

UDC 619:616–089.8:636.7.082.34

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DETERMINATION OF OPERATIVE APPROACH FOR OVARIOHYSTERECTOMY OF BITCHES THROUGH THE LATERAL ABDOMINAL WALL

Abstract

This article proposes an optimal surgical approach for performing ovariohysterectomy in bitches through the right lateral abdominal wall.

In order to find the optimal operative access for ovariohysterectomy in bitches through the side, experiments were conducted using operative accesses in two areas of their right lateral abdominal wall.

Research work was carried out on healthy sexually mature bitches of various breeds, as well as purebreds. Given the anatomical location of the uterus and ovaries, two operative approaches were used. A transverse incision was made at the border of the inguinal and ilium regions, as well as a vertical incision in the ilium region.

A transverse incision was made in the upper third of the lateral abdominal wall in the direction from the front edge of the hook-bone to the fourth nipple of the corresponding side of the mammary gland.

To make a vertical cut, retreat three finger widths caudal from the last rib. The lower end of the incision did not go below the knee crease.

The study revealed that the most anatomically appropriate method of ovariohysterectomy in bitches through the right side is to perform an operation with an incision in the upper third of the lateral abdominal wall at the border of the inguinal and ilium area in the direction from the front edge of the hook-bone to the fourth nipple of the corresponding half of the mammary gland.

It has been proven that the use of the proposed surgical approach during ovariohysterectomy in bitches provides favorable conditions for finding and removing the ovaries, uterine horns, and part of the uterine body. This reduces the duration of the operation. At the same time, the relatively small size of the surgical wound and its location create conditions for wound healing.

It was also noted that a right-sided vertical incision in ilium area due to difficulties in accessing the uterine body is recommended for ovariectomy.

Key words: sterilization of bitches, ovariohysterectomy in female dogs, right flank laparotomy, right flank approach.

Introduction. Planned sterilization of domestic dogs is a common surgical procedure performed in veterinary practice [6]. The main advantage of sterilization is population control and a reduction in the number of cases of euthanasia of unwanted dogs. The most common method of sterilization of female dogs is ovariohysterectomy [5].

During the operation, both ovaries, uterine horns and the body of the uterus are removed [9].

Ovariohysterectomy is performed using a median laparotomy or through an incision in the area of the lateral abdominal wall [8].

Lateral access is an alternative to the traditional ventral median access for ovariohysterectomy in bitches [4].

Despite the fact that lateral access for ovariohysterectomy of bitches has been proposed for quite a long time, it has not become as widespread as ventral. Although, in some cases, ovariohysterectomy in bitches is indicated only through the lateral abdominal wall. This refers to excessive mammary gland development in lactating females or in connection with mammary gland hyperplasia [10].

Mammary hyperplasia or fibroadenomatous hyperplasia is characterized by rapid abnormal enlargement of one or more mammary glands. It has been proven that performing ovariectomy or ovariohysterectomy leads to regression of the mammary gland 3–4 weeks after the operation [11].

Similarly to lactating bitches, the use of lateral access in bitches with mammary hyperplasia avoids dissection near the mammary gland and minimizes possible postoperative complications due to damage to the enlarged mammary gland [2]. The advantages of lateral access during ovariohysterectomy include the ability to observe the state of the wound from a distance and the low risk of evisceration in the event of a gaping wound [4].

These advantages are especially important when operating on stray animals. The ability to study these animals after surgery is often limited. Therefore, it is necessary to control them from a distance. Lateral access allows visual assessment of the wound without fixing the animal, which is not possible with median access [1].

Another advantage of the lateral approach is the comfort of the operation for the surgeon. This is due to the ease of detection of the ovary compared to the ventral approach, which leads to a reduction in the time for surgery [4].

When using a lateral approach, the bitches can be placed in a left or right lateral position, depending on the surgeon's preference.

According to some surgeons, the right-sided approach is more convenient due to the more cranially located right ovary and the omentum covering the viscera when approached from the left, although Holly McGrath et al. found no advantage to right-sided access compared to left-sided access [7].

The purpose of the study is to determine the optimal operative approach for ovariohysterectomy in bitches through the right lateral abdominal wall.

Materials and methods. All experiments on animals were carried out in compliance with ethical standards and rules of humane treatment of animals. The work was performed at the clinic of the Faculty of Veterinary Medicine of the SHE "Podillia State University". Ovaries were removed from healthy sexually mature bitches of various breeds, as well as outbreeds. A total of ten sterilizations were performed using accesses: through an incision on the border of the right inguinal and ilium areas and in right ilium area.

In the evening before the operation, as well as in the morning of sterillisation, the animal was not fed. After premedication and general anesthesia, the animal was positioned in the left lateral position with the pelvic limbs pulled back.

When performing operative approach on the border of the inguinal and ilium areas, a skin incision was made in the upper third of the abdominal wall, along the direction from the anterior edge of the hook-bone to the fourth nipple of the corresponding side of the mammary gland (Fig. 1).

A piece of subcutaneous fat was excised with scissors, exposing the external oblique abdominal muscle in the wound. The abdominal muscles were bluntly separated. In larger females, the muscles were punctured with the thin end of the scalpel handle, and the opening was enlarged with the movements of the tool (Fig. 2). The peritoneal fold was cut with scissors.

In small bitches, the abdominal muscles along with the peritoneum were carefully punctured in the center of the wound using small hemostatic tweezers with thin sponges. The hole in the abdominal cavity was enlarged by dilating the branches of the clamp.



Fig. 1. Incision of the skin

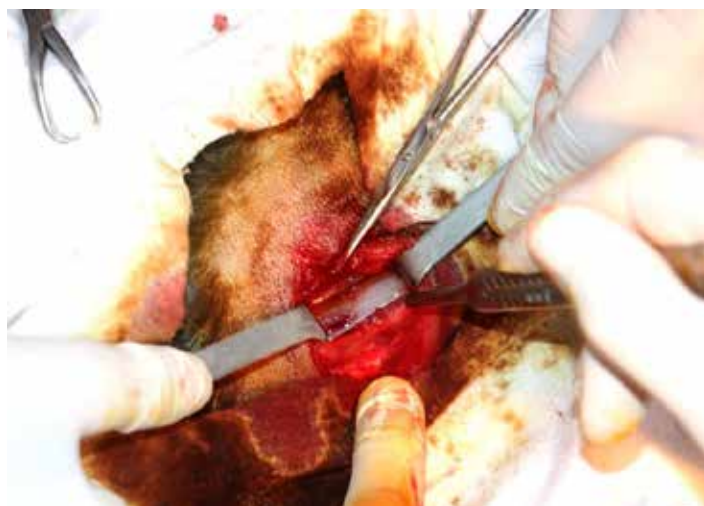


Fig. 2. A hole in the abdominal wall

A castration hook was inserted into the wound. The right horn of the uterus was grasped and pulled outward by directing the hook from the abdominal wall deep towards the spine (Fig. 3).



Fig. 3. Withdrawal of the right uterine horn from the wound

In the wound, the right ovary was removed, and operative admission was performed according to the generally accepted method [3] (Fig. 4).



Fig. 4. Removed ovaries, horns and part of the body of the uterus

The operation was completed by applying several separate nodal sutures to the internal and external oblique muscles (Fig. 5) and a nodal suture to the skin.



Fig. 5. Nodal sutures on the oblique muscles

When using access through the right ilium area, a vertical skin incision was made three fingers away from the last rib. The lower end of the incision did not extend below the knee fold (Fig. 6). The operation was performed in the same way as on the border between the inguinal and iliac areas.

On the day of the operation, the animal was not fed, only given water to drink. In the following days, a protective diet was used. In each case, the duration of the operation, the complexity of its implementation, and the course of the postoperative period were recorded.

Results and discussion. When performing a laparotomy on the border of the inguinal and ilium areas in the direction from the anterior edge of the hook-bone to the fourth nipple of the corresponding side of the mammary gland, it was easy to determine the place of the skin incision. The laparotomy and the detection and removal of the ovary and uterus were also easy. Applying ligatures to the ovarian ligaments and the body of the uterus, as well as the separation of the ovaries, horns of the uterus, and part of the body of the uterus were also without difficulties. Passing from one horn of the uterus to another was quite easy due to the favorable opportunities for access to the ovarian ligaments and the uterus provided by the laparotomy on the right side of the body at the level of the upper third of the abdominal wall along the hook-bone line – the fourth nipple of the corresponding half of the mammary gland creates favorable opportunities for access to the ovarian ligaments and the uterus. Therefore, no excessive tightening of the ovarium ligaments or uterus was necessary.



Fig. 6. Vertical section in the area of the iliac crest

The sterilization procedures were successful, and the wounds had an average length of $3,43 \pm 0,44$ cm. The operations lasted an average of $35,5 \pm 1,58$ minutes, and after the operation, the animals were mobile and had a normal appetite, showing no attention to the wound. Healing took place within $10,2 \pm 1,5$ days.

When using a vertical incision in the of the right ilium area, the length of the wound was $3,54 \pm 0,36$ cm, and all surgical interventions were effective. The laparotomy procedure was performed quite easily and quickly, and the right ovary was found easily due to the incision's proximity to the location of the ovary. This facilitated easy removal beyond the abdominal wall wound, even without severing the supporting ligament, which created conditions for the correct application of clamps and ligatures on the ovarian ligament. The left ovary was also easily removed from the wound.

However, the remoteness of the incision from the body of the uterus made it difficult to apply a ligature and perform the actual hysterectomy. Due to the strong tension of the uterus, there was a threat of rupture, and in six bitches, the uterine incision was performed through the bifurcation area. Increasing the incision's size did not improve access to the uterus, and the operations lasted an average of $38,4 \pm 2,51$ minutes.

Starting from the second day after sterilization, the animals ate food, and after three days their condition was almost the same as before the operation. All surgical wounds healed without complications within $10,0 \pm 1,2$ days.

Thus, the conducted studies have shown that using incisions in the area of the right lateral abdominal wall provides the necessary conditions for effective surgical intervention when performing ovariohysterectomy in bitches.

The characteristic features of the approaches used are the relatively small size of the wound and the simple performance of the laparotomy. Similar results were also obtained in other studies [4; 10].

According to the data we obtained, the duration of the operation using access at the border of the inguinal and ilium areas is shorter than through an incision in the middle in illiak area, although the difference between the animal groups was insignificant. Favorable conditions for the operation ensure that it is carried out within 34-40 minutes, which corresponds to the data obtained by Sharda R. et al. [8].

In addition, the position of the wound on the lateral abdominal wall contributes to the course of the postoperative period and healing. There was no significant difference in the duration of healing between animal groups.

During the research, it was established that determining the place of the skin incision, as well as finding and removing both ovaries, horns, and part of the uterus during ovariohysterectomy through a right-sided incision on

the border of the inguinal and ilium areas in the direction from the front edge of the hook-bone to the fourth nipple of the corresponding side of the mammary gland, is quite simple.

At the same time, it has been proven that a vertical incision in right ilium area allows quick access to the right ovary. However, such an operative approach is associated with difficulties in manipulating the body of the uterus and may be recommended only for performing ovariectomy.

Conclusions:

1. During ovariohysterectomy in bitches, a characteristic feature of using incisions in the area of the right lateral abdominal wall is the small size of the wound and the ease of performing laparotomy.

2. The position of the wound when using approaches through the right lateral abdominal wall creates favorable conditions for the postoperative period and healing.

3. The most anatomically justified method of ovariohysterectomy in bitches through the right side is to perform an operation with an incision in the upper third of the lateral abdominal wall at the border of the inguinal and ilium area in the direction from the front edge of the hook-bone to the fourth nipple of the corresponding side of the mammary gland.

4. Performing ovariohysterectomy in bitches using a vertical incision in the of the right ilium area is associated with difficulties in accessing the body of the uterus.

5. If ovariohysterectomy is necessary in bitches, we recommend using a right-sided surgical approach at the border of the inguinal and ilium areas in the direction from the anterior edge of the hook-bone to the fourth nipple of the corresponding side of the mammary gland. A vertical incision in right iliac area may be recommended for ovariectomy.

Prospects for further research. The conducted work opens opportunities for researching the impact of various methods of performing ovariohysterectomy in bitches on indicators of the physiological state of their body. This will make it possible to determine the most optimal of them not only from the point of view of performance technique, but also in connection with the effect on the animal's body.

References

1. Acharya M., Sah K.M., Singh K.D. (2016). Comparative advantage of keyhole right flank laparotomy and ventral midline celiotomy for ovariohysterectomy in bitches. *Int. J. Appl Sci Biotechnol.* V. 4 (2). P. 198-202. DOI: <https://doi.org/10.3126/ijasbt.v4i2.15098>.
2. Arunkumar S, Dilipkumar D., Shivaprakash B.V. (2017). Comparison of right flank and ventral midline approach for ovariohysterectomy in dogs. *Journal of Entomology and Zoology Studies.* V. 5 (6). P. 2411-2416.
3. Bencharif D., Amirat L., Garand A., Tainturier D. (2010). Ovariectomy in the Bitch. *Hindawi Publishing Corporation Obstetrics and Gynecology International.* DOI: <https://doi.org/10.1155/2010/542693>.
4. Dhakal I., Regmi B., Thakur B. (2023). Comparison of Ventral Midline and Right Flank Approaches of Ovariectomy in Bitches. *Journal of Veterinary Clinics.* V. 40 (1). P. 25-30 DOI: 10.17555/jvc.2023.40.1.25.
5. Kutzler M.A. (2020). Gonad-Sparing Surgical Sterilization in Dogs. *Frontiers in Veterinary Science.* V. 7 (342). DOI: <https://doi.org/10.3389/fvets.2020.00342>.
6. Leupolt B., Barbieri C.R., Jesus L. (2021) Prevalence and risk factors for urinary incontinence in bitches five years after ovariohysterectomy. *Arq. Bras. Med. Vet. Zootec.* 73 (02). DOI: <https://doi.org/10.1590/1678-4162-12031>.
7. McGrath H., Hardie R.J., Davis E. (2004). Lateral flank approach for ovariohysterectomy in small animals. *Compend. Contin. Educ. Small. Anim. Pract.* V. 26. P. 922-930. Corpus ID: 4973644.
8. Raju S., Dhaleshwari S., Rukmani D. (2022). Conventional ventral midline and right flank approach for ovariohysterectomy in female dogs. *The Indian journal of animal sciences.* V. 92 (5). P. 565-569. DOI: <https://doi.org/10.56093/ijans.v92i5.111066>.
9. Sakunde K., Chompoosan C., Tuchpramuk P. (2020) . The influence of duration on pain stress, oxidative stress, and total antioxidant power status in female dogs undergoing ovariohysterectomy. *Vet World.* 13 (1). P. 160–164. DOI: 10.14202/vetworld.2020.160-164.
10. Stepanov A.D. (2020). Comparison of the flank and ventral midline approach for ovariohysterectomy in bitches. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies.* V. 22 (98). P. 63-68. DOI: <https://doi.org/10.32718/nvlvet9811>.
11. Wehrend A., Hospes R., Gruber A.D. (2001). Treatment of feline mammary fibroadenomatous hyperplasia with progesterone antagonist. *Vet Rec.* N. 148 (11). P. 346-347. DOI: 10.1136/vr.148.11.346.

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ВИЗНАЧЕННЯ ОПЕРАТИВНОГО ДОСТУПУ ЗА ОВАРІОГІСТЕРЕКТОМІЇ СУК ЧЕРЕЗ БОКОВУ ЧЕРЕВНУ СТІНКУ

Анотація

Запропонований оперативний доступ для виконання оваріогістеректомії у сук через правий бік.

У статті наведено результати досліджень, направлених на пошук оптимального оперативного доступу за оваріогістеректомії у сук через праву бокову черевну стінку.

З метою пошуку оптимального оперативного доступу за оваріогістеректомії у сук через бік були проведені дослідження із застосуванням оперативних доступів у двох ділянках їх правої бокової черевної стінки.

Дослідницька робота проводилася на здорових статевозрілих суках різних порід, а також безпородних. Враховуючи анатомічне розміщення матки і яєчників, використовували два оперативні доступи. Застосовували поперечний розріз на межі пахвинної і здухвинної ділянок, а також вертикальний розріз у ділянці здухвини.

Поперечний розріз вели у верхній третині бокової черевної стінки у напрямку від переднього краю маклока до четвертого соска відповідної половини молочної залози.

Для проведення вертикального розрізу відступали на ширину трьох пальців каудально від останнього ребра. Нижній кінець розрізу не опускався нижче колінної складки.

Встановлено, що анатомічно найбільш обґрунтованим способом оваріогістеректомії у сук через правий бік є проведення операції з розрізом у верхній третині бокової черевної стінки на межі пахвинної і здухвинної ділянки у напрямку від переднього краю маклока до четвертого соска відповідної половини молочної залози.

Доведено, що використання запропонованого оперативного доступу за оваріогістеректомії у сук забезпечує сприятливі умови для пошуку і видалення яєчників, рогів матки і частини тіла матки. Це зменшує термін проведення операції. Разом із тим порівняно невеликий розмір операційної рани і її розташування створюють умови для загоєння рани.

Також відмічено, що правосторонній вертикальний розріз у здухвині у зв'язку з труднощами доступу до тіла матки рекомендовано використовувати для виконання овариоектомії.

Ключові слова: стерилізація сук, оваріогістеректомія сук, правобічна лапаротомія, правобічний доступ.

Список використаних джерел

1. Acharya M., Sah K.M., Singh K.D. Comparative advantage of keyhole right flank laparotomy and ventral midline celiotomy for ovariohysterectomy in bitches. *Int. J. Appl Sci Biotechnol.* 2016. V. 4(2). P. 198–202. DOI: <https://doi.org/10.3126/ijasbt.v4i2.15098>.
2. Arunkumar S, Dilipkumar D., Shivaprakash B.V. Comparison of right flank and ventral midline approach for ovariohysterectomy in dogs. *Journal of Entomology and Zoology Studies.* 2017. V. 5(6). P. 2411–2416.
3. Bencharif D., Amirat L., Garand A., Tainturier D. Ovariohysterectomy in the Bitch. *Hindawi Publishing Corporation Obstetrics and Gynecology International.* 2010. DOI: <https://doi.org/10.1155/2010/542693>.
4. Dhakal I., Regmi B., Thakur B. Comparison of Ventral Midline and Right Flank Approaches of Ovariohysterectomy in Bitches. *Journal of Veterinary Clinics.* 2023. V. 40(1). P. 25-30 DOI: 10.17555/jvc.2023.40.1.25.
5. Kutzler M.A. Gonad-Sparing Surgical Sterilization in Dogs. *Frontiers in Veterinary Science.* 2020. V. 7(342). DOI: <https://doi.org/10.3389/fvets.2020.00342>.
6. Leupolt B., Barbieri C.R., Jesus L. Prevalence and risk factors for urinary incontinence in bitches five years after ovariohysterectomy. *Arq. Bras. Med. Vet. Zootec.* 2021.73(02). DOI: <https://doi.org/10.1590/1678-4162-12031>.
7. McGrath H., Hardie R.J., Davis E. Lateral flank approach for ovariohysterectomy in small animals. *Compend. Contin. Educ. Small. Anim. Pract.* 2004. V. 26. P. 922–930. Corpus ID: 4973644.
8. Raju S., Dhaleshwari S., Rukmani D. Conventional ventral midline and right flank approach for ovariohysterectomy in female dogs. *The Indian journal of animal sciences.* 2022. V. 92(5). P. 565–569. DOI: <https://doi.org/10.56093/ijans.v92i5.111066>.
9. Sakundeck K., Chompoosan C., Tuchpramuk P. The influence of duration on pain stress, oxidative stress, and total antioxidant power status in female dogs undergoing ovariohysterectomy. *Vet World.* 2020. 13(1). P. 160–164. DOI: 10.14202/vetworld.2020.160-164.
10. Stepanov A.D. Comparison of the flank and ventral midline approach for ovariohysterectomy in bitches. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies.* 2020. V. 22(98). P. 63–68. DOI: <https://doi.org/10.32718/nvlvet9811>.
11. Wehrend A., Hospes R., Gruber A.D. Treatment of feline mammary fibroadenomatous hyperplasia with aprogesterone antagonist. *Vet Rec.* 2001. N. 148(11). P. 346–347. DOI: 10.1136/vr.148.11.346.