

Incisional Hernia in a Dog

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ABSTRACT

Background: The rupture of the suture in the abdominal wall, but with integrity of the cutaneous suture, results in a condition known as incisional hernia. It is characterized by the protrusion of the abdominal viscera through orifices or areas of the abdominal wall. In most of the cases these defects in the abdominal wall are iatrogenic. The incisional hernia occurs in an intact wall that is weakened by surgical incisions. The available literature on the incidence of incisional hernias in animals is scarce. With the aim to contribute to the information about incisional hernia in animals, it was decided to describe the case of incisional hernia in a female dog after performing ovariohysterectomy (OH).

Case: An adult mongrel shelter bitch, of unknown age, weighing 9.5 kg was admitted for OH in a practical class of the veterinary surgical technical discipline. Once the anesthetic condition was established, a retro-umbilical cutaneous incision was made. After opening the abdominal cavity, the bitch was castrated routinely. The abdominal wall was sutured including peritoneum, muscle fascia, and rectus abdominis muscle with nylon thread and U-stitches. The subcutaneous tissue was then sutured with the same thread using Cushing suture. Ten days after the surgery, when the stitches were removed, the bitch revealed an increase in volume at the region of the surgical scar. Incisional hernia was diagnosed after careful palpation. For correction of the hernia, the bitch was submitted to surgical procedure. After the skin opening, an intense inflammatory reaction was observed in the subcutaneous tissue. The inflamed skin and subcutaneous tissue were removed. The abdominal cavity was closed with nylon thread by means of U-stitches. The subcutaneous and skin sutures were the same as the first surgery. Ten days after the second surgery, stitches were removed, and the bitch had fully recovered.

Discussion: One of the factors that may have contributed to the occurrence of the hernia was carrying out the surgical procedure in a practical class. The difficulties shown by students are related to the long learning curve, the complexity of the invasive technique, and the lack of ability. The apprentice surgeon can cause injuries in the tissues due to excessive manipulation. Post-incision hernias are acquired and formed when a cavity wall closed by surgery is ruptured. Another factor that may have contributed to the occurrence of the hernia described here is unsatisfactory postoperative care, which may be considered as one of the factors for acute cases of incisional hernias. Information on postoperative care after the patient was returned to the shelter is not available. Therefore, it cannot be ruled out that the patient, in contact with other animals by means of games or even fights, could have ruptured the points, thus causing dehiscence of the suture in the abdominal wall. However, it was concluded that the most probable factors involved in the etiology of the hernia in question were nutritional deficiencies along with the inexperience of the surgeon. The treatment adopted in the patient (herniorrhaphy) was adequate for the correction of the hernia. The technique and the material to be used in the procedure are of great importance, since it must be resistant enough to avoid recurrences. In the patient in question, nylon thread was used in separate U-shaped stitches. In the literature, there are reports that unabsorbable yarns used at separate points present the lowest rate of dehiscence and relapse in the abdominal wall sutures. The incisional hernia can be prevented by preparing the patient for surgery, improving the nutritional requirements, and by a more intense training of the students performing the surgical procedure in the neutering program of dogs and cats during practical classes.

Keywords: bitch, postoperative complication, herniorrhaphy, abdominal wall rupture.

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INTRODUCTION

Many surgical procedures require surgical access to the abdomen. In most this access is obtained through the ventral midline, after the end of the procedures, the incisions are closed. Surgical complications, such as rupture of sutures, have serious consequences and, therefore, the closure of incisions has been widely discussed in the literature [4].

The rupture of the suture in the abdominal wall (including muscle and fascia), but with integrity of the cutaneous suture, results in a condition known as incisional hernia, characterized by the protrusion of the abdominal viscera through holes or areas of the abdominal wall with abnormal weakness caused by the trauma and surgical incisions. Therefore, it represents the failure of the access route used or the defective synthesis of the parietal anatomical planes, which is caused by the existence of a local or general lesion compromising healing [12].

It can be avoided, consisting of avoiding the predisposing factors that lead to its occurrence, minimizing the risk of acute dehiscences of surgical wounds and, consequently, decreasing the incidence of incisional hernias [17].

The available literature on incidence in animals is scarce. However, in an article, the incidence in dogs and cats was 6.5% [16]. In large animals, it was detected in more than 16%, varying with the surgical approach used, pre-established factors and the patient's general clinical status [17].

In order to contribute to the information on incisional hernia in animals, it was decided to describe the case of incisional hernia in dogs after an ovariohysterectomy (OH).

CASE

An adult mongrel bitch, of unknown age, weighing 9.5 kg and belonging to an animal protection non-governmental organization (NGO), was admitted for OH in a practical class of the veterinary surgical technical discipline, at a private university.

After trichotomy of the ventral abdominal region, the dog was anesthetized with the following protocol: pre-anesthetic medication (PAM) with acepromazine¹ [Acepran 0.2% - 0.1 mg/kg/IM] and morphine² [Dimorf[®] 1% - 1 mg/kg/IM]. Ten minutes after PAM, anesthesia was induced with propofol³ [Provide 1% - 4 mg/kg/IV]. Anesthesia maintenance was performed

by inhalation of isoflurane² [Isoforine[™]]. In the immediate preoperative period, benzathine penicillin⁴ [Pentabiótico[®] - 40,000 IU/kg/IM] and meloxicam⁵ [Maxicam[™] 0.2% - 0.2 mg/kg/IM].

Once the anesthetic condition was established, a retro-umbilical cutaneous incision was made. The subcutaneous was dissected until visualization of the linea alba that was incised to access the abdominal cavity. After opening of the abdominal cavity, the right ovary was located, and the ovarian pedicle was clamped and ligature by transfixation was performed, with the use of a surgical nylon thread. The same maneuver was performed on the left ovary. Following this, the broad ligament was released and the uterine body was ligated with transfixation ligature using a nylon wire. The piece was removed, the cavity inspected, and the abdominal wall was sutured, including peritoneum, muscle fascia, and rectus abdominis muscle with nylon thread and U-stitches. The subcutaneous tissue was then sutured with the same thread using Cushing suture. The skin was closed by means of separated simple stitches with the nylon thread.

At the end of the surgery, the bitch was hospitalized for 4 days. During this period, daily dressing of the wound was performed, and meloxicam⁵ [Maxicam[™] 0.2% - 0.1 mg/kg/IM] was given once daily for 3 days. No interurrences were observed during hospitalization. On the fourth postoperative day, the bitch was returned to the NGO. Ten days after the surgery, when the stitches were removed, the bitch revealed an increase in volume at the region of the surgical scar (Figure 1A).

The bitch was clinically examined and incisional hernia was diagnosed after careful palpation. An inflammatory skin reaction was also observed and the presence of transmissible venereal tumor (TVT) was detected (Figure 1B). For correction of the hernia, the bitch was anesthetized again with the same anesthetic protocol as used for the first surgery. After the skin opening, an intense inflammatory reaction was observed in the subcutaneous tissue, and the decision to remove the inflamed skin and subcutaneous tissue was taken (Figure 2A), which allowed for the revival of the abdominal wall. The abdominal cavity was closed with nylon thread by means of U-stitches (Figure 2B). The subcutaneous and skin sutures were the same as the first surgery (Figure 2C).

After the surgery, the dog was returned to the NGO and was prescribed anti-inflammatory meloxicam⁵

[Maxicam™ 0.2% - 0.1 mg/kg/IM] once daily for 3 days, orally and an antibiotic enrofloxacin⁶ [Enrofloxacin 5% - 5 mg / kg/IM] twice a day for 5 days, orally.

Ten days after the second surgery, stitches were removed and the bitch had fully recovered. Vincristine⁷ [Sulfato de vincristina - 0.025 mg/kg/IV] was prescribed for the treatment of TVT.

DISCUSSION

In this study, the dog was an NGO animal, and such patients may present with several health problems, including hematological alterations [9]. These alterations interfere negatively in the healing of the wounds, and among the systemic factors that make healing difficult, nutritional status is included [14]. In addition, one of the indications of the nutritional deficiency of the bitch

was the presence of TVT (Figure 1B), since it is known that the animals with tumors are immunosuppressed [3].

One of the factors that may have contributed to the occurrence of the hernia presented here was carrying out the surgical procedure in a practical class. The use of live animals for teaching purposes is restricted by law, but castration of dogs and cats may be carried out in the practical classes of the veterinary medicine course as a public health measure in the projects pertaining to the population control of stray dogs and cats [10]. However, as most of the students do not master the technique, difficulties occur when practicing it individually, which in turn prolong the operative time of the animal [1]. These difficulties are related to the long learning curve, the complexity of the invasive technique, and the lack of ability [15]. The longer the

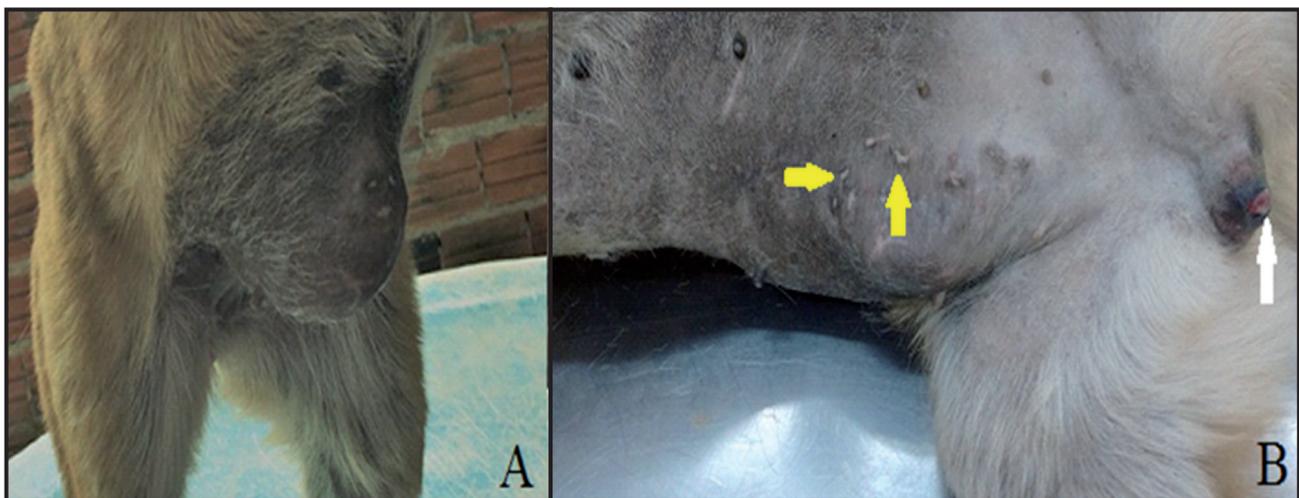


Figure 1. Mongrel bitch, of unknown age, weighing 9.5 kg. A- Increase in the volume in the ventral abdominal region post the diagnosis of incisional hernia, ten days after ovariectomy. B- Inflammatory processes caused by cutaneous points (yellow arrows) and the presence of transmissible venereal tumor (white arrow).

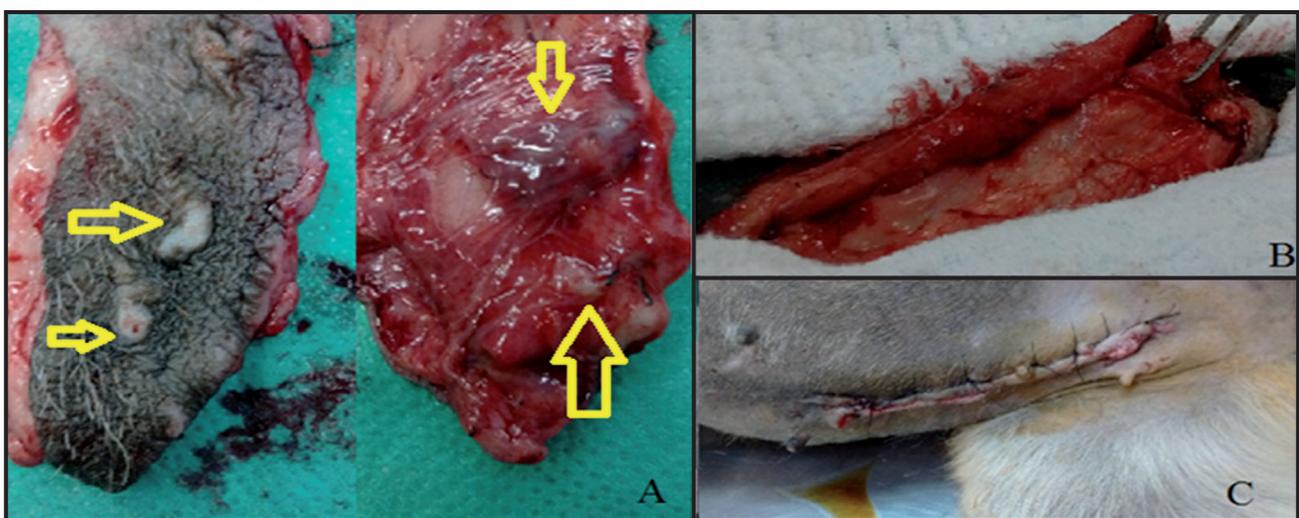


Figure 2. A mongrel bitch of unknown age, weighing 9.5 kg diagnosed with incisional hernia ten days after ovariectomy. A- Tissue segment (skin and subcutaneous) removed from the hernia site, with signs of inflammatory processes (arrows). B- Appearance of abdominal wall closure suture after hernia repair. C- Final appearance of the cutaneous suture after reduction of hernia.

operative time, the greater the possibility of infections, which is a common cause of suture dehiscence [6]. Incisional hernias can occur in OH performed in a neutering program of dogs and cats [13].

The apprentice surgeon is not always able to recognize the anatomical variations, and due to insecurity this apprentice causes injuries in the tissues or even an intense inflammatory process due to excessive manipulation [2]. In the patient of this case, it was possible to observe an intense inflammatory reaction not only in the skin, but also in the subcutaneous tissue (Figure 2A).

In the case described here, the dehiscence of the suture occurred in the abdominal wall, demonstrating the difficulty in closing this anatomical plane of suture. Post-incision hernias are acquired and formed when a cavity wall closed by surgery is ruptured, [17]. In a study carried out with the students, on the performance of OH in felines, the learning curve was satisfactory but presenting greater difficulties during the closure of the abdominal wall [5].

Most incisional hernias in dogs and cats occur in the first few days after the procedure [13,17] and are therefore classified as acute hernias. After the first week, such hernias can already be considered chronic [17]. Although it was found 10 days after the surgery, the hernia in this case may be considered acute. The hernia was only found when the stitches were removed, but it is likely that this had occurred earlier, because macroscopic changes caused by inflammation were clearly visible (Figure 2A), indicating that the disease was already present. In addition, after the fourth postoperative day, the dog was housed in the NGO, where monitoring was probably not intense. In a classical Brazilian study of the disease, the hernia occurred more frequently between the 5th and 9th postoperative day in dogs [16].

The clinical signs presented by the patient (painless volume increase at the site of the surgical scar) (Figure 1A) were characteristic of incisional hernia [16] and assisted in the clinical diagnosis for the bitch in this report.

The treatment adopted in the patient (herniorrhaphy) was adequate for the correction of the hernia (Figure 2 B and C). In herniorrhaphy, the technique

used should restore structural support, establish efficient soft tissues coverage, improve aesthetic appearance, and reduce patients' morbidity and disability [11]. The technique and the material to be used in the procedure are of great importance, since it must be resistant enough to avoid recurrences [8]. In the patient in question, nylon thread was used in separate U-shaped stitches, both in the first surgery and in herniorrhaphy. In the literature, there are reports that unabsorbable yarns used at separate points present the lowest rate of dehiscence and relapse in the abdominal wall sutures [7]. Thus, the suture technique and the wire type were most probably not involved in the etiology of the incisional hernia reported here. The bitch recovered completely post herniorrhaphy, thus confirming this claim.

Another factor that may have contributed to the occurrence of the hernia described here is unsatisfactory postoperative care, which may be considered as one of the factors for acute cases of incisional hernias [17]. Information on postoperative care after the patient was returned to the NGO is not available. Therefore, it cannot be ruled out that the patient, in contact with other animals by means of games or even fights, could have ruptured the points, thus causing dehiscence of the suture in the abdominal wall.

It was concluded that the most probable factors involved in the etiology of the hernia in question were nutritional deficiencies along with the inexperience of the surgeon. Such a disease can be prevented by preparing the patient for surgery, improving the nutritional requirements, and by a more intense training of the students performing the surgical procedure in the neutering program of dogs and cats during practical classes.

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