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ETIOLOGY, CLINICAL SIGNS, AND PREVENTION OF UMBILICAL HERNIA (BASED ON A REVIEW OF THE LITERATURE)

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Abstract. This article examines the causes, symptoms, pathogenesis, diagnosis, and prevention of umbilical hernias.

Keywords: Umbilical, hernia, etiology, pathogenesis, symptom, diagnostics, clinical, physiological, laboratory, intoxication, resistance, productivity, collapse, meteorism, coprostasis.

Relevance of the topic: It has been noted that various infectious and parasitic diseases hinder the development and efficiency of livestock farming. Among these, helminthic infections (helminthoses) play a significant role, leading to high animal mortality, reduced productivity, and stunted growth and development in young animals. Furthermore, these infections result in high rates of infertility among ewes, a diminished ability of the animals' bodies to resist other diseases, and a decline in milk and meat yields—by 15–30% and 10–30%, respectively.

It should be noted that, at present, a wide range of diseases—including parasitic, non-infectious, and infectious conditions—are causing significant economic losses in the livestock sector. These impacts include reduced animal productivity, such as weight loss in animals being fattened for slaughter, decreased milk yield in dairy breeding herds, delayed sexual maturity in heifers, stunted growth and development in young calves, and, in some instances, mortality. Furthermore, the increasing prevalence of umbilical hernias among young animals—particularly calves—leads to stunted growth and development, subsequent impairments in sexual

and physiological maturation, and the onset of various other diseases, all of which result in substantial economic losses for agricultural enterprises.

Umbilical hernia: An umbilical hernia refers to the protrusion of abdominal organs—along with the peritoneum—into the subcutaneous space through either anatomical or pathological openings.

If organs move into the subcutaneous space as a result of a rupture in the peritoneum and the underlying structures, this condition is termed a "prolapse." If, due to a breach in the integrity of the abdominal walls—including the skin—the internal organs are exposed to the external environment, this condition is known as "eventration."

According to the literature, hernias are a widespread pathology among animals; they occur in 25% of pigs, 10–12% of ruminants (horned livestock), and 5–7% of dogs and cats.

Origin and causes of the disease: Hernias are classified as either congenital or acquired, depending on their origin. Congenital hernias may result from abnormal fetal development, hereditary factors, or trauma. Animals with such conditions are born with enlarged openings in the umbilical or inguinal (groin) regions.

Acquired hernias develop during an animal's lifetime due to factors such as physical strain, improper management, increased intra-abdominal pressure, or trauma.

A hernia consists of three components: the hernial ring (opening), the hernial sac (formed by the expansion of the peritoneum/abdominal lining), and the organs that have protruded into this sac.

Based on their location, hernias are categorized as umbilical, inguinal, scrotal, lateral abdominal, perineal, femoral, diaphragmatic, or vertebral.

The causes of hernias can be local or general. Local causes relate to the anatomical structure of specific body regions (such as the perineal area or the umbilical region) where a hernial sac might protrude. General causes include heavy

physical exertion—often associated with strenuous labor—or increased intra-abdominal pressure (for instance, during pregnancy), which can cause the abdominal wall to weaken and thin, thereby increasing the risk of a hernia. According to the literature, there are many causes for the development of (swellings/lumps), including, in particular: inbreeding (mating between closely related individuals), heredity, improper feeding, and gastrointestinal diseases.

Clinical signs of the disease: Based on clinical signs, hernias are classified as reducible, irreducible, or strangulated.

Reducible hernias: The organs that have entered the hernial sac can easily return to the abdominal cavity.

Irreducible hernias: The organs that have entered the hernial sac become adherent (stuck) to its walls.

Strangulated hernias: A distinct category in which organs become compressed due to the presence of fecal matter or tissue.

In such cases, symptoms of intestinal disorders develop in the animal—including collapse, meteorism (bloating), and coprostasis (fecal impaction)—while vomiting may occur in dogs.

If the animal does not receive immediate medical attention, its condition will deteriorate, potentially leading to death.

Strangulated hernias are extremely dangerous; the organs within the hernial sac become compressed at the hernial ring (the opening). These are further classified into elastic strangulation and fecal strangulation.

Elastic strangulation typically occurs when intra-abdominal pressure rises, causing strong tension on the peritoneum and omentum; this triggers spasms in the muscles that form the hernial ring. As the opening constricts, the organs contained within it become compressed. The resulting disruption of blood and lymph circulation leads to tissue necrosis.

In cases of fecal impaction, the proximal (receiving) segment of the intestine becomes filled with stool, while peristalsis in the distal (efferent) segment decreases, which leads to obstruction.

According to recent findings, the development of diverticula may be caused by a disruption in the process of collagen formation within the connective tissue.





Figure 1. *Clinical presentation of a calf with an umbilical hernia.*

Diagnosis: The diagnosis of the disease is established based on anamnestic data, clinical signs, and pathological-anatomical changes.

Treatment. Umbilical hernias are treated using either conservative or surgical methods.

The conservative approach is effective only for congenital hernias that have a distinct hernial ring. This method involves the application of irritating substances to induce an aseptic inflammatory process around the hernial ring, which causes the opening to shrink and close. Substances such as 95% alcohol, a 2% alcoholic iodine solution, or a hypertonic saline solution may be used for this purpose.

When the hernial sac has enlarged, treatment is carried out surgically. Numerous surgical techniques have been proposed, all of which are based on the principle of closing the hernial ring.

Various methods have been developed for the surgical treatment of umbilical hernias:

1. Gutman
2. Olivkov
3. Sapojnikov

Before surgery, animals affected by a hernia are kept in a state of fasting or semi-fasting for 12–18 hours. The incision can be made using various techniques; if the hernial sac is not large, a straight-line incision is performed.

In the surgical treatment of hernias, after an incision is made in the skin, the hernial sac is separated from the surrounding tissue—up to the hernial ring—using a gauze swab or the back of a scalpel. In the case of small, reducible hernias, the sac (along with any organs contained within it) is returned to the abdominal cavity, and the opening is closed using interrupted or purse-string sutures. If the hernial ring is excessively large, it is closed using alloplastic material.

To promote rapid wound healing and prevent secondary complications, agents such as chlorhexidine, Betadine, or Chemispray are used, along with tetracycline-class antibiotics, such as 20% oxytetracycline or Limoxin.

Prevention. Naturally, preventing a disease is a more effective and simpler solution than treating it. This involves paying special attention to the conditions in which animals are kept, as well as isolating young animals that are either ill or

suspected of being ill for observation and care. Furthermore, it is advisable to treat the umbilical cords of newborns with iodine or methylene blue, maintain continuous monitoring for up to two months, and conduct periodic clinical examinations.

Conclusions and practical recommendations:

1. Umbilical hernias are a common pathology among animals; specifically, umbilical hernias account for 66.7% of cases, while inguinal/scrotal hernias account for 33.3%.
2. Avoiding close inbreeding, ensuring high-quality nutrition, and keeping calves in separate housing significantly reduce the incidence of umbilical hernias.
3. For the treatment of small umbilical hernias, the first methods developed by Spojnikov and Olivkov are primarily used.
4. Large umbilical hernias were treated using the Gutman method and the second method developed by Olivkov; all the calves recovered.
5. In the treatment process, the use of chlorhexidine, Betadine, Chemispray, ASD ointment, and vitamin-mineral supplements—both before and after surgery—contributes to a faster recovery for the calves.

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