

SRS Narrative: Rodent Surgery

Procedure: Femoral Vein and Artery Cannulation

Species: Rat.

Animals were obtained from an approved vendor at a weight ranging from 300 – 350 grams. Upon arrival animals were placed on a required 5-day acclimation period before they could be used for surgery.

Anesthesia used: Isoflurane was used at a level of 2.5 % for induction and maintenance.

Preparation of the surgical area:

The surgical area that was used was clean, well lit and had the appropriate equipment needed for the surgery. The room is a designated room for all rodent surgery. The surgical area was set up with a circulating water heating pad that was placed on the surgical table, a blue underpad was placed on top of the heating pad and a barrier sterile field was placed on top of the blue underpad. Another sterile field was also placed next to the surgical area to place the sterile instruments and supplies on that are necessary for the surgery.

Preparation of instruments and supplies:

All the instruments and supplies (i.e. drapes, gauze) steam sterilized prior to surgery. All catheter materials were soaked in Cidex Plus 28 day solution for at least 20 minutes and rinsed with sterile water prior to implantation into the animal. All catheters were flushed with saline before they were implanted into the animal.

Preparation of the animal:

The animal was induced and maintained at 2.5 % isoflurane. Ophthalmic ointment was then placed in the animal's eyes to prevent drying during surgery. The animal's hair was clipped at the nape of the neck between the shoulder blades to remove any loose hair and dirt. Wiping the area with 70% alcohol and scrubbing with betadine in a circular motion to clean the area, and finishing with a 70% alcohol wipe to remove the betadine scrub performed an aseptic prep of the surgical site. This process was repeated two more times. After the third scrub and wipe, betadine solution was applied and allowed to dry. The animal was then turned over on its back with a piece of sterile gauze covering the previously scrubbed area. Once the animal is on its back, the left inguinal area was clipped from the foot, up over the leg and up to the mid-abdominal region. Standard aseptic technique was used to prepare the site for surgery. The animal was then transferred to the sterile surgical field that was prepared earlier. The animal is placed in dorsal recumbency with the left leg taped to the sterile field.

Preparation of the surgeon:

The surgeon is wearing a bonnet, mask and clean lab coat or jumpsuit. Immediately before starting the surgery, the surgeon must wash her hands and put on a pair of sterile gloves. Once the surgeon is properly gowned and gloved, she places a sterile drape over

the animal with the hole over the incision site. Once this is done, she is now ready to begin the surgery.

Monitoring:

During the induction of the animal, anesthetic onset is determined when the animal loses its righting reflex. Once this occurs, leave the animal in the induction chamber for 2 to 3 more minutes to assure a surgical plane of anesthesia. At this point the animal may be removed from the induction chamber and placed in the nose cone in order to be clipped and scrubbed for surgery. During preparation and surgery, anesthetic depth can be monitored by observing the animal's respiratory pattern and tissue perfusion and by pinching the toe to see if there is any response. During recover, the animal is removed from the nose cone and placed in a dry, clean cage. The animal is then observed until it has returned to full sternal recumbency and is walking around his cage. This usually takes about 3 minutes. Post-operative monitoring was done on a daily basis by the surgeon.

Analgesia:

If upon post-operative monitoring it was determined that an animal was in pain, (evidenced by signs such as decreased food or water intake, weight loss, aggression, vocalization, or unkempt appearance) analgesics such as Banamine 1 mg/kg SQ would be given

Operative description:

With a pair of forceps, lift a 2 mm area of skin about 1 mm from the abdominal wall in the femoral region and make an incision approximately 1cm in length using a disposable scalpel (#11). Blunt dissect downward until you expose the femoral nerve, artery and vein (this is called the femoral complex). Isolate the vein, which is the vessel that is the most caudal, from the artery. Once it is isolated, make a loop with a strand of 4-0 silk and pass it under the vein. Pull it through and cut the loop on the other side to give you two independent pieces of suture. Attach the catheter tubing to a 10 cc syringe with saline and a blunt 26-gauge needle. Make a small cut on top of the vessel by using a pair of sharp microvessel scissors. Using a catheter introducer or a right-angled bevel down 22-gauge needle, insert the catheter into the vessel and advance it to the first bulb (the catheters are pre-measured). Once the catheter is in the vessel, withdraw on the syringe to confirm you are in the vessel. You should see blood come back into the catheter when you draw back on the syringe. Once the catheter is in the vessel, secure both proximal and distal knots with a surgeon's knot. Place one other silk suture proximal to the bulb on the catheter/vessel surface for added security. With the same technique used on the vein, cannulate the artery. However, once the catheter is attached to the syringe, make sure the catheter is clamped off to prevent any back flow of blood into the catheter once it is in the vessel. Using blunt dissectors, prepare a subcutaneous pocket in the femoral region where the catheter can be formed into a loop that is approximately 2 mm in diameter to help alleviate any stress that may be placed on the catheters. Place a suture using 4-0 silk with a P-3 cutting needle on both sides of the bulb within the loop. Closer to the incision site, clamp off the catheters with a hemostat and detach them from the syringes. Make a small incision between the shoulder blades on the back of the neck

region. Using the proper size trocar, tunnel subcutaneously from the neck down to the femoral region or from the femoral region up to the neck. When the trocar has exited the subcutaneous space, insert the catheters into the trocar and feed them up the trocar until they come out the other end. Once the catheters are through the other end, remove the trocar from the subcutaneous space and pull the catheters through making sure no kinks occur. Reattach your syringes filled with saline and remove the clamp that is near the incision site. Suture the skin by using 4-0 ethilon with a P-3 cutting needle with a simple interrupted pattern. Place at least two sutures on the exit on the neck region to secure the catheter in place. Measure approximately 25 mm from the neck region of the catheter and place a hemostat on the catheter. Cut the catheter and attach a syringe with an anticoagulant lock solution and a blunt 25-gauge needle into the catheter. Insert approximately 0.3 ml of lock solution into the catheter. Remove the syringe with the lock solution and place a red (for artery) or blue (for vein) plug into the catheter. Upon completion of the surgery, weigh the animal and place him in a dry, clean cage. Observe the animal until he has regained full sternal recumbency and is walking around the cage.