THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center

Peripheral and Dorsal Column Stimulation to Treat Radiation Induced Throat Pain in a Patient with an Automated Implantable Cardioverter Defibrillator (AICD)

Mitchell P. Engle MD PhD, Brian M. Bruel MD, Marc Rozner MD PhD, Larry C. Driver MD
Department of Pain Medicine, MD Anderson Cancer Center, Houston
Peggy and Avinash Ahuja Center of Excellence in Pain Research and Treatment

Background:
Radiation induced peripheral neuropathy is a particularly vexing problem to treat clinically. We present a patient with radiation induced glossopharyngeal nerve and great auricular nerve neuropathy secondary to laryngeal cancer treatment. The patient presented approximately one year following his radiation therapy with persistent paroxysmal pain in both his throat and around his ipsilateral ear. He failed trials of traditional oral antineuropathic medications and high dose opioid medications only modestly controlled his pain. In addition, he received only short term relief after pulsed and conventional radiofrequency ablation of the glossopharyngeal nerve, stellate ganglion block, and cervical epidural steroid injection. Prior to proceeding with a neurosurgical glossopharyngeal neurectomy, we trialed peripheral field stimulation over the styloid process, C2 dorsal root ganglion stimulation, and cervical dorsal column stimulation.

Procedure:
We placed a four electrode lead over the left styloid process, a four electrode lead in the far lateral epidural gutter at the C2 dorsal root ganglion, and a single eight lead electrode midline on the dorsal columns at the C2 level. The C2 dorsal root ganglion lead was chosen because several recent abstracts have demonstrated efficacy of this lead placement for occipital and trigeminal neuralgias.

Following placement of the leads, anesthesia was deepened and all leads were stimulated up to 5 V while AICD sensitivity was maximized. This did not produce interference with AICD rhythm detection. Throughout the procedure the AICD was monitored by an expert in pacemaker and AICD technologies. For a margin of safety, the maximum stimulation was then set to 2.5 V for the duration of the trial.

Outcome:

Stimulation using the peripheral lead overlying the styloid process reduced the patient's left ear pain by 60-75%. Interestingly, stimulation using the far lateral C2 dorsal root ganglion lead reduced the patient's throat pain by greater than 50%. The patient maintained this throat coverage for approximately four days, but then lost his throat coverage and acquired left shoulder and arm parasthesias. Fluoroscopic imaging of the temporary leads prior to removal showed the C2 dorsal root ganglion lead had migrated to a more posterior-medial position. The patient is currently awaiting permanent implantation.

Conclusion:
This case demonstrates several important points. First, far lateral epidural gutter lead placement at the C2 dorsal root ganglion is able to capture difficult to treat throat pain related to cancer treatments. Second, peripheral field stimulation over the styloid process is able to capture ear pain likely via the stimulation of the great auricular nerve. Finally, both cervical lead placement and peripheral lead placement over the glossopharyngeal and vagus nerve are safe in selected circumstances where interference with the AICD is monitored.