A Target Approach to Neuroma Pain – Review of Latest Neuroma Treatment Options

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INTRODUCTION
Neuromas result from abnormal axonal regeneration following a peripheral nerve injury when the proximal regenerating axons are impeded from re-entering the distal stump. This uncoordinated regeneration of nerve fibers can cause acute and chronic pain that is difficult to treat. Postsurgical incidence of painful neuromas ranges from 1%-26%. Mostly described after diabetes related conditions. The incidence of painful neuromas ranges from 1%-26%.1-5 Mostly described after trauma, peripheral vascular disease, oncologic or diabetes related conditions.8 Close to half of these patients receive opiates for pain management, exposing them to increased risk of addiction.9 With this in mind, it is important to study surgical approaches that will successfully prevent and treat symptomatic neuromas.

METHODS
Retrospective review of our institution’s experience with surgical treatment of symptomatic neuromas, from 2016-2018 was performed. Neuromas were identified preoperatively by positive painful Tinel’s sign over the symptomatic neuroma and confirmed via nerve blockade in the clinic setting. Patients reported their pain on follow-up consultation.

RESULTS
Allografts were used for segmental nerve injuries (defect range 2-7cm) in 18 nerves of the extremities with no occurrence or recurrence of painful neuroma. Targeted muscle reinnervation (TMR) was employed in 18 amputees having painful neuromas (average 2-5 neuromas treated per case) with 1 report of recurrent neuroma pain. Nerve caps from porcine submucosa ECM were employed in 3 digital nerves of the hand with 0 reports of neuropathic pain in early postoperative setting. Range of follow-up was 1-24 months.

CONCLUSION
The surgical management for symptomatic neuromas is ultimately dictated by the local anatomy. Our group prefers a target algorithm. If a distal nerve end is identified and amenable to repair, then nerve repair with or without grafting can be performed with excellent results. However, if an autograft is used, it may paradoxically lead to a neuroma at the donor site. When the distal nerve end is absent, traction neuroectomy has historically been employed, but yield unsatisfactory results. Nerve translocation, as described by Boldrey and Dellon, has mixed results with significant reoperation rates. In order to effectively quell the pain response, one must complete the nerve circuit. This can be accomplished by TMR and implantation of regenerated peripheral nerve interface (RPNI). We propose that a distal target algorithm is the optimal approach for the treatment and prevention of neuroma pain.

REFERENCES