

Brief Communication

**TRANSPORT OF RADIOPAQUE FLUID INTO THE UTERUS
AFTER VAGINAL DEPOSITION IN THE OESTROUS BITCH**

A limited number of studies have been published concerning intrauterine infusions in the bitch, presumably because it is difficult to pass a catheter into the canine cervix. *Cobb* (1959) designed an apparatus for hysterosalpingography with which he reported fairly easy catheterization of the cervical canal in the anaesthetized bitch. Recent advances made in the field of deep-freezing of dog semen have emphasized the need for a simple method for intrauterine infusion in the unanaesthetized bitch. The first successful insemination with frozen dog semen was reported in 1969 by *Seager*. The semen was frozen in pellets and deposited vaginally. Over a six-year period 61 (39.1 %) out of 156 bitches inseminated with this method became pregnant (*Seager et al.* 1975). *Andersen* (1972), however, when inseminating dog semen frozen in French straws, reported no success after vaginal deposition of the thawed semen. Based on experience with insemination in Blue foxes *Andersen* (1975) developed a special catheter which he could introduce through the cervix to deposit the semen into the corpus uteri without anaesthetizing the bitches. With this method 19 (73.1 %) out of 26 bitches became pregnant (*Andersen* 1977, personal communication). This method of passing the catheter through the cervix requires training and the method is impractical in nervous or obese bitches in which palpation of the abdomen is difficult or impossible. In order to fully use the advantages offered to the dog breeders by deep-freezing of dog semen, it is necessary to develop a simple method of inseminating the bitch that can be employed by practising veterinarians without previous special training. The present investigation was undertaken as an introduction to further studies of the problems related to the use of frozen dog semen.

Three mature, healthy, multiparous bitches were used. Two were pure-bred beagles, approx. weight 13 kg, and one was a mongrel bitch of about the same size. The bitches were tested for standing heat daily in presence of a male. Blood samples were drawn and vaginal smears taken daily during oestrus. The blood samples were analyzed for oestradiol-17- β and for progesterone by radio-immunoassay (*Edqvist & Johansson* 1972, *Bosu et al.* 1976) and the vaginal smears were stained with haematoxylin-eosin and examined for changes in the appearance

of epithelial cells in order to time the stage of oestrus. An isotonic radiopaque fluid was used for intrauterine infusion (Amipaque 3.75 g, Nyegaard, dissolved in 10 ml of diluent). A plastic insemination catheter for cattle (41.3×5 mm) was placed in a Magill's endotracheal tube (No. 13) which was cut off at its caudal end. In order to make it airtight, the cranial end was covered with a piece of rubber through which the insemination catheter protruded (Fig. 1). A 100 ml syringe was used as an airpump. After lubricating the Magill's tube with a non-spermiocidal lubricant (liquid paraffin) it was introduced into the vagina of the bitch so that the air cuff was placed just anterior of the vaginal sphincter muscle. The cervix was fixed through the abdominal wall between the thumb and index finger of the left hand and the insemination catheter inserted through the Magill's tube to reach as close to the portio as possible. The air cuff was inflated to a diameter of about 5 cm, which corresponds to the average size of the bulbus glandis of the male beagle. The hindquarters of the bitch were elevated to an angle of 60° to the floor. Two ml of radiopaque fluid was infused through the insemination catheter. By gently stroking the vulvar area the bitch was stimulated to assume the breeding stance with her tail bent to the side and the vulvar lips elevated. The bitch was held in this position for 10 min., whereafter the insemination equipment was removed. Two radiographic exposures were made, one lateral and one dorso-ventral. Each bitch was infused two-three times during mid-oestrus. In all the trials the radiopaque fluid could be seen to have entered the uterus (Fig. 2). The amount of fluid in the uterus varied slightly between infusions and in no case was the uterine cavity completely filled. The 2 ml dose of contrast material used in this study, chosen to represent the ordinary insemination volume with frozen semen, might be too small. Other studies have shown that at least 5 ml of radiopaque fluid was necessary to fill the horns of the uterus during oestrus in bitches of similar size (*Funkquist, Linde, Obel unpublished results*).

In an attempt to study the fluid transport under an image intensifier, one infusion was made with the bitch lying on her side. No radiopaque fluid could be seen in the uterus in this case. The different response seen during the standing and lying positions of the bitch may be due to the fact that the standing position gives a better pooling of the fluid around the cervical os.

This preliminary study has demonstrated that radiopaque

Fig. 1

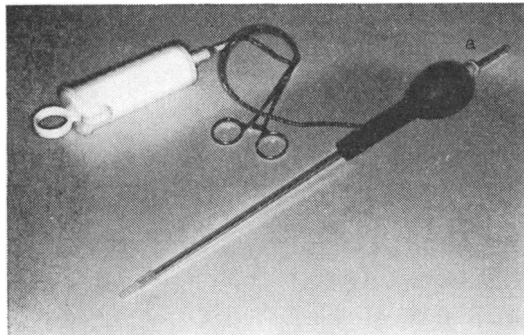


Fig. 2



Figure 1. The infusion equipment. (a) Cranial end of Magill's endotracheal tube through which the insemination catheter is seen to protrude. Figure 2. Radiographic exposure of the abdomen of an infused bitch. The radiopaque fluid is seen to have passed the cervix (arrow) and entered the horn.

fluid may enter the uterus of the mid-oestrous bitch after vaginal deposition when equipment mimicking the tie during the normal copulatory act is used. Further studies on the transport of fluid in the tubular genitalia of the bitch will be made and the described method will be tested using frozen dog semen to decide whether it is possible to impregnate the bitch in this manner.

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Catharina Linde

The Department of Obstetrics and Gynaecology, College of Veterinary Medicine, Swedish University of Agricultural Sciences, Uppsala.

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Reprints may be requested from: Catharina Linde, the Department of Obstetrics and Gynaecology, College of Veterinary Medicine, Swedish University of Agricultural Sciences, S-750 07 Uppsala, Sweden.