



# The Potential Role of Medial Branch Block as a Diagnostic Test in a Patient with Post Mastectomy Pain Syndrome

John J Hartman<sup>1\*</sup>; Krishna Shah<sup>1,2</sup>

<sup>1</sup>Baylor College of Medicine, Department of Anesthesia, Houston, Texas, USA.

<sup>2</sup>Baylor College of Medicine, Interventional Pain Medicine, Houston, Texas, USA.

**\*Corresponding Author(s): John J Hartman**

Department of Anesthesia, Baylor College of Medicine, Houston, TX 77030, USA.

Email: John.Hartman@bcm.edu

## Abstract

Postmastectomy pain syndrome is a debilitating pain sequelae from inadvertent nerve transection after breast cancer surgery. The pain is neuropathic in nature and often treated with medications that showed benefit in other neuropathic syndrome like post-herpetic neuralgia. However, these conservative treatment modalities often fail. We received the patient after conservative therapy failed and offered a radio frequency ablation to help with her pain. Central sensitization and the associated changes in proinflammatory milieu in the spinal cord make it susceptible to sympathetic sprouting in the dorsal root ganglion. We propose that and radio frequency ablation aimed at medial branches can somehow attenuate the sympathetic component of neuropathic pain.

Received: Jan 08, 2021

Accepted: Feb 08, 2021

Published Online: Feb 11, 2021

Journal: Annals of Anesthesia and Pain Medicine

Publisher: MedDocs Publishers LLC

Online edition: <http://meddocsonline.org/>

Copyright: © Hartman JJ (2021). *This Article is distributed under the terms of Creative Commons Attribution 4.0 International License*

## Introduction

Post Mastectomy Pain Syndrome (PMPS) occurs secondary to stretch during retraction and/or nerve transection of the intercostobrachial nerve after dissection of breast tissue following a cancer diagnosis [1]. The incidence of chronic pain after cancer breast surgery is as high as 50% [1]. Along with the chronic pain are the psychological stressors associated with chronic pain, which is already significant in this patient population.

The described pain is neuropathic in nature and similar to the well described pain associated with post-herpetic neuralgia. Therefore, treatment modalities for PMPS parallel what

has been proposed for post-herpetic neuralgia with minimal evidence describing central nervous system pain interventions that help with the syndrome.

A group in Egypt has described thoracic sympathetic Radio-frequency Ablation (RFA) as a method to ameliorate the neuropathic pain associated with breast surgery [2]. We have demonstrated significant resolution of the neuropathic pain with 1cc 0.5% bupivacaine injections when targeting T2-T4 medial branches. To date, there is no algorithm that utilizes the aforementioned procedure to provide diagnostic utility in patients with PMPS.



**Cite this article:** Hartman JJ, Krishna S. The Potential Role of Medial Branch Block as a Diagnostic Test in a Patient with Post Mastectomy Pain Syndrome. *Ann Anesth Pain Med.* 2021; 4(1): 1019.

## Procedural method and materials

The patient was consented for intercostal nerve block versus RFA versus spinal cord stimulation with the risks and benefits of each of the procedures described in detail. The procedure of choice was the RFA. Prior to RFA, a diagnostic block with 0.5% bupivacaine at T2-T4 was used targeting the medial branches under fluoroscopic guidance. After the procedure, the patient reported immediate relief with a 90% reduction in pain. The patient was scheduled for an RFA 1 week later. Under fluoroscopic guidance, four RFA needles were placed targeting the medial branches. Nerves were anesthetized with 1% lidocaine. Prior to ablation, the nerves were stimulated for sensation and motor responses to verify placement. Patient was subsequently ablated. Patient was discharged from clinic with 150mg Lyrica taken twice a day by mouth for pain.

## Case report

Ms. H is a 54 year old woman with a history of breast cancer status post right side mastectomy one year earlier who describes a constant burning sensation from T2-T4 with maximal intensity in the T4 region that extends from the back to midaxillary line. She has poor sleep, diminished mood, and her activities of daily living are limited because of the pain. She was referred to our clinic because her pain was refractory to conventional medical management with medications by mouth. The patient decided to try an RFA. Prior to RFA a diagnostic block with bupivacaine was attempted to assess if RFA would be viable. Patient reported over 90% relief from the block and was subsequently scheduled for an RFA. RFA was completed and at one month follow up, patient had significant relief from her pain with no need for repeat procedures.

## Discussion

PMPS is a chronic neuropathic pain syndrome that belongs to a list of associated pain syndromes after breast cancer surgery [1]. A more apt name would be intercostobrachial neuralgia as this nerve is commonly dissected and stretched during tissue removal. Unfortunately, chronic neuropathic pain is common among women who have breast cancer surgery. In fact, up to 17% of women will have PMPS up to 12 years after surgery [3]. Some women will have refractory pain that is resistant to physical therapy and pharmacological agents. There is limited evidence that suggest pain interventions could benefit this patient population.

A group in Egypt is studying RFA sympathectomy in the thoracic region for PMPS patients with a sympathetic component [2]. Their results seem promising; however, the study is limited to a single center with a small N.

Traditionally, the RFA technique we utilized is beneficial in patients with facet joint pain. The medial branches typically arise from the posterior primary rami and course towards the facet joints. They are easily targeted under fluoroscopic guidance. Often a diagnostic block is performed first before pursuing RFA [4]. Conceptually, the same approach was utilized for

our patient with PMPS. However, we hypothesized that the local anesthetic for the diagnostic block designed for a medial branch block would spread towards the nerve root, which would alleviate the pain. We decided to pursue RFA of the medial branches. The chances of this block causing relief from the PMPS was likely minimal. However, we did not want to discount the effectiveness of the medial branch block with local anesthetic. The patient decided to try the RFA to see if it could alleviate the neuropathic pain. Surprisingly, the patient did seem to have significant relief.

As mentioned, a group in Egypt demonstrated relief with RFA when thoracic sympathetic nerves were targeted when patient had PMPS. They suggested that neuropathic pain may arise from aberrant innervation from sympathetic nervous system into the dorsal root ganglion after nerve transection is alleviated from their block. The effect of sprouting of these sympathetic nerves could possibly extend to the stimulation of these medial branches. To our knowledge there is no evidence of this phenomenon happening in animal models for chronic pain. Moreover, the maladaptive changes in the spinal cord and resultant central sensitization is often triggered by abnormal peripheral stimulation with resultant glial activation causing a proinflammatory milieu that disrupts regular spinal cord regulation [5]. Is it possible that if we are disrupting sympathetic stimulation with our block that the proinflammatory changes in the spinal cord are alleviated?

We have only been able to conduct such a block in one patient in our clinic. We have a high degree of confidence that the nerve block with local anesthetic is reproducible. It will be interesting to see if RFA at the medial branches could alleviate PMPS in other patients.

## References

1. Jung BF, Ahrendt GM, Oaklander AL, Dworkin RH. Neuropathic Pain Following Breast Cancer Surgery: Proposed Classification and Research Update. *Pain*. 2003; 104: 1-13.
2. Hetta DF, Mohamed AA, Hetta HF, Abd EL-Hakeem EE, Boshra MM, et al. Radiofrequency Thoracic Sympathectomy for Symptomatically Maintained Chronic Post-Mastectomy Pain, a Preliminary Report: 6-Month Results." *Pain Practice*. 2020.
3. Macdonald L, Bruce J, Scott NW, Smith WC, Chambers WA. Long-term follow-up of breast cancer survivors with post-mastectomy pain syndrome. *British journal of cancer*. 2005; 92: 225-230.
4. Bogduk N, Dreyfuss P, Govind J. A Narrative Review of Lumbar Medial Branch Neurotomy for the Treatment of Back Pain. *Pain Medicine*. 2009; 10: 1035-1045.
5. Lee S, Shi XQ, Fan A, West B, Zhang J. Targeting macrophage and microglia activation with colony stimulating factor 1 receptor inhibitor is an effective strategy to treat injury-triggered neuropathic pain. *Molecular pain*. 2018.
6. Shaffer K, Kancler E. Thoracic spine AP 1, *Radiology for Anatomists*, accessed. 2020.
7. Shaffer K, Kancler E. Thoracic spine oblique, *Radiology for Anatomists*, accessed. 2020.