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A look at laparoscopic ovariectomy in the bitch ("lap spay", "keyhole spay")

In recent years, laparoscopic ovariectomy ("lap spay", "keyhole spay") has been of increasing interest to owners and veterinary surgeons, as an alternative to traditional ovariohysterectomy at laparotomy. This article discusses the background to this surgery, the instrumentation required and and includes a description of the technique used by the author, with some reference to alternative approaches.

Key words: Canine, surgery, neutering, spay, ovariectomy, laparoscopy

Introduction

The lap spay has become a viable alternative to the traditional, ovariohysterectomy at laparotomy over the last 15 years, and is now offered by many UK veterinary practices. This article will consider the rationale for offering this procedure, some of the particular instrumentation requirements and present a step by step approach. Any practice considering offering the technique will need to do a great deal of preparation to be ready to start. The author recommends that in addition to reading articles such as this, textbooks on laparoscopy need to be consulted, practical courses attended and some one-to-one practical training arranged.

Advantages of lap spay over traditional surgery

Why should we offer this technique is a common question raised by practitioners. This is most easily answered by considering studies of recovery from the surgery. There are now several studies directly comparing post-operative pain and activity levels after open surgery and laparoscopic neutering, and it is clear that patients are typically less painful and more active after laparoscopic ovariectomy than after either ovariectomy or ovariohysterectomy at laparotomy (Culp *et al.* 2009, Devitt *et al.* 2005). Reduced pain after laparoscopy is attributed to reduced tissue traction as well as simply smaller incisional length. These studies are difficult to perform in a blinded way of course, but the evidence seems to be clinically relevant. In addition to the effect on animal welfare, major wound complications (skin breakdown, seroma formation, failure of abdominal wall closure) are probably reduced in incidence (there are no large enough studies to assess this), and similarly evidence of difference in complications (such as ovarian remnant syndrome, urinary incontinence, haemorrhage) is lacking.

Disadvantages over traditional open surgery

The most commonly suggested clinical disadvantages of the lap spay are the surgical time required and the possibility of uterine disease.

Considering the surgical time, this has been considered in at least one study (Devitt *et al.* 2005) when the surgical durations were similar for ovariohysterectomy at laparotomy or laparoscopy. There is no doubt that during the period required to develop experience, surgical times are longer with laparoscopy, as is preparation time, but once experience has been gained, the difference is no longer apparent. In either technique, some types of patient do take more time than others (larger and obese dogs, and particularly small patients, for example).

During the lap spay, ovariectomy, rather than ovariohysterectomy, is the routine. This is because removal of the uterus is unnecessary (see below) and haemostasis of the vaginal pedicle is technically more difficult laparoscopically than at open surgery.

Regarding complications relating to removal of the ovaries, rather than the ovaries and uterus, a long term comparison (Okkens *et al.*1997) showed no health differences in the two groups (this was with the surgery performed at laparotomy). In particular, there is no greater risk of pyometra or urinary incontinence. Pyometra development requires the hormonal influence of either ovarian tissue

or drug therapy. It will not occur in the absence of these (that is, unless ovarian remnant remains or due to medications, notably progestagenic agents).

Practical disadvantages are due to the significant capital cost of the equipment required, and the investment in time and training required to master the technique.

Instrumentation requirements

Suppliers of surgical equipment often offer a package of equipment for this surgery. Standard text books are also a good source of information. Table 1 lists the minimum requirement (a standard set of instruments such as that used for ovariohysterectomy at laparotomy is also required).

Combined haemostatic forceps/scissors

A critical requirement is the ability to efficiently provide haemostasis of the ovarian pedicle and transect the tissue. Several choices of technique are available but the author strongly recommends the use of a form of bipolar electrosurgery with an instrument that both seals and transects the tissue in a one stage process.

The preferred approach is to use specialised handpieces that combine vessel sealing with cutting, and which is accompanied by a dedicated generator that measures the effect of the instrument on the tissue and alerts the surgeon when adequate sealing is achieved.

Some systems use handpieces that can be autoclaved and have replaceable blades (e.g. Vet Seal), others have handpieces intended for single use but which are generally cleaned and sterilised by cold techniques (preferably ethylene oxide).

The author currently uses the Ligasure system (Figures 1-3) which is of the latter type. Both 5mm and 10mm handpieces are available and it seals and cuts with safety and efficiency. This type of equipment is associated with a capital cost of £6,000-12,000.

Systems using vessel sealing technologies, (which remodel collagen and reliably seal vessels of 3mm and over in diameter) are preferred to conventional bipolar devices. The author does not recommend the use of monopolar technology (hooks or scissors with monopolar attachments, since they cause smoke and obscure the surgical field, and have a greater risk of collateral tissue damage.

Table 1: Instrumentation requirements

Item	Number required	Author's recommendation
Laparoscope	One	5mm diameter 30cm working length, zero degree viewing angle
Camera unit (head and control box)	One	A combined control box, light source and monitor is practical and economic
Light source	One	See above. A xenon light source is the minimum specification
Monitor	Two	One as part of combined unit and a second mounted elsewhere in the room. HD quality is unnecessary
Insufflator	One	Automatic carbon dioxide insufflator
Light guide	Two	Autoclavable preferred. A spare is economic
Insufflator hose	Two	Autoclavable preferred. A spare is economic
Trocars	Three minimum	5mm blunt tipped trocar for first access Two 5mm pyramidal tip trocars for secondary access One 10mm trocar for secondary access 5mm trocars autoclavable 10mm trocar disposable
Verres needle	One	Autoclavable. Author rarely uses
Grasping forceps	Two pairs	5mm diameter, 30cm working length Autoclavable. Babcock pattern
Palpation probe	One	5mm diameter
Scissors	One	5mm diameter. Autoclavable. Rarely used
Combined haemostatic forceps/scissors	One	See below
Long chamber vacuum autoclave		Standard chamber will not accommodate laparoscopic instruments Hollow instruments cannot be sterilised in a gravity displacement autoclave
Cold sterilisation		Anprolene long chamber steriliser
Patient positioning device		TT endoscopic positioner or similar

Figure 1: The dedicated generator for use with Ligasure vessel sealing handpieces. This model has been superceded but is affordable and still available on the reconditioned market