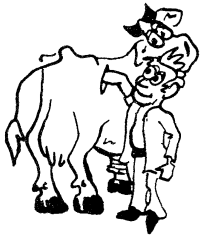
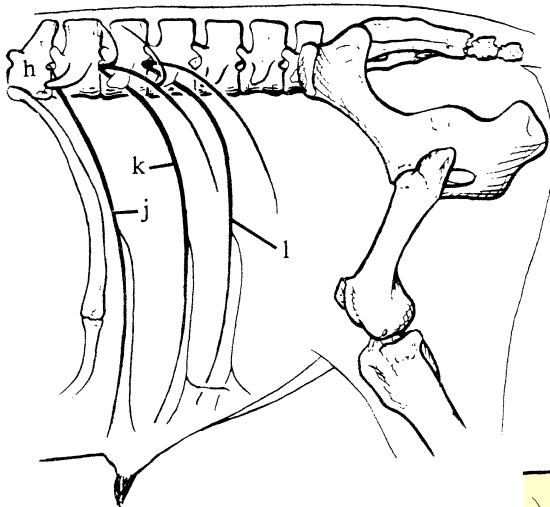


FLANK ANESTHESIA



Ox - lat. view



Ox - Lumbar vertebrae
dors. view

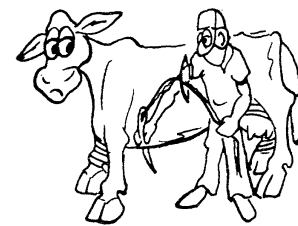
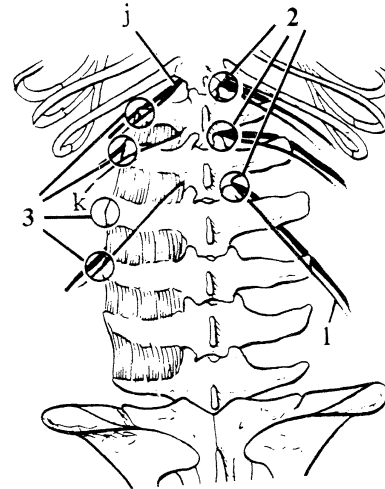
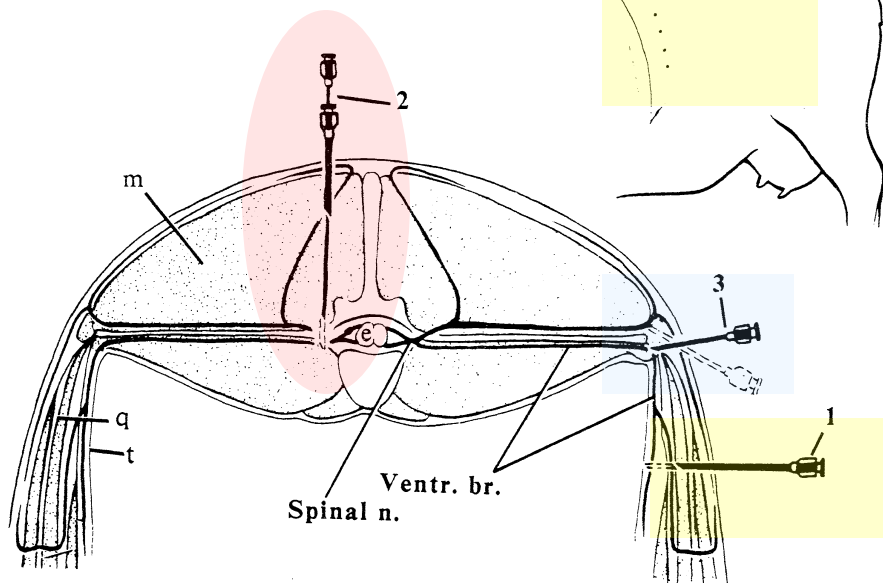


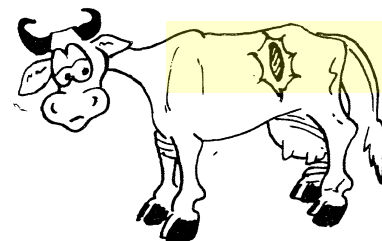
Fig. X-74 - Ox - Flank
- lat. view



Ox - 1st lumbar
vertebra - cross section

Anatomy: pg. 498

- 1. Inverted "L" block
- 2. Paravertebral block
- 3. Magda block



FLANK ANESTHESIA

Standing flank surgery in the ox: opening the paralumbar fossa to perform surgery on such problems as "hardware disease", dystocia, displaced abomasum, etc. The first three or four ventral lumbar nerves and the last thoracic nerve are anesthetized in flank surgery of the ox and horse.

Local anesthesia for a flank surgery: concerned with T₁₃, L₁ and L₂ nerves and can be done in a number of ways.

- **Line block:** infiltration of the intended incision line.
- **Inverted "L" block:** injections are done in the abdominal wall, from the subcutaneous area to the peritoneum, in the pattern shown.
- **Paravertebral block:** blocks all branches of the spinal nerves.
- **Distal paralumbar analgesia or Magda block:** blocks only the ventral and lateral dorsal branches of the spinal nerves.

Line block: infiltration of the intended incision line. This is probably the most commonly used technique. Multiple subcutaneous injections (1" 20-gauge needle) are made in the skin. Then a needle (3" 18 gauge) is inserted through the desensitized skin to infiltrate the muscles and peritoneum (10 - 100 ml). Allow 10 to 15 minutes for the anesthetic to take effect.

- Advantages: easy.
- Disadvantages: edema in the incision site and possible interference with healing.

Inverted "L" or "7" block: the line infiltration of anesthetic cranial and dorsal to the intended incision site, taking advantage of the caudoventral course of the nerves of the region. Two lines are laid down, one caudal to the last rib and one ventral to the transverse processes of the lumbar vertebrae. Up to 100 ml of anesthetic is injected. Allow 10 to 15 minutes for analgesic to take effect.

- Advantages: easy and is away from incision site.
- Disadvantages: amount of anesthetic required.

Proximal paravertebral analgesia, Farquharson technique: desensitizing the dorsal and ventral nerve branches T₁₃, L₁ and L₂ spinal nerves as they emerge from the intervertebral foramina. The injection sites are from 1 to 2 inches lateral to the dorsal midline over the cranial edge of transverse process of L₁ and the caudal edge of the transverse processes of L₁ and L₂. Prep and desensitize the skin over these areas with 3 ml of anesthetic subcutaneously. Push a 1/2 inch 14-gauge needle through the skin as a cannula. Pass a 2 to 6", 18-gauge spinal needle through the 14 gauge needle. To desensitize T₁₃, pass the needle ventrally to contact the transverse process of L₁. Walk the needle off the cranial edge of the transverse process and through the intertransverse fascia 1/2 inch (1 cm) below the transverse process. Inject 5 to 10 ml of anesthetic to desensitize the ventral branch of T₁₃. Withdraw the needle 1/2 to 1 inch above the transverse process and inject 5 ml of anesthetic to block the dorsal branch of T₁₃. Desensitization of L₁ and L₂ are done at similar levels with the same amounts of anesthetic as for T₁₃. The only difference is the transverse process and direction you walk off it. Walk the needle off the caudal border of the transverse process of L₁, for L₁;

off the caudal border of L₂ for L₂. Locating the transverse process of T₁₃ can be difficult because it is in the angle between the last rib and the spinal column. Locate the easily palpated transverse processes of L₂ and L₃. Measure the distance between them and use this distance to estimate how far in front of L₂, T₁₃ is. Signs of successful block are analgesia to the skin of the area and scoliosis toward the blocked side because of paralysis of the epaxial muscles. Analgesia usually begins in 10 minutes and last 90 minutes.

- Advantages: small amount of anesthetic needed, good analgesia and no anesthetic near wound site.
- Disadvantages: difficulty of technique, possibility of hitting large abdominal vessels, paresis of hind limb.

Distal paravertebral analgesia, Magda technique: desensitizes (blocks) the dorsal and ventral branches of spinal nerves T₁₃, L₁ and L₂ at the distal end of the transverse processes (L₁, L₂ and L₄). Insert a needle (3" 18-gauge) under the ventral tip of the respective transverse processes (L₁, L₂ and L₄). Inject 10 to 20 ml of anesthetic in a fan-shaped pattern. Withdraw the needle and reinsert it dorsal to the transverse process in a slightly caudal direction. Inject 5 ml of anesthetic around the dorsal branches of T₁₃, L₁ and L₂.

- Advantages over the proximal paravertebral analgesia: no scoliosis because not all branches of the dorsal branches are blocked. There is also minimum pelvic limb paresis, no danger of hitting abdominal vessels and uses standard needle sizes.
- Disadvantages: more anesthetic needed, effectiveness can vary, especially if the nerves vary.

Segmental dorsolumbar epidural analgesia, Arthur block: desensitization of the nerve roots as they leave the spinal cord by injecting into the epidural space through the dorsal space, between first and second lumbar vertebrae. Thorough restraint is necessary. Locate the space between the spinous process of L₁ and L₂ by palpating the transverse processes of L₂. Inject 2 to 4 ml subcutaneous at this site. Insert a 1/2" 14 gauge needle through the skin as a cannula. Insert a 4 1/2" 18-gauge needle through the cannula. The needle is directed ventrally at an angle of 10 to 15° to the vertical for 3 to 4 inches. Direct the needle through the interarcuate ligament into the epidural space. Inject anesthetic into the epidural space. The amount of anesthetic depends on the size of the animal and the nerves that you want to block. To block T₁₃, L₁ and L₂ of a 1100 pound cow, 8 ml of anesthetic is injected. Resistance will be felt as the needle passes through the interspinous ligament and the interarcuate ligament. If the needle hits the arch of a vertebrae then withdraw it and redirect it. Once the interarcuate ligament is penetrated you are in the epidural space. Do not go any further and remove the needle immediately after injection. Aspiration of CSF indicates the needle has crossed the epidural space, through the dura mater and arachnoid and into the subarachnoid space.

- Advantages over proximal and distal paravertebral analgesia: only one injection, small amount of anesthetic, and uniform analgesia.
- Disadvantages: difficult technique, motor loss to hind limbs, possibility of damage to spinal cord and venous sinuses.