Pre-implantation testing for trigeminal branch stimulation to treat atypical facial pain.

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• The rest of the authors have no disclosures to make
• Atypical facial pain may arise after trauma, infection, dental procedures or be idiopathic, and can be debilitating and extremely difficult to treat.

• There have been reports of multiple therapeutic modalities, including medications, psychotherapy, lesioning and stimulation procedures with variable results, highlighting the need for treatment individualization.

• Trigeminal branch stimulation is a minimally-invasive treatment, that has shown benefit in earlier series.

• However, there is currently no widely-accepted method to predict response.

• We propose a quick, office-based, non-invasive method to assess possible pain relief before the final decision for electrode implantation in patients with refractory atypical facial pain.
• We retrospectively reviewed patient records from 2009-2017 for patients undergoing transcutaneous facial nerve stimulation testing before receiving trigeminal branch electrode implantation.

• Testing was done using an Ojemar Cortical Stimulator (OCS1) or a Grass S-88 Nerve/Muscle Stimulator via two SIU-7 CC isolators over the painful area.

• Frequency, pulse width and amplitude were set at values consistent with implanted electrode settings.

• Patients reporting more than 50% relief after up to 2 hours of stimulation, and loss of relief after stimulation was discontinued, were deemed proper candidates and subsequently underwent implantation.
• Eleven (11) patients with atypical face pain were evaluated between 2009-2017 using externally-applied electrodes overlying the region of the nerve and painful region.
Results

- Stimulation in clinic for up to 2 hours
- Ojemann OCS1 or a Grass S-88 via two SIU-7 CC isolators with
  - Frequencies: 40 to 130 Hz
  - Pulse widths: 60 to 500 μS
  - Amplitudes: 0 to 8 mA
  - Ranges consistent with values used after electrodes are implanted
Patients who reported more than 50% relief in the clinic, and who typically reported loss of relief if the stimulation was off were deemed candidates for implantation.
Results

• Follow-up ranged from 2 months to 8 years.
• During last follow-up, 7 patients (64%) are still using their systems.
• Electrode removal was necessary because of loss of efficacy or infection.
• Three patients still using their systems also required implant revision.
• Initial visual analogue pain (VAS) score ranged from 8-10.
• Patients with systems still in use reported VAS 1-4 on last follow-up, with pain relief of about 70%.
• Transcutaneous office-based testing provides a simple and cost-efficient method to gauge response to trigeminal branch stimulation in patients with atypical facial pain.

• Further research is needed to better individualize therapy in this setting.