

Case Report / Olgu Sunumu

Schistosomus (Fissura abdominalis), atresia ani and arthrogryposis in a Turkoman foal

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Summary: Schistosomus reflexus (SR) is a rare monstrosity. This fatal congenital anomaly is characterized by defect fusion that result in abdominal and sometimes thoracic viscera exposure (schistosomus), ventral curvature of the spine and curved chest walls as lateral (reflexus). The present study describes schistosomus (Fissura abdominalis) without reflexus in a Turkoman foal. The foal exhibited rupture of abdominal wall and the internal organs were exposed and outside the body. Arthrogryposis and atresia ani were other anomalies associated with SR. To the authors' knowledge, it seems the first report of SR with atresia ani and arthrogryposis in a foal.

Keywords: Atresia ani, foal, schistosoma reflexus.

The occurrence of inherited anomalies is economically considerable. Although the etiology of congenital anomalies remains unclear, the majority of these anomalies can be related to genetic factors (mutations, chromosomal anomalies), infectious agents, and environmental factors (25). Schistosomus reflexus (SR) is a rare monstrosity primarily in cattle (13, 23). This fatal congenital anomaly is characterized by defect fusion that result in abdominal and sometimes thoracic viscera exposure (schistosomus), ventral curvature of the spine and curved chest walls as lateral (reflexus) (22). This malformation has also been reported lambs (25), camels (6), dogs (20), cat (19), goat (24) and foal (10). This anomaly may be associated with other congenital defects. Congenital anomalies and lesser multiple anomalies are reported in domestic animals and some of them may be associated with obstetrical problems (2). The present study describes schistosomus (Fissura abdominalis), concurrent with atresia ani and arthrogryposis in a Turkoman foal.

A Turkoman foal was born from a six-year old mare with dystocia signs in Isfahan province, Iran in a small farm. The foal exhibited rupture of abdominal wall and the internal organs were exposed and outside the body. The fissure was continued to near the anus site. A part of the intestines was congested. No abnormality was observed in the formation of thoracic cavity. Ribs and

costal cartilages were intact. Only partly open ventral body closure was determined. The animal was diagnosed as schistosomus with no reflexus. Arthrogryposis and atresia ani were other anomalies associated with schistosomus. The fore and hind limbs were observed to be fully developed, and to display normal bone structure but had arthrogryposis. Also, the head, eyes and nose were formed completely. The cervical, thoracic and lumbar vertebrae as well as the sacrum and costae were also determined to be fully developed. No findings were present about lordosis or dorsoflexion in this case.

Schistosomus reflexus (SR) is a birth defect that means inside out and bent backwards. This rare anomaly is reported primarily in cattle with about 1.3% of bovine dystocias (12). The exact etiology and the pathogenesis of SR are unknown. Role of environmental teratogens and genetic factors in development of this fetal condition are not demonstrated clearly (7). Genetic factor is suggested for occurrence of SR and some indications supporting this hypothesis. An autosomal recessive inheritance has been suggested in bovine SR that the same bull had sired affected calves (7, 14). Kovacs and Stranzinger (13) found no chromosomal defects in the somatic cells of a female calf affected to SR, but they observed a higher incidence of synaptic anomalies in meiocytes of calf in compared to normal bovine fetuses.



Figure 1. Schistosomus in Turkoman foal. Not fused abdominal wall and the exposed gastrointestinal tract outside the body.



Figure 2. Atresia ani characterizes with agenesis of anal orifice.

The present foal was born from a mare with dystocia and displayed schistosomus (Fissura abdominalis) associated with atresia ani and arthrogyposis. Equine dystocia is a true emergency that threatens the survival of both dam and fetus. One of agents of dystocia is

malformations like schistosomus reflexus. In the literature, the most reports of SR are documented in the calves (12, 13, 14). Few reports on schistosomus reflexus or schistosomus reflexus-like conditions have been reported in equids. Johnstone (10) reported equine

schistosomus that was born by caesarian section. Proctor (21) described foetal monstrosity resembling schistosomus reflexus in a Thoroughbred mare. The foal was born from a 6-year-old mare with dystocia. The case had marked dorsal angulation at the cervicothoracic junction and sternal cleft at its caudal extremity. The hind showed arthrogryposis. The diaphragm was complete. Ventral abdominal wall had closure defect. The kidneys were in a retropleural position within the thorax. The visceral organs were herniated from the ventral abdominal wall defect. Addo et al. (1) reported schistosomus reflexus-like syndrome in a twin foal. One of the twin displayed eventration of abdominal viscera and kyphoscoliosis in the thoracic spinal vertebrae. Ectrodactyly and ankyloses were observed in the right foreleg. Abdominal fissure was expanded from the xiphoid cartilage to the pubis. All viscera appeared normal but the liver was abnormally lobulated, cystic and fibrotic. Dubbin et al. (5) reported dystocia attributable to a fetal monster resembling schistosomus reflexus in a donkey.

SR uses for variable extension of visceral exposure and spinal inversion. Laughton et al. (14) stated that only cases show both exposed viscera and spinal inversion are considered as true SR. In the previous studies, the cases with only ventral clefts and no spinal inversion had been categorized as SR (9, 16).

A wide variety of other malformations reported in conjunction with SR are including thoracoschisis, extreme dorsal spinal flexion, limb arthrogryposis, positioning of the limbs near to the head, lung and diaphragm hypoplasia, skeletal anomalies (prognathia, scoliosis), urogenital anomalies, intestinal and anus atresia were with reported SR (14, 15). Atresia ani and a bifurcated scrotum has occurred in a conjoined twin lambs (5). Ozalp et al. (19) described SR in a cat. Abdominal wall was ruptured and the most internal organs protruded. No abnormality was observed in the formation of thoracic cavity and only a part of ventral body was opened. Lungs, liver and heart were hypoplastic. Atresia ani is characterized by imperforated anus at birth time that results in lack of defecation. This condition can occur individually, but may also be associated with other congenital abnormalities in different body systems such as distal spine, urogenital tract or colon atresia (3, 17).

The precise causative agent of the most congenital malformations is not clear because of the complex mechanisms in their development (11). Genetic causes are main risk factor, although toxic plants and some viral infections during the early stages of pregnancy can also been responsible in occurrence (18).

In conclusion, schistosoma is a rare anomaly in foal. To the authors' knowledge, it seems, this is the first case of this anomaly with atresia ani and arthrogryposis in a Turkoman foal.

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