Residual limb pain is common post-amputation with incidence reported as high as 74%. This pain can severely affect quality of life and if poorly treated may interfere with the patient's ability to wear a prosthesis."\(^2\) Residual limb pain can be difficult to treat with medications. Medications also have the potential to expose the patient to undesirable side effects. Although peripheral nerve stimulation has been utilized for decades, it has seen significant technologic advances in recent years. Today this form of neuromodulation may be performed with image guidance in a minimally invasive manner. Modern implantable devices designed specifically for the periphery are an emerging treatment modality for those with refractory residual limb pain.

**Case Report**

**HPI**

- A 64 year old male was involved in a high speed snowmobile collision in 2000 resulting in surgical below the knee amputation.
- Shortly after amputation, patient began to experience episodic throbbing pain in in the residual limb. Each episode lasting approximately five hours.
- Pain would occur several times per month with the majority of symptoms occurring at night. Pain was improved with use of the residual limb.
- Frequency of episodes increased following surgical removal of Baker's cyst.
- No intervention provided relief during his pain episodes. Treatment modalities had included gabapentin, pregabalin, TENS, oxcarbazepine, opioids, capsaicin cream, and physical therapy.
- Patient underwent MMPI with no overt psychiatric issues.

**Procedure**

- 10/13/17 - Implant placed
  - Patient placed in left lateral decubitus position on OR table. Skin prepped from right hip to residual limb. Full body drape applied.
  - Ultrasound used to locate sciatic nerve in popliteal fossa
  - Under ultrasound guidance, a stimulating electrode was advanced to lay next to the sciatic nerve
  - Confirmed that appropriate stimulation was achieved in the distribution of the right sciatic nerve
  - 9-French dilator and sheath were advanced over the stimulating electrode
  - Stimulating electrode and dilator were removed leaving the sheath in place
  - Permanent electrode placed through the sheath and sheath was removed deploying electrode
  - Stimulator was then tunneled in the subcutaneous tissue
- 10/27/17 - Patient returned for device activation with initial benefit of 50%
- 03/14/18 - Patient continued to report benefit with >50% pain reduction

**Discussion**

Chronic pain following amputation is a common problem with limited therapeutic options. In this case, the patient had ongoing residual limb pain for over fifteen years. He experienced significant improvement with peripheral nerve stimulation when pharmacologic interventions had provided limited benefit. Transcutaneous placement of the device via ultrasound provided a relatively non-invasive approach for neuromodulation in his specific nerve distribution along the sciatic nerve.

**Conclusion**

Twelve months post-implant, our patient continues to report improved analgesia as well as improvement to his quality of life.

**References**