Use of Cooled Radiofrequency Lateral Branch Neurotomy for the Treatment of Sacroiliac Joint Mediated Low Back Pain: A Large Case Series

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Background

The prevalence of sacroiliac joint (SIJ) pain among patients with chronic axial low back pain is reported to be between 18% and 30%.[1, 2] Pure SIJ pain may be difficult to diagnose because it can be confused with referred pain from other low back structures. Diagnosis of SIJ pain typically consists of physical examination, including medical history and a series of provocation maneuvers, followed by diagnostic blocks.[3] Some authors have advocated a single diagnostic block, while others have advocated confirmatory (double) diagnostic blocks with anesthetics of different duration of effect.[1, 2, 4-7]
This is the first study to examine the efficacy of Cooled RF LBN in a European population, and also the first study to report study outcomes up to 24 months in duration.

Objective

To retrospectively evaluate the use of Cooled RF lateral branch neurotomy (LBN) to treat chronic SIJ mediated low back pain in a large European study population.

Methods

The charts of 126 consecutive subjects treated with Cooled RF LBN between January 7th, 2008 and May 26th, 2009 were reviewed. To be treated with Cooled RF LBN, patients needed to present the following characteristics: chronic low back pain for longer or equal to 6 months; a visual analogue scale (VAS) pain score of greater or equal to 5; pain localized in the SIJ region; signs and symptoms of SIJ mediated low back pain upon physical examination; previously failed to achieve adequate improvement with conservative noninvasive treatments; and, received ≥50% relief from a single fluoroscopically confirmed intra-articular SIJinjection (2.5ml lidocaine 2% and 1ml Bupivicaine 0.5%, plus 0.5-1ml Jopamiro). Cooled RF LBN involved lesioning the L5 dorsal ramus (L5DR) and lateral to the S1, S2 and S3 posterior sacral foraminal aperatures. Visual analog scale (VAS) pain scores, quality of life, medication usage, and satisfaction were collected before the procedure, at 3-4 weeks post-procedure (n =97), and once again between 4-24 months post-procedure (n = 105).

Charts of 126 consecutive subjects treated with Cooled RF LBN between January 7th, 2008 and May 26th, 2009 were reviewed. Charts were required to have a VAS pain score recorded before treatment, and once again 4-24 months post-treatment.

21 charts were removed from analysis due to incomplete data:
- **9 lost to follow-up**
- **2 had psychological barriers to reporting outcomes**
- **3 had incomplete records**
- **7 had confounding pain generators or disease states at follow-up:**
  - **2 herniated disc;**
  - **2 rheumatoid arthritis;**
  - **1 spastic paraparesis and full body pain;**
  - **1 inflammation of nerve roots;**
  - **1 hospitalized with liver disease**

105 charts were eligible for analysis

97 subjects had VAS pain score reported between 3-4 weeks post treatment. Analyzed for short-term pain relief and response to diagnostic injections

105 subjects were stratified by time to final follow-up and analyzed for durability of outcomes:
- **4-6 months follow-up (n = 26)**
- **6-12 months follow-up (n = 45)**
- **>12 months follow-up (n = 34)**

Results

When stratified by time to final follow-up (4-6 months, 6-12 months, >12 months, respectively): 86%, 71% and 48% of subjects experienced ≥50% reduction in VAS pain scores; 96%, 93%, and 85% reported their quality of life as Much Improved or Improved; and, 100%, 62%, and 67% of opioid users stopped or decreased use of opioids.

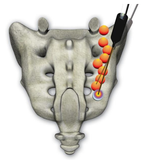
Conclusions

The current results show promising, durable improvements in pain, quality of life and medication usage in a large European study population, with benefits persisting in some subjects at 24 months after treatment. These results are consistent with previous study findings on the use of Cooled RF to treat SIJ mediated low back pain

Disclosures:

No direct compensation was given to the physicians or staff who performed these procedures

Cooled RF



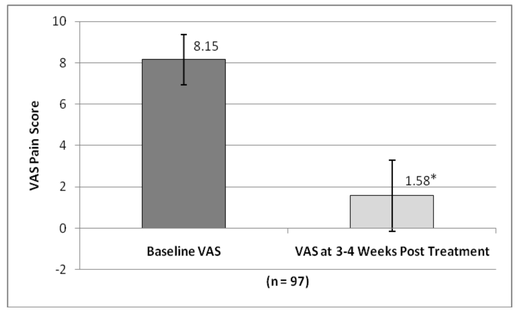
. Illustration of lesioning pattern during Cooled Radiofrequency lateral branch neurotomy. Three lesions were created lateral to the S1 and S2 sacral foramina, two lesions lateral to the S3 sacral foramen, and one lesion to target the L5 dorsal ramus

Results:

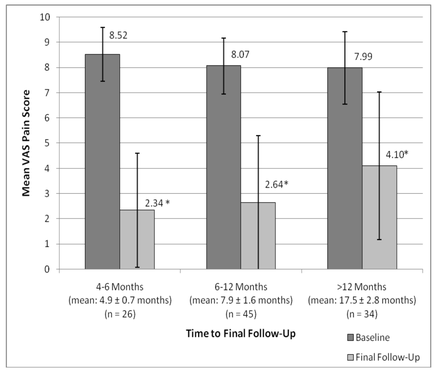
Demographic and Clinical Characteristics, for the Entire Study Population and Stratified by Time to Final Follow-Up

Feature	4-6 months follow-up group (n = 26)	6-12 months follow-up group (n = 45)	>12 months follow-up group (n = 34)	P Value
Age	66 ± 11.5	67 ± 14.0	70 ± 12.3	0.437
Gender	15% male, 85% female	36% male, 64% female	26% male, 74% female	0.184
Baseline Opioid Users	5	13	15	0.107
Bilateral	0	0	1	---
VAS Before Diagnostic Block	8.52 ± 1.07	8.07 ± 1.11	7.99 ± 1.44	0.209
VAS After Diagnostic Block	1.21 ± 1.38	1.42 ± 1.28	2.10 ± 1.40	0.025
VAS at 3-4 Weeks After Treatment (n = 97)	1.59 ± 1.44 (n = 24)	1.50 ± 1.86 (n = 42)	1.69 ± 1.76 (n = 31)	0.898
Surgery before study	92% none; 8% minimally invasive or open surgery; 0% spinal fusion	64% none; 19% minimally invasive or open surgery; 17% spinal fusion	77% none; 23% minimally invasive or open surgery; 0% spinal fusion	0.032

Mean visual analogue scale (VAS) pain scores at baseline and at 3-4 weeks after treatment with Cooled Radiofrequency Lateral Branch Neurotomy, for 97 subjects with 3-4 week follow-up data. Whiskers represent standard deviation. *P < 0.001 as compared with baseline VAS scores.

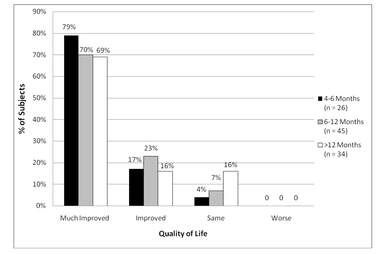


Mean visual analogue scale (VAS) pain scores at baseline and at final follow-up, with subjects stratified according to time to final follow-up. Whiskers represent standard deviation. *P < 0.001 compared with baseline of the respective group

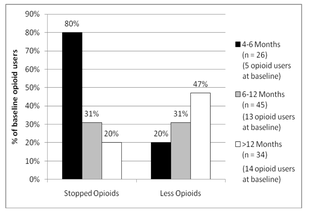


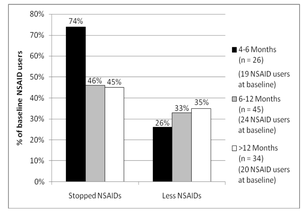
Results:

Bar graph demonstrating patient-reported quality of life outcomes at final follow-up, with subjects stratified by time to final follow-up



% of baseline opioid and NSAID users who stopped or decreased use, with subjects stratified by time to final follow-up.





Discussion

The prevalence of sacroiliac joint (SIJ) pain among patients with chronic axial low back pain is reported to be between 18% and 30%.[1, 2] Pure SIJ pain may be difficult to diagnose because it can be confused with referred pain from other low back structures. Diagnosis of SIJ pain typically consists of physical examination, including medical history and a series of provocation maneuvers, followed by diagnostic blocks.[3] Some authors have advocated a single diagnostic block, while others have advocated confirmatory (double) diagnostic blocks with anesthetics of different duration of effect.[1, 2, 4-7]

Previously published results on using Cooled RF probes to treat chronic SIJ pain have demonstrated ≥50% pain relief in 50% and 64% of subjects at 3-4 months, respectively.[8, 9] A retrospective analysis of a large series of patients found the use of Cooled RF technology to be the only positive predictor of treatment success.[10] Further, a recent evidence-based review of SIJ pain treatment options has recommended Cooled RF LBN for subjects who fail, or receive only short-term effects, from intra-articular injections.[3]

This is the first published study on Cooled RF LBN to report outcomes in a European population and the first to report outcomes up to 24 months in duration. Many regions in Europe have yet to adopt this treatment modality, but these results are encouraging and in line with, if not more positive, than those reported in American studies of Cooled RF LBN.[8, 9] These results further support the recommendation of Cooled RF LBN as the treatment option for subjects who are not able to achieve adequate benefit from conservative medical management or therapeutic SIJ injections.[3] The decreases in chronic pain and medication usage, along with the improvement in quality of life and high amount of treatment satisfaction, may justify the use of Cooled RF equipment in a broader population.

References

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