

Retrobulbar block: 1 point

CONTRIBUTOR(S): [Gayle Hallowell](#) [Alex Dugdale](#)



Synonym(s): Retrobulbar, eye block

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Introduction

- **Note from the Editor:** *the naming of the techniques used to deposit local anesthesia behind the globe is a little controversial!*
 - *At present, different authors use different names for the various techniques.*
 - *We have chosen to use the names shown, for these techniques, but have included alternative names in the synonyms section (below the title).*
 - *The authors and editor feel that the naming of these techniques is of secondary importance to the correct performance of them.*
 - *Full details of when and how to perform these techniques are given in the articles.*
- Retrobulbar injection of local anesthetic desensitises the structures of the eye and paralyses the external ocular muscles, providing a globe which is anesthetized, immobile and central.

Uses

- Analgesia for Enucleation [Enucleation](#), which is usually undertaken in standing, sedated or unsedated cattle that are well restrained in a crush [Restraint techniques](#).

Advantages

- Provides excellent peri-operative analgesia.

Disadvantages

- Inadvertent injection of local anesthetic agent into a blood vessel could lead to sudden death.
- Inadvertent injection of local anesthetic agent into the CSF surrounding the optic nerve could lead to collapse, seizures and respiratory arrest (followed by cardiac arrest) due to brainstem anesthesia.
- Risk of globe trauma if performed incorrectly. Prior to enucleation this complication is less of a concern unless endophthalmitis is present, in which case it risks local spread of infection.
- Risk of trauma to local tissues.
- Risk of initiation of oculocardiac reflex.

Alternative techniques

- Retrobulbar nerve block: 4-point [Retrobulbar nerve block: 4-point](#).
- Peterson nerve block [Peterson nerve block](#).

Time required

Preparation

- 5 min to prepare syringes and anesthetic agents.

- Skin should be aseptically prepared at sites of injection using Chlorhexidine [Chlorhexidine](#) or povidone-iodine.



Procedure

- 5 min to perform injection.

Decision taking

Risk assessment

- Procedure carries some risk.
- Always aspirate prior to injection to ensure needle placement is not within a blood vessel or likely to result in injection into the brainstem.

Requirements

Materials required

Minimum consumables

- 19G 3.5 inch spinal needle – curve by hand to approximate curvature of the bony orbit.
- 20 ml syringe.
- Procaine [📄 Procaine](#) or Lidocaine [📄 Lidocaine](#) are usually used.
- Clippers, razor or blade.
- Chlorhexidine, povidone-iodine and swabs.

Preparation

Site preparation

- Clip peri-ocular skin. Prepare skin and conjunctival sac with aqueous povidone-iodine solution or chlorhexidine.

Restraint

- Crush, halter with head tied up.
- Occasionally sedation with Xylazine [📄 Xylazine](#) or Detomidine [📄 Detomidine](#) is required in fractious animals, but this can result in recumbency.

Procedure

Approach

- Option 1.
 - Introduce a straight needle, inserted near the medial canthus, along the orbital floor and aiming for the tip of the cone of the main extraocular muscles, where the optic nerve is located.
 - Care: this technique may result in the needle tip being in close proximity to the meningeal sheath of the optic nerve.
 - Care: the third eyelid may get in the way, when performing this technique.
 - If you are performing an eye block, to investigate/treat squamous cell carcinoma of the third eyelid, then the author prefers to avoid this technique, so as to avoid the needle going near the tumor and risking iatrogenic spread of neoplastic cells.
- Option 2.
 - Insert a curved needle, just (~1cm in adult cattle) dorso-medial to the lateral canthus.
 - The needle will be directed inside the upper bony orbital rim, and curve ‘around and behind the globe’.
 - Care: although this option keeps you away from the optic nerve, you may not get a good block. Hence some prefer the 4-point retrobulbar injection [📄 4-point retrobulbar injection](#).

For either option:

- Once the needle is in place, aspirate gently. If no blood or CSF is obtained, 20ml of local anesthetic is deposited behind the eye.
 - If blood or CSF is obtained the reposition the needle and try again



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- Proptosis suggests a successful block, as does loss of corneal sensation, mydriasis and reduced lacrimation – but these may not be obvious in diseased eyes and/or after tarsorrhaphy.

Outcomes

Complications

- Incorrect technique may result in globe perforation, local tissue trauma, hemorrhage.
- Rapid injection of a large volume of local anesthetic solution, especially if cold, can result in stimulation of the oculo-cardiac reflex. Standing animals, especially if already sedated, may become recumbent as cardiac output falls.
- Inadvertent injection of local anaesthetic into a blood vessel could lead to sudden death.
- Inadvertent injection of local anaesthetic agent into the CSF surrounding the optic nerve could lead to sudden death.
- Although the Peterson block [📄 Peterson block](#) is technically more challenging, the risk of these complications is less but it is also said that the success rate is less.

Reasons for treatment failure

- Only if anesthetic is improperly placed.

Further Reading

Publications

Refereed Papers

- Recent references from [PubMed](#) and [VetMedResource](#).
- Edmondson M A (2016) **Local, Regional, and Spinal Anesthesia in Ruminants.** *Vet Clin North Am Food Anim Pract* **32** (3), 535-552.

Other Sources Of Information

- Valverde A & Sinclair M (2015) **Ruminant and Swine Local Anesthetic and Analgesic Techniques.** In: *Veterinary Anesthesia and Analgesia*. Blackwell Publishing, UK.
- Clarke K & Trim C (2014) **Anaesthesia of Cattle.** In: *Veterinary Anaesthesia*. 11th edn. Elsevier.

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