dose used one day before amputation. Multivariate linear regression was performed to examine the association between postoperative opioid use and the main predictors—(1) TMR, (2) Regional pain catheters, and (3) Preoperative opioid use—in addition to several possible confounders, including age, sex, and Charlson Comorbidity Index (CCI).

RESULTS: An estimated 198 patients were reviewed. In total, 95 patients received perioperative regional anesthesia and 111 patients underwent TMR. Mean preoperative opioid use was 75.9 MME (standard deviation (SD) 166.9 MME) per day while mean postoperative opioid use was 98.4 MME (SD 192.0 MME) per day. Undergoing TMR significantly reduced daily postoperative use by 41.5 MME ($P < 0.05$, 95% confidence interval (CI) $-82.01$ to $-0.89$). Every 1 MME of preoperative opioid use significantly increased postoperative opioid daily use by 0.87 MME ($P < 0.001$, 95% CI 0.77–0.97). Regional anesthesia, age, sex, and CCI were not found to have significant effects on postoperative opioid use.

CONCLUSIONS: Our results suggest TMR nerve transfers are independently effective in reducing postoperative opioid requirements following major lower extremity amputation. Regional anesthesia did not have an individual, statistically significant effect, although it may have amplified the opioid lowering effects of TMR. Minimizing baseline opioid use prior to amputation may also decrease postoperative opioid use. TMR nerve transfers can decrease reliance on postoperative pain control with opioids in lower extremity major amputation patients and may subsequently reduce rates of opioid dependence.

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A Markov Analysis of Surgical versus Medical Management of Chronic Migraines

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PURPOSE: Refractory chronic migraine (CM) is a common and debilitating neurological condition, affecting over 8 million people in the United States. It is associated with billions of dollars in lost productivity annually. Novel medical (anti-calcitonin gene-related peptide antibodies, or erenumab) and surgical treatment modalities have emerged for CM in recent years. Given the substantial economic burden of CM, it is not sufficient to simply understand clinical outcomes: it is also critical to study the cost-utility of CM treatment, especially in refractory cases. Although prior studies have demonstrated the cost-utility of migraine surgery over long-term onabotulinumtoxinA injections, no one has investigated the cost-utility of migraine surgery versus medical management of CM with erenumab. The current study examined the cost-utility of surgical versus medical management of refractory CM.

METHODS: This was a cost-utility analysis comparing surgical therapy to erenumab in adults with refractory CM. The primary model outcomes were the incremental cost-effectiveness ratio (ICER), which is represented in terms of cost per quality-adjusted life year (QALY) gained. Hybrid Monte Carlo patient simulation and Markov cohort modeling were used to study the cost-effectiveness from both societal (indirect costs—time lost from work, productivity lost, etc.) and payer perspectives (direct costs—costs of care, cost of medication, facility fees, etc.).

RESULTS: Migraine surgery was associated with a 0.2 increase in QALYs per patient when compared with erenumab. In terms of direct costs (ie, payer perspective), migraine surgery resulted in a decrease in cost of $19,337 when compared with erenumab. Thus, surgery was a dominant strategy compared with erenumab given that it reduced global costs and improved patient-reported outcomes. In terms of indirect costs (ie, societal perspective), migraine surgery resulted in a decrease in cost of $470 when compared with erenumab. Thus, surgery was again the dominant strategy as it reduced indirect costs and improved patient outcomes in comparison with erenumab. Multiple scenario analyses were completed to more-comprehensively evaluate cost-effectiveness. In one scenario, we extended the time horizon of the model, and we assumed that 12% of patients undergoing migraine surgery required revision surgery within five years of the initial procedure, based on published results by Guyuron et al. Even in this scenario, surgery remained the dominant strategy over erenumab, as global direct and indirect costs considering revision procedures were still less than costs associated with lifetime utilization of erenumab. Sensitivity analyses demonstrated that surgery was cost-effective compared with erenumab when patients required medical therapy for at least 1 year.
CONCLUSIONS: Given that migraine surgery and erenumab each have their respective benefits and limitations, it is important to specifically understand the relative cost-utility of these two treatment modalities for refractory CM. Our model suggests that surgical deactivation of migraine trigger sites may pose a cost-effective approach to treating refractory CM in adults. This is especially the case when patients are anticipated to require medical therapy with erenumab for more than 1 year. Understanding when it is cost-effective to perform migraine surgery may help expand coverage and access for those patients who can specifically benefit from this therapy.

Endoscopic Nerve Decompression in the Lower Extremity: Limiting Incisional Morbidity in High-risk Patients

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BACKGROUND: Open decompression of the tibial nerve at the tarsal tunnel and superficial peroneal nerve (SPN) in the lateral compartment has proved beneficial in patients with entrapment and/or diabetic neuropathy. However, these procedures typically require significant surgical exposure. The benefit of such procedures may be outweighed by prolonged immobilization and high rates of wound dehiscence, particularly in the diabetic population. We propose an endoscopic technique to reduce postoperative surgical site morbidity while still allowing for long-segment nerve decompression.

METHODS: Patients with identifiable nerve compression in the lower extremity with no prior nerve surgery were chosen to undergo endoscopic decompression. All procedures were performed using an endoscopic retractor fitted with a 4-mm, 0-degree endoscope. Patients were immediately mobilized with full weight-bearing status and followed postoperatively to assess wound healing and improvement in symptoms.

RESULTS: Endoscopic release was performed on 59 extremities in 52 patients. Patient age ranged from 17 to 78 years. The average BMI was 29.7 kg per m². There were no intraoperative complications, nerve/vessel injuries, or conversions to an open approach. Within the follow-up period (mean = 17.3 months), all but one patient reported improvement in pain and sensation, or regained strength, and there were no wound-healing complications requiring reoperation.

DISCUSSION: We present a novel endoscopic approach for decompression of the tarsal tunnel and medial ankle tunnels, and SPN decompression in the lower extremity. The procedure can be performed both safely and effectively to relieve lower extremity compression neuropathies while limiting potential incisional morbidity, particularly in high-risk diabetic patients.