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KOYUN VE KEÇİLERDE PREPUBİK TENDON RUPTURU VE GÜÇ DOĞUMA YÖNELİK UYGULAMA YAKLAŞIMLARININ KARŞILAŞTIRMALI ANALİZİ

A COMPARATIVE ANALYSIS OF MANAGEMENT APPROACHES FOR PREPUBIC TENDON RUPTURE AND DYSTOCIA IN SHEEP AND GOAT

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ÖZET

Amaç: Bu çalışmada gebe koyun ve keçilerde meydana gelen prepubik tendon rupturu (PTR) vakalarında farklı uygulama ve tedavi yaklaşımların güç doğumlara neden olması açısından değerlendirilmesi ve karşılaştırmalı bir analizinin yapılması amaçlanmıştır.

Gereç ve Yöntem: Bu çalışmanın materyalini Burdur Mehmet Akif Ersoy Üniversitesi Veteriner Fakültesi Doğum ve Jinekoloji Kliniğine PTR şikâyeti ile gelen gebe koyun ve keçiler (n=11) oluşturdu. Verilerin sağlanmasında klinik kayıtları kullanıldı. Ayrıca hayvanların sürü dışına çıkarılma verilerinin alınması amacıyla yetiştiriciler ile iletişim kuruldu. Çalışmada gıda alımı, sternal pozisyonda veya yürümede ağrı durumları ve PTR dereceleri değerlendirildi. PTR için tedavi yaklaşımları, sezaryen veya normal doğum durumları, yavru sayıları karşılaştırmalı olarak değerlendirildi.

Bulgular: Hayvanların 5/11'inde güç doğum, 2/11'inde ise normal doğum tespit edildi. Ayrıca sezaryen ve normal doğumda yavruların canlı doğum oranı %100 iken güç doğum vakalarında bu oran %33,3 olarak gerçekleşti. Hasta sahiplerinden alınan veriler doğrultusunda bazı hayvanların doğum sonrasında sürü dışına çıkartıldığı (8/11) belirtildi. Çalışmaya alınan tüm hayvanlarda ortalama yavru sayısı 2,45±0,68 olarak tespit edildi. Karşılaştırmalı analizler tablolarda gösterildi.

Sonuç: Sonuç olarak PTR görülme sıklığı oldukça düşüktür. Ancak oluştuğu durumlarda küçükbaş hayvanlarda güç doğumlara neden olabilir. Bu nedenle PTR vakalarında gebeliğin sonuna kadar anne ve fetüsün sağlıklı yaşamlarının sürdürülmesi esastır. Bu nedenle mümkünse doğum zamanı belirlenmeli ve doğuma uygun müdahale girişimleri düşünülmelidir.

Anahtar Kelimeler: Gebelik, Güç Doğum, Küçük Ruminant, Prepubik Tendon

ABSTRACT

Objective: This study aimed to conduct a comparative analysis of different approaches in cases of prepubic tendon rupture (PTR), which is a little-known cause of dystocia.

Material and Methods: The material for this study was pregnant sheep and goats (n=11) that came to Burdur Mehmet Akif Ersoy University Faculty of Veterinary Medicine, Obstetrics and Gynecology Clinic with complaints of PTR. Clinical records were used to provide animal data. In addition, contact was made with breeders to obtain data on culling animals from the herd. Food intake, pain in the sternal position or walking, and PTR degrees were evaluated in the study. Treatment approaches for PTR, cesarean or normal birth situations, and the number of offspring were evaluated comparatively.

Results: Dystocia was detected in 5/11 of the animals and normal birth was detected in 2/11 of the animals. In addition, while the live birth rate was 100% in cesarean section and normal birth, this rate was 33.3% in cases of dystocia. It was stated that some animals were culled from the herd (8/11) after parturition in line with the data received from the patient owners. The average number of offspring in all animals included in the study was determined as 2.45±0.68 Comparative analyses are shown in tables.

Conclusion: As a result, the incidence of PTR is quite low. However, when it occurs, it can cause dystocia in small ruminants. Therefore, in PTR cases, it is essential to maintain the healthy lives of the mother and the fetus until the end of pregnancy. Therefore, if possible, the time of birth should be determined and interventions appropriate to birth should be considered.

Keywords: Dystocia, pregnancy, small ruminant, tendon

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1. Giriş / Introduction

Dystocia is a birth that does not occur within the physiological period and requires assistance (1,2). Although the dystocia incidence in sheep and goats is low (3-5%), it is especially important in terms of causing great economic losses. The most common cause of dystocia in these species is fetal factors (50-56%) (3,4).
The contraction of the uterus and abdominal muscles is an important mechanism for parturition. Uterine inertia is the loss of expulsion force for parturition to the fetus. Primary uterine inertia occurs because of decreased or impaired uterine activity in sheep with metabolic diseases such as hypocalcemia and pregnancy toxemia, endocrine disruption such as consumption of estrogenic alfalfa, or physical injuries such as abdominal wall rupture, abdominal hernia, umbilical hernia, or perineal hernia (2). Secondary uterine inertia due to myometrial fatigue may be the result of prolonged labor, fetal malpresentation, loss of uterine tone, or stress (5).
The prepubic tendon is a straight T-shaped compound tendon that provides attachment to the gracilis, pectineal, and various abdominal muscles. Since the abdomen expands ventrally in ruminants, the prepubic tendon extends ventrally from the pelvis, making an almost right angle with the pelvic floor. The prepubic tendon consists of the transverse and non-transverse tendons of the pectineus muscles, the pelvic tendons of the rectus and obliquus abdominal muscles, and the tendons arising from the cranial portions of the gracilis muscles (6). Prepubic tendon rupture (PTR) can cause herniation of the pregnant uterus. It may be related to pregnancy and trauma. With a ventral abdominal hernia, the fetus's life is in danger during birth, and birth intervention is necessary (7).
PTR is encountered in many different animals. PTR has been reported more frequently in mares. It is rarely seen in cows and sheep. This condition is less common in cattle due to the presence of the subpubic tendon, which provides extra support to the prepubic tendon. (8). In this report, the approach to dystocia cases that occurred in 6 sheep and 5 goats with PTR during the prepartum period was discussed.

2. Materyal ve Metot / Material and Method

Animal material
The material of this study consisted of sheep and goats brought to Burdur Mehmet Akif Ersoy University, Faculty of Veterinary Medicine, Obstetrics and Gynecology Clinics. A total of 11 animals (6 sheep and 5 goats) were brought to the clinics and their data between 2015 and 2023. An informed consent form was obtained from the owners of each animal used in this study. All animals were in the last trimester of pregnancy and were between 140-150 days of pregnancy.
Clinical examination and treatment
During the clinical examination, the viability of the fetuses was evaluated by ultrasonography (Hasvet 838, Türkiye). However, the exact number of fetuses could not be determined due to the late gestation period. In all cases, caudoventral displacement of the uterine on the abdominal wall was observed to varying degrees. In determining the degree of case severity, the extent of udder extension to the ground was taken as a criterion. The diagnosis of PTR was performed by inspection during the surgical intervention, detection of the fetal extremities at the base of the abdominal wall during the ultrasonographic examination, and clinical findings. After clinical examinations, alternative approaches and treatments for animals were offered to the patient owners. These treatments included routine clinical protocols such as clinical observation until birth, cesarean section, or abdominal bandage options.
Data collection and analyses
Data from all animals were collected, including cases diagnosed with prepubic tendon rupture and/or abdominal hernia. Additionally, animal data on food intake, difficulty in sternal position, difficulty during walking, degree of rupture, treatment protocols, number of kids at birth, number of live kids at birth, and culling status were collected. The data of the study were collected from the registry system or anamnesis reports. The data of the study were stated numerically in tables. Data are shown as mean ± standard deviation.

3. Bulgular / Results

Anamnesis information obtained from animal owners indicates that many animals have difficulty walking (5/11) and feel pain in the sternal position (11/11). There was food intake in all animals. These cases were described as severe (7/11). The displacement that occurred only in the base wall of the abdomen was described as mild (4/11). These details are presented in Table 1.

Table 1: Clinical findings and PTR degree according to cases

Animal no	Animal species	PTR	Abdominal hernia	Food intake	Pain in sternal position	Difficulty during walking	PTR Degree
1	Goat	+		+	+	+	Severe
2	Goat	+	+	+	+	+	Severe
3	Goat	+		+	+		Severe
4	Goat	+		+	+		Mild
5	Goat	+		+	+		Severe
6	Sheep	+		+	+	+	Severe
7	Sheep	+		+	+	+	Severe
8	Sheep	+	+	+	+	+	Severe
9	Sheep	+		+	+		Mild
10	Sheep	+		+	+		Mild
11	Sheep	+		+	+		Mild

One goat (case 2) and one sheep (case 8) also had abdominal hernia. A total of 4/11 of these cases were brought back again to clinics for cesarean section. Other cases were observed by the owners until the time of birth. Some birth and fetus numbers data were reported to us later by the patient owners. Dystocia was detected in 5/11 of these cases and normal birth was detected in 2/11. In addition, while the live birth rate of the offspring was 100% in cesarean section and normal birth, it was 33.3% in dystocia cases. The culling statement of the animals was also investigated in line with the data received from the patient owners (8/11). Additionally, it was determined that the chances of survival of the offspring decreased in cases of dystocia in animals with PTR and abdominal hernia (Table 2).

Table 2: Treatment, kids number, and culling status according to cases

Animal no	Animal species	Treatment protocol	Approach for birth	Number of kids on birth	Number of live kids on birth	Number of dead fetus on birth	Culling status
1	Goat	Operation	Cesarian Section	3	3	0	Culled
2	Goat	Operation	Cesarian Section	2	2	0	Culled

3	Goat	Bandage	Dystocia	2	2	0	No inform
4	Goat	Operation	Cesarian Section	2	2	0	Culled
5	Goat	Bandage	Normal	4	4	0	Culled
6	Sheep	Observation	Dystocia	2	1	1	No inform
7	Sheep	Observation	Dystocia	3	0	3	Culled
8	Sheep	Operation	Cesarian Section	2	2	0	Culled
9	Sheep	Observation	Normal	2	2	0	No inform
10	Sheep	Observation	Dystocia	2	1	1	Culled
11	Sheep	Observation	Dystocia	3	0	3	Culled
mean±SD	-	-	-	2.45±0.68	1.72±1.19	-	-

The mean number of offspring in all animals in the study is 2.45±0.68 Figures of the cases are presented in Figures 1, 2 and 3.

Figure 1. Mild degree prepubic tendon rupture in case 4 (a) and case 10 (b)

Figure 2. Before (a) and after (b) cesarean section in case 8

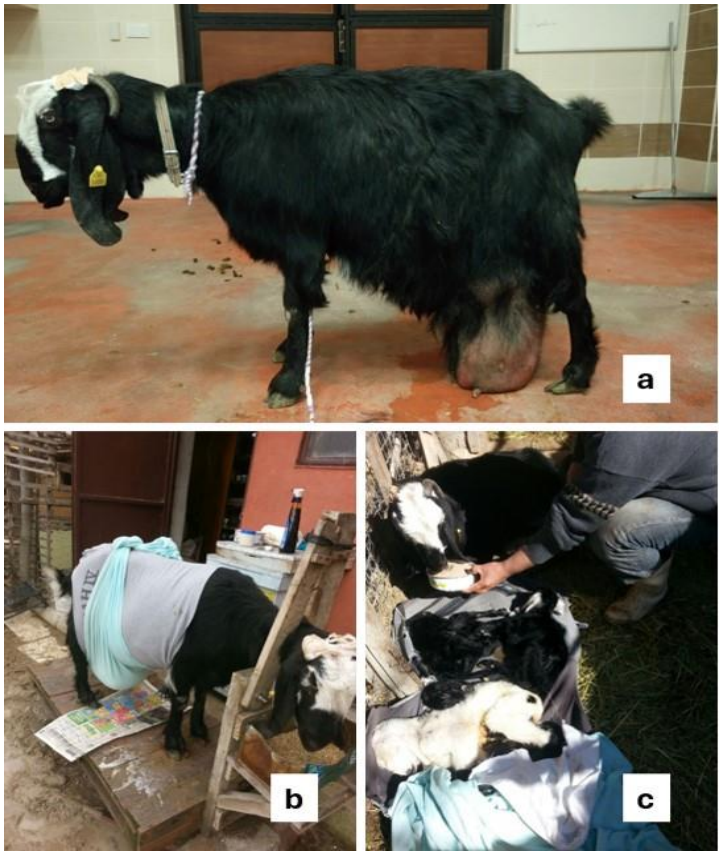

Figure 3. Severe degree case in case 3 (a), abdominal bandage (b) and after parturition with kids (c)

4. Tartışma ve Sonuç / Discussion and Conclusion

Reports of such cases in cows, sheep, and goats are rare, while PTR is generally more prevalent in mares. This rarity could be attributed to the presence of the subpubic tendon in cattle, providing additional support to the prepubic tendon (8). In recent years, several authors in Türkiye have documented cases of PTR in sheep and goats (9,10). Similar case reports may be encountered in various countries (6,11). This study presents clinical findings, various treatment modalities, surgical approaches, and their outcomes in cases of PTR occurring during the prepartum period in small ruminants. Various researchers have reported that factors such as trauma, multiple pregnancies, and fetal size contribute to the etiology of PTR (12,13). In the present study, it was hypothesized that the high incidence of twins and triplets in sheep and goats might be closely associated with PTR. Additionally, based on the anamnesis, there was no history of trauma in any of the animals. Hydroallantois was not clinically observed in any of the cases presented.

Intra-abdominal adhesions can hinder the mobility of the uterus within the abdominal cavity, consequently reducing expulsive force (1). However, in the current study, no adhesions were observed during the cesarean section. Additionally, the decrease in uterine expulsive force is believed to be directly associated with PTR. In some instances, the development of a hernia is estimated to be an additional factor contributing to dystocia. Ventral hernia occurs when internal organs protrude through a tear in the abdominal wall, often resulting from trauma such as kicks, horn injuries, forceful contact with blunt objects, or sudden movements. Ventral abdominal hernia is a commonly acquired condition in ruminants and horses (14). It is thought that the hernias observed in cases 2 and 8 were also formed due to PTR. However, it is not possible to determine whether the hernia formed before or after the rupture.

Clinical symptoms of PTR include caudoventral sagging of the abdomen in later stages of pregnancy, difficulty in walking, difficulty in breathing, pelvic asymmetry, pain, tachycardia, and tachypnea (10,11,13). A case was reported involving a three-year-old Merino sheep in the fifth month of pregnancy, presenting with excessive abdominal sagging. Physical examination revealed ventral edema, abdominal pain, reluctance to walk, tachycardia, tachypnea, elevation of the ischiatic tuberosity, and lordosis. The

observed findings in the current study data were consistent with previous data. Rupture of the prepubic tendon in small ruminants is more complex as it often results in udder injury due to its proximity to the ground (13). Similarly, the udder was observed to extend entirely to the ground in cases 1 and 7.
PTR occurs secondary to trauma. It can also occur in cases of animals carrying multiple fetuses and is seen towards the end of the pregnancy period. In this case, normal birth is not possible (6,15). Al-Ani and Khamas, (2016) reported three pregnant female goats with PTR in the last month of pregnancy in Shami breed goats. Clinical examination revealed normal parameters in all three cases and no signs of herniation in the abdominal wall. In these cases, a cesarean section was performed. All the kids were alive. Conceição et al., (2020) reported using traction intervention during labor in a sheep with PTR in which labor was induced with corticosteroids (16). In this study, in cases 4 and 8 where cesarean section was performed, the kids were healthy and alive. Also, dystocia was observed in all cases except cases 5-9. Dystocia affected the viability of the offspring. The reason for the increase in dead births in cases of dystocia may be related to the long stay of the offspring in the uterus and the development of aspiration pneumonia.
The abdominal bandage provides abdominal support, helps control the progression of edema and rupture, and reduces abdominal tension (17). Schutten (2016) applied an abdominal bandage to a pregnant mare with PTR to reduce ventral edema over time. The mare continued to feed and there were no signs of colic. Approximately on the 340th day of pregnancy, the mare's physiological parameters were observed to be positive (18). In cases 3-5, a similar method was applied 10 days before the expected birth, and the one goat had dystocia and one goat had a normal birth.
The prognosis for the current pregnancy and the next pregnancy is poor in cases of PTR. Rebreeding is not indicated for mares (8). It is known that symptoms in sheep and goats that are followed up continue in the postpartum period.
As a result, the incidence of PTR is quite low. However, in cases where it occurs, it can cause dystocia in small ruminants. Therefore, in cases of PTR, it is essential to continue the healthy lives of the mother and the fetus until the end of pregnancy. The appropriate birth time should be determined according to the farming conditions and birth should be intervened.

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Conflict of Interest Statement
The authors have no conflicts of interest to declare.

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Authors Contributions
GB: Conceptualization; Data curation; Investigation; Methodology; Validation; Visualization; Writing-original draft.
MY: Conceptualization; Methodology; Resources; Writing-review & editing.
AÇ: Investigation; Validation; Visualization
ŞG: Investigation; Visualization
HÇ: Resources; Visualization; Editing
YÇ: Supervisor; original draft; Editing

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