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Short communication

Laparoscopy-guided prostate biopsy in dogs – a study of 13 cases

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Abstract

This paper describes laparoscopy-guided prostate biopsy experiments in 13 dogs. Biopsy material was evaluated histopathologically to diagnose causes of prostatic gland enlargement. Laparoscopic biopsy was performed in male dogs diagnosed with prostatic gland enlargement, based on clinical symptoms and results of rectal examinations.

Key words: laparoscopy, prostate biopsy, dog

Introduction

The diagnosis of prostatic disorders begins by eliciting information on the patient's urination and defecation patterns, the shape of the stool and the presence of blood cells in urine. A rectal examination is performed, and based on the results, additional tests may be prescribed, including radiological, ultrasonographic, microbiological and bacteriological analyses of prostatic secretions as well as a biopsy (Ling et al. 1983, Johnston et al. 2000). The results of a histopathological examination ultimately confirm the nature of the prostatic disorder, which is why a correctly performed biopsy has a high diagnostic value.

Materials and Methods

The dogs studied were aged from 5 to 14 years with body weight from 10 to 25 kg. The patients were qualified for laparoscopy-guided biopsy based on interview data and results of rectal and ultrasonographic examinations.

Biopsies were performed under general anesthesia. Laparoscopy was carried out using standard laparoscopic equipment. The biopsy was performed using Tru-Cut semi-automatic biopsy needles, 1.2 mm in diameter and 150 mm long. Patients were placed on the operating table in the Trendelenburg position. Pneumoperitoneum was created using carbon dioxide under a pressure of 12 mm Hg. An optical port was introduced into the umbilical area. The biopsy needle was inserted through the abdominal integument, and it was placed paramedially at approximately one-half penis length. The needle was guided parallel to the neck of the urinary bladder and the urethra to collect samples in the long axis of the gland (Fig. 1). A minimum of three samples were collected from sites marked and not marked by macroscopic changes in both prostatic lobes. The biopsy site was observed for signs of hemorrhage. In cases of prolonged bleeding, an additional working port was introduced to insert hemostatic electrocoagulation forceps. After biopsy the port was removed and the wound was closed with two layers of sutures. All patients were administered post-operative antibiotic cover.

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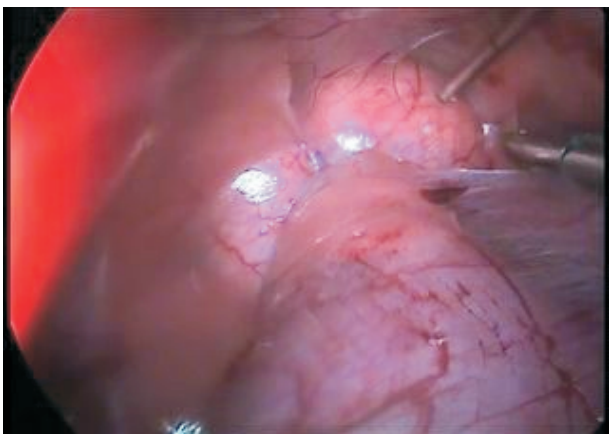

Fig. 1. Prostatic gland biopsy using a Tru-Cut needle under laparoscopic control.

Results and Discussion

In the group of 13 animals examined, benign prostatic hyperplasia was diagnosed in 12 patients and adenocarcinoma was reported in one dog based on the results of histopathological analyses. In addition to gland enlargement, the laparoscopic image of benign prostatic hyperplasia also showed changes in the appearance of the prostate surface which was irregular. In the dog diagnosed with adenocarcinoma, the prostatic gland was characterized by uneven surface and numerous proliferative changes. Hematuria persisted for two days in 11 patients after the surgery.

The diagnosis of prostate disorders in animals usually takes place when clinical symptoms are advanced. A complete diagnosis of prostatic diseases in dogs should involve a biopsy of the affected gland (Kustritz 2006). Histopathological analyses of the sampled material determine further course of the treatment. In veterinary literature, there is a pancity of detailed studies discussing the effectiveness of biopsies. In this experiment, biopsy proved to be an effective diagnostic technique in 13 patients. Histopathological analyses revealed changes in the prostatic gland tissue in all the dogs. Tissue samples were collected from sites showing visual changes in comparison with other locations in the prostate area. In dogs whose the prostatic tissue showed no signs of visual differentiation, three samples were collected from every prostatic lobe. According to the authors, the experiment did not produce any false-negative results because samples were collected from various regions of the prostatic gland. In several cases, the disease was also advanced, and it affected the entire gland.

In dogs, the prostatic gland may be examined by blind biopsy via the rectum or by laparoscopy-guided or ultrasonography-guided percutaneous biopsy (Smith 2008). A blind biopsy is the least safe and the least precise method. Ultrasonography-guided biopsy of the prostatic gland is a much safer procedure which delivers samples of greater histopathological value. Ultrasonography supports the imaging of the gland's internal structure and the determination of sites with a changed structure for histopathological analyses (Boland et al. 2003). Nevertheless, the collection of samples in this approach requires significant experience, and several attempts are often made to obtain samples from the appropriate location. A disadvantage of ultrasonography-guided biopsy is that hemorrhaging from the examined gland, a normal consequence of the biopsy procedure, cannot be monitored.

Laparoscopy-guided biopsy is the only technique supporting a complete visualization of the organ examined without direct surgical access. Direct visualization also supports the collection of tissue samples from various regions of the gland, and it rules out the possibility of erroneous material sampling from the same location, thus minimizing the probability of false-negative results. The number of punctures is usually higher in humans, but according to the author, three needle insertions produced an abundance of samples from the entire gland cross-section. Hemorrhaging from the prostatic gland into the abdominal cavity is a biopsy-related complication, and dielectric heating was applied in two patients affected by profuse bleeding and an absence of hemostasis. The only other technique that supports full management of post-biopsy hemorrhaging is open surgery.

Laparoscopy-guided prostate biopsy is a new imaging technique that ensures higher procedural safety. As an additional advantage over other imaging methods, laparoscopy can be converted to conventional surgical techniques whenever required.

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