

## **CASE REPORT ON SPINAL STIMULATOR IMPLANTATION**

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**Abstract:** A method for treating chronic pain syndrome, spasticity, and pelvic organ dysfunction. The effect is achieved by electrical impulses delivered by electrodes implanted in the epidural space. Electrical impulses activate pain-inhibiting neurons in the posterior horn of the spinal cord, resulting in a decrease in the sensation of pain; stimulation also causes paresthesia (a feeling of soft, pleasant vibration) in the area where the pain originates and its surroundings. SCS is considered successful if more than 50% pain reduction has been achieved on a visual analogue scale. However, a 30% pain reduction is also clinically significant. Neurostimulators are implanted in over 15,000 patients worldwide each year to treat chronic neuropathic pain. Electrodes are connected to a neurostimulator, which is implanted subcutaneously. To date, conservative treatment methods do not always provide sufficient pain relief. Pharmacotherapy is usually the first and main treatment method, however. More than 50% of patients remain dissatisfied with pharmacotherapy, regardless of the drug used. Many drugs cause various side effects. Neurostimulation is an alternative treatment method for patients with NB when traditional conservative treatment methods do not produce the desired results.[1][2].

**Key words:** trauma, spinal cord, stimulator, implantation.

### **Introduction**

Spinal stimulation is a method of treating chronic pain that involves implanting a device that sends electrical impulses to the spinal cord to alter pain sensations and improve the patient's functional state. This method is actively used in neurosurgery to treat patients with various diseases, including spinal cord injuries, chronic pain, and to manage the consequences of spinal injuries. In this article, we will consider examples of the use of spinal stimulator implantation in a patient with a closed spinal cord injury at the level of the 12th thoracic vertebra[3].

### **Materials and methods**

We present a clinical case based on a hospitalized patient diagnosed with "Consequences of a spinal fracture. ICD-10: T91.1 Consequences of spinal cord injury. ICD-10: T91.3. Consequences of previous closed vertebrospinal injury (03/07/2021) of the thoracic spine and spinal cord. SPO (03/07/2021) laminectomy VTh11-Th12 + implantation of TPF on VTh11 and L1. SPO (12/28/2021) reoperation MESH-System + implantation + TPF on VTh10-VTh11-VL1-VL2. Thinning and interruption of the course of the spinal cord tracts, extended areas of myelomalacia on the level of VTh11-Th12-VL1. Old compression fracture of the body of the VTh12 grade III, with compression of the spinal cord in front (Urban wedge). Lower deep paraparesis. VAS-8. Dysfunction of the pelvic organs. According to the Frankel scale - C".

### **Test neurostimulation (TN)**

TN involves implantation of an electrode, which is part of the testing system. The electrode is inserted under local anesthesia. TN makes it possible to obtain an analgesic (pain-relieving) effect already on the operating table, and to predict the effectiveness of neurostimulation with a higher degree of probability even before implantation of the entire system. The 20-minute test period is carried out in a hospital setting for a better assessment by the patient of the dynamics of the pain syndrome and its impact on the functions of the pelvic organs. During the test period, the optimal parameters of electrical stimulation are selected. If, according to the results of TN, it was possible to achieve a 50% reduction in pain according to the Visual Analogue Scale (pain intensity assessment scale), the patient can be completely implanted with the neurostimulation system. In case of failure, the question of moving to the next stage will arise. It should be noted separately that in case of some pain syndromes, for example, in case of traumatic rupture of the nerve plexus roots, patients undergo surgical interventions, for example, DREZ-operation. In case of intervertebral disc herniation - appropriate excision of the hernia. And in case of oncological pain – cordotomy.

Mandatory condition: Before installing the neurostimulating system, a test stimulation is carried out (see above), which allows the doctor to verify the effectiveness of the method [4][5].

## Results

Implantation of a spinal stimulator in a patient with a closed spinal cord injury at the level of the 10th and 12th thoracic vertebrae, as well as at the level of the 3rd sacral vertebra, helped to significantly improve the quality of life and reduce chronic pain. After the operation, the patient noted a decrease in the intensity of pain, improved sleep, and the appearance of movement in the toes (previously absent). VAS-3. The patient began to feel control over the pelvic organs [6].

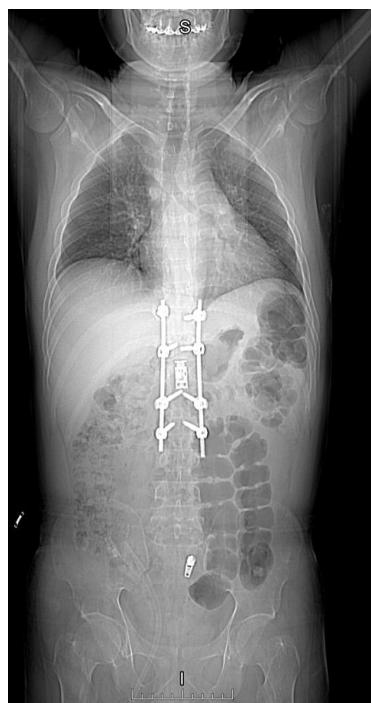


Fig. 1. MSCT of the patient before implantation of the stimulator (body)

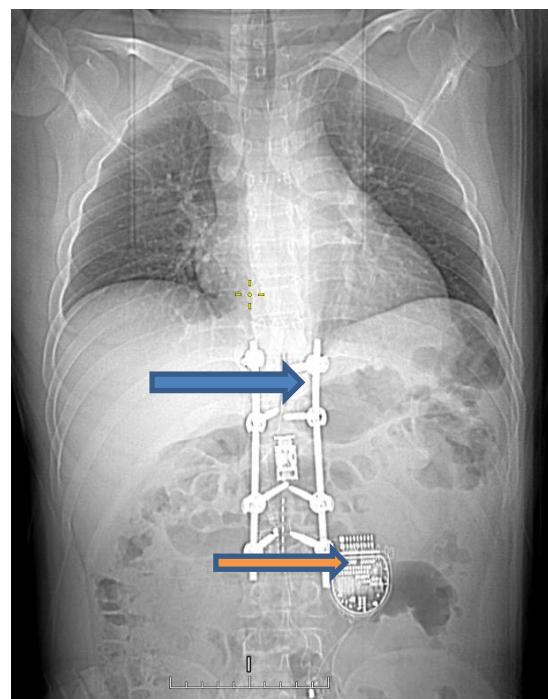


Fig. 2. MSCT of a patient after implantation of a stimulator (chest)

Blue arrow – electrodes

Green arrow - stimulant



Fig. 3. MSCT. Electrode placement in Foramina Sacralia pelvina

## Conclusion

Spinal stimulator implantation is an effective method of treating chronic pain in patients with spinal cord injuries, including closed spinal cord injuries at the thoracic level. This method can significantly improve the quality of life, reduce pain and increase the functionality of patients. Despite possible complications, the results of using spinal stimulation in clinical practice show a high level of effectiveness and patient satisfaction.[7].

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