

Targeted Peripheral Nerve-Directed Onabotulinumtoxin A Injection is an Effective Long-Term Therapy for Migraine Headache

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Background: Onabotulinumtoxin A (BOTOX®) is an FDA-approved treatment for chronic migraine headaches that involves on-label, high-dose administration across 31 anatomic sites. Anatomically-specific peripheral nerve trigger sites have been identified that contribute to migraine headache pathogenesis and are amenable to both BOTOX® injection and surgical decompression. These sites do not always correlate with the on-label FDA-approved injection pattern, but represent a more targeted approach. The efficacy of targeted peripheral nerve trigger site BOTOX® injection as an independent long-term therapeutic option has not been investigated.

Methods: A retrospective review was completed for 223 patients with migraine headaches. Sixty-six patients elected to proceed with diagnostic BOTOX® injections. Of these, 24 continued long-term therapeutic BOTOX® injections while 42 matriculated to surgery. Outcomes were tracked.

Results: Therapeutic long-term targeted trigger site-directed BOTOX® injection resulted in significant improvement in migraine headache index (MHI) (53.5 ± 83.0 , $p < 0.006$), headache days/month (9.2 ± 12.7 , $p < 0.0009$) and migraine severity (2.6 ± 2.5 , $p < 0.00008$) versus baseline. MHI improved from the initiation of diagnostic injections to the establishment of steady-state injections ($p < 0.002$), and further improved over time ($p < 0.05$, mean follow-up 615 days) with no desensitization observed. Decompressive surgery resulted in significant improvement in MHI (100.8 ± 109.7 , $p < 0.0000005$), headache days/month (10.8 ± 12.7 , $p < 0.000002$), migraine severity (3.0 ± 3.8 , $p < 0.00001$), and migraine duration in hours (16.8 ± 21.6 , $p < 0.0007$). MHI improvement with surgery was better than long-term BOTOX® injections ($p < 0.05$).

Conclusions: Though inferior to surgical decompression, targeted peripheral nerve trigger site-directed BOTOX® injection is an effective primary therapy for migraine headache representing a possible alternative to non-directed BOTOX® injection with decreased dosage requirements and the potential for decreased cost.