Transcutaneous Electrical Nerve Stimulation for Postoperative Pain Relief after Arthroscopic Rotator Cuff Repair: A Prospective, Double-blinded Randomized-control Trial
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INTRODUCTION:
Arthroscopic rotator cuff repair (ARCR) can be associated with significant postoperative pain which, in turn, can affect the overall rehabilitation and outcomes. While a variety of anesthetic types can be used intraoperatively, the postoperative period typically centers around the use of oral opioids. Concern for opioid abuse has led surgeons to identify novel, efficacious methods of analgesia that can reduce opioid utilization. Transcutaneous electrical nerve stimulation (TENS) has been proven to reduce postoperative pain scores and result in significantly less opioid usage after total joint arthroplasty. To determine if TENS can have a similarly beneficial effect in shoulder procedures, we conducted a prospective, double-blinded randomized control trial in patients undergoing outpatient ARCR.

METHODS:
IRB approval was obtained to enroll all patients 18 and older undergoing ARCR of a full-thickness rotator cuff tear by senior authors. Patients with a history of narcotic abuse or under management of a pain control specialist were excluded. Patients were randomized into two groups: active or sham TENS. All patients received same dosage opioid for use as rescue pain pills. Active TENS units delivered full stimulation when used, whereas sham TENS delivered intermittent stimulation at non-therapeutic levels. Both patient and physician were blinded as to study group. All patients were instructed to use their TENS units four sessions a day, with each session lasting 45 minutes. All patients were provided a log to record their pain scores and number of pills taken for the first postoperative week.

RESULTS:
Thirty-seven patients (21 active, 16 sham) were enrolled and have complete one-week data. Preoperative ASES and VAS pain scores did not differ between groups. At one week postoperatively, patients in the active group had significantly lower pain scores (3.6 +/- 2.0 vs. 5.8 +/- 1.2; p<0.001) than sham group of patients. Postoperative opioid use for the initial 48 hours (12.8 +/- 4.7 vs. 17.1 +/- 6.3, p=0.020) and total one week opioid use (25.4 +/- 10.1 vs. 33.3 +/- 14.4, p=0.050) were significantly lower in the active group than sham group (Figure 1). No TENS-related complications occurred in either group.

DISCUSSION AND CONCLUSION:
Results from our prospective, double-blinded randomized-control trial demonstrate that compared to sham TENS, active TENS can result in significantly less pain and opioid usage in the immediate postoperative period after ARCR. Although these results are preliminary, our data suggests that TENS units may be potentially useful in a multimodal approach of improving patient analgesia.