COOK®
VETERINARY PRODUCTS
VETERINARY OBSERVER

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Indwelling ocular lavage set allows repeated flushing of the eye with minimum discomfort to both patient and operator

Subpalpebral lavage set simplifies eye treatment for horse and vet

The COOK VETERINARY PRODUCTS Ocular Lavage Set is designed for continuous lavage of the eye, with solutions or paste, through an indwelling catheter situated under the eyelid of the affected eye. The catheter baseplate is placed under the eyelid after the eyelid has been punctured with a specially designed trocar.

Components:

- 5 or 8 French lavage catheter, 90cm long with endhole design and a special baseplate for catheter retention; 5 French baseplate, dimensions 2mm x 7mm
- Angled trocar with proximal catheter attachment design
- Scalpel
- Needle and suture
- Injection cap

After placement of the catheter, further manipulations of the eye area are not necessary.

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Technical tips on ocular lavage

By Dr James V. Schoster DVM, Dip. ACVO,
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1. **Always use a trocar (size matched to the size of the lavage tubing) to implant the lavage catheter. Do not pass the catheter through a hollow needle, for the conjunctival hole will be too large and the foot plate may pull through.**
2. **Be sure to make a clean entry at the 12.00 conjunctival fornix. Avoid lateral movements of the trocar which could result in a radial conjunctival tear as the foot plate may pull through.**
3. **Once the conjunctival fornix is penetrated, then tunnel the trocar just over the edge of the orbital rim and travel about 1–2cm before exiting the skin.**
4. **Make sure the foot plate is seated and aligned in the fornix.**
5. **Dry the tubing before applying duct adhesive tape or similar.**
6. **Apply a piece of duct tape across the tubing exactly where the tubing exits the skin. Use a piece that is about 2cm wide and apply it so it overlaps on itself, resulting in a "wing" of tape on each side of the tubing.**

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Set makes lavage easy

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The frequent application of antibiotic solutions can be done quickly and easily. Viscous liquids and pastes can be injected through the 8 French catheter.

Because an extremely soft silicone material is used, no irritation of the corneal surface of the eye is experienced. Also, in cases of long-term use, the silicone will not stiffen with time. Subcutaneous introduction and additional sutures ensure a secure fixation.

The COOK VETERINARY PRODUCTS Ocular Lavage Set — is not time consuming to place, is inexpensive, and some components are reusable. For a demonstration, please contact your nearest COOK VETERINARY PRODUCTS distributor.

With thanks to Prof. Dr Gerhards, University Veterinary Clinic of Munchen, Germany, for photographs.

BELOW, BELOW RIGHT: Ocular lavage catheter in situ, showing external fixation of the catheter. (These photographs demonstrate an alternative fixation technique to that described by Dr Schoster.)

Technical tips on ocular lavage

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These two "wings" will be used to anchor the tubing to the skin with sutures or surgical staples.

7. The proximal edge of the tape should be against the skin exactly where the tube exits and the tape should be placed on the tubing while a slight amount of traction is applied to the tube to ensure that the foot plate is snug in the fornix.
8. Rub a smooth instrument on the surface of the tape where it comes in contact with the tubing to assure adhesion.
9. Use 2.0 or 3.0 monofilament nylon or polypropylene suture. Take full thickness skin bites and about 1cm wide. Do not over tighten to prevent premature pull through of the suture. A snug but not tight fit is the best.
10. The section of tubing distal to the first piece of tape should be slackened to form an "S" shape for strain relief. The next "wing" of tape should be applied just distal to the "S"; usually this is on the forehead.
11. The tube then travels to the opposite site between the forelock and ear and is anchored with tape and suture on the poll.
12. Use the 8 French tubing if you plan to infuse a thicker medication, i.e. methycellulose base. The 8 French tube has a smaller ratio of tube outside diameter to width of foot plate, therefore there is a greater chance of conjunctival pull through if a radial tear in the conjunctiva is created at the time of implantation.
13. The lavage catheter was designed to remain in place for two to three weeks — any longer could result in infection, dislodgment or granuloma formation. If longer therapy is needed, the veterinarian should consider replacement of the lavage catheter with a new one. If the latter is done, the entry site should be far enough away from the first site to avoid creating a conjunctival hole that is too large, which could result in pull through of the foot plate.
14. The sutures should be checked at least twice a week, especially after the first 10 days, since it is common for the sutures to work their way out. If the sutures or tape are loose or coming off they should be replaced.

Dr Schoster developed the COOK VETERINARY PRODUCTS Ocular Lavage Set. ■

Intraosseous fluid therapy

By Greg Martin BVSc, MACVSc,
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University of Queensland, Australia

Most small animal vets have experienced it: a cat (neonate or bird) is presented in shock (often acute haemorrhagic shock as a result of trauma), and intravenous fluids are needed stat. But the peripheral veins have all collapsed, and you just can't get an i/v line in place.

An alternative to central venous access is to place an intraosseous cannula and administer fluids or other drugs via this route. Most drugs that can be administered intravenously can be given by this route. Vessels within bone are supported by a rigid matrix, so circulation is maintained even in severe circulatory failure; therapeutics administered via this route enter the general circulation rapidly.

A variety of routes of access can be used, depending on the age, size and species of the animal. I have had most experience placing cannulae in the proximal femur of cats, so I will describe this as an example. The reader is referred to the references below for further details and suggestions for other species.

Bones used for intraosseous infusion should be intact (that is, not fractured), and the skin over the insertion site should be unbroken to avoid contamination of the bone with bacteria — infection is the most common complication of this procedure.

To place a cannula into the proximal femur of a cat, the area over the greater trochanter/hip is clipped and surgically prepped. The point of insertion into the bone is the trochanteric fossa (the exit point of a Steinmann pin).

Firstly, local anaesthetic (for example, lidocaine) is applied to the subcutis over the insertion point, then down onto the periosteum of the trochanteric fossa.The needle should be introduced down the medial side of the greater trochanter, and "walked" down the bone into the fossa, injecting small amounts of local as the needle is advanced. By introducing the needle in this fashion, the ischiatic nerve is avoided.

Once local anaesthesia is performed, a small stab incision should be made in the skin to allow insertion of the intraosseous cannula. The cannula is advanced in a similar fashion down the medial side of the greater trochanter into the trochanteric fossa.

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Intraosseous Infusion — Rate of Administration

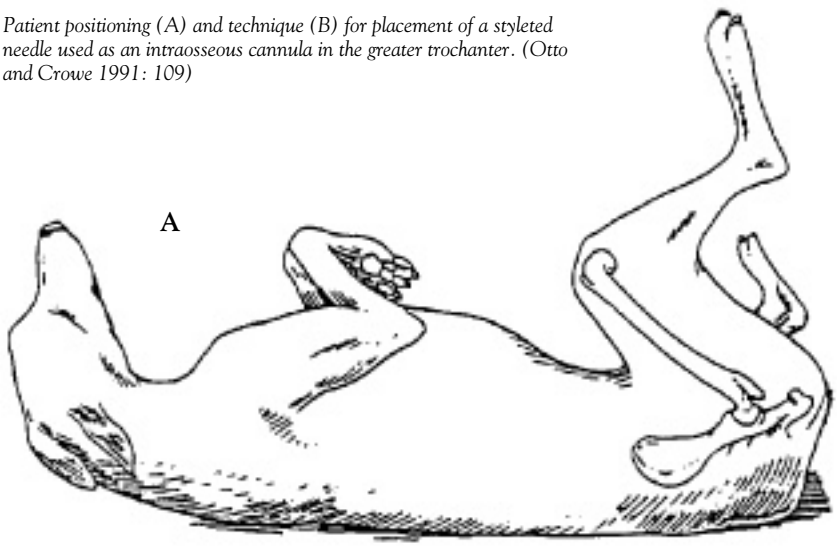
The rate of delivery of fluids by the intraosseous route is limited to 11ml/min with gravity flow and 24ml/min with 300mm Hg pressure. Pressure can be provided by a commercially available pressure-infusion cuff. The following recommendations are for delivering shock doses (90ml/kg/hr):

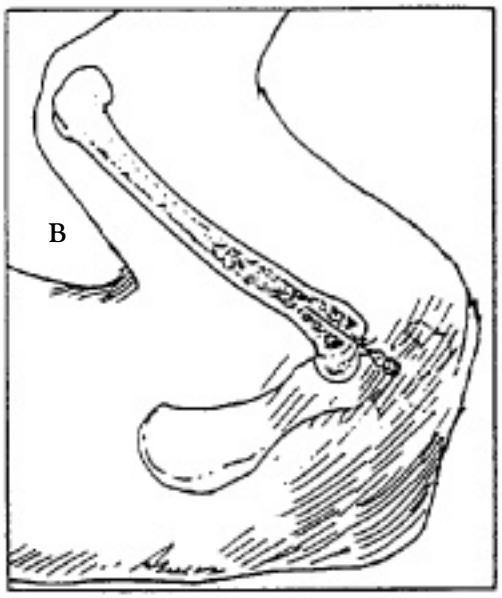
- Gravity flow through a single catheter is used for animals that weigh up to 7.3kg (16lb)
- Pressurised flow through a single catheter or gravity flow through multiple catheters is used for animals that weigh between 7.3 and 16.4kg (16 to 36lb)
- Pressurised flow through multiple catheters is used for animals that weigh more than 16.4kg (36lb)
- A separate bone must be used for each catheter.

Restoration of peripheral pressure by rapid intraosseous fluid replacement enables routine intravenous catheter placement and continued volume fluid therapy.

From Otto, C.M., G.M. Kaufman and D.T. Crowe (1989), "Intraosseous infusion of fluids and therapeutics", Compend Contin Educ Pract Vet 11 (4): 421–30.

Patient positioning (A) and technique (B) for placement of a styleted needle used as an intraosseous cannula in the greater trochanter. (Otto and Crowe 1991: 109)





Intraosseous fluid therapy

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Once in position, the cannula is driven through the cortex into the medullary cavity by downward pressure and rotation (about a quarter turn at a time).

Once in place, the needle should be checked for proper positioning by manipulation of the femur, and flushed with heparinised saline. If correctly positioned, saline should infuse easily into the medulla of the bone. The cannula is then sutured in place, and a fluid line is attached, before being covered by a protective bandage.

Intraosseous cannulae can remain in place for up to 72 hours. Once removed, further cannulation of the same bone cannot be performed as fluids infused will leak out from the original hole in the cortex into the surrounding tissue.

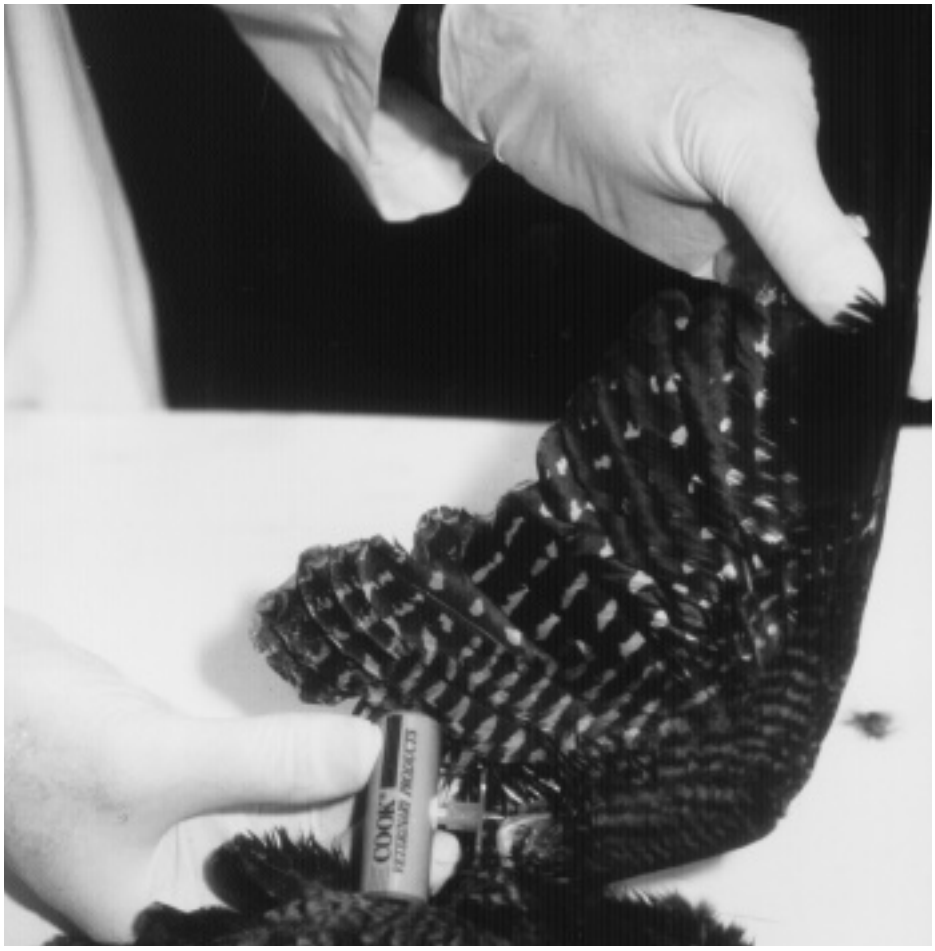
Administration rates for this route are limited, so care should be taken if positive pressure infusion is to be used.

When I have used this technique, I have removed the cannula and changed to the intravenous route once the acute shock has been successfully treated (that is, after 6–12 hours). If the cannula is to remain in place for longer than this, it should be flushed with heparinised saline every 6 hours.

Before attempting this procedure, I would advise reading one or both of the below references and practising cannula placement on cadavers if possible.

References

- Otto, C. and D.T. Crowe (1991), "Intraosseous resuscitation techniques and applications", in *Current Veterinary Therapy* XI, ed. R.W. Kirk, Philadelphia: L&B Saunders, 107–09.
- Otto, C.M., G.M. Kaufman and D.T. Crowe (1989), "Intraosseous infusion of fluids and therapeutics", *Compend Contin Educ Pract Vet* 11 (4): 421–30. ■



RIGHT ABOVE: In birds, the proximal end of the ulna is an excellent site for intraosseous cannula placement.
RIGHT BELOW: Intraosseous cannula, in situ, with insertion trocar removed.