

SWINE ANESTHESIA

Introduction

- Pigs range in size from small newborns to adult boars weighing about 350 kg, and methods of restraint and for administration of anesthesia must be varied accordingly
- Although pigs are easily trained, handled and restrained, some pigs can be extremely difficult to control
- In general pigs are good subject for general anesthesia. They do not become violently excited, despite loud squeals they produce, and it does not seem to increase the epinephrine release induced dysrhythmias, and the recovery is usually calm.

Figure 7 Pigs may resent human handling and it may present difficulty in effective premedicating

Drug administration

- Intravenous injections are best made into one of the auricular veins in the external aspect of the ear-flap
- The ear vein is not suitable for injecting large volumes of fluids, and surgical cut-down of jugular vein may be necessary
- Cephalic vein can be used although direct visualization is difficult due to skin thickness, but most experienced handlers do well with blind attempts
- For intramuscular injection of drugs neck muscles are usually used. In large pigs (or pot-bellied pig), long needle must be used to have the injected drug to reach into muscle tissue. Rear limb may be preferred injection site in large pigs (or pot-bellied pig) to avoid injecting drugs into the deep fat in the neck

Anesthetic induction

- Just as in other domestic species balanced anesthetic technique is the most common approach
- Combination of alpha 2 agonists with dissociatives IM, IV
 - o Xylazine-Ketamine, Medetomidine-Ketamine
 - o Much less sensitive to alpha 2 agonists than other species
- Combination of benzodiazepines with dissociatives IM, IV
 - o Ketamine-Midazolam, Ketamine-Diazepam
- Telazol (\pm Ketamine and Xylazine; Ketamine and Medetomidine) IM, IV

- Thiopental, Propofol IV etc.
- Opioids such as butorphanol or morphine can be added to the above combination to enhance the degree of CNS depression and analgesia, and to spare maintenance agent requirements.

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Endotracheal intubation

- Intubation is not easy in the pig.
- The shape and size of the head and mouth make the use of a laryngoscope difficult
- Laryngeal spasm is easily provoked so that intubation must be carried out under deep general anesthesia or with the aid of muscle relaxant or local anesthetic spray
- The size of ET tube when compared to those used in dogs of similar weight is unexpectedly smaller (e.g. 6 mm ID for a 25 kg pig)
- Introduction of the tube may be made easier by using stylet. Malleable metal stylet or plastic urinary catheter can be used
- Laryngoscopes made for man can be suitable for small pigs, but Rowson laryngoscope may be needed for large pigs to expose the larynx to view
- The rima glottis is extremely small and the larynx is set at an angle to the trachea, causing difficulty in passing the ET tube beyond the cricoid ring.
- The induced pig is usually placed in dorsal recumbency with the head and neck extended. The shape of larynx is unique in the pig so that flexing the neck will facilitate when the tube's progress arrested with re-angled tube end.
- When resistance to the advancement of the ET tube is met, the tube is rotated to 180 degree which should effectively introduce the tube beyond the ventral floor of the larynx and allow successful completion of the intubation

Anesthetic maintenance

- Just as in the other domestic species maintenance of anesthesia for prolonged duration is best done with inhalation anesthesia
- Isoflurane, halothane, sevoflurane and desflurane all can be used, although halothane is the least desirable due to malignant hyperthermia.
- In farms, procedures such as C-section can probably be best performed under epidural or regional anesthesia.

Porcine malignant hyperthermia

- Some strains and breeds suffer from a biochemical myopathy which manifests itself during general anesthesia
- Termed 'porcine malignant hyperthermia', this is characterized by development of muscle rigidity, tachypnea, tachycardia, a severe sustained rise of body temperature, hyperkalemia, respiratory acidosis and metabolic acidosis.
- Common breeds affected by this syndrome include heavy muscled show pigs such as Poland-China, Pietrain, Landrace, Large White, Hampshire. Some breeds are less susceptible and include Duroc breed.
- Dantrolene sodium, a skeletal muscle relaxant, given orally in doses of 2 to 5 mg/kg 6 to 8 hours before the induction of anesthesia, may prevent the onset of the syndrome in susceptible pigs and IV in doses of 2 to 10 mg/kg, has proved of some use in treating the established condition

Recovery

- During recovery it is important to keep the pig in warm environment as due to their lack of body hair they are prone to develop hypothermia if left in cold surrounding
- Adequate post-operative pain relief should be provided by opioids, NSAIDs or local anesthetics
- Close observation to the upper airway obstruction must be ensured and any problem attended appropriately.

References

- Hall, Clarke, Trim. Veterinary Anesthesia WB Saunder London 2001
- Thurman, TRanquilli, Benson. Lumb & Jones Veterinary Anesthesia 3rd Edition, Williams & Wilkins, Baltimore, 1996
- Muir, Skarda, Hubbel Handbook of Veterinary Anesthesia, Mosby Co., St. Louis, 2000.
- Riebold Large Animal Anesthesia Principles and Techniques. Iowa State Press, Ames, 1982.

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