Abstract—Chronic headaches cause a drastic detriment to the quality of life of those who suffer from them. By targeting specific nerve bundles that have been linked to headache formation, facial nerve stimulation, both invasive and non-invasive, seeks to block headaches before symptoms become severe.

I. INTRODUCTION

Chronic primary headaches, which include migraines and cluster headaches, are common conditions that impair many people’s quality of life. It is estimated that between 2 and 5% of the general population suffers from some form of chronic headache. Individuals who suffer from chronic headaches are more likely afflicted with anxiety, depression, and underemployment. Traditional treatment has been preventative medication and drugs like Aspirin, but these remedies often have limited effectiveness or unwanted side effects, leading to termination of treatment in many patients. In order to provide more effective treatment for primary headaches, the focus has been shifted to the cause of headaches, which is thought to be the sphenopalatine ganglion (SPG) of the face. Through the use of a small implant, electrical impulses are applied to the SPG in an attempt to block neurotransmitters that cause these headaches.

II. METHODS

The device, called the ATI SPG Neurostimulator, is implanted with minimally invasive surgery through the roof of the mouth. Surgeons are aided by a parasinal CT scan to accurately place the device. The stimulating electrodes are placed on the pterygopalatine fossa (where the SPG is located), and the base is anchored on the maxilla bone. Using a remote control paired with the device, patients can activate stimulation when they begin to feel symptoms of a cluster headache.

III. RESULTS

In a case study on the ATI SPG Neurotransmitter, 28 patients were implanted with the device. During the study period, a total of 566 headaches were treated. Pain relief was achieved in 67.1% of stimulation-treated attacks after 15 minutes, and 18 patients experienced a reduction in headache frequency after prolonged treatment.

IV. DISCUSSION

The 67.1% treatment rate of the ATI SPG Neurostimulator, coupled with the reduction in headache frequency experienced by patients makes this a promising technology for headache treatment in the future. Currently, there are several challenges to overcome with the device. In some cases, the electrodes can become dislodged from their intended location, and the device would need to be surgically extracted. Also, the frequency at which the stimulation is applied still requires further testing to maximize efficacy. The 67.1% treatment rate could be improved as more data is collected on the appropriate frequency levels.

The ATI SPG Neurostimulator provides an excellent alternative for treatment for those who are unable to take preventative medicine for chronic headaches. As the technology improves, the success rate of this treatment could surpass that of medication alone. This device can greatly increase the quality of life of those who suffer from chronic headaches, and could even pave the way for treatment of other diseases through the use of electrical stimulation.

REFERENCES