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Short Communication / *Kısa Bilimsel Çalışma*

Urinary bladder retroflexion and dystocia in a bitch with the vaginal supportive connective tissue failure

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Summary: This article describes a 2.5 years old cross breed bitch, weighing 35 kg, with dystocia and a large mass protruding through the vulva. A surgical resection of a type III vaginal prolapse had been performed 1.5 years previously. On admission, transabdominal ultrasonography revealed several live foetuses in the uterine horns, but the urinary bladder was not visible in the abdomen. An anechogenic, fluid-filled bladder was observed during ultrasonography of the protruded mass. Foetuses were removed by caesarean section. During the surgery, it was realized that the uterine body and a live foetus were confined within the vagina as well as the bladder. The foetus was removed by repositioning the corpus uteri and bladder gently, and ovariohysterectomy was performed. Although the situation is exceptional, urinary bladder retroflexion could occur due to the failure of supportive connective tissue of pelvic floor and extreme straining during parturition. Therefore, retroflexion should be managed as an emergency to reduce the pressure in the bladder and to rescue the foetus if it is in the protruded tissue into the vagina.

Keywords: Bitch, bladder retroflexion, dystocia.

Bir köpekte vajinanın konnektif dokusunun yetersizliği ve güç doğum ile birlikte seyreden idrar kesesi retrofleksiyonu olgusu

Özet: Bu olguda, 2,5 yaşında ve 35 kg ağırlığında melez ırk bir köpekte rastlanan güç doğum şikayeti ile birlikte vulvada büyük bir kitle olgusu sunuldu. Alınan anamnezde, 1,5 yıl önce köpeğe tip III prolapsus vagina nedeniyle submukozal rezeksiyon operasyonu uygulandığı öğrenildi. Kliniğimizde yapılan transabdominal ultrasonografik muayenede uterusta birkaç adet canlı fetüs saptanırken, idrar kesesi abdomen içinde gözlenemedi. Vulvadan dışarı çıkan kitleye yapılan ultrasonografi muayenesinde anekojenik yapıda, içi sıvı dolu idrar kesesi görüldü. Fetüsler sezaryen operasyonu ile alındı. Operasyon sırasında, korpus uteri ve bir adet canlı fetüs ile birlikte idrar kesesinin vagina duvarı içinde sınırlı olduğu saptandı. Korpus uteri ve idrar kesesi dikkatle abdominal boşluk içine alınarak fetüs çıkarıldı, ardından ovaryohisterektomi gerçekleştirildi. Bu olguya oldukça nadir rastlansa da, idrar kesesinin retrofleksiyonu pelvis tabanını destekleyen konnektif dokudaki yetersizliğe ve doğum sırasında aşırı ıkınmalara bağlı olarak şekillenebilmektedir. Bu nedenle, idrar kesesindeki basıncın azaltılması ve kitle içinde olabilecek fetüsün kurtarılabilmesi amacıyla olguya hızla müdahale edilmesi gerekmektedir.

Anahtar sözcükler: Güç doğum, idrar kesesi retrofleksiyonu, köpek.

Dystocia means an abnormal or a difficult parturition. Maternal causes for dystocia include uterine inertia, inadequate birth canal size, lack of adequate abdominal contractile force, and obstruction of a normal birth canal. Vaginal sources of obstruction include anomalies, prolapse, and masses (3).

Retroflexion of the urinary bladder has been mostly encountered in older male dogs (1). It is especially seen as a complication of abdominal trauma (12, 22), perineal hernias (19, 25), and increased intra-abdominal pressure (15). In this study, we reported the retroflexion of urinary bladder associated with dystocia and described clinical presentation, history and therapy of the dystocia due to urinary bladder retroflexion in a bitch.

A 2.5 years old crossbreed bitch, weighing 35 kg, was referred to the Department of Obstetrics and Gynaecology, Faculty of Veterinary Medicine, Afyon Kocatepe University due to dystocia. The bitch had been submitted to our clinic because of a protruded mass through the vulva 1.5 years ago, and a surgical resection of a type III vaginal prolapse had been performed with a circumferential incision. The bitch had been in early pregnancy period during this operation and she had delivered four healthy puppies without dystocia 1.5 months after the surgery. After the following estrous cycle (6 months later), she had delivered 4 puppies again without dystocia but all the puppies had died in a short time period.

Due to anamnesis, the most recent parturition was initiated late at night, and one healthy puppy was delivered about at 04.00 a.m. On admission at 13.00 p.m., the bitch was in regular body condition and the rectal temperature (38.6°C), the heart rate (82 bpm) and the respiratory rate (32 breaths/min) were within normal parameters. Clinical examination revealed a mass protruding through the vagina (Figure 1). The tissue was clean with no haemorrhage or ulceration. The urethral opening was not identified and dysuria/stranguria was present. Transabdominal ultrasonography (veterinary ultrasound equipment, SLE 901, Medelkom Ltd, Lithuania) revealed several live foetuses in the both uterine horns, but the urinary bladder was not visible in the abdomen. However, an anechogenic, fluid-filled bladder was observed during ultrasonography of the protruded mass (Figure 2).

Caesarean section was scheduled to remove foetuses from uterus. For operation, the bitch was premedicated with atropine sulfate (0.04 mg/kg, s.c.) and xylazine hydrochloride (2 mg/kg, i.m.). General anaesthesia was induced using ketamine hydrochloride (10 mg/kg, i.m.). Six live foetuses were removed from the uterine horns, however, uterine body could not be found in its correct anatomical position. The vaginal mass was positioned ventrally in the vaginal wall. Thereupon, the protruded vaginal mass was cleaned and pushed into the pelvic cavity with gentle pressure. After replacement of the protruded uterine body and bladder from the vaginal mass, a live foetus was observed in the corpus uteri and removed gently (Figure 3). The foetus in the uterine body was normally positioned. The ovariohysterectomy was performed with the owner's consent. Neonates were resuscitated after retrieval via caesarean section. The noses and oropharynx were cleared free of fluid or foetal membranes. Respirations were stimulated by rubbing the head and chest with a dry, warm towel. All neonates were breathing spontaneously following the resuscitation. Nevertheless, 2 puppies died about one hour after caesarean section. After surgery, the bitch was treated with amoxicillin/clavulanic acid (Synulox® 8.75 mg/kg/day, IM, Pfizer, Italy) for 5 days. The bitch was discharged after surgical treatment with her six healthy puppies. Follow-up by telephone 2 weeks postoperatively confirmed that both urination and defecation were normal. Two months after the surgery, the bitch was referred to the clinic due to recurrence of bladder retroflexion without any signs of perineal hernia or vaginal stricture. For this reason, we have decided to perform an abdominal cystopexy. Caudal midline laparotomy was performed under general anaesthesia and the bladder was repositioned in the abdominal cavity. Abdominal cystopexy was performed with 3/0 polydioxanone. Two weeks after the surgical treatment, owner reported that the bitch was clinically normal.

Figure 1. The ball-shaped mass protruding through the vagina in the bitch.
Şekil 1. Köpekte vaginadan dışarı çıkan yuvarlak şekilli kitle.

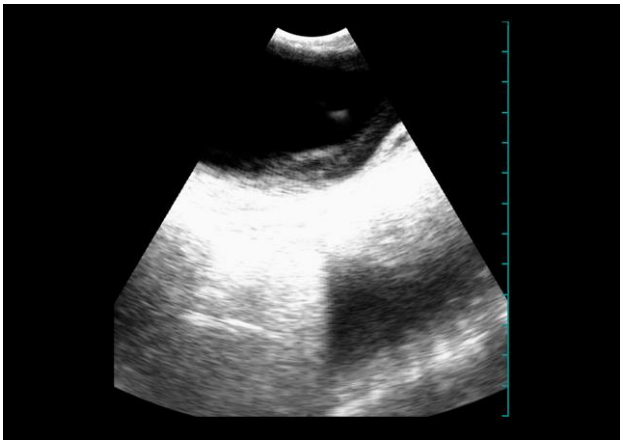

Figure 2. The USG image of anechogenic, fluid-filled bladder in the protruded mass.
Şekil 2. Kitle içinde bulunan idrar kesesinin anekojenik USG görüntüsü.

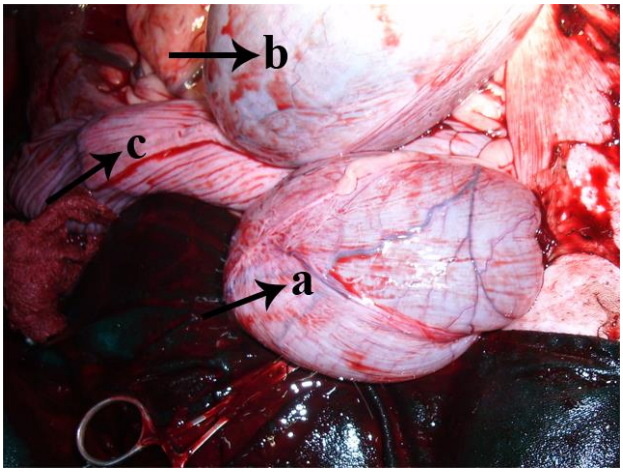

Figure 3. The bladder (a) and the corpus uteri (b) after replacement from vaginal mass. The right uterine horn after removing foetuses (c).
Şekil 3. Vaginal kitlenin yerine alınmasından sonra görülen idrar kesesi (a) ve korpus uteri (b). Fetüsler çıkarıldıktan sonraki sağ kornu uteri (c).

In bitches, ~2-5 per cent of pregnancies ended with dystocia (5, 15). The 75% of dystocia cases are of maternal origin and 24.7% of dystocia cases are of foetal origin (7). Dystocia which arise in the mother are due to either to constriction of the birth canal or to a deficiency of expulsive force. The constrictive forms, of which the most important are pelvic inadequacies, incomplete dilatation of the cervix and uterine torsion will be considered first (2). Foetal causes include foetal monsters, true oversize foetuses or foetal oversize in relation to the maternal pelvis, foetal malposition or malposture, and foetal death (11). In the present case, dystocia probably occurred because of maternal factors, as there was obstruction of birth canal by urinary bladder and uterine body.

Compared to other vaginal disorders, vaginal prolapse, herniation of the other organs such as urinary bladder, uterine body and distal aspect of the colon are uncommon conditions in the bitch (18). To our knowledge only 3 cases of urinary bladder retroflexion associated with dystocia have been reported in animals. In one case retroflexion was described as a type of porcine dystocia in which the birth canal was obstructed by the urinary bladder under the vaginal floor where it acted like a ball-valve in the birth canal. The author has been associated with a very relaxed birth canal (9). The other case report about dystocia and bladder retroflexion was reported in a marsh deer (*Blastocerus dichotomus)* (26). In their case report, the retroflexion of the bladder occurred together with a rectal prolapse. The third case was reported in a pregnant pit bull terrier bitch with a mass protruding from the vulva (6). In one study (25) the authors were reported a case with a large, ball-shaped mass protruding through the vulvar lips in a pregnant bitch. In their case, the gestation age was estimated to be 35 to 40 days. However, in that case report, foetal death was diagnosed on ultrasonography and the mass was detected as retroflexion of bladder confined to the vagina. In our case report, the mass was diagnosed as a retroflexed urinary bladder as well as the uterine body and a live foetus projecting extramurally into the vaginal wall. The owner stated that the mass in the vagina was not observed before the beginning of the parturition. In our opinion, the bladder retroflexion occurred as a result of extreme straining during parturition, and relaxation of the pelvic ligaments and the cervix.

The supportive connective tissue of pelvic floor is related to fibrillar collagens I, III and V, present in the vagina, and the abnormalities in the collagen metabolism may cause to pelvic organ prolapse (13, 23). The balance between synthesis and degradation of collagen is crucial for keeping on tissue integrity and tensile strength. Matrix metalloproteinase 2 and 9 (MMP-2 and MMP-9) are the controllers of the degradation of collagens. Studies about the pelvic organ prolapse showed that a decreased total collagen content and increased activity of MMP-2 and MMP-9 might be cause to the weakness of connective tissue support (10, 20, 21). Additionally, elastin and tenascin are the important components of connective tissue, and any failure of these components may lead to spontaneous prolapse in the pelvic organs (8, 16). In the present case, the supportive connective tissue of the bitch was significantly weakened considering to her history such as a surgical resection of a type III vaginal prolapse, dystocia due to the urinary bladder retroflexion and the recurrence of retroflexion two months after surgery. It has been suggested that the connective tissue proteins as collagen, elastin and tenascin were insufficient in this bitch. However, the detailed analyses of the supportive connective tissue components were not performed because of the financial constraints of the owner.

In several studies, urinary bladder retroflexion was associated with perineal hernias (22, 24, 25, 27, 28). In addition, in severe cases; the bladder is dislocated caudally from its normal abdominal position to the pelvic or perineal region (4, 27). Mandel and Drobatz (17) reported a case with urinary bladder herniation through a vaginal laceration with dystocia in a dog. In the present case, any herniation or laceration areas were not detected in the perineal region, vagina or vulva; therefore, we thought that the retroflexion was not associated with herniation. The uterine body, a live foetus and retroflexed bladder were confined within the vagina.

The preferred diagnostic imaging modality in dogs with urinary system pathology is ultrasonography as this provides information about bladder content, bladder wall and associated pathologies (14). Radiography or ultrasonography may be used to confirm a bladder retroflexion (27). In our case, an anechogenic, fluid-filled bladder was observed during ultrasonography of the protruded mass and it was confirmed at laparotomy. Transabdominal ultrasonography revealed several live foetuses in the uterine horns, but the urinary bladder was not visible in the abdomen. The corpus uteri and foetus could not be seen during ultrasonography of the protruded mass because of the fluid-filled bladder. Abdominal radiography was not necessary in this case because caesarean section had to be performed to remove the foetuses from the uterus.

Although the situation is exceptional, urinary bladder retroflexion could occur as a result of the failure of supportive connective tissue of vaginal wall and extreme straining during parturition. Therefore, retroflexion should be managed as an emergency to reduce the pressure in the bladder and to rescue the foetus if it is in the protruded tissue into the vagina. To the authors' knowledge, this is the first reported case where urinary bladder retroflexion with the uterine body and a live foetus against the intrapelvic vaginal wall may have caused acute obstructive dystocia in a bitch.

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