How to... place a subpalpebral lavage system

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Introduction
A subpalpebral lavage system (SPL) is used to deliver medication to the eye via a flexible silicone tube with an angled footplate that sits securely in the conjunctival fornix of the upper or lower eyelid. The tube is passed through the eyelid and then woven through the mane so that the opposite end can be accessed remotely from the eye via a closed injection port. Medications can then be delivered to the cornea intermittently or via a continuous fluid delivery pump. The SPL system improves patient and owner compliance, operator safety and clinical outcome in horses with painful ocular diseases where frequent or prolonged application of topical medication is difficult or impossible. It is also indicated for ocular diseases where pressure on the globe is contraindicated (e.g., corneal lacerations).

Equipment
Several commercial SPL systems are available in the UK. They all have a similar design, consisting of 5F silicone tubing that has a footplate at one end, and is swaged on to a straight or angled insertion trocar at the other end. The equipment is delivered in a sterile pack, which also contains a 20 gauge 125 inch over-the-needle catheter to create the injection port, a closed luer injection port and a tongue depressor.

Placement of the SPL
An SPL is usually placed under standing sedation and is facilitated by an auriculopalpebral nerve block for upper eyelid akinesia and topical proxymetacaine for desensitisation of the cornea. Additional regional anaesthesia will depend upon whether the SPL is placed in the upper or lower eyelid. For the upper eyelid, a supraorbital nerve block will be sufficient. For the lower eyelid, local infiltration or infraorbital and zygomatic nerve blocks are necessary.

Techniques for placement of the SPL in the upper and lower eyelids have been described. Both sites are associated with a similar complication rate and there is limited evidence to suggest that placement in either the upper or lower eyelid is superior [1]. The author’s preference is to place the SPL in the ventronasal fornix of the lower eyelid as it is technically easier to perform and has the added advantage that the third eyelid protects the cornea from ulceration if the footplate is inadvertently displaced.

Once the position of the SPL has been determined and regional anaesthesia has been performed, the skin surrounding the egress portal of the cannula should be disinfected. It is also prudent to disinfect the conjunctival sac with a 150 dilution of 1% povidone-iodine solution; however, this is not strictly necessary.

Holding the sharp end of the trocar against your gloved index finger to protect the cornea, you should insert it into the conjunctival fornix until the bony orbital rim is palpable at the tip of your finger. This will ensure that the footplate is positioned in the conjunctival fornix. The trocar should then be carefully guided through the eyelid and out through the skin, pulling the tubing slowly with it until the footplate lies snugly against the palpebral conjunctiva without undue tension.

The tubing is then passed caudally over the poll and woven through the plaited forelock and mane until it reaches the base of the neck on the contralateral side to the affected eye. The tubing should be secured to the skin on the head in at least two different places. This can be done by placing tabs of adhesive tape around the tubing and suturing them to the skin, or alternatively, the tube can be tunnelled under the skin using the trocar. You should ensure that the tube is patent prior to securing it to the skin. Once the tubing has been secured, it is cut off the trocar and the 20-gauge over-the-needle catheter is inserted into the end, taking care not to puncture the tubing with the needle tip. The needle is then removed, and the closed infection port is securely attached. The catheter/injection port assembly should be ‘braced’ against a wooden tongue depressor to prevent kinking and secured to a braid of mane using adhesive tape. A small zip-lock plastic bag can be placed over the entire assembly between treatments to keep it clean.

Administering medications through the SPL
Medication should be injected through the injection port in 0.2 ml aliquots followed by sufficient air (approx. 1.5 to 2 ml) to advance the medication through the tubing and into the eye. When administering more than one medication at a time, it is advisable to wait 5 minutes between medications to prevent washout and dilution. Continuous fluid delivery pumps are also available and are particularly useful for fractious horses. When administering more than one medication at a time, it is advisable to wait 5 minutes between medications to prevent washout and dilution. Continuous fluid delivery pumps are also advisable to wait 5 minutes between medications to prevent washout and dilution. Continuous fluid delivery pumps are also advisable to wait 5 minutes between medications to prevent washout and dilution. Continuous fluid delivery pumps are also advisable to wait 5 minutes between medications to prevent washout and dilution.

Removal of an SPL
Removal of the SPL is possible without sedation or regional anaesthesia. The tube should be cut approximately 5 cm from the egress hole in the eyelid and the remaining tubing should be cleaned with a 1:50 dilution of 1% povidone-iodine solution before removal. The tubing should then be gently pushed in a retrograde direction until the footplate is visible in the palpebral fissure, at which point it can be grasped and removed. In rare cases, the footplate may become embedded in the subconjunctival tissues, in which case, a cut down procedure will be necessary to remove it.

Complications
The most common complications are corneal ulceration from incorrect positioning or displacement of the footplate, eyelid infection, lack of patency of the tube due to leakage or breakage, and loss of the footplate into the eyelid.

References