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Case Studies: Development of Novel Ear Lavage Catheter

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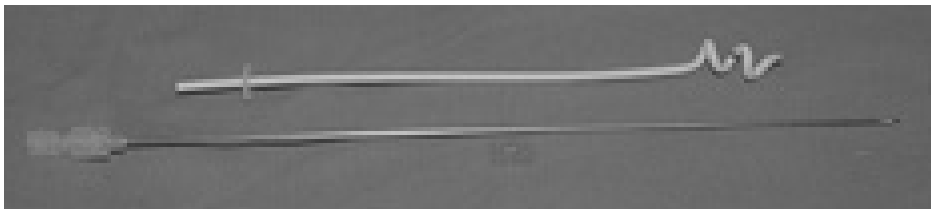
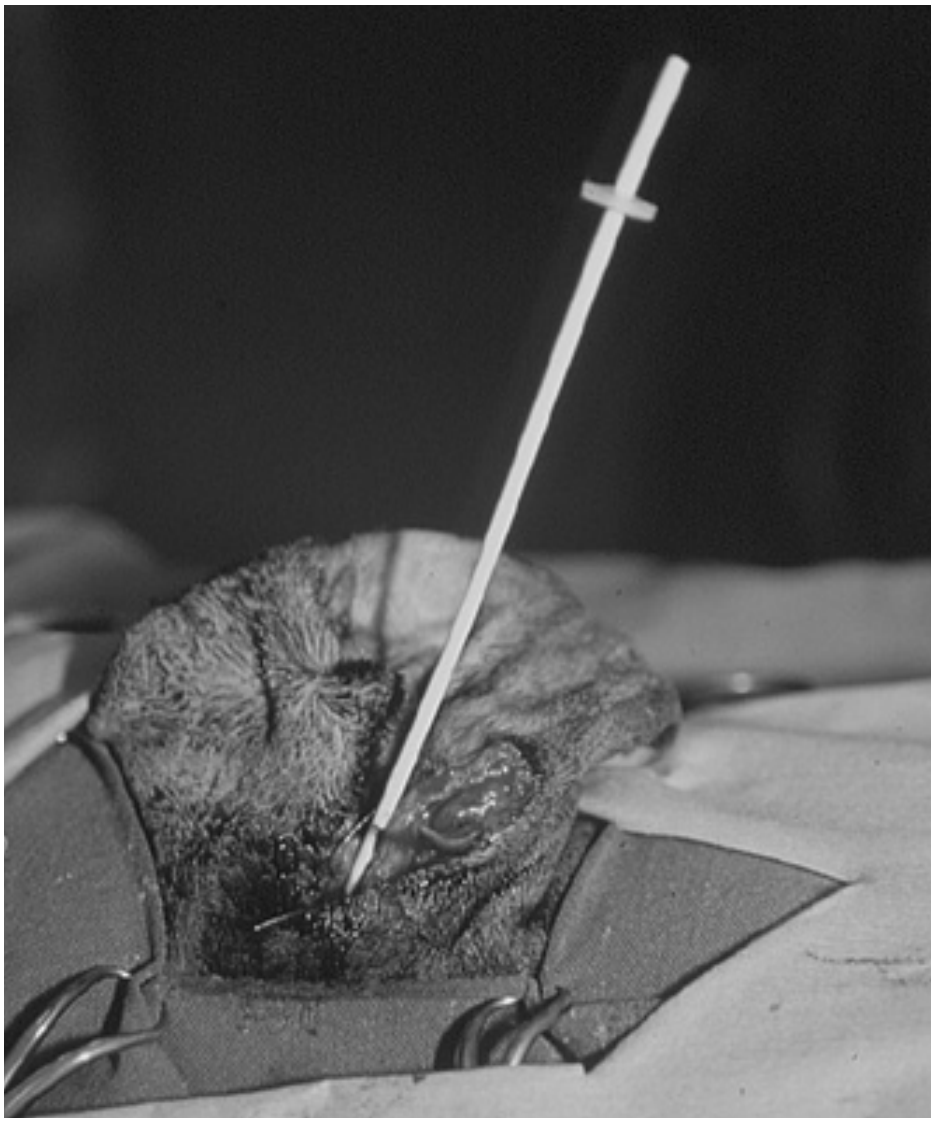




Case 1: Cocker Spaniel, 7 years old

Presented with bilateral otitis externa and ruptured tympanum. Head tilt to the left with presence of bulla osteitis (otitis media). A total ear canal ablation was performed on the left side as well as a ventral bulla ostectomy with curettage. The COOK VETERINARY PRODUCTS catheter (V-IEDS-700U-MONTAVON, above right) was inserted, mounted on the trocar through the horizontal external ear canal with the tip of the catheter into the bulla (below right). Trocar was removed and the proximal extremity of the catheter was tunnelled under the skin, exiting over the head, caudal to the basis of the pinna. It was fixed onto the skin using the available silicone discs. The distal extremity coiled into a pigtail shape which immobilised it within the middle ear cavity. The Luer lock hub was attached to allow lavage with a syringe. A Penrose drain was placed from the ventral surgical site and also passed through the removed horizontal external ear canal and sutured on itself to allow drainage during lavage through the COOK VETERINARY PRODUCTS catheter (picture see page 3). The surgical wound was left open for second intention healing and an Elizabethan collar was placed to prevent the dog from displacing the drains.

• **Continued page 3**

Guide to Direct Puncture Pericar

By Mike Martin, MVB, DVC, MRCVS, Kenilworth, UK

Equipment

- Analgesia and sedative drugs for premedication, local anaesthesia (2% lignocaine), needle and syringe.
- No. 11 scalpel blade for stab skin incision, 20ml and 50ml syringes, 3-way tap and collecting container.
- Sterile window drape and Pericardiocentesis Set, ECG monitor.
- Sterile ECG extension cable and crocodile clip (optional).

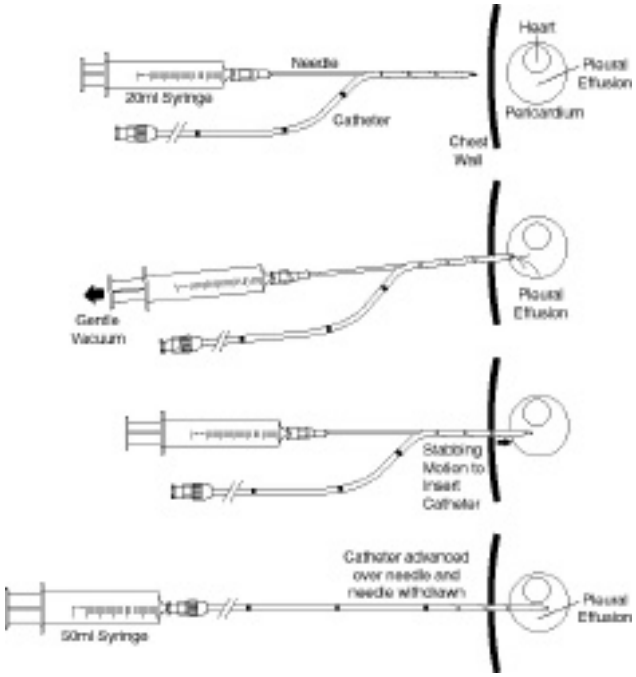
Preparation of dog

— following a diagnosis of pericardial effusion and cardiac tamponade

- Obtain peripheral blood and check PCV and whole blood clotting time.
- Premedicate with an analgesic such as morphine. Some dogs may also require gentle sedation (for a guide on sedation see Martin & Corcoran 1997). Allow 20 to 30 minutes for effective sedation.
- Place the dog in left lateral recumbency, clip and surgically prepare the area of the right cardiac apex, ie. 5th to 6th intercostal space just below the costochondral junctions.
- Infiltrate local anaesthesia into the site of puncture and deep to the pleural membrane.

Preparation of pericardiocentesis set

- Under sterile conditions, prepare the pericardiocentesis set (V-TPT-1020U-MARTIN), take out the needle to ensure it doesn't stick and replace into position again.
- Attach a 3-way tap to the end of the catheter, closing off to the catheter. Attach a 20ml syringe to the needle.
- Attach the ECG extension lead to the metal of the needle, at the hub end, and connect to an ECG monitor.



Procedure for pericardiocentesis

1. Make a stab incision through the skin and partially through the intercostal muscle at the site of local anaesthesia.
2. Holding the needle in one hand and the 20ml syringe in the other, insert the pericardiocentesis set through the stab incision and into the pleural cavity.
3. Once the needle touches the dog the ECG monitor can be connected to the ECG extension lead.
4. Advance the set until the needle can usually be felt to enter the pleural cavity — check for pleural effusion (usually a modified transudate). Large effusions are sometimes best drained prior to pericardiocentesis. If present the pericardiocentesis set can be used to drain the pleural effusion at this point.
5. Redirect the needle and catheter so that it is perpendicular to the pericardium — this usually means directing towards the centre of the heart.
6. Advance the needle and catheter until the pericardium is felt to scratch on the end of the needle.
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Alternative

- Emergenc
- Temporar
- Peritonea

Reference

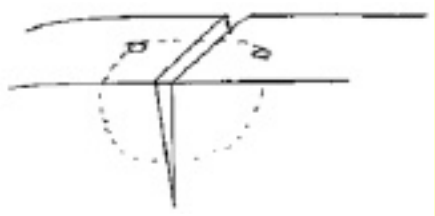
- Martin,
Cardiores
Blackwell

News from the Field: Tension Suturing

Closing elastic wounds often leads to cheese wiring round the wound. Ms Kim Lundberg-Young, an equine vet from Frome, U.K., is using small sections of Flexi-drains (V-PWD-12-40) to spread the load, preventing secondary wound breakdown. The technique relies on threading a piece of Flexi-drain onto the suture before penetrating the tissue and finishing off the loop with another piece before tying off.

The technique has worked well for large abdominal wounds and hock injuries. ■

1. Ordinary suture



diocentesis

ntinue to advance the needle, maintaining a uum on the 20ml syringe, until pericardial usually a bloody effusion) is withdrawn.

oint, although the tip of the needle is in the l space, the catheter may not be because the um can be pushed away by the thickness of eter. Make a short, quick 5.0 to 10mm action to push the catheter through the um.

eedle touches the heart it may result in or a change in the ST segment.

the catheter over the needle (rather than ing the needle) until less than half its length outside the chest and withdraw the needle ly.

50ml syringe to the 3-way tap and withdraw ardial effusion. If this is a bloody effusion, re not certain it is pericardial (versus cardiac check the PCV and clotting time of the The PCV is usually very different and the l effusion does not clot.

e to gently withdraw all the pericardial nd then remove the catheter, suturing the ion.

the pericardial effusion

e volume, colour and consistency.

ge some of the effusion, note the PCV and e pH in the supernatant.

ff the supernatant and make rapid air dried rom the buffy coat layer — submit to a to check for evidence of neoplasia.

uses of the Pericardiocentesis Set

cy drainage of a pneumothorax.

ry drainage of pleural effusion.

l lavage.

Mike W.S., and Brendan M. Corcoran, *piratory Diseases of the Dog and Cat*, Oxford: Science. ■

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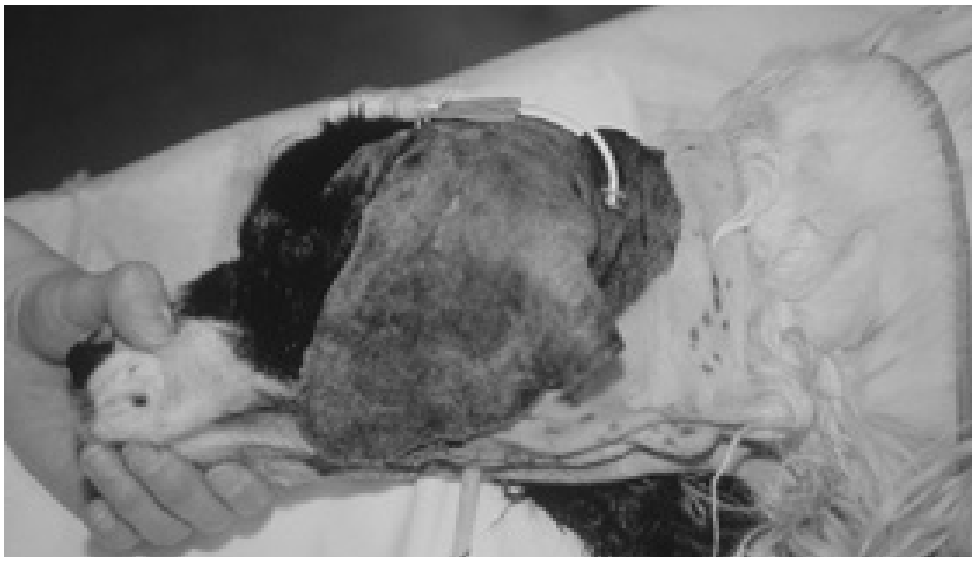


Lavage catheter shown in situ and sutured to the rear of the head

• From page 1

Lavage of the middle ear was performed with 10ml saline solution i.d. through the catheter.

The dog was discharged after 7 days. The owners continued lavage during another week. The COOK VETERINARY PRODUCTS catheter was then removed first, and the more ventrally placed Penrose drain was removed two days later.

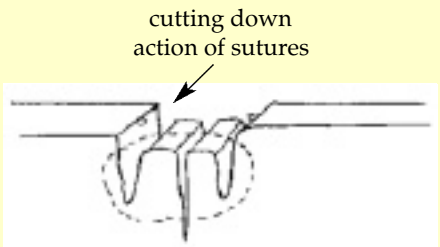
Case 2: Labrador Retriever, 6 years old

Presented in March 1997 with history of reoccurring left middle ear infection and multiple surgeries performed elsewhere. An acetinobacter infection, resistant to any antibiotics was present. This would produce abscess formation with pus accumulation (ca. 30ml), fever, anorexy and head swelling, until spontaneous rupture and drainage; the process would recur at a 4–6 week time interval. Head tilt was present, with intact cranial nerves. Bacteriology, repeated at our hospital, confirmed presence of acetinobacter infection. A computer tomographic study revealed presence of bulla osteomyelitis extending locally to the cranium.

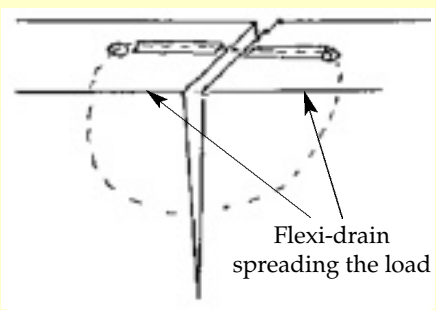
Ventral surgical approach to the bulla was used to debride the area. Rest of the annular cartilage, likely cause of the local infection process, was removed and submitted for histological evaluation. Neoplasia was diagnosed (suspicion of adenocarcinoma of the ceruminal glands of the external ear canal).

A COOK VETERINARY PRODUCTS catheter was placed using the same technique as in Case 1. The dog was kept 3 weeks in the hospital and a second abscess more lateral had to be drained after 10 days. Recovery was uneventful and the clinical signs have resolved up to now, 3 months after the surgery. ■

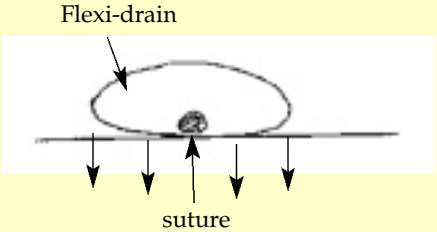
2. Ordinary suture with wound breakdown



3. Tension suture with Flexi-drain



4. Spreads the load, preventing wound breakdown



Koala Urogenital Insemination Catheter

By S.D. Johnston, BSc (Hons) and M.R. McGowan, PhD, University of Queensland, and P. O'Callaghan, Lone Pine Koala Sanctuary, Brisbane, Australia

The use of artificial breeding technology in most marsupials is limited primarily by a lack of basic information on their reproductive physiology and behaviour. However, compounding this problem is the unusual morphology of the female reproductive tract, making artificial insemination via the urogenital sinus a difficult proposition.

Originating from the longitudinal folds of the urogenital sinus are twin vaginae which terminate cranially into left and right vaginal cul-de-sacs. The cul-de-sac in the koala is partitioned by a medial septum which completely separates left and right sides of the reproductive tract. Each cul-de-sac communicates with a muscular cervix, the ostia of which protrude into the cul-de-sac some 3.0mm to 5.0mm. This makes artificial insemination into the cervix via the urogenital sinus virtually impossible.

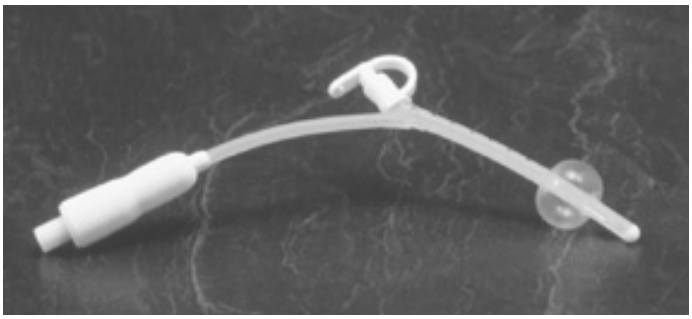
In addition, the ovaries of the koala are held up against the dorsal wall of the abdomen by a small opaque bursa, making ultrasonic detection of ovarian structures such as a pre-ovulatory follicle or a corpus luteum somewhat difficult. Even with the aid of laparoscopy it is difficult to ascertain which ovary has released the oocyte and consequently which side of the reproductive tract to inseminate.

There are two possible approaches to artificial insemination in the koala. The first involves laparoscopic insemination directly into the uterus. This approach may be the preferred option for frozen-thawed semen, but has not been attempted and has the disadvantage of requiring the animal to be anaesthetised. The second approach is a much less invasive procedure, can be performed in the conscious koala and involves deposition of semen in the urogenital canal.

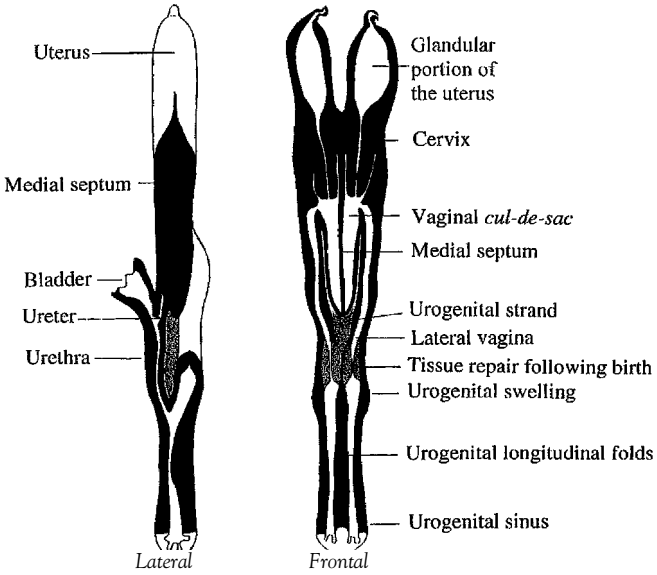
In collaboration with COOK VETERINARY PRODUCTS, we have been developing a urogenital insemination catheter for use in the koala, the basic design of which could be used for any marsupial. The catheter has been especially engineered, based on measurements of koala cadavers, to deliver semen into the upper urogenital sinus immediately distal to the entrances of each lateral vaginae.

The catheter, which is essentially a modified silicone foley catheter, is inserted into the urogenital canal a depth of approximately 30mm to 40mm. The cuff is then inflated and approximately 1.0ml of fresh, undiluted semen is deposited, followed by a further 1.0ml of air. Semen is expelled into the urogenital canal through a small aperture located on the dorsal aspect of the catheter. The catheter is then held in place for a further 10 minutes. Retrograde flow of semen is prevented by the cuff of the catheter and the semen is drawn into the lateral vaginae by positive displacement.

Initial insemination studies using dye as the inseminant have shown that the catheter is capable of delivering dye as high up as the lumen of both glandular uterine horns.



Koala Balloon Insemination Catheter



Recent studies have indicated that ovulation in the koala is induced by coitus. This obviously has a major impact on the protocol used for artificial insemination. While artificial induction of ovulation in the koala is still under development, a method of ovulation induction has been developed. A teaser male is allowed to mate with the female to the point of ejaculation but subsequently removed before he ejaculates. Using this system we have attempted five inseminations using the COOK catheter and produced two offspring.

However, given the mechanism used to induce ovulation, it will be necessary to confirm the parentage of the offspring before an artificial insemination success can be duly claimed.

Unfortunately, development of the koala pouch young is slow and it will be another six months before both joeys are old enough for blood sampling. ■