Sickle cell pain is often classified as either acute or chronic. The acute type is the recurrent painful crisis that often requires treatment in the emergency room. Chronic pain becomes a disease by itself due to central sensitization. Here we report a patient with sickle cell pain who was treated with Spinal Cord Stimulator (SCS).

The patient was 28 years old female. She has a history with frequent hospitalizations caused by painful crises, operations due to vertebral fracture, femoral head osteonecrosis and pulmonary hypertension. When the patient was referred to the pain clinic her back and chest pain 9 on a numeric rating scale (NRS). Magnetic resonance imaging of the whole spine shows non-enhancing areas involving vertebral bodies at dorsal and lumbar levels suggesting infarcts. Pain control could not be achieved medically; all of NSAIDs and opioids had been unsuccessful. After evaluation of Local Pain Council of the hospital, the patient underwent implantation of a SCS.

She was taken to the operating room and placed in the prone position. A 15-gauge Tuohy needle was inserted in the T6-7 interlaminar space under fluoroscopic guidance. Eight electrode epidural leads was inserted through the needle and advanced under until the tip
laying at the T1-T4 intervertebral disc level (Figure-1). The stimulation parameters were pulse width of amplitude 2.5 mA, and frequency of 10 kHz. After one week successful trial period with greater than % 60 of pain relief the lead being connected to an implantable pulse generator placed subcutaneously on the left buttock. The patient’s back and chest pain decreased to 3 on the NRS after four weeks control period. Same excellent pain relief one year after implantation of HF-SCS, as well as improvement in her ability to perform activities of daily living.

SCS is a type of neuromodulation which has gained significant popularity in recent years for managing certain chronic, intractable pain which other procedures have failed in failed back syndrome (1), ischemic limb pain (2) angina pectoris (3) and painful peripheral neuropathies. (4) The mechanism of pain relief by SCS stil remains unclear. (5) According to the gate control theory, cell associated with central transmission of pain in dorsal column is controlled by the afferent activity of large-fiber or small-fiber in the peripheral nerve system. This gate closes when an excess of large-fiber activity. (6) Also autonomic nervous system activity could be involved in the pathophysiology of sickle cell disease. (7) Inadequate perfusion is caused by a reduction in oxygen delivery to the tissues, usually due to reduction in blood flow because of constriction or obstruction of a blood vessel. (8) The sympathetic pain pathway, which carry nociceptive information in small fibers can be blocked by HF-SCS.

The present report describes the first patient with intractable pain due to sickle cell disease who was treated with HF-SCS successfully. This technique may be a therapeutic alternative for patients who have exhausted all available treatments or who have an increased risk for more invasive surgical interventions.

References

**Figure 1:** MRI shows multiple infacts involving vertebral column T2 and T1 sagittal image. Non-enhancing areas involving vertebral bodies at dorsal and lumbar levels, suggesting infarcts.
Figure 2: Plain X-ray demonstrating placement of SCS electrodes at the level of T1-T4