



Cooled Radiofrequency Ablation of Cervical Nerves for the Treatment of Chronic Pain

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Introduction

- Chronic neck pain is a leading cause of disease in the United States, with a mean one-year prevalence of 25.8% of the population.¹
- Conservative treatment for neck pain includes physical therapy, exercise, analgesics, anticonvulsants, muscle relaxants, and opioids.²
- Medical management of chronic pain has been associated with unsuitable side effects and a risk of opioid dependence. Other invasive interventions include steroid injections and surgery.
- Many patients experience chronic pain refractory to conservative treatment and would potentially benefit from minimally invasive therapy for pain relief.
- Cooled radiofrequency ablation (c-RFA) is a minimally invasive therapy that uses thermal energy generated by electrical currents to lesion the medial branches of the dorsal rami and disrupt the transmission of pain stimuli to the brain^{3,4}

Methods

- Retrospective analysis of 450 procedures between 2015-2022 for patients who received c-RFA for chronic neck pain, 203 were included
- Exclusion criteria included missing pre-op or post-op pain scores and other invasive procedures at the ablation site
- All patients included had cervical facet arthropathy diagnosed via cervical facet loading.
- Visual analog scale (VAS) was used to measure pre-operative and post-operative pain scores
- A two-tailed paired t-test was used for statistical significance between pre-operative and post-operative pain scores with a p-value ≤ 0.05
- Duration of relief was only calculated in patients with symptom improvement > 0%
- All adverse events associated with the included in the analysis

Results

Average VAS pain score pre-procedure (n=298)	6.15 ± 1.55
Average VAS pain score post-procedure (n=298)	3.64 ± 2.09
Mean % improvement in effective RFAs (n=263)	48.04% ± 26.53
Average duration of improvement (n=298)	6.67 months ± 4.84

Table 1. Summary of results, including average pre-procedure pain score and post-procedure pain scores, mean percent improvement, and average duration of improvement

Adverse Event	Number Reported
Post-operative headache	2
Palpitations	1
Postoperative pain/soreness at site of RFA	66
Post-operative pain radiating down the arm	5
Total	74

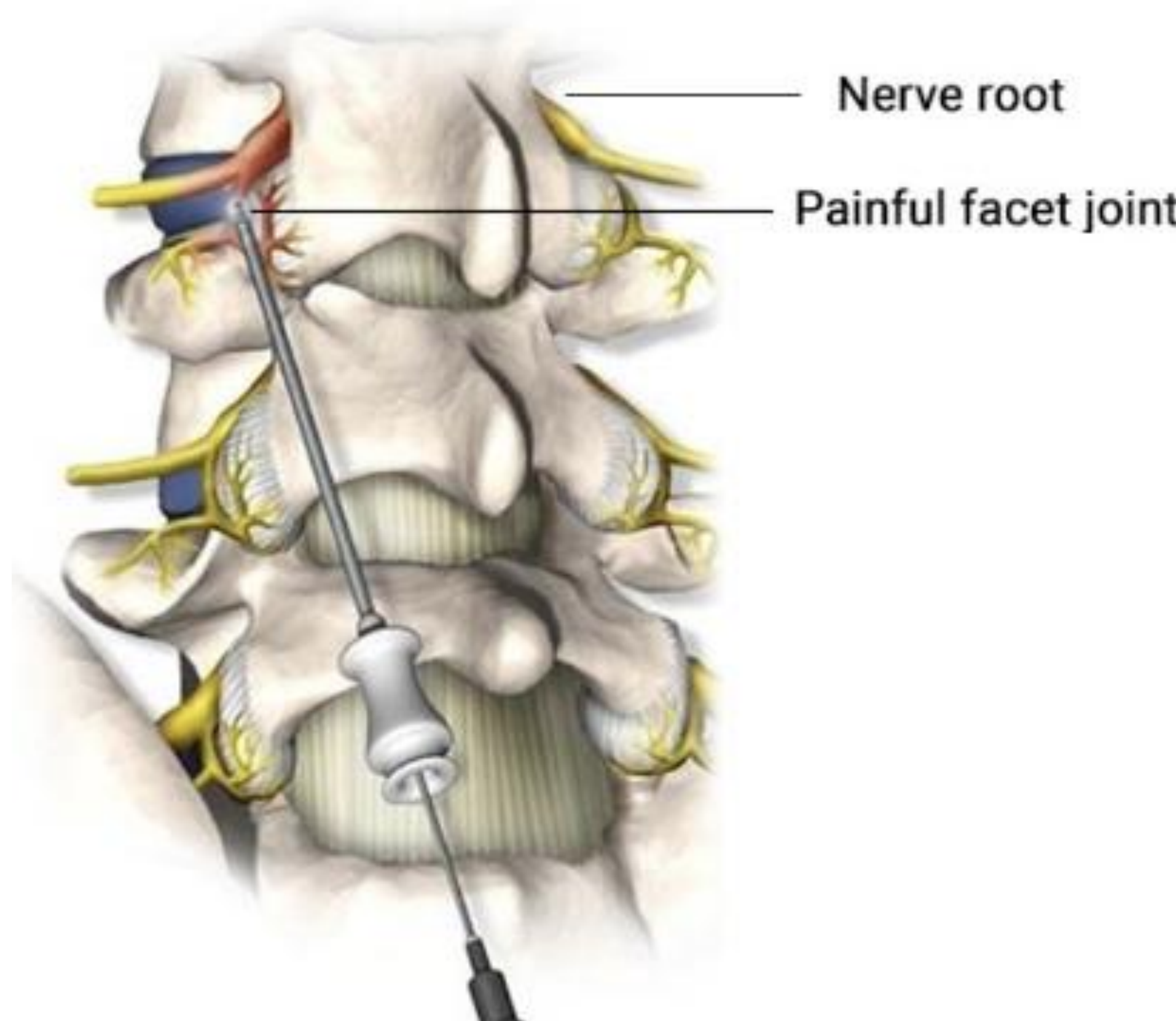
Table 2. Summary of adverse events including post-operative headaches, palpitations, soreness at site of RFA, and post-operative pain radiating down the arm

Total # of patients	203
Sex	F=129/ M=74
Average Age	56.03 ± 12.76
Average BMI	28.76 ± 6.05

Table 3. Patient demographics including sex, age, and BMI

Discussion

- Average reduction in pain scores from pre-op scores was 48.04%, with an improvement in pain scores reported in 85.23% of patients
- Previous studies report 69% pain reduction at six months and 29% of patients with complete pain relief⁵
- This study demonstrated an average greater pain reduction (85.23%) but fewer incidences of complete pain remission
- 79 adverse events were reported of 298 procedures (26.5%), however all were self limiting and resolved in 6 months
- The most common adverse event was post-operative pain at the site of ablation
- 152 of 450 procedures lacked pre- or post-op scores which were excluded from the analysis
- COVID-19 pandemic contributed to patient loss at follow-up



Conclusions

- Cooled radiofrequency ablations is an effective treatment chronic neck pain refractory to other treatments.
- RFA provides significant long-term pain relief with minimal side effects.

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