

Longitudinal craniotomy

Equipment required

1. A hard hat, particularly if working in an abattoir or knackery
2. Safety eye glasses, particularly if using hammers and axes
3. Strong gloves to protect against sharp bone fragments
4. Overalls
5. Rubber boots (gumboots)
6. One small stone hammer (mash hammer)
7. One $\frac{3}{4}$ size axe preferably with fibreglass handle
8. One sharp boning knife
9. One plastic 2 litre jar with a secure screw top lid half filled with 10% buffered formalin for the brain
10. One smaller jar to hold the fresh spinal cord sample
11. Knee pads to make working in the kneeling position cleaner and more comfortable (optional)
12. A piece of carpet to serve as a good working surface for this method (optional).

Step-by-step instructions to perform the longitudinal craniotomy method

1. Using a knife, skin the ventral (lower) head and remove the tongue and soft tissues of the throat to expose the hard palate and ventral cranium (the skull).
2. Turn the head over, and using a knife, cut the skin on the top of the head along the midline.
3. Using a knife, extend the cut into the soft cartilage of the nose in the midline to split the nose.
4. Using an axe, crack the dorsal (upper-side) skull along the length of the midline where the skin cut has been made. The cracks made on top of the brain should not go too deep. The aim is to crack the cranium surrounding the brain without damaging the brain and to fully cut through the depth of the nose and jaw.
5. Turn the head over, and using an axe, split the ventral portion of the head by splitting the front of the bottom jaw, cracking the cranium along the midline and splitting the hard palate and nose to its full depth. The cuts made to the bone of the ventral cranium should not go too deep in order to avoid the axe penetrating the underlying brain stem.
6. Continue cutting until the two halves of the head are loose.
7. Stand the head on its neck end and start to lever the two halves apart from the nose end by grabbing the two halves of the split nose and slowly pulling them apart. Take care not to tear the brain.
8. Using a knife, cut any soft tissue attachments that might prevent the two halves of the head being levered apart. More cracking of the cranium will be required if the head will not come apart easily. If the cranium has been cracked sufficiently, the whole head can be levered open and the brain will be exposed.
9. Lever the head apart to its full extent.

10. Using a knife, cut the part containing the brain away from the other part of the skull.
11. Using a knife (or scissors), cut the cranial nerve roots and the dura mater (the thin sheath covering the brain) and the tentorium cerebelli (an extension of the dura mater which separates the cerebrum from the cerebellum) as the brain is exposed and removed. The hemisected pituitary gland is exposed at the base of the brain.
12. Collect a 2-3 cm length of spinal cord and place in the smaller plastic screw top jar. **Freeze this sample.**
13. Make a gentle knife cut between the cerebral hemispheres to expose the ventricles so the formalin can enter inside the brain for better fixation.
14. Place the brain into the jar of 10% buffered formalin nose first so the brain stem does not fix in a distorted position. **Do not freeze.**
15. Submit the spinal cord, and the fixed brain to the accredited laboratory in your state or territory, where they will be permanently stored.