A Case of Atresia Ani in an Anatolian Water Buffalo Calf*

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Summary: In this case report; an Anatolian water buffalo calf with defecating problem since birth, was referred to the our clinic, was evaluated. Clinically no anal opening of anus was visible. There was a soft swelling under anal region which suggested us the case to be atresia ani. The animal was prepared for surgery. Following anaesthesia plus (+) shape like incision was made over the anal region, skin retracted. Greyish colour of rectum end was seen in two cm inside of the skin. Rectum was withdrawn towards anal skin and fixed. After fixation, rectal end was perforated and meconium coming up to was observed. This case, atresia ani alone was reported first time in an Anatolian water buffa-lo calf with case report in Turkey.

Key words: Atresia ani, congenital defect, water buffalo calf

Introduction
Congenital defects are the functional anomalies that present in birth. Genetic or environmental factors alone or together cause these defects. In many occasions, reasons behind this are not known. The most widespread environmental teratogens for cattle are; eating toxic plant by mother cow, viral infections during pregnancy and maternal-fetal viral infections (6,13). Atresia ani is a congenital anomaly reported in all domestic animals which characterized with anal opening closure and end up with blind pouch under the skin (6,18,27).

Clinically observed findings are, the absence of feces, dullness, anorexia, abdominal strain, discomfort and tension associated with defecation attempt (2,6). In domestic animals, to correct atresia ani, various surgical techniques have been suggested (14,28). In surgical techniques; + like incision and circular incision are the most common used surgical methods. But, stenosis like complication has been reported to developed in above techniques (1,3,23).

In this case report, the presence of atresia ani in an Anatolian water buffalo was described which is seen rarely and applied surgical method were also presented.

Case Report
The animal was referred to University of Erciyes, Faculty of Veterinary Medicine Clinics for defecating problem since birth. Body temperature, respiratory and pulse frequency were as 37.8ºC, 24/min and 124/min respectively. Clinically observed findings are, the absence of feces, dullness, anorexia, abdominal strain, discomfort and tension associated with defecation attempt (2,6). In domestic animals, to correct atresia ani, various surgical techniques have been suggested (14,28). In surgical techniques; + like incision and circular incision are the most common used surgical methods. But, stenosis like complication has been reported to developed in above techniques (1,3,23).

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Atresia ani; develops at the embryonic stage as a result of formation failure in cloacal plate dorsal pieces (6,10,18,27). In other words, a thin membrane covering normal anal canal does not disintegrate. Furthermore, cattle are more susceptible to chromosomal anomalies causing mutations at 14-42 days of embryonic age (15). Atresia ani is congenital and hereditary and is an autosomal recessive gene anomalies occurred at embryonic stage.

Environmental factors, plant toxins, and viral infections may also cause in the development of atresia ani. But in many cases, reasons behind development of anomaly is not clearly understood (4,22).

The animal was the first calf of the mother in the farm. No anomalies in mother sisters calves were also noted. There were no signs of feeding material causing any teratogenic effects. Newman et al. (19) have reported that rectal ultrasonographic examination made twice in per week, from the day of 28 to 90. Days of pregnancy may contribute to atresia ani development. In our case no rectal ultrasonographic examination was made till the end of pregnancy and therefore no possible relationship was detected with rectal examination and atresia ani development. The most frequently encountered intestinal anomaly is the atresia ani in ruminants. The anomaly occurs usually in urogenital and skeleton-muscle system.

Atresia ani and recti have been frequently reported in male lamp and female calves (20,21).
In contrary to these studies, the animal in our study was male.

Atresia ani in literatures has been classified as four types according to various degree of anus and rectum agenesis. In Type I, anus is open but narrows (anal stenosis), rectum develops normally. In type II, anus coats with a thin membrane. Rectum is located just in front of anal membrane as a blind sac. In type III, anus is not developed and rectum locates cranially as a blind sac. In type IV, terminal section of rectum and anus are normal but there is rectal atresia in pelvic canal (rectal agenesis) (17,24,25). Atresia ani associated with rectovestibular fistula and vulvar agenesi together have been reported in water buffalo by Sreenu et al. (30) Moreover, Velavan et al. (32) have recorded a buffalo calf with atresia ani and recti. Krishna et al. (16) have also recorded vulva agenesis and terminal urethra with ani and recti in a buffalo calf.

In the present study, the buffalo calf had atresia ani and the rectum was as blind sac located in front of anal membrane which was in type II classification. The clinical signs of anorectal anomalies are associated with the duration of meconium retention (1). Anomalies should be treated surgically, otherwise death occurs due to disruption of physiological feeding and endotoxemic shock (1,16). Physiological leucocytosis may associate with stress, stimulation, fear or pregnancy in ruminants. Short term physiological leucocytosis may be seen after releasing of epinephrine.

The causes of pathological leucocytosis are infections, endogenous and exogenous intoxications, hormonal and central nervous disorders, ana-

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Findings</th>
<th>References Mean ±SD (10,11,29)</th>
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<tbody>
<tr>
<td>pH</td>
<td>7.404</td>
<td>7.36 ± 0.01</td>
</tr>
<tr>
<td>pCO₂(mmHg)</td>
<td>51.9</td>
<td>54.7 ± 1.3</td>
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<tr>
<td>pO₂(mmHg)</td>
<td>29.0</td>
<td>37.0 ± 1.2</td>
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<tr>
<td>Na⁺ (mmol)</td>
<td>138.9</td>
<td>134.0 ± 4.0</td>
</tr>
<tr>
<td>K⁺ (mmol)</td>
<td>4.06</td>
<td>4.3 ± 0.24</td>
</tr>
<tr>
<td>iCa (mmol)</td>
<td>1.43</td>
<td>2.85 ± 0.07</td>
</tr>
<tr>
<td>HCO₃ (mmol)</td>
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<td>23.8 ± 1.2</td>
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<tr>
<td>TCO₂</td>
<td>33.6</td>
<td>32.5 ± 0.83</td>
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<tr>
<td>BEb (mmol)</td>
<td>5.8</td>
<td>-1.10 ± 0.10</td>
</tr>
<tr>
<td>BEef (mmol)</td>
<td>7.3</td>
<td>NR</td>
</tr>
<tr>
<td>O₂Sat (+)</td>
<td>54.7</td>
<td>42.4 ± 11.0</td>
</tr>
</tbody>
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pH: Actual blood pH; pCO₂: Partial pressure of carbon dioxide; pO₂: Partial pressure of oxygen; Na⁺: Sodium; K⁺: Potassium; iCa: Iyonized calcium; HCO₃: Bicarbonate; TCO₂: Total carbon dioxide; BEb: Standard base excess blood; BEef: Base excess extrasellüler fluid; O₂Sat(+): Oxygen saturation; NR: Not Recorded
phyllactic shock, leukemia and cattle leucocytes adhesion (26). In parallel to these facts, white blood cells (WBC) (65.5 \times 10^9/l) values detected before surgery was high (Table I). The possible reasons of leucocytes might be attributed to stress, endotoxemia and inflammation due to lack of defecation.

Thrombocytosis may occur in ruminants as a result of splenic narrowing which induces by epinephrine. Essential or primer thrombocytosis is a condition of rare myeloproliferation. Cytokine releasing is triggered in reactive or secondary thrombocytosis and is seen in connection with stress, chronic blood loss, inflammation, neoplasia and iron deficiency (26).

In the lights of these informations, platelet (PLT) level in this study was found as 756\times 10^9/l. The possible reason in high PLT was considered due to inflammation associated with no defecation (Table I).

Furthermore, venous blood gas measurement of HCO_3, BEb and pH were 32.0 mmol, 5.8 mmol and 7.404 respectively which were higher than those of references values (Table II). The alternations of gas values were attributed to metabolic alkalosis arising from absence of defecation (31).

Surgical intervention in atresia cases should be initiated as early as possible. The place of constructed artificial anus is over the side of swelling area (12). The most common complications encountered postoperatively are functional insufficiency of anal sphincter or fecal incontinence depending on disruption of sphincter muscles during surgery (1,23). Moreover, some authors have suggested that a plus (+) shape of incision over the anus resulted in excessive tissue formation which induced anal stenosis (1,5). However, from 32 of cases with atresia that treated with an incision like +, only one animal had anal stenosis (12). Dreyfuss and Tulleners (7) used different techniques for anal reconstruction and they detected no signs of anal stenosis following circular incision. The anus was constructed by a plus shape of incision in the present study. Moderate degree of stenosis and little sign of straining in defecation were determined two months after surgery.

In conclusion, atresia ani was alone reported first time in an Anatolian Water Buffalo calf. The anal construction was made with a plus (+) shape of incision up to 2x2 cm in length. Moderate degree of anal stenosis was experienced in the animal. Therefore, longer incision might result in less complication for the further interventions.

References


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