



Retrospective Study on Efficacy of Radiofrequency Ablation (RFA) of Sacroiliac Joint (SIJ) performed at UMMC

University of Mississippi Medical Center

Walker Robison, MD, Ike Eriator, MD, MPH, MBA, Alan Hsu, MD, and William Chiang, MD



INTRODUCTION

- Low back pain affects up to 70% of individuals ⁽¹⁾
- Up to 40% of acute back pain becomes chronic back pain
- Low back pain estimated to cost > \$100 billion in US annually ⁽²⁾
- 30-40% of all low back pain attributed to SIJ ⁽³⁾
- Limited efficacy data on SIJ interventional treatments
- At UMMC we have a chronic pain management fellowship program
- We perform hundreds of sacroiliac joint interventions annually, including diagnostic blocks and radiofrequency ablations
- Purpose of this study was to analyze our own efficacy data on SIJ procedures performed in clinic

STUDY DESIGN

- Retrospective case control study performed by chart review
- Review of all SIJ procedures performed at UMMC between January 1, 2018 and December 31, 2019.
- All patients were assigned case number and de-identified.
- Total of 376 SIJ procedures in 2019 and 416 in 2018
- 57 of the 376 were SIJ RFA in 2019 and 36 of 416 in 2018
- All of these SIJ RFA had two diagnostic blocks followed by RFA
- Each SIJ RFA patient was their own control (diagnostic block)
- Demographics were taken for each patient
- Primary outcomes measured were
 - Percent relief compared to baseline pre-intervention pain score
 - Time of relief (weeks) until return to baseline pain score

MAIN FINDINGS

Comparison of Mean % Relief of Diagnostic Block 1, 2, and RFA

SIJ Diagnostic Block #1	60.6% (0 – 100%)
SIJ Diagnostic Block #2	65% (0% - 100%)
SIJ RFA	70.9% (0% - 100%)

Comparison of Mean Time of Relief of Diagnostic block 1, 2, and RFA

SIJ DB#1 in weeks	3.35 (0 – 8)
SIJ DB #2 in weeks	3.31 (0 – 12)
SIJ RFA in weeks	13.3 (0 – 52)

Relief Time ANOVA

Data Summary						
	Samples					
	1	2	3	4	5	Total
N	35	34	35			104
$\sum X$	117.286	106.074	465.573			688.933
-Mean	3.351	3.1198	13.3021			6.6244
$\sum x^2$	602.102	648.8038	14234.6359			15485.5417
Variance	6.1492	9.6325	236.516			106.0369
Std.Dev.	2.4798	3.1036	15.3791			10.2974
Std.Err.	0.4192	0.5323	2.5995			1.0097

standard weighted-means analysis					
ANOVA Summary Correlated Samples k=3					
Source	SS	df	MS	F	P
Treatment [between groups]	2353.3156	2	1176.6578	13.9	<.0001

LIMITATIONS

- Retrospective study with non-standardized methods of post-procedure follow-up assessments
- Small sample size Resources and time

RESULTS

- Statistically significant difference in time of relief between diagnostic blocks (1 and 2) vs RFA ($p = <0.0001$)
- Not statistically significant difference in percent relief between diagnostic blocks and RFA ($p = 0.228331$) for combined 2018 and 2019 data.
 - Was statistically significant between diagnostic block #1 and RFA ($p <0.05$) according to Tukey HSD Test

REFERENCES

- 1.Andersson GBJ. Epidemiologic features of chronic low-back pain. *Lancet*. 1999; 354: 581–585.
- 2.Grönbald M, Jupli M, Wenestrand P, et al. Interrelation and test-retest reliability of the pain disability index (PDI) and the Oswestry disability questionnaire (ODQ) and their correlation with pain intensity in low back pain patients. *Clin J Pain*. 1993; 9: 189–195.
- 3.Nachemson AL, Jonsson E. Neck and Back Pain. Philadelphia: Lippincott, Williams & Wilkins, 2000.
- 4.Steenstra, I.A., Munhall, C., Irvin, E. *et al*. Systematic Review of Prognostic Factors for Return to Work in Workers with Sub Acute and Chronic Low Back Pain. *J Occup Rehabil* 27, 369–381 (2017). <https://doi.org/10.1007/s10926-016-9666-x>
- 5.Chia-Lung Shih, Po-Chih Shen, Cheng-Chang Lu, Zi-Miao Liu, Yin-Chun Tien, Peng-Ju Huang, Shih-Hsiang Chou, A comparison of efficacy among different radiofrequency ablation techniques for the treatment of lumbar facet joint and sacroiliac joint pain: A systematic review and meta-analysis, *Clinical Neurology and Neurosurgery*, Volume 195, 2020, 105854, ISSN 0303-8467
- 6.Cheng, Jianguo MD, PhD¹; Pope, Jason E. MD²; Dalton, Jarrod E. MA^{1,†}; Cheng, Olivia BA¹; Bensitel, Albatoul MD² Comparative Outcomes of Cooled Versus Traditional Radiofrequency Ablation of the Lateral Branches for Sacroiliac Joint Pain, *The Clinical Journal of Pain*: February 2013 - Volume 29 - Issue 2 - p 132-137 doi: 10.1097/AJP.0b013e3182490a17
- 7.Ferrante FM, King LF, Roche EA, et al. Radiofrequency sacroiliac joint denervation for sacroiliac syndrome. *Reg Anesth Pain Med*. 2001;26:137–142
- 8.Yin W, Willard F, Carreiro J, et al. Sensory stimulation-guided sacroiliac joint radiofrequency neurotomy: technique based on neuroanatomy of the dorsal sacral plexus. *Spine*. 2003;28:2419–2425
- 9.Steven P Cohen, Yian Chen & Nathan J Neufeld (2013) Sacroiliac joint pain: a comprehensive review of epidemiology, diagnosis and treatment, *Expert Review of Neurotherapeutics*, 13:1, 99-116, DOI: [10.1586/ern.12.148](https://doi.org/10.1586/ern.12.148)
- 10.Cohen SP, Strassels SA, Kurihara C *et al*. Outcome predictors for sacroiliac joint (lateral branch) radiofrequency denervation. *Reg. Anesth. Pain Med.* 34(3), 206–214 (2009).
- 11.Bruners P, Müller H, Günther RW, Schmitz-Rode T, Mahnken AH. Fluid-modulated bipolar radiofrequency ablation: an *ex vivo* evaluation study. *Acta Radiol.* 49(3), 258–266 (2008).
- 12.Provenzano DA, Lassila HC, Somers D. The effect of fluid injection on lesion size during radiofrequency treatment. *Reg. Anesth. Pain Med.* 35(4), 338–342 (2010).
- 13.Dobrogowski J, Wrzosek A, Wordliczek J. Radiofrequency denervation with or without addition of pentoxifylline or methylprednisolone for chronic lumbar zygapophysial joint pain. *Pharmacol. Rep.* 57(4), 475–480 (2005).