

# Spinal Cord Stimulation - Surgical Technique

Typically this procedure is done in one stage and under general anaesthetic with intra-operative low frequency motor stimulation to confirm lead placement before full internalization of the system.

An extended trial would normally be performed using a percutaneous equivalent electrode array.

## Stages

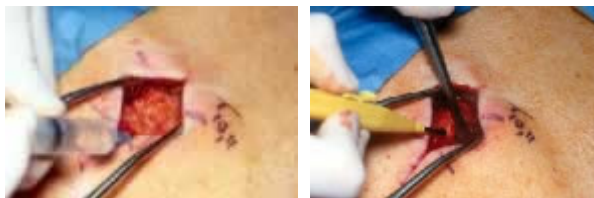
- Placing the lead
- Perform an intra-operative motor test to determine optimal lead positioning
- Creating a pocket for the receiver
- Connecting the leads to the receiver

Fluoroscopy is required for this procedure to achieve correct lead positioning.

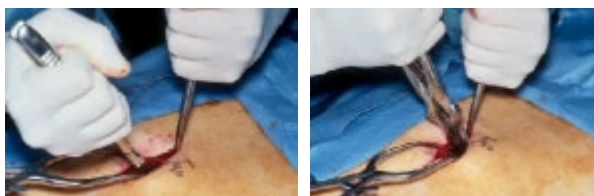
The patient is placed on the operating table in chest rolls and flexed with the feet elevated and then prepped. The fluoroscopy C-Arm is positioned over the patient to localize the level of surgery and facilitate placement. The intended insertion level for the lead in this instance (for low back and legs) is between T10 and T11 spinas processors so that the electrodes will ultimately lie between T8 and T10.



A local anaesthetic is injected into the planned skin incision, in part for control of bleeding and also to provide pre-emptive anaesthesia. An incision is made sharply from T10 through T11. The bovi is used to coagulate bleeding points and also to dissect. After the dorsal fascia is divided a sharp square is used to reflect the paraspinas muscles laterally and a retractor is put in place.



The ligaments between the spinas processors are removed. These are sharply divided and the ligament is re-sected. The base of the spinas process and a small portion of the lamina is removed.



The ligamentum flavum is divided and then removed and a Bilateral subtotal laminectomy is initiated. It is necessary to remove sufficient amounts of lamina to ensure passage of the Lamitrode paddle into the epidural space.



The paddles can now be passed. Fluoroscopy is used to ensure a successful midline placement. It is common in patients that have had numerous epidural blocks as well as percutaneously placed SCS leads at periods remote to the time of the laminectomy implant to have substantial epidural scarring so dissecting of the epidural space may be required to aid in the steering of the paddle. At this point the wound is irrigated and the lead is secured to prevent movement.

In order to determine the actual physiologic midline, intra-operative testing should now be performed.

There are several methods for this including:

- Waking the patient up for an on table trial
- Low frequency stimulation to elicit motor responses and thus determine laterality

One of the key advantages of this 16 electrode system is the ability to direct the parasthesia coverage in a broad or specific manor. This lessens the importance of intra-operative testing and allows optimization of the SCS therapy to be accomplished in a less expensive post-operative setting using the PainDoc computer system.

Once intra-operative testing has been completed, the lead should be secured. A towel clip is used to create a hole in the spinas process. Through this hole a suture is passed, both of the lead tails can then be individually retained at that site using a butterfly type lead anchor or anchored together by stacking one on top of the other and placing in the lead anchor. If necessary the paddle can also be attached to the dura. The fascia is then reconstructed.

An incision is made for placement of the receiver. A pocket is developed of sufficient size to accept the receiver. The position of the pocket should be away from the incision to reduce the possibility that scarring from the suture line will interfere with the transmission of the RF signal from the antenna to the receiver.



A tunnel is made from one incision to the next and subsequently the lead tails are passed through the tunnel. The dorsal incision is now closed. Connector boots are then placed over the leads prior to the leads being attached to the receiver. The boots should be irrigated with sterile water to facilitate their movement down the lead.



Successful stimulation over the long term is highly dependent on a clean dry interface between the receiver connectors and connector end of the leads as well as the dry secure placement of the boots. Without using force, fully insert the lead into the connector block. Use the torque wrench to tighten the screws until a click is heard. Slide the boot over the connector. The receiver can then be placed in the pocket with the label side facing up towards the skin surface and at a depth not exceeding 1mm. Excess lead should be coiled under the receiver which will also act as a strain relief. The incision site can now be closed.

Programming is usually performed a few days after surgery.