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Laparoscopic ovariectomy in standing donkeys by using a new instrument

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Abstract

Bilateral laparoscopic ovariectomy was performed in six female donkeys. Laparoscopic ovariectomy was performed in standing position by using a new laparoscopic instrument which was developed by the authors. We used the instrument for isolation, coagulation and cutting of mesovarium. One laparoscope portal and two instrument portals were located in each paralumbar fossa. The ovary was removed through an enlarged second portal. The contralateral ovary was removed through the opposite paralumbar fossa. Hemostasis, coagulation and cutting of the mesovarium were achieved successfully using the new laparoscopic instrument. The time required for removal of each ovary was between 2 and 4 min (average 2.8 min). While the total time of unilateral ovariectomy was between 10 and 15 min (average 12 min). No additional ligature was required in all operations. There was no complication, hemorrhage or oozing of blood from the mesovarium during or after the operations. In conclusion, laparoscopic ovariectomy in donkeys by using this new instrument was safe and effective. The new instrument reduced the time of operation and provided a viable hemostasis and coagulation for blood vessels within the mesovarium. Also cutting of the mesovarium was very easy.

Keywords: Ovariectomy; Standing donkey; Laparoscopy; New instrument

1. Introduction

Ovariectomy is a surgical procedure performed to remove one or both ovaries. In the equine, bilateral ovariectomy is done as an elective surgery used to prevent estrus associated behaviour, manage colic associated with estrus and to prevent pregnancy (Trotter and Embertson, 1992;

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Hooper et al., 1993). It is also done to remove the ovaries in some pathologic conditions such as ovarian hematoma, teratoma and granulosa cell tumor (Carson-Dunkerley and Hanson, 1997; Palmer, 2002; Catone et al., 2004).

Various methods can be used for ovariectomy; these include colpotomy (Colbern and Reagan, 1987), ventral midline approaches (Ragle, 2002), paramedian approaches (Moll et al., 1987), and laparoscopic techniques (Hanson and Galuppo, 1999; Rodgerson et al., 2001).

Laparoscopic ovariectomy provides good visualization of the ovary and mesovarium and allows tensionless manipulation of the mesovarium during pedicle transection, visual assessment of hemostasis and smaller body wall incisions (Palmer, 1993; Ragle and Schneider, 1995; Boure et al., 1997; Hanson and Galuppo, 1999; Rodgerson et al., 2001). This technique has been developed for mares in the standing (Hanson and Galuppo, 1999; Rodgerson et al., 2001) and dorsal recumbent positions (Ragle and Schneider, 1995; Santschi and Troedsson, 2001). Standing laparoscopic ovariectomy has advantages over dorsal recumbent technique because it eliminates the risk of general anesthesia (Hanson and Galuppo, 1999), and it provides excellent visualization to locate and manipulate the ovaries (Boure et al., 1997; Al-Badrany, 2007).

The main challenge with laparoscopic ovariectomy technique is finding the best way to ligate the ovarian pedicle and provide hemostasis. Therefore, numerous methods are used for hemostasis of the mesovarium and the associated ovarian vessels which include electrocoagulation (Rodgerson et al., 2001; Hand et al., 2002), ligature application (Boure et al., 1997), laser techniques (Palmer, 1993), stapling instruments (Doran et al., 1998), vascular clips (Rodgerson et al., 1998), ultrasonic shears (Alldredge and Hendrickson, 2004), and Harmonic Scalpel (Düsterdieck et al., 2003). These methods of hemostasis are time consuming and have some other disadvantages, which include difficulty in applying the hemostatic devices, ligature slippage and the cost of device.

The aim of the present study was to develop a bilateral ovariectomy procedure in female donkeys using a new laparoscopic instrument which has been developed by the authors. We used this instrument for isolation, coagulation and cutting of mesovarium.

2. Materials and methods

2.1. Laparoscopic equipment

In addition to the standard laparoscopic instruments; cannulas, telescope, insufflator, Veress needle and forceps (Karl Storz, Germany), a new laparoscopic instrument, designed and manufactured by the authors, were used in this study. The new instrument has an outer body (metallic tube with an outer diameter of 10 mm), internal movable part with two movable arms (length of each one is 7 cm) for holding the thermal wire, a thermal wire (0.5 mm in diameter and 8 cm long), on/off switch and a source of continuous electrical current (12 V, 12 A) (Fig. 1). In the abdominal cavity, the instrument is opened by pushing its internal part toward the cavity of abdomen; the two instrument arms and the thermal wire form a loop (the major axis of loop is 10 cm, the minor axis is 5 cm, the circumference of loop is 22 cm and the area of the inside of loop is 25 cm^2). The thermal wire was used to isolate, coagulate, and for cutting of mesovarium.

2.2. Animals

Six adult female donkeys (age, 3–5 years and weight, 120–150 kg) were used in this study. The animals were donated to the Clinic of College of Veterinary Medicine, University of Mosul for