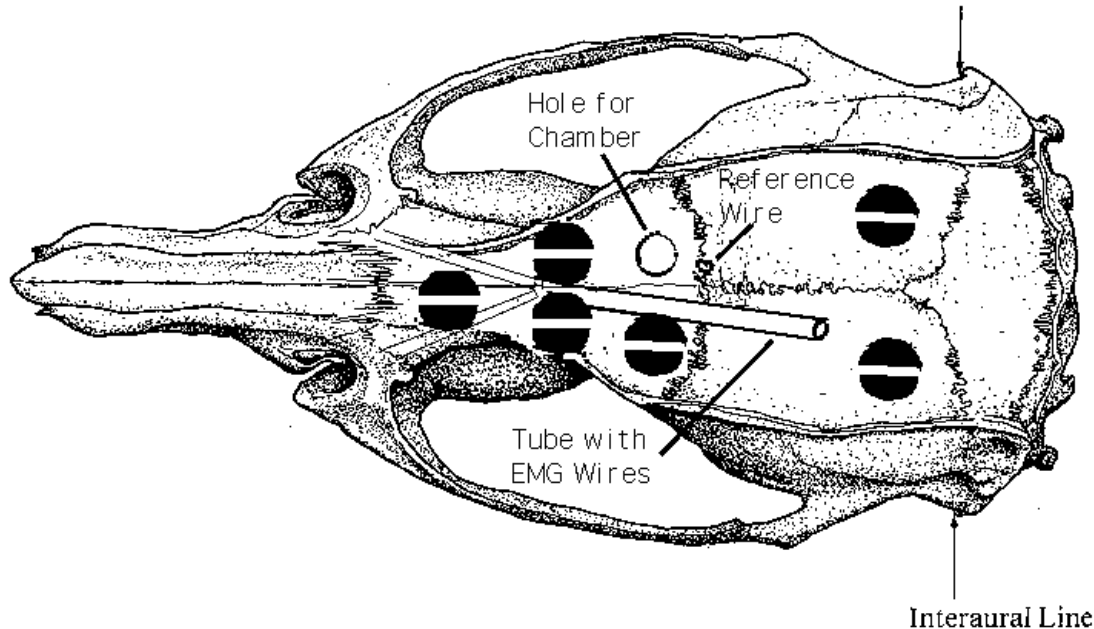


Surgery (typical) for Chronic Cortical and EMG Recording

1. Open the skin at the midline, gently scrape soft tissue as necessary and retract skin.
2. Prepare a circular craniotomy, ~2.9 mm in diameter when viewed from above. The bone is carefully cleared with the dura intact. The completed craniotomy is covered with Gel Foam™.
3. A series of size 00-90 3/32" screws are placed in the skull to act as anchors. In brief, a hole that just penetrates the skull, or is at most 1 mm deep, is cut with a # 1/4 round burr. The diameter is enlarged with a # 34 tapered burr, and the final hole is treaded with a #00-90 bottom tap; typically 1-2/3 threads are cut. Nominally, one screw is placed in each of plate, as shown. Each screw is sealed with Loctite™ 495.



4. Each EMG wires is inserted and then threaded through the Teflon™ tube. The wires are glued inside the tube, which is then anchored with stainless steel wire to a screw.
5. A hole is cut with a # 1/4 burr ~ 2 mm caudal to the craniotomy. The cortical reference is inserted and held in place with dental cement.
6. The screws are greased and inserted into the lower chamber to protect the threaded holes and the dummy guide tube array is inserted to the proper height. The lower chamber, including the insert, is positioned over the craniotomy with the vacuum tube positioned lateral. The chamber is then lightly glued in place with dental cement.
7. The bolts and chamber are tied with stainless steel wire, followed by silver wire that forms the ground connection.
8. The ground wires and cortical reference wire are grouped with the Teflon™ tube with the EMG wires. The collection of EMG wires are grouped placed proximal to the chamber.
9. The screws and wires are potted in dental acrylic.
10. The dummy guide-tube array is removed from the chamber and the lid is secured.
11. The EMG wires and the ground lead are soldered to the connector, which is held by a jig.
12. The connector is positioned and glued in place with dental acrylic.
13. The cortical reference lead is wrapped around the connector, covered with tape, and sealed with Loctite™ 495
14. The dental acrylic above the interorbital line is built-up to form a flat surface. Two #00-90 nuts are positioned on the surface with the aid of a jig. The nuts are cemented into place with dental acrylic.
15. The implant is inspected and shaped if necessary to insure smooth edges. the skin is cleaned of any cement. The wound site is covered with antibiotic ointment and topical anesthetic ointment.

Materials for headstage (Venkatachalam et al. 1999) surgery

Headstage parts

- 1 of lower chamber with vacuum port
- 1 of lid
- 3 of #0000-160 3/32" filister-head screws
- Dummy insert of guide tube array

EMG

- 5 of 0.002" Teflon™ coated (formerly 0.001" HML coated) tungsten wires; 2 leads for each muzzle plus one reference. Each with one end stripped (1 mm) and inserted into a # 27 1/2 gauge syringe needle
- 1 of 15 mm of 0.055" OD Teflon™ tubing
- 1 of 10 pin male connector (or equivalent)
- Dummy 10 pin female connector (or equivalent)
- Acid flux and fine solder

Cortex reference

- 1 of 0.002" Teflon™ coated tungsten wire with 1 mm at one end stripped, the end sharpened, and electroplated with gold
- 1 of 5 mm of 0.055" OD Teflon™ tubing

Blindfold

- 2 of #00-90 nuts
- Jig for nuts

Miscellaneous

- Loctite™ 495
- 0.005" stainless steel wire
- ~ 0.008" silver wire
- ~6 of #00-90 1/8" filister-head screws
- Emergency supply of #0-80 1/8" filister-head screws

Special Tools

- Jig for connector, made with Newport Optical miniature rods and posts
- Jig for nuts
- Notched forceps to hold screws
- Miniature screwdriver
- # 1/4 - round head air-drill burr
- # 34 - tapered air-drill burr
- #00-90 bottom tap in holder
- #0-80 bottom tap