A urolithiasis case related to nutritional disorders in a male cat

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ABSTRACT

Urolithiasis was diagnosed by clinical and radiographic examination in a 2.5 year old male cat. Under general anesthesia routine laparotomy procedure was applied. Urine was taken out from the filled bladder and vesicotomy was performed. Crystallloid structures (urooliths) found in the bladder and urethra was removed. Urinary system antiseptic and antibiotics were administered during the postoperative period. Owner of the patient was informed about a proper feeding in order to avoid relapse. As a result, the diet of the castrated male cats requires special attention in order to avoid calculi formation. Low-protein foods which prevent crystallization in urinary tract must be preferred. Urine pH should occasionally be checked and water consumption should be encouraged by providing a source of fresh water.

Key words: Castration, Male cat, Nutrition, Urine pH, Urolithiasis.

Urolithiasis is a nutritional disease that affects domestic carnivores (Tion et al., 2015) and defined as the formation of sediment within the urinary tract which consists of urine crystalloids (Ulrich et al., 1996). An important factor necessary for calculi formation is a high concentration of magnesium or phosphorus in urine ultimately derived from high dietary levels (Goldson et al., 1982). A diet high in magnesium and phosphorus, low in chloride, or with a calcium-phosphorus ratio less than one, predisposes cats to urolithiasis. Urethral obstruction could be induced by feeding a diet containing 75% magnesium and 1.6% phosphorus on a dry matter basis in male cats (Dibartola and Chew, 1981). On the other hand, dietary calcium prevents calculi formation in case dietary magnesium or phosphorus is low. However, when both are high, increasing dietary calcium enhances calculi formation (Lewis and Morris, 1983). Diagnosis of the disease can be made on the basis of history of anuria, clinical signs, radiographic, ultrasonographic, haematobiochemical, and peritoneal fluid examinations (Parrah et al., 2011).

CASE REPORT

A 2.5 year old male cat was brought to the Surgery Department with a history of difficulty urinating with pain and bloody drops since one week. The patient was a castrated cat fed with fish-vegetable, chicken, roasted meat by turns each week. In clinical examination the bladder was excessively filled and painful during palpation. The bladder was swollen with a thick membrane in radiologic and ultrasonographic examination. In the urine test glucose and leucocyte results were positive whereas pH was 6.5.

In treatment procedure, urethra was firstly catheterized from orificium urethra externa with a cat urine catheter and isotonic solution was administered via catheter. However the obstruction was not completely relieved after performing catheterization because the catheter did not move forward. Therefore routine laparotomy was performed under general anesthesia and 80 ml urine was taken out from the filled bladder with a syringe. Then cystotomy procedure was carried out. The bladder wall found to be hyperemic and 2-3 times thicker than the normal values. Crystallloid structures were found in the bladder. Catheterization was done in the reverse direction from bladder to urethra, because orificium urethra externa was closed. Blood clots and stones were removed from the bladder using isotonic solution and urinary tract was opened. The stones with an average of 2 g were taken out from bladder and sent to the lab for analysis. The formation of the stones was determined as triple phosphate and uric acid crystals. Urinary tract antiseptics and parenteral antibiotics were prescribed as medical therapy. No abnormality or relapse was observed during the control one month later.

Male cats are prone to urinary blockage since their urethras are longer and narrower than female cats (Wael, 2012). In this case, feeding with a false diet triggered urethral blockage by formation uroliths. On the other hand, the solubility of the calculogenic substances calcium, magnesium and phosphate is greatly increased in a urine pH less than 6.6 (Lewis and Morris, 1983). The pH level of the urine was determined as 6.5 in the current case which confirms this finding. Moreover, the changes in the pH value influence

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the structure of the meat which could result in calculi formation in the urinary tract. Nazli (2015) reported that pH value of the fresh red raw meat is around 7 when it is cut off. This value begins to fall with the effect of enzyme activity in time. It declines and remains at a constant point which is called as isoelectric point. At this point the pH is between 5.4-5.6. Then it rises again. It reaches 5.8-6.0 points. The limit is 6.2. If the pH exceeds 6.2, the meat begins to deteriorate. The pH of the meat is fixed at which phase it is cooked. Depending on the heat treatment, affected protein and fat can increase the pH slightly. In this case, being fed with roasted meat probably paved the way to the formation of stones in the lower urinary system of the cat due to the changes in pH. Another point to be considered in calculi formation is the effect of neutering on the structure of the urethras. Neutered kitties tend to experience more frequent urinary infections than non-neutered ones (Anonymous, 2016). As a result, the diet of the castrated male cats requires special attention in order to avoid calculi formation. Low-protein foods which prevent crystallization in urinary tract must be preferred. Urine pH should occasionally be checked to keep between the reference intervals. Water consumption should be encouraged by providing a source of fresh water and liquids that the animal likes to drink.

CONCLUSION

Urolithiasis generally occurs due to the lower urinary tract, anatomic defects, urinary tract infections and mostly because of nutritional disorders in cats. Therefore special attention should be given to the diet and provide water to avoid calculi formation.

REFERENCES


