Role of Radiofrequency Ablation in Chronic Abdominal Pain: An Evidence Based Review

Mani Singh, MD[†]; Jay Karri, MD[‡]; Laura Lachman, MD[‡] w; Vwaire Orhurhu, MD[§]; Alaa Abd-Elsayed, MD[◊]

[†] New York-Presbyterian Hospital – Columbia and Cornell, Physical Medicine and Rehabilitation, New York, NY
[‡] Baylor College of Medicine, Physical Medicine and Rehabilitation, Houston, TX
[§] Massachusetts General Hospital – Harvard Medical School, Anesthesia, Critical Care and Pain Medicine, Boston, MA
[◊] University of Wisconsin School of Medicine, Anesthesia, Division of Pain Medicine, Madison, WI

BACKGROUND

- Chronic abdominal pain is a frequently cited complaint but one that can be difficult to diagnose, localize, and treat
- Conventional management with oral analgesics may be ineffective or poorly tolerated secondary to side effects
- Radiofrequency ablation (RFA), including pulsed and continuous radiofrequency (PRF/CRF) options, has emerged as a promising treatment modality
- However, its role, safety, and efficacy for chronic abdominal pain has not been clearly delineated

OBJECTIVE

- To establish the role of RFA in the treatment of chronic abdominal pain and to determine its safety and efficacy

METHODS

- PubMed, Scopus, RefWorks, AccessMedicine, VisualDx, and Cochrane Library databases were searched
- **Key Words:** radiofrequency ablation, pulsed radiofrequency ablation, abdominal pain syndromes, chronic abdominal pain, abdominal cancer pain, and anterior cutaneous nerve entrapment syndrome
- 22 articles were reviewed for pain syndrome, nerves targets, outcome measures, complications, limitations, and overall conclusions

RESULTS

- 3 randomized-controlled trials, 8 observational studies, and 11 case series were included (2002-2019)
- Common indications for RFA included abdominal cancer pain, anterior cutaneous nerve entrapment syndrome, chronic pancreatitis, loin-pain hematuria syndrome, post-surgical pain, and myofascial pain
- Frequent targets included splanchnic nerves, celiac ganglia, dorsal root ganglia (commonly at T11 or T12 levels), and anterior cutaneous nerves
- PRF was utilized in 12 studies, CRF was utilized in 10

Pain Condition	Nerve Targets	Study Design	Sample Size	Consensus for RFA Treatment
[1]Cancer Pain: Pancreatic Hepatocellular Gallbladder	Splanchnic Nerves (RFA vs Alcohol)	Randomized Controlled Trial	N=60	➢ Reduction of pain (VAS) ➢ Improved QOL (GPES)
[2]Cancer Pain: Pancreatic	Celiac Plexus (Neurolysis vs RFA)	Randomized Controlled Trial	N=26	➢ Decreased pain scores (VAS) ➢ Improved quality of life scores (PAN26)
[3]Anterior Cutaneous Nerve Entrapment	Anterior Cutaneous Nerve (T7 - T12)	Randomized Controlled Trial	N=60	➢ Decreased pain at 8-weeks ➢ Higher success rate compared to neurectomy group
[4]Chronic Pancreatitis	Splanchnic Nerves (T11-T12)	Retrospective Observational Study	N=11	➢ Decreased NRS scores ➢ Median pain relief of 45 weeks
[5]Abdominal Myofascial Pain Syndrome	Variable Abdominal Trigger Points	Observational Study	N=120	➢ 60% patients reported sustained relief ➢ Decreased pain (NRS) at 6-mo

Table 1. Summary of Selected Articles Highlighting the use of RFA in Chronic Abdominal Pain. **Key:** VAS (Visual Analog Scale); QOL (Quality of Life); GPES (Global Perceived Effect Satisfaction); NRS (Numerical Rating Scale); AMPS (Abdominal Myofascial Pain Syndrome)

DISCUSSION

- RFA is effective, well tolerated, and beneficial in refractory abdominal pain
- RFA decreased pain scores (generally for 2-5 months), improved quality of life, decreased analgesic consumption, and was shown to be superior to chemical or alcohol blocks
- Many patients required multiple procedures following limited post-PRF pain-relief
- Patients who underwent CRF had minor complications including diarrhea and transient post-procedure pain, and a few required additional treatments

CONCLUSIONS

- Chronic abdominal pain syndromes are common and can significantly impact quality of life
- When traditional management (including pharmacotherapy) fails to provide pain relief, RFA can be an effective and safe option
- Further high-quality data is necessary before RFA can become standard practice in the treatment of chronic abdominal pain

REFERENCES

1. Amr SA, Reyad RM, Othman AH, et al. Comparison between radiofrequency ablation and chemical neurolysis of thoracic splanchnic nerves for the management of abdominal cancer pain, randomized trial. Eur J Pain. 2018;22:1782-1790.
2. Bang JY, Sutton B, Hawes RH, et al. EUS-guided celiac ganglion radiofrequency ablation versus celiac plexus neurolysis for palliation of pain in pancreatic cancer: a randomized controlled trial. Gastrointestinal Endoscopy. 2019;89(1):58-66.
3. Maatman RC, Kuijk SMJ, Steegers MAH, et al. A Randomized Controlled Trial to Evaluate the Effect of Pulsed Radiofrequency as a Treatment for Anterior Cutaneous Nerve Entrapment Syndrome in Comparison to Anterior Neurectomy. Pain Practice. 2019;19(7):751-761.
4. Verhaegh BPM, van Kleef M, Geurts JW, et al. Percutaneous Radiofrequency Ablation of the Splanchnic Nerves in Patients with Chronic Pancreatitis: Results of Single and Repeated Procedures in 11 Patients. Pain Practice. 2013;13(8):621-626.
5. Niraj G. Pathophysiology and Management of Abdominal Myofascial Pain Syndrome (AMPS): A Three-Year Prospective Audit of a Management Pathway in 120 Patients. Pain Medicine. 2018;19(11):2256-2266.

Weill Cornell Medicine | NewYork-Presbyterian Rehabilitation Medicine | Columbia University Vagelos College of Physicians and Surgeons