New Zealand Veterinary Association | Guideline | Approved Feb 2025

Surgical Artificial Insemination in Dogs

Background

Artificial insemination in the dog was first described nearly 250 years ago and plays a significant role in dog breeding today. The primary purposes of AI are to allow the use of frozen semen either to introduce new genetic material from overseas or to make use of historically frozen genetic material, or with fresh semen to facilitate breeding where natural mating is not possible.

During AI, semen is deposited in the female dog, either into the vagina ('intravaginal') or directly into the uterus ('intrauterine'). Effective use of frozen-thawed, or chilled semen requires intrauterine insemination for acceptable pregnancy rates. Moreover, intrauterine insemination of fresh ejaculated semen generally results in higher pregnancy rates and larger litter sizes than when semen is deposited intravaginally.

Initially, surgery was required to successfully deposit frozen–thawed semen into the uterus. Surgical AI has been performed in dogs since the 1970s[1]. This procedure requires general anaesthesia to allow laparotomy. The uterus is then exteriorised and spermatozoa (frequently frozen-thawed) is introduced through the uterine wall. The uterus is then replaced into the abdomen, and the laparotomy site is closed. Surgical AI requires minimal practice and skill for a general veterinarian, does not require any specialised equipment, and allows visualisation of the ovaries and uterine surface.

However, surgical AI does require general anaesthesia and is painful and invasive for the female dog. Complications such as significant post-surgical pain, seroma formation at the incision site and delayed wound healing have all been noted following surgical AI [2]. Risks associated with general anaesthesia, including bradycardia[2] and anaesthetic death[3] have also been documented. Other noted complications include pyometra[4] and fibrinolysis leading to haemorrhage[5].

In an effort to eliminate the need for general anesthesia and surgery, TCI was developed which is equally, or more, successful than surgical AI[1,2,3,4]. It was developed in 1993 by Marion Wilson, and has subsequently become a relatively common procedure in veterinary clinical canine breeding practice [6].

The TCI procedure requires:

- The female dog to be in standing position, typically using minimal restraint.
- A TCI shunt is placed into the vagina and a cuff insufflated to secure the shunt and provide an air lock cranially which aids visualisation.
- The TCI endoscope is placed through the shunt and gently advanced to the point of the cervix.
- The TCI catheter is extended through the cervix into the body of the uterus and semen is deposited into the uterus.

This technique requires practice and skill, and an investment in equipment but is minimally invasive, allows visualisation of the reproductive tract up to the cervix (and if indicated the uterine lumen), and is repeatable. When conducted by trained operators, TCI is usually completed within 10 minutes with the female dog standing using minimal restraint. No sedation is typically required and the risks associated with anesthesia and surgery are avoided. Studies have reported no complications during or after insemination with endoscopic assisted transcervical catheterisation[2]

Reports from Australia[2] and New Zealand[7] have shown that the fertility rates for TCI are equal to or better than those of surgical AI in dogs, especially when using frozen-thawed semen. TCI results in higher pregnancy rates with both fresh semen (when compared to vaginal insemination) and frozen semen (when compared to surgical AI)[8]. These findings have contributed to debate as to whether invasive surgery with the associated risks of general anaesthesia and potential post-operative complications, should continue to be used as a technique to inseminate bitches, when other non-invasive techniques available achieve the same whelping rates[2,3,7,9,10].

Internationally, surgical AI has been prohibited in Norway and Sweden, where it is deemed unethical to perform unnecessary surgery when other methods of insemination pose fewer health or welfare risks to dogs. In 2019, the United Kingdom prohibited surgical AI under the Animal Welfare Act 2019. The Royal College of Veterinary Surgeons amended section 27 of its Supporting Guidance to the Code of Professional Conduct to include surgical AI on the list of banned procedures[11]. The Australian Veterinary Association (AVA) holds a recently developed policy against surgical artificial insemination (AI) in dogs, stating that it should not be performed. They recommend that all states and territories across Australia incorporate a ban on surgical AI in dogs into their respective Animal Welfare Acts.

References:

1. **Whittler W.** Canine transcervical insemination: history and technique. *Clinical Theriogenology*15, https://doi.org/10.58292/ct.v15.9320, 2023

2. **Mason SJ, Rous NR**. Comparison of endoscopic-assisted transcervical and laparotomy insemination with frozen-thawed semen: a retrospective clinical study. *Theriogenology* 82, 844–50, 2014

3. **Mason SJ.** Current review of artificial insemination in dogs. *Veterinary Clinics of North America: Small Animal Practice* 48, 567–80, 2018

4. **Gaytán L, Rascón CR, Angel-García O, Véliz FG, Contreras V, Mellado M.** Factors influencing English Bulldog bitch fertility after surgical uterine deposition of fresh semen. *Theriogenology* 142, 315–9, 2020

5. **Lara-García A, Couto CG, Iazbik MC, Brooks MB**. Postoperative bleeding in retired racing greyhounds. Journal of Veterinary Internal Medicine 22 525–33, 2008.

6. **Romagnoli S, Lopate C**. Transcervical artificial insemination in dogs and cats: review of the technique and practical aspects. *Reproduction of Domestic Animals*; 49, 56–63, 2014

7. **Hollinshead FK, Hanlon DW.** Factors affecting the reproductive performance of bitches: a prospective cohort study involving 1203 inseminations with fresh and frozen semen. *Theriogenology* 101, 62–72, 2017

8. **Mason S, Rous N, Lougher A.** Transcervical insemination in bitch. *Clinical Theriogenology* 11, 203–9, 2019