**CAUDAL EPIDURAL ANAESTHESIA**

Caudal epidural anaesthesia involves injection of local anaesthetic and, or other appropriate drugs into the epidural space at the sacro-coccygeal or first intercoccygeal junction in order to produce analgesia of the tail, perineum, genitalia and pelvic viscera.

**Indication**

Caudal epidural anaesthesia is indicated in:

1. Obstetrical procedures, such as: to overcome straining while manipulation and correction of malpresentation, during dystocia, simple embryotomy, operative treatment of parturient injuries, reduction of prolapsed uterus and vagina.
2. General procedures, such as: operations of tail; perineum, vulvar tears, examination of vagina, retraction of uterine cervix.

**Contraindication**

Contraindications of epidural anaesthesia are:

1. Damage to vertebrae (lumbar or sacral) or spinal cord meninges.
2. Stenosis in vertebral canal
3. Defect at injection site or in canal.
4. Lameness or paralysis of hind quarters of nervous origin.
5. Low blood pressure or circulatory collapse.
6. Loss in the body condition of serious nature e.g. debility, anaemia etc

Additionally Epidural anesthetic injections should not be administered to patients with increased intracranial pressure, clotting disorders (because of the possibility of causing an epidural hematoma), uncorrected hypovolemia, degenerative central or peripheral axonal diseases, anatomical abnormalities that make location of landmarks difficult, or skin infection at the site of needle penetration.

**Drugs used:**

In this lab xylazine (0.05 mg/kg) was used as a sedative while 2% lidocaine was used for the epidural procedure. 4.5mls of Lidocaine was injected into the epidural space between C1 and C2.

**\*See dosage calculations on the drug section\***

**Other drugs that can be used involve:**

* Bupivacaine
* Mepivacaine
* Prilocaine

**Procedure**

1. First the first intercoccygeal space was located by:
   * + Raising and lowering the tail and palpating the depression and movement between the first and second coccygeal vertebrae: the first intercoccygeal space is the first obvious articulation caudal to the sacrum.

Other methods of locating the intercoccygeal space include:

* + - Standing to one side of the animal, along the line of the croup observe the prominence of the sacrum and caudal to this the next prominence which is the spine of the first coccygeal vertebra; the first intervertebral space is the depression immediately behind this prominence.
    - Palpate the caudal prominence of the tuberosity of the ischium and move about 10-11 cm forwards in a medium sized cow. A line drawn over the animal at this point will pass through the depression between the first and second coccygeal spines.

1. The skin over the first intercoccygeal space was cleaned and sanitized with alcohol swabs.
2. Directly over the midline a 3.75cm long 18 gauge needle was inserted into the intercoccygeal space between C1 and C2 directed at about a 45 degrees angle.
3. The needle was advanced until it penetrated the ligamentum flavum (which emits a popping sound) and entered into the epidural space
4. The hang drop technique and the non-resistance technique were conducted.
5. 4.5mls of lidocaine was then injected into the epidural space

**The “hanging drop” technique**

This involves removing the stylet of the spinal needle, filling the hub of the needle with saline or anesthetic solution, and allowing one drop to hang from the hub. As the needle is advanced through the ligamentous structures, the drop does not move. However, upon penetration of the ligamentum flavum, the negative pressure in the epidural space will draw the drop of solution into the needle, indicating proper placement in the epidural space. A “pop” felt through the needle is usually encountered when the spinal needle is passed through the ligamentum flavum.

**The “lack of resistance” technique**

This indicates proper placement of the injection needle in the epidural space based on the amount of resistance to the injection of air or saline. Once in the epidural space, the injection of air, saline, or anesthetic solution will encounter minimal resistance. Air is pulled into the syringe and the injection is given. Correct placement of the needle will result in no resistance and the volume of air in the syringe should remain the same.

\* To rule out the possibility of administering drugs into the venous sinus (presence of the blood) or subarachnoid space (presence of CSF), it is important to aspirate allow a few seconds to check bleeding before epidural injection.\*

After five minutes there was analgesia of the tail, perineum, genitalia and pelvic viscera.

**Complications / Risks**

There were no complications which occurred during our procedure however, complications can occur in any method. Some of these rare complications include postural instability, recumbency, hemorrhage if a venous sinus is punctured and infection if sterility is not maintained during the procedure. There is a risk of hind limb ataxia if an epidural is used. Infection of the epidural space has occurred in cattle following caudal epidural block, although only rarely. Doses greater than 10 ml of 2% lidocaine in cattle (of approximately 450 kg bodyweight) may result in hind limb incoordination and recumbency. Preparations containing adrenaline (epinephrine) are not suitable for intra-articular, intravenous, epidural or intra-digital administration.

**References**

* Dr Debra Bourne MA VetMB PhD MRCVS (V.w5), Caudal epidural anaesthesia of cattle,(cited 12.09.15) web page: <http://wildpro.twycrosszoo.org/S/00Man/VeterinaryTechniques/PainRumIndTech/Caudal_Epidural_Cattle.htm>
* Lyon Lee DVM PhD DACVA, Local Anesthesia & Analgesia, (cited 12.09.15) web page: <file:///C:/Users/V/Documents/14LocalAnesthesia2006b.pdf>