Poster #7

Sidney Brown

Vagal Nerve Modulation in Systemic Mastocytosis: The Role of Osteopathic Manipulative Treatment

Background

Mast cell diseases are characterized by abnormal or hyperactive mast cells, which release substances like histamine, heparin, cytokines, and growth factors. Mast cells play a key role in tissue repair, wound healing, and angiogenesis (Springer et al., 2017). Mast cell disorders can be further categorized as clonal or non-clonal. Clonal disorders arise from genetic mutations, such as the **KIT** D816V mutation, which alters the mast cell DNA.
Dermatographism urticaria is a wheal and flare response to moderate pressure via a stroke or gently scratching the skin, and mast cell release of histamine is thought to play a role (Nobles & Schmieder 2023). Allergens trigger mast cells to release inflammatory mediators through interaction with allergen-specific IgE and the high-affinity receptor FcεRI, contributing to immune responses (Janeway et al., 2001).
Vagus nerve stimulation dampens inflammation and could be a promising treatment for mastocytosis, though its connection to this condition has not yet been explored (Yuan & Silberstein, 2016). To monitor effect of vagal nerve stimulation and histamine response, a dermatographism test is a viable option. To date, treatment options for mast cell diseases often involve off-label use of various medications. However, avapritinib has gained FDA approval for the treatment of systemic mastocytosis. We hope to further explore the role of Osteopathic Manipulative Techniques (OMT) as a therapeutic option for mast cell conditions.

Aim

To assess the impact of OMT on vagal nerve function and symptom severity in a patient with systemic mastocytosis.

Case Presentation

A 47-year-old male with PMH of systemic mastocytosis presents with the chief complaint of "abdominal pain after eating triggering food."

History of Present Illness

3-day history of abdominal pain and distension after eating pizza with tomato sauce. Usual triggers include nightshade plants, insect bites, and heat exposure. Notes difficulty adhering to low histamine diet. Manages symptoms with daily antihistamine use. Routine visit to PCP one week prior showed 9.7% eosinophil % auto (reference: 0-5%) and 1.7% imm. granulocyte (reference: 0-0.4%).
PMH: Indolent systemic mastocytosis (confirmed KIT D816V mutation), Type 0 Budd-Chiari, Trigeminal Neuralgia, GERD, GAD
PSH: Orchiopexy, vasectomy, tonsillectomy, adenectomy, hemorrhoidectomy
Medications: Rizatriptan, ondansetron, hydroxyzine, propranolol, fexofenadine
Allergies: Nightshade plants and insect bites/stings (papular urticaria), NKDA
Social History: Poor adherence to low-histamine diet, 8 glasses water/day, no alcohol/tobacco/recreational drugs, exercises 3x/week, drinks pot of dark coffee daily

Review of Systems

Pertinent Positives: Frontal sinus pressure, headache (5/10), paresthesia in feet, "difficulty taking deep breath," GI irregularity (diarrhea/constipation), bloating, urinary hesitancy
Pertinent Negatives: Shortness of breath, cough, chest pain, palpitations

Physical Exam

HEENT: No conjunctivitis/scleral injection, frontal sinus tenderness
Skin: Xerosis, mild erythema in sun-exposed areas
Abdomen: Epigastric tenderness (7/10), distension
MSK: Right-sided rib hump, functional scoliosis

Osteopathic Exam

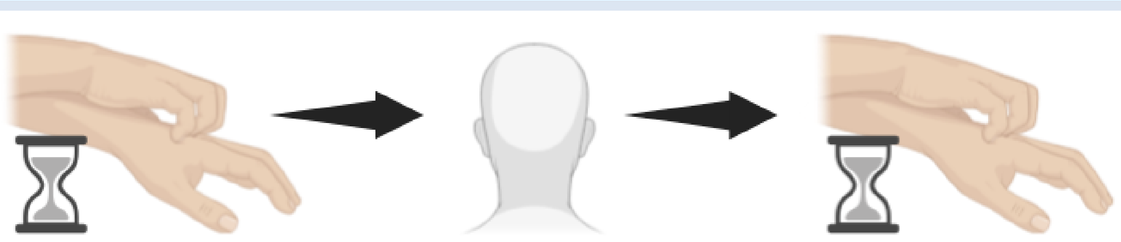
Area of Greatest Restriction: Cervical region
Structural Exam Findings:
- Cervical Region SD (OMT indicated)- Motion restriction and TTA in the C1–C3 area; OA NSRRL
- Rib Region SD (OMT indicated)- Motion restriction and TTA in left ribs 7–10
- Thoracic Region SD (OMT indicated)- Restricted motion of the thoracoabdominal diaphragm bilaterally
- Sacral Region SD (OMT indicated)- Tenderness and asymmetry of the right sacral base (right unilateral extension);

Seated Forward Bend Test + R

Differential Diagnosis

1. Systemic Mastocytosis
2. Viscerosomatic Dysfunction (CN X)
3. Inflammatory Bowel Disease
4. Paradoxical Bowel Dysregulation

Methodology



Results

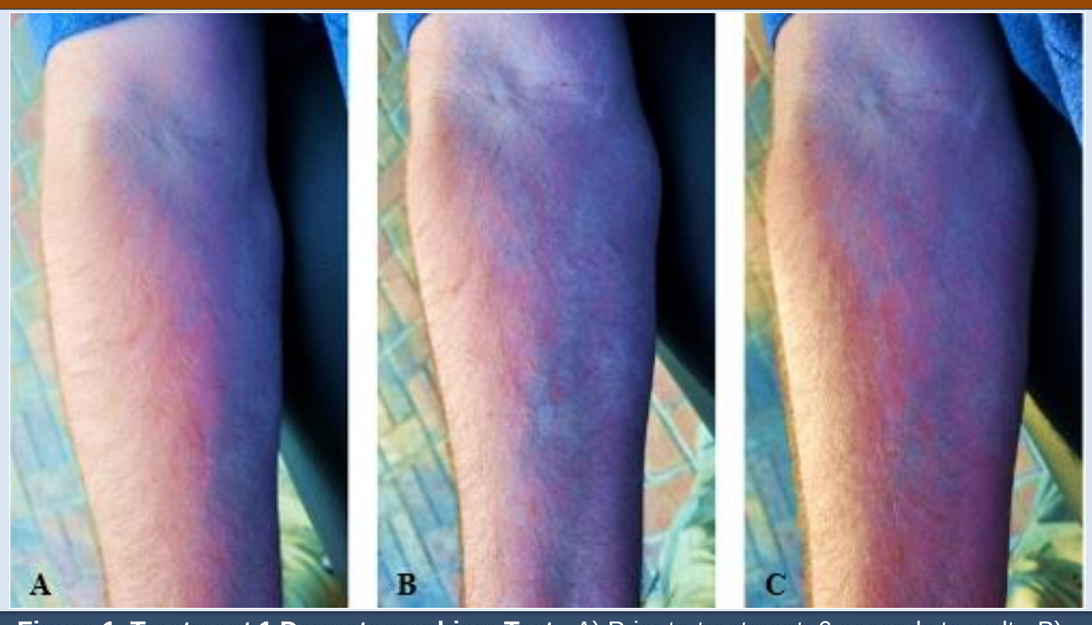


Figure 1. Treatment 1 Dermatographism Test - A) Prior to treatment: 6 seconds to welt - B) After Techniques 1-3: 9 seconds to welt - C) After Techniques 4-5: 14 seconds to welt

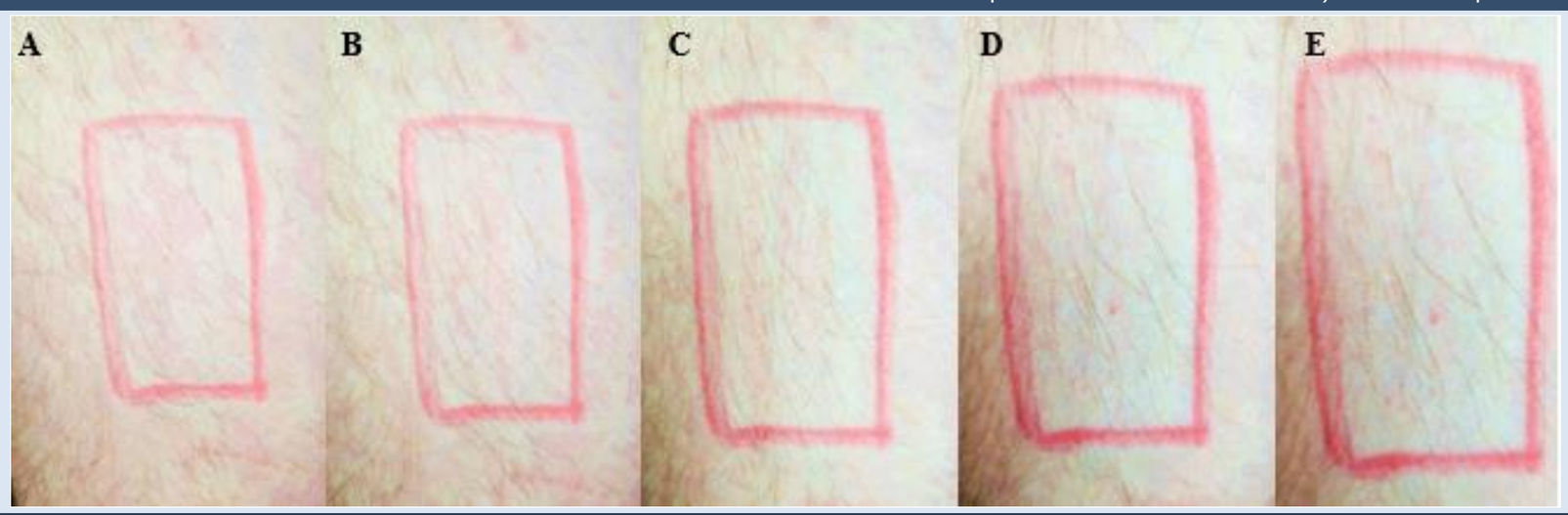


Figure 2. Treatment 2 (Eight Weeks Later) Dermatographism Test - A) Before test - B) Pre-treatment: 20 seconds - C) After Techniques 1-3: 24 seconds - D) After Techniques 4-5: 35 seconds - E) After shotgun sacral MET: 50 seconds

Conclusions

OMT contributed to reduced abdominal pain (2/10), decreased headache severity (1/10), and improved cervical/rib dysfunction. This case supports the potential of OMT in symptom relief and systemic regulation in rare mast cell disorders.

References

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Acknowledgements

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