OBSERVATIONS REGARDING SOME REGIONAL BOVINE ANESTHESIA


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Abstract: Regional anesthesia at cattle provided a good superficial and deep analgesia which allowed effectuation of complex surgical interventions on standing restrained animal; at lower costs and without major risks.

INTRODUCTION

Often it is possible to perform complex bovine surgery under neuroplegy and local and regional anesthesia; some of them even on standing restraint cattle. This type of anesthesia has the advantage of using less toxic anesthetics; with neurovegetative protection; convenient anesthetic effects and at reasonable costs. It is possible to be applied with facility in field condition; without special equipments.

In this paper our purpose was to accentuate in a suggestive manner the sites of administration for regional anesthesia; in the vicinity of peripheral nerve; to allow surgical procedures. In this context; we present this sites of administration on drawings; skeleton and clinical cases.

MATERIAL AND METHODS

The observations were performed on 20 bovines which required surgical intervention. We have utilize the instruments normally used in injections; and as anesthetics we have choused lidocaine 2% and bupivacaine 0.75%; 10-20 ml. injected nearly of nerves.

Cranial nerves block:  
Frontal nerve block is recommended in surgery on upper eye lid and forehead; the needle is placed above de median canthus thru the middle of upper eyelid (fig. 1).
Cornual nerve block is performed in dehorning and horn injures; below the frontal crest; midway the line joining the center of the orbit and the base of the horn (fig. 2).
Retrobulbar block is recommended in interventions on eyeball and his appendices; forehead; upper eyelid and temporal region; with many sites of administration:
  a. thru the middle of inferior eyelid the needle is introduced 5-10 cm under the eyeball toward the eyehole bottom (fig. 3a).
  b. in the anterior angle of temporal fossa the needle is introduced ~10 cm bon; toward temporomandibular joint (fig. 3b).
  c. at 1 cm of nasal angle; transpalpebral; the needle is placed between eyeball and socket; dorsal orientated and introduced for 10-12 cm deep (fig. 3c).
d. at the temporal angle of palpebral slant; transpalpebral; the needle is introduced beside eyeball in cranio-caudal direction and latero-medial toward opposite temporomandibular joint bon; after that the needle is draw back 0.5 cm (fig. 3d). *Auriculopalpebral* nerve block is recommended in eyelids operations; the needle is introduced oblique toward posterior; anterior of auricular muscle; bon (fig. 4).

![Fig. 1 Frontal nerve block](image1)

![Fig. 2 Cornual nerve block](image2)

![Fig. 3 Retrobulbar block](image3)

![Fig. 4 Auriculopalpebral nerve block](image4)

*Infraorbitar* nerve block is recommended in interventions on upper lip and gums; the site of injection is the infraorbital foramen (fig. 5a).

*Maxillary* nerve block is indicated in interventions on nose; upper lip; premolars and molars; it is done by introducing the needle 3-4 cm in the infraorbital foramen (fig. 5b).

*Mental* nerve supplies to the upper lip and it is blocked at the mentle foramen at 1 cm under the commissure of lips (fig. 6).

*Mandibulo-alveolar* block causes desensitization of lower jaw; lower lip and molar teeth by introducing the needle approximate 6-7 cm deep; tangentially to medial surface of jaw at the intersection of imaginary line drawn from the masticatory surface of lower molar teeth bisected by the perpendicular line drawn from the lateral canthus of the eye; where is site of mandible foramen (fig. 7).

*Lingual* and *hypoglossal* nerves block is recommended in tongue surgery; the needle is introduced medial in the intermandibulary space; 3-4 cm cranially from glossohyal; 4-5 cm deep for hypoglossal nerve. For lingual nerve the needle is pull back under skin and redirected oblique by the internal surface of jaw in both sides (fig. 8).

*Thoracoventral* nerve is blocked in surgical interventions on lateral and ventral region of thorax and abdomen; the administration site is at a palm caudally from elbow (fig. 9).
*Intercostal* nerve block abolishes nociceptors input from thoracic organs; the block is performed dorsally as possible; near the intervertebral foramen; and the needle is advanced onto the rib; enters under the caudal border of the rib and ileospinal muscle (fig. 10).

*Paravertebral* block is performed in cervical; lumbar and sacral segment and provide desensitization of the abdominal wall; peritoneum and more.

a. *Cranial rachidians* nerves block is used in interventions on esophagus; needle is vertically introduced until reach the transversal apophysis; and then oriented caudally in the proximity of conjugation hole (fig. 11).

b. *Lumbar cranial* nerves block is used in operations in abdominal flank

- Proximal paravertebral block performed front of the transversal apophysis base L I; L II; L III (fig. 12a);
Distal paravertebral analgesia has as an administration site the posterior angle of transversal apophysis extremities L I; L II; L IV (fig. 12b).

Spinal anesthesia could be performed epidural and subdural in different sites of administrations:

a. anesthesia in the lumbar segment is performed at the interarcual space LI and LII (fig. 13).

b. lumbosacral anesthesia is executed in lumbosacral intervertebral space (fig. 14).

c. sacral-coccygeal anesthesia is the high epidural anesthesia used in obstetrical interventions and it is performed at the sacral-coccygeal junction (fig. 15).

d. coccygeal epidural anesthesia is used in interventions on vulva; vagina and the anesthetic administration site is between first and second coccygeal vertebra (fig. 16).
Thoracic limb nerves block is done for the analgesia induced by the surgery on the front limb:

a. **median** nerve block it is applied in operations on pectorals muscles; flexor carpi radialis; deep and superficial digital flexor; skin on the median face of the arm. The administration site is the median aspect of the elbow between radius and flexor carpi radialis muscle (fig. 17).

b. **musculocutaneous** nerve block is recommended in interventions on brachial muscle and skin from forbrachial; carpal and metacarpal regions. The administration site is at the median aspect of forearm; in the length of extensor carpi radialis muscle median edge; between accessory subcutaneous vein and radial subcutaneous vein (fig. 17).

c. **ulnar** nerve block is applied in operations on posterior forearm skin; antero-lateral carpal region; lateral metacarpal region; deep and superficial digital flexor. The site of the injection is at a palm above pisiform bone; between flexor carpi ulnaris and ulnaris lateralis muscle (fig. 17).

d. **radial** nerve block is performed in surgical interventions on triceps brachii; anconeus; extensor digitorum communis; lateralis; carpi radialis and carpi ulnaris muscles. The administration site is the median aspect of arm inferior third or forearm superior third; in the length of extensor digitorum communis external edge (fig. 17).

e. **thoracic autopodium** nerves block is performed in interventions on foot distal regions; affecting dorsal metacarpal nerve; dorsal digital communis IV; etc. (fig. 18 and 19).

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**Fig. 17 Thoracic limb nerves block**

Desensitizing of the pelvic limb

a. **tibial** nerve block is performed in interventions on skin from tarsus and metatarsus regions; femoral biceps; semitendinosus and semimembranosus; gastrocnemian; solear; superficial phalanx flexor; popliteus and flexor digitorum longus muscles. The anesthesia is done by introducing the needle perpendicularly; 15 cm deep; between femoral biceps and semitendinosus; at the intersection of the line from ischium inferior point to stifle with the horizontal line crossing at a palm above stifle (fig. 20).

b. **fibular** nerve block is recommended in interventions on the skin from stifle region; medial region of metatarsus and musculature from anterior region of calf. The administration site is on the lateral side of external tibial tuberosity (fig. 21).

c. **pelvic autopodium** block is recommended in intervention on the digits and it is performed in metatarsal region trough tree injections: dorso-lateral side and on the
sides of the deep digital flexor tendon; affecting superficial fibular nerve and deep fibular nerve (fig. 22).

1. Long digital extensor muscle
2. Lateral digital extensor muscle
3. Communis digital extensor muscle
4. Dorsal metacarpal artery
5. Metacarpal dorsal nerve
6. Dorsal metacarpal nerve
7. Third digital dorsal nerve abaxial
8. Fourth digital dorsal nerve abaxial
9. Interdigital artery
10. Dorsal branch of proximal phalanx artery
11. Third and fourth dorsal digital nerves abaxial

1. Medial palmar nerve
2. Palmar artery
3. Second palmar metacarpal vein
4. Superficial branch of deep palmar arch
5. Fourth digital palmar nerve abaxial
6. Third communis digital palmar vein and artery
7. Third digital palmar nerve axial
8. Second communis digital palmar vein and artery
9. Third digital palmar nerve abaxial
10. Third digital palmar vein and artery abaxial
11. Superficial palmar arch
12. Interdigital artery
13. Fourth digital palmar nerve axial
RESULTS AND DISCUSSIONS

Regional anesthesia provided a good superficial and deep analgesia; starting 5-10 min. after anesthetics administrations and it last between 30 and 70 min. if we use lidocaine and 6-7 hours in case of bupivacaine use. If the surgical intervention is longer; additional anesthetics administration can be done without major risks. After the surgery; patients have walked away voluntarily.

CONCLUSIONS

- Regional anesthesia provide one of the most important desideratum of anesthesia; the analgesia; which at cattle allowed effectuation of complex surgical interventions on standing restrained animal; at lower costs and without major risks.
- It is easy to apply in field conditions; without special instruments and equipments. This type of anesthesia has low toxicity and is free of adverse reactions.
- We recommend regional anesthesia to be use in various bovine surgical interventions; alone ore in association with general anesthesia (neuropelage for aggressive; scared either fractious patients) and/or local anesthesia.

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