

PERFORMING A RENAL BIOPSY IN DOGS

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Abstract

Performing a renal biopsy has its reasons in establishing a specific diagnosis, evaluating the severity of the renal lesions and establishing an etiological treatment. Kidney diseases have a high incidence rate in dogs and cats. In order to make a differential diagnosis of a chronic or acute renal insufficiency or of a glomerular lesion, the anamnesis, clinical examination and lab results are not always enough. Renal biopsy is always necessary to establish the degree of severity, a definitive diagnostic and a treatment plan. The success of the treatment is related to knowing the type and extension of the lesion. The literature indicates that the risks and complications that follow a renal biopsy are extremely low. Still, how we choose the patient and the proper technique may considerably decrease the risk and increase the success rate of the biopsy. In the final stages of kidney disease, assessed through clinical and laboratory exams, renal biopsy is useless. In the less advanced stages the diagnosis offered by a histopathological examination of the biopsy fragment may prove to be an important factor in achieving a successful treatment of the glomerular illness in both dogs and cats. The studies that have approached this subject show that kidney biopsy performed in patients that suffer from a chronic renal insufficiency are not recommended, due to the fact that the risks are higher.

Key words: renal biopsy, recommendations, risk

General recommendations before considering a renal biopsy

Generally, it is recommended that before we perform a renal biopsy we consider the history of the patient, the results of the physical exam, its blood pressure, biochemical profile, blood profile, urine analysis and blood clotting parameters.

Situations when kidney biopsy is not recommended include coagulopathies, severe anemia, hydronephrosis, arterial hypertension, large or multiple renal cysts, perirenal abscesses, severe pyelonephritis and "end-stage" kidney. In patients that only have one kidney, renal biopsy may sometimes be an option, as long as there isn't any other reason against it. Also, any urinary tract infections are to be treated before this procedure. Performing a biopsy on a kidney suffering from severe hydronephrosis is not recommended because the deep puncturing down to the renal basinet, already distended by urine under pressure may cause its release, but also because there is a high risk of encountering blood vessels from the medulary area.

Identifying patients with a tendency towards bleeding (coagulopathies) is imperative when selecting a candidate for a biopsy.

Ultrasound guided biopsies are not recommended in dogs with severe thrombocytopenia ($\leq 80000/\mu\text{l}$), extended prothrombine time (OSPT $> 1,5 \times$ normal), increased levels of nitrogen in the blood stream (serum creatinin $> 5 \text{ mg/dl}$), uncontrolled arterial hypertension or those to whom were administered non-steroidal anti inflammatories for the past 5 days. Still, when biopsy is absolutely necessary, the animal must be monitorized in order to prevent possible perirenal hemorrhages and a blood transfusion protocol may also be prepared in stand by.

From a technical point of view, biopsies may be performed either transcutaneously or surgically. The first ones may be done using a laparoscope, an ultrasound or blind.

No matter the method, the biopsy should concern only the renal cortex, as the renal medular area is constituted mainly of tissues abundant in blood vessels, thus risking a large hemorrhage, infarcts or fibrosis.

For the biopsy it is recommended to approach the cortical area through either the apical or the caudal pole. The right kidney is preferred due to the fact that it is more stable (less floatant), being more attached to the caudate lobe of the liver.

Sedation and anaesthesia

Performing a biopsy presupposes a prior restraining of the animal. In order to achieve a good immobilization of the animal anaesthesia or sedation is recommended. In animals with a good health status, we recommend general anesthesia, whilst in those with a precareous health status sedation is more suited.

Choosing the percutaneous biopsy needles is done according to the patient and biopsy gun (fig. 1). The size may vary (14G, 16G, 18G, 20G with lengths of 6, 9, 15 cm) from case to case (fig. 2).

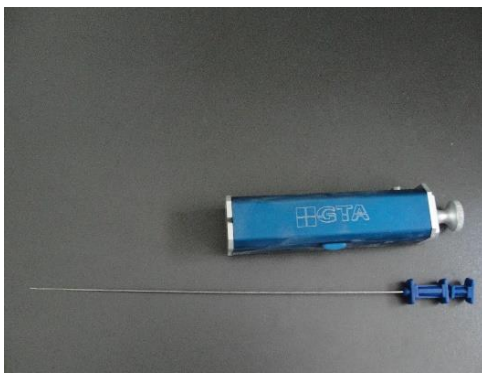


Fig. 1. Automated GTA biopsy gun for ultrasound guided transcutaneous biopsies. Biopsy needle.

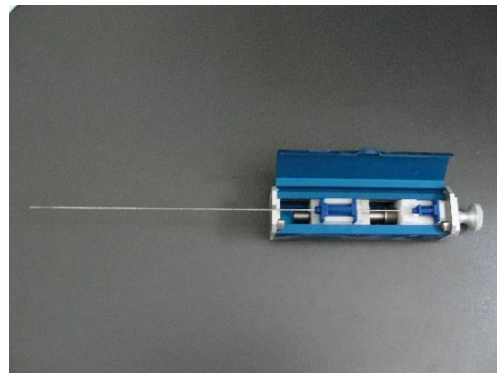


Fig. 2. Armed biopsy gun.

Complications and risks associated with a renal biopsy

The results of the clinical studies indicate that complications of kidney biopsies occur with a frequency of approximately 1% to 18%. This variation in the incidence of complications is directly linked to the health status of the patient at the moment of the biopsy.

The higher incidence of post-biopsy complications was observed in dogs of ages above 4-5 years and weighing less than 4 kg, with a high level of creatinine (above 5 mg/dl). Also, complications sometimes followed general anesthesia in dogs with severe renal insufficiency.

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