Case Report

A new laparoscopic approach for ovariohysterectomy by tracing the round ligaments in a bitch

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Abstract

Laparoscopy is a minimally invasive surgery that is widely used in humans and animals. Ovariohysterectomy (OHE) is one of the most common operations in dogs as it is encouraged by governmental policy in Taiwan. In this study, we presented a new laparoscopic approach to OHE in dogs by tracing the round ligaments rather than exploring around the ovaries through dissection of tissues near the ovaries or the uterus. The latter may result in soft tissue injury around the ovaries or the uterus. To our knowledge, this is a new laparoscopic approach for locating the ovaries directly by tracing the round ligaments and reducing soft tissue injury due to dissection. This approach may be useful for the veterinary clinician.

Keywords: dog, laparoscopy, ovary, round ligaments

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Introduction

Laparoscopy has been used in both humans (Asimakidou *et al.*, 2019, Knudsen *et al.*, 2020) and animals (Davidson *et al.*, 2004, Khan *et al.*, 2018, Griffin *et al.*, 2021, Prządka *et al.*, 2021, Hayes G, 2022) to replace the traditional open surgery approach in selected surgeries for decades. In dogs, ovariohysterectomy (OHE) by laparoscopy is one of the most common surgeries (Shariati et al., 2014). However, vascular injury (Paśnik and Modrzejewski, 2018) or hemorrhage (Davidson *et al.*, 2004) may occur during dissection. This is because the ovaries are conventionally located by dissecting the soft tissues adjacent to the ovaries to find the proper ovarian ligament, ovarian pedicle, and suspensory ligament, which are sealed using an energy device (Tapia-Araya et al., 2015). This report aimed to introduce a new laparoscopic approach for OHE by tracing the round ligaments in a bitch.

Case description

A 5-month-old intact female Mongrel dog, weighing 7.9 kg, was scheduled for laparoscopic OHE. Blood samples were collected before surgery and analyzed by the ProCyte Dx™ and Catalyst One™ (IDEXX, USA). The blood results were within normal ranges. The dog was determined to be ASA I. Intramuscular dexmedetomidine hydrochloride 5 mg/kg (Dexdomitor®, Zoetis, Finland) and ketamine 3 mg/kg (Imalgene 1000®, Merial, France) were administered as preanesthetic medicine. Propofol 2 mg/kg (Anesvan®, Chi Sheng, Taiwan) was used for induction, and 2–3% isoflurane was used to maintain anesthesia during the surgery. Using the open method, a 5-mm trocar insertion was made 2 cm below and 2 cm above the umbilicus. Then, pneumoperitoneum was established by CO_2 air insufflation after the first port was established, with the pressure maintained at 8 mmHg. Subsequently, a 12-mm trocar in the midline at the suprapubic region at the level of the uterus body was inserted under a 5-mm diameter 30° angled vision telescope (Laparoscope HOPKINS II; Karl Storz). With the assistance of a telescope, the left round ligament was found and by tracing the round ligaments dorsally from the inguinal canal, the ovary was easily identified with gentle retraction of the round ligament anterior to the abdominal wall (Fig. 1A). The left ovary and suspensory ovarian ligament could be easily found (Fig. 1B). The left ovarian vessels were occluded with an ultrasonic dissection device (Medtronic Sonicision™ Cordless Ultrasonic Dissection System), at a level below the uterine branch of the ovarian artery (Fig. 1B). Transection was performed along the avascular plane of the left suspensory ligament and the lateral peritoneum, to the round ligaments, using the cutting mode of Sonicision (Fig. 1C). The left ovary and uterine horn were then fully mobilized medially without manipulating any hollow organs (Fig. 1D). The right ovary and uterine horn were found and removed by tracing right round ligament following the left one's technique (Fig. 2A, 2B and 2C). After both the ovaries and uterine horns were freely mobilized, extracorpolization was performed via the suprapubic 12-mm trocar site (Fig. 2D). The uterine branch of the vaginal vessels was occluded with the Sonicision extracorporeally. Then, the uterine body was ligated and transected just above the uterine cervix. The ports were closed by 3-0 monofilament synthetic absorbable sutures (SmiAG, Belgium).

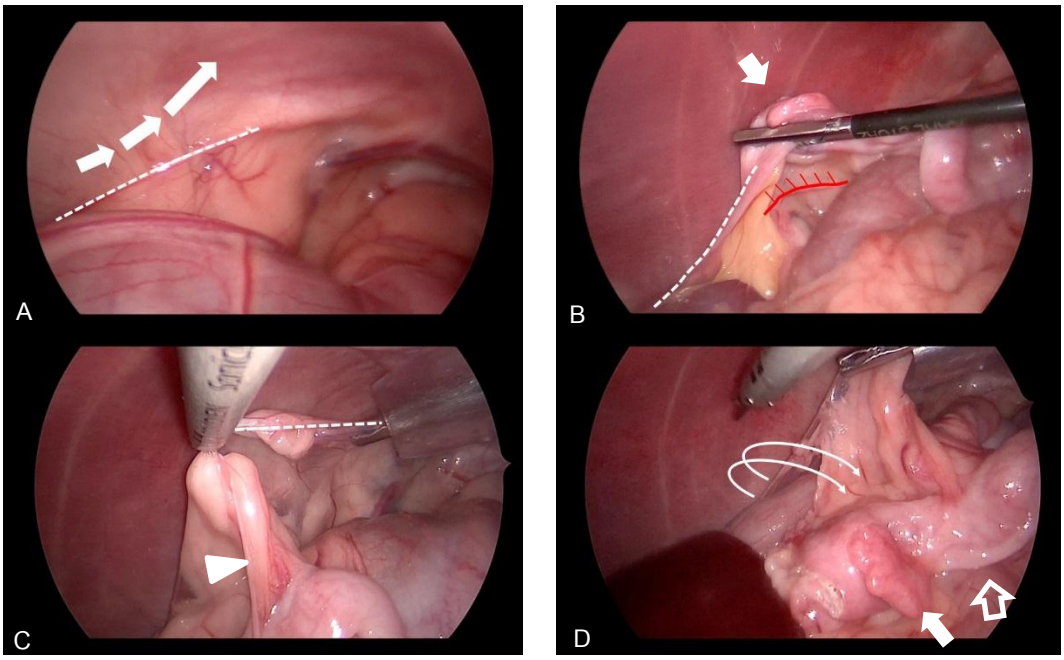

Figure 1 A) With the assistance of a telescope, the left round ligament (white dot line) was found. The left ovary was located by tracing the round ligament dorsally from the ligament canal. The left ovary could be easily identified (white arrow). B) The left ovary (white arrow), left suspensory ovarian ligament (white dot line) and uterine branch of the ovarian artery (red line) could be found by tracing round ligament, and then C) transection of the round ligaments (white dot line) and suspensory ovarian ligament (white arrow head) was performed using the Sonicision cutting mode. D) The left ovary (white arrow) and uterine horn (hollow arrow) were flipped medially to expose the lateral margin of the mesometrium (circle arrow) after ovarian artery, suspensory ligament and round ligament transection.

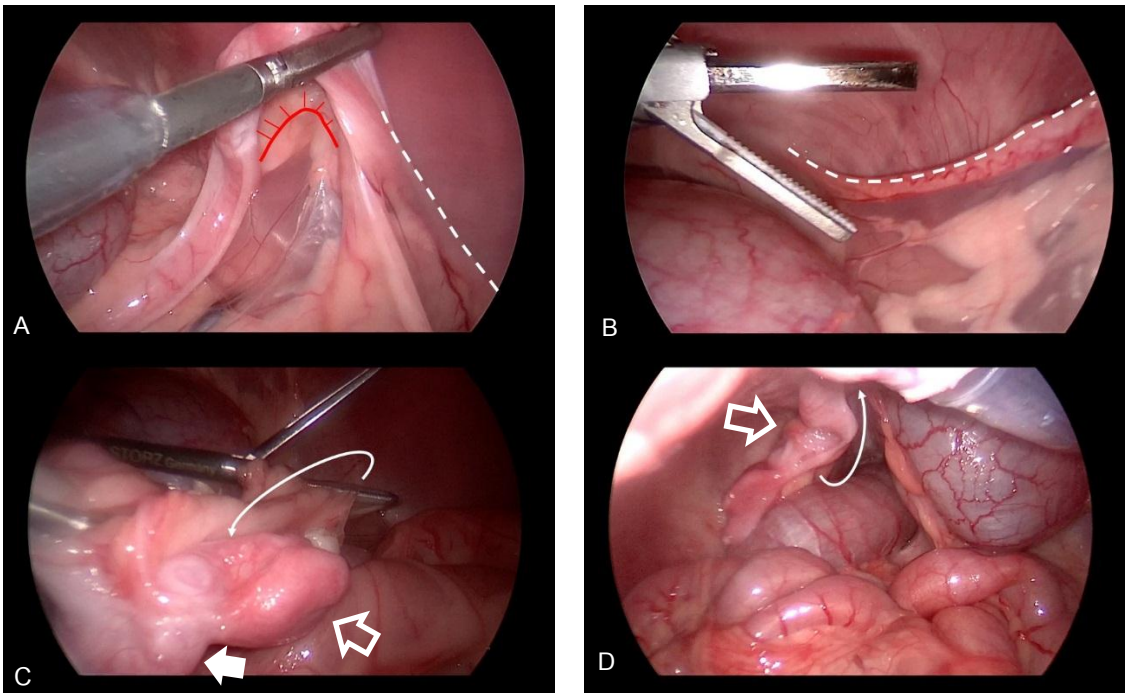

Figure 2 A) The right suspensory ovarian ligament (white dot line), uterine branch of the ovarian artery (red line) and right ovarian artery and vein were found by tracing the right round ligament. B) Transection was performed of the right round ligament (white dot line) using Sonicision after ovarian suspensory ligament and ovarian artery and vein transection. C) The right ovary (white arrow) and uterine horn (hollow arrow) were flipped to expose the lateral margin of the mesometrium (circle arrow). D) After both of the ovaries and uterine horns (hollow arrow) were freely mobilized, extracorporalization via the suprapubic 12 mm trocar site was carried out (circle arrow).

Discussion

In this report we presented a new laparoscopic approach for OHE in a bitch. By tracing the round ligaments to reach the ovaries, not only are the ovaries more easily detected but also the approach decreases soft tissue damage adjacent to the ovaries. For decades, laparoscopy has been used in veterinary medicine for procedures such as inguinal herniorrhaphy (Griffin *et al.*, 2021), cryptorchidism (Khan *et al.*, 2018.), adrenoectomy (Hayes G, 2022), urethrostomy (Prządka *et al.*, 2021) and OHE (Tapia-Araya et al., 2015). The standard approach for locating the ovaries during OHE involves dissecting the soft tissues near the ovaries to find the proper ovarian ligament, ovarian pedicle and suspensory ligament (Tapia-Araya et al., 2015). This approach may cause hemorrhage (Davidson *et al.*, 2004) or vascular injury (Paśnik and Modrzejewski, 2018). In this report, we presented a modified laparoscopic approach for OHE by tracing the round ligaments to locate the ovaries, which may provide veterinary clinicians with an alternative.

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