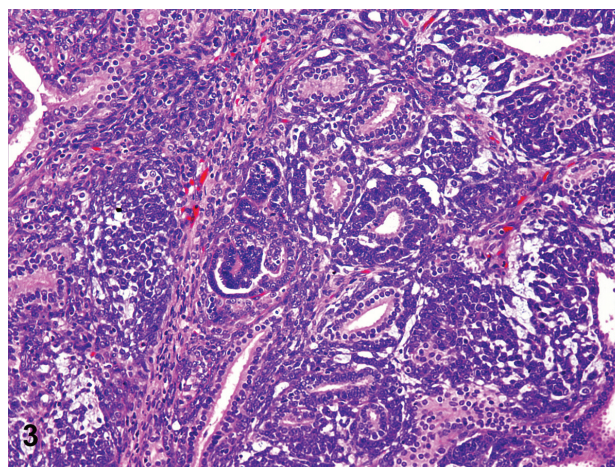


Figure 3 – Wistar rat; Histological section of the kidney showed glomeruloid structure lined by cuboidal to flattened epithelial cells. HE. 200x

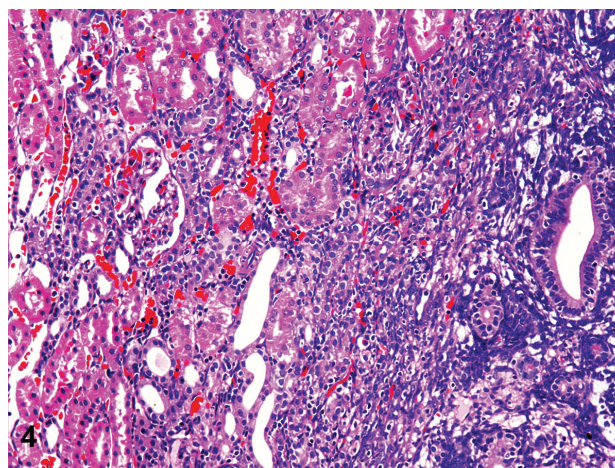


Figure 4 – Wistar rat; Histological section of the kidney revealed blastemal cells were invading to adjacent renal parenchyma. HE. 200x.