



A trip to the vet

Dr Aidan O'Donnell, Specialist Registrar, South East Scotland School of Anaesthesia

A chance meeting with a veterinary colleague provided me with the opportunity to visit a veterinary hospital, and observe veterinary anaesthetic practice at first hand.

Veterinary anaesthesia is in some ways a clearly recognisable cousin to human anaesthesia: many of the drugs, equipment and techniques are identical. On the other hand, one could not fail to be surprised from time to time at the differences: our first patient was a three-year old, weighing 350kg, listed for castration! (He was, of course, a horse). It was arresting to read a name badge and see 'Equine Orthopaedic Surgeon' or 'Lecturer in Feline Medicine'.

A different 'species' of anaesthetist

My guide for the day was Louise, a resident in veterinary anaesthesia, approximately at my own level of seniority and experience (post-fellowship SpR). I was struck at once by her confidence and ease with the animals, and her obvious skill as an anaesthetist.

Louise had pre-assessed our patient the evening before, but took me to meet him in the yard, where she invited me to auscultate the heart. The horse's apex beat is located on the left flank just behind the elbow, and the normal resting heart rate is about thirty beats/minute: it seemed extraordinarily loud and slow. Louise cannulated the left (external) jugular vein with a 20 cm long 13G cannula, under local anaesthesia.

We changed into theatre scrubs and went into theatre to check the equipment. The operating theatre was a mixture of the familiar and the bizarre. The anaesthetic machine was recognisably similar to the ones I use every day, with

flowmeters, vaporisers, a bellows-in-a-jar ventilator and a circle breathing attachment with a soda lime absorber. However, the components seemed grotesquely oversized: the ventilator could deliver tidal volumes up to 20 litres, and the reservoir bag was beach-ball sized. The operating table was designed to take an adult horse. Overhead ran the rails of a hoist for carrying the patient through from the anaesthetic room.

Louise ran through her pre-op checklist of equipment, and drew up some drugs.

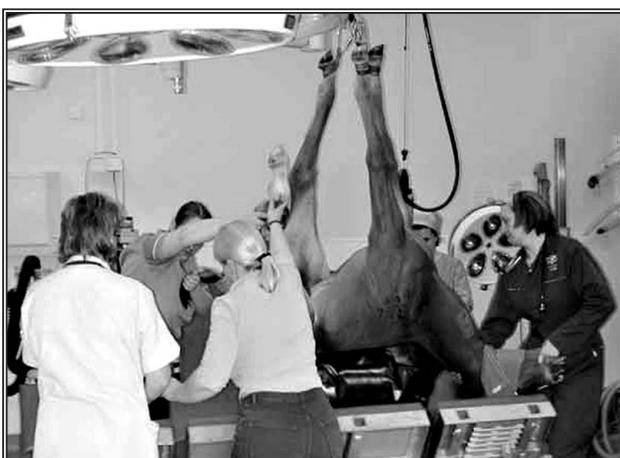
A different species of patient

Through a large set of double doors was the anaesthetic room, an empty, square room with padding on the walls and floor. Our patient was led in and made to stand in the middle. Pre-anaesthetic sedation was provided with romifidine, an alpha-2 agonist. Within three minutes, the horse became quite deeply sedated with a low head carriage and apparent ataxia. Anaesthesia was induced with a combination of ketamine and diazepam. It was much slower than a human induction, but still startlingly fast. The horse staggered a little, then his hind legs toppled over sideways, followed by his front legs. Louise guided his head gently to the floor.

She invited me to help intubate the horse, which was still breathing. No laryngoscope was needed: an extended neck brings everything into a straight line. The cuffed endotracheal (ET) tube was enormous: 26 mm internal diameter (though some racehorses will take a 35 mm tube). There was no need for muscle relaxant, as the equine larynx is forgiving and does not go into spasm. It was clear the tube was in the right place as an enormous steamy breath gushed out of it.

The veterinary nurse and Louise shackled the horse's four legs together, and the overhead hoist was used to lift him by the shackle and carry him into theatre. Louise supported his head (by the ear and the jaw), and he was carefully positioned on the table. She attached the tube to the Y-connector of the circle and gave him oxygen, nitrous oxide and halothane to breathe. The injectable technique maintains anaesthesia for long enough to bring the animal into theatre and commence an inhalational agent for maintenance.

It was a very odd sight to see a horse wedged on his back (the 'dorsal' position), with his huge abdomen spilling out to the sides, his legs tied up over his body, his neck stretched out and a huge ET tube protruding from his mouth.



Hoisting the patient into theatre



An intubated horse

We monitored the ECG by attaching the usual electrodes, and oxygen saturation by clipping the pulse oximeter probe to the tongue, which is easily accessible and has a good blood supply. Non-invasive blood pressure is impractical in the horse, so Louise sited an arterial cannula in the facial artery. Blood gas monitoring was performed regularly intra-operatively, as horses tend to become hypoxaemic and hypercapnic under anaesthesia, and capnography is not particularly accurate in this species. Horses are sensitive to volatile agents, and Louise had dobutamine run through a drip, which she was ready to commence in the event of hypotension – a very common occurrence and of serious concern because of its association with post anaesthetic myositis/myopathy.

Once the patient was draped and the surgeon had begun, things began to look much more familiar, right down to the students being asked uncomfortable anatomy questions. Louise kept the chart, wrote in the casenotes and prescribed postoperative analgesia. When the procedure was over the horse was hoisted back through into the padded anaesthetic room, where he was unshackled, extubated while deep, and left on his side to recover.

We retired to a neighbouring room to watch him recover. A ceiling-mounted camera allows the horse to be watched closely without a human being present in the room (which can panic the animal). Normally horses remain on their side until they are awake, then roll on to their front until they feel steady, then rise slowly to their feet when able. Our patient was frisky and made several unsuccessful attempts to rise too soon: he crashed down against the padded walls and floor. Louise was concerned that he might injure himself, although he calmed down after a few minutes.

All creatures great and small

Later in the day Louise took me to another wing of the building to see some small animal anaesthesia. I

participated in the anaesthetic of a dog that was having an anal operation. I was allowed to cannulate a vein; to intubate (in an odd manner: face to face with the animal, one holds the laryngoscope upside down and inserts it into the mouth like a tongue depressor, then the larynx pops into view), and to insert a single-shot epidural (using a 22G Quincke needle; the landmarks and sensation were remarkably similar). My veterinary colleagues were amused to hear of us using 'caudal' anaesthesia in a species with no tail! Later on the list I intubated a cat in a similar fashion.

The veterinary anaesthetists treated me with great courtesy and interest during the whole day. They plied me with questions about human practice, and answered my own questions with great patience and some amusement.

Similarities and differences

In dealing with humans, the majority of our patients can tell us when they are sore, or have other problems. In animals, it is much harder to judge. According to the vets, some animals are more 'demonstrative' than others, but it seemed to me that a great deal of empathy and experience is required to be sure of doing the job properly. Dealing with a frightened patient with reassuring tones and a gentle manner seems similar on both sides.

I was surprised to hear of some techniques being used in animal anaesthesia. They were no strangers to TIVA (even in horses!) or remifentanyl; and agents such as sevoflurane and desflurane are commonly used. Oxyglobin, an artificial preparation of cross-linked haemoglobin in suspension, may be used in place of red cell transfusion. In addition, vets require a larger arsenal of drugs to cope with the different species, and they use several classes of drugs that we rarely use, particularly the alpha-2-agonists. We have, at least, only one species to consider, with a (relatively) narrow range of weights. Louise pointed out that one can anaesthetise a 500kg horse in the morning and a 5kg cat in the afternoon! Veterinary anaesthetists have a wide knowledge of comparative physiology and pharmacology: different species may react very differently to the same anaesthetic drugs (cats, for example, may develop methaemoglobinaemia with propofol). Veterinary anaesthesia is a postgraduate discipline, with an extensive training programme.

Some of the drugs used in veterinary anaesthesia are very differently priced: isoflurane costs about seven times as much as for humans, and most drugs are more expensive (although halothane is about half price). When I asked why, I was told that it costs a tremendous amount of money to obtain licences for drugs in veterinary anaesthesia, especially for animals that might end up in the human food chain.

A four-legged friend

For a few privileged animals, with very wealthy owners, the pinnacle of medical care is as high as for humans. MRI scanning, cardiac catheterisation, renal dialysis, and even intensive care are available. The value of the animal is measured not in financial but in emotional terms, and in this situation, the motivation for treatment is love for the animal.

On the other hand, some animals, like racehorses, whose value may be measured in millions of pounds, may be extremely valuable in a commercial sense. In this situation, the motivation for the treatment of the animal is predominantly economic, and an owner may still pay huge sums for the finest veterinary care available.

Finally, there are some animals, such as dairy animals, where there is neither strong emotional nor economic motivation to treat, and here treatment is purely pragmatic: if the problem can be quickly and cheaply cured, the animal will be treated. If not, it is usually destroyed.

Acknowledgement

I enjoyed my 'trip to the vet' enormously. It was fascinating to see my own specialty approached from a very different angle, and to meet a new 'species' of anaesthetist! I was impressed by the quality of anaesthetic care that animals can receive. My thanks to Louise Clark, BVMS Cert VA Dipl ECVA MRCVS, for kindly looking after me the whole day, and to the staff of the Royal Dick School of Veterinary Studies Field Centre in Roslin, near Edinburgh.

I would also like to thank Ms Caroline Gilroy, Undergraduate Admissions Secretary at the Royal Dick School of Veterinary Studies in Edinburgh for making it possible to let me reproduce the two photographs used in this article.