

Standing enucleation.

We have performed enucleation both with and without intra-orbital silicon implants since 1995 exclusively in the standing sedated horse. Our sedation techniques have varied over the years however profound regional anaesthesia remains the key to successful and “stress free” surgery. Our current sedation technique of choice is Detomidine (by CRI or top up) after pre-surgical acepromazine and morphine – the aim is to keep a still, standing, sedate horse with minimal tremor twitch or staggering. Achieving profound regional anaesthesia means that we aim to keep our patients lighter rather than deeper which aids in avoiding unexpected movement. Good blocks are more important than specific sedation protocols.

BLOCKS

Local – use intra-epicaine as lignocaine too short acting

Good local blocks are essential for success, perform blocks carefully and in the order described.

- 1) AP block – palpate dorsal to zygomatic arch
- 2) Frontal block – palpate infra-orbital foramen medial to dorsal orbital rim
- 3) Perform retrobulbar block: (NB this takes 20mins to work)
 - Position head in a neutral position.
 - Sterile gloves, clip and prep retrobulbar space with dilute iodine (1 in 50).
 - Draw virtual line from middle of pupil to brain
 - Draw virtual line at 90 degrees to this line as it passes caudal to the dorsal orbital rim to determine your point of entry.
 - Inject 1-2ml local at caudal edge of dorsal orbital rim at point of entry for block.
 - Pass 3” spinal needle through skin, walk needle off back of dorsal orbital rim
 - Now look from the side, assess position of the caudal pole of the globe and adjust angle of needle so that when advance you are aiming sufficiently caudally that you do not hit the back of the globe.
 - Start wriggling the needle up and down as you advance slowly whilst looking at the globe.
 - As the needle point touches the dorsal rectus muscle you will see a definite dorsal globe rotation.
 - At this point you will need to advance the needle a further ½” through the dorsal rectus in to the muscle cone – this will feel similar to passing a needle through a joint capsule. The optic nerve is positioned very ventrally in the horse so the risk of injecting local in to the meninges surrounding the optic nerve is very low.
 - Inject 10mls local slowly after drawing back – there should be little resistance.
- 4) Infra-trochlear block – palpate the infra-trochlear notch on the medial aspect of the orbit, leave finger on notch whilst pass needle from skin of medial upper eye lid until point of needle palpable. Inject 1ml local over this notch.
- 5) Perform line block along ventral orbital rim starting medially.
- 6) Extend line block along lateral orbital wall.

- 7) Perform line block 1" from lid margin starting with upper lid before repeat in lower lid.
- 8) Topical local anaesthetic application to cornea – use proxymetacaine in preference but tetracaine or amethocaine are also effective – give 6 applications 10 secs apart blinking for the patient to spread the local evenly across the cornea.

PREP:

1. Clean washed, sterilised, rope head collar
2. Clip or (my preference) trim with scissors periorbital hair when long. If short and clean I do not generally clip or trim.
3. DON'T CLIP VIBRISSAE – these have a valuable sensory function in the horse – think of them like cats whiskers.
4. Scrub:
 - a. Use dilute iodine – povidine iodine – make sure no spirit or detergent in. (We add 10mls of povidine iodine to a 500ml bag sterile saline)
 - b. Physically remove all debris, mucus, pus etc. before start timed scrub – remember iodine is quenched by organic material and needs to remain in it's aqueous form to sterilise tissue. The aim of surgical "scrubbing" with iodine is to soak the tissue for sufficient time to kill infectious organisms i.e. an iodine soak rather than a "scrub" which we are used to doing with detergent based surgical scrubs.
 - c. Time scrub (minimum 3minutes) – aim to soak all tissue for a minimum of 30 seconds. If bacterial infection suspected repeat 3 minute iodine soak/scrub.
 - d. Start with periorbital tissue, upper eye lid first.
 - e. Flush conjunctival sack thoroughly – use a 20-30mls syringe and lots of power – flush dorsally, ventrally in front of and behind third eye lid. Use sterile cotton buds to aid removal of debris in conjunctival fornices if needed.
 - f. Flush nasolacrimal ducts via both upper and lower punctae with 20-30 mls dilute iodine
5. Glove
6. Drape - clip drape to a clean head collar (we use a white rope head collar, this can be autoclaved if needed). We double drape, first with a small fenestrated drape followed by a larger drape with a fluid catching pocket.

SURGICAL TECHNIQUE:

I prefer a trans-palpebral technique and salvage the upper lid margin and eye lashes by splitting the upper lid – this requires magnification, practice and small instruments and is not essential (however leaving the vibrissae IS essential). I would suggest keeping it simpler and removing both upper and lid margins.

1. 15 blade – incise lid skin 10mm from lid margin upper and lower lids.
2. Using a gloved finger inside the eye lids to palpate scissors as dissect aim to dissect caudally from skin incision to conjunctival surface then follow plane of dissection until you reach the limbus.

3. You should appreciate the medial and canthal ligament as you dissect down to the conjunctiva medially and laterally.
4. Once at the limbus continue dissection staying as close to the sclera as possible.
5. Identify the dorsal medial and lateral rectus and dorsal oblique muscles and section them at their insertions (anterior to the globe equator) – if you are struggling to find you are probably not dissecting close enough to the sclera.
6. Once sectioned the globe should be very mobile.
7. Use curved artery forceps – spread “blades” pass behind globe ensuring tips very ventral and passed either side of axis – then gently push back approx 10mm and clamp.
8. Pass curved scissors between globe and clamp to section the optic nerve
9. Should be able to rotate globe out of orbit and continue dissection of ventral muscle and third eye lid from the behind the globe before removing the globe, the third eye lid and conjunctival sack in one unit.
10. Pack orbit with swab for 5 mins.
11. Spray 10mls intra-epicaine in to base of the orbit using a 21-23g needle on a 10ml syringe.

CLOSURE:

If not using an implant.

1. Identify connective tissue attached to orbital rim (the orbital ligament or septum)
2. Flush orbit with sterile fluid prior to close
3. Weave a mesh of nylon across orbital opening making sure use the orbital ligament to secure the mesh and not the sub cutaneous tissues, keeping these two layer separate gives a much more natural postoperative appearance and discourages wound breakdown.
4. Close periorbital connective tissue in 2 more layers over the nylon before close skin. This is a minimum of 3 layers of tissue closure before close skin.
5. Close skin – ensure get first intention healing at skin margin by placing skin sutures carefully – skin edge to skin edge (I use 6-0 vicryl)
6. Place temp stent over orbit – remove 6 hours + later

If using an implant:

1. Identify connective tissue attached to orbital rim (the orbital ligament or orbital septum)
2. Flush orbit with sterile fluid prior to close
3. Flush orbital implant with sterile fluid.
4. Place orbital implant in to orbit (round face INTO orbit, flat face outwards).
5. Secure implant to orbital implant to orbital ligament using simple interrupted nylon sutures to dorsal, medial, lateral and ventral orbital ligament.
6. Weave a mesh of PDS (1) across orbital implant making sure use the orbital ligament to secure the mesh.
7. Close connective tissue in 2 more layer over the nylon before close skin. This is a minimum of 3 layers of tissue closure before close skin.
8. Close skin – ensure get first intention healing at skin margin by placing skin sutures carefully – skin edge to skin edge (I use 6-0 vicryl)

9. Place temp stent over orbit – remove 6 hours + later

POST OP MEDS:

If place implant: 10 days post op TMPS and NSAID

If no implant placed: 5 days post op TMPS and NSAID