CASE REPORT

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Osteopathic Findings and Treatment of Patient with Crohn's Disease and Post-Ileocecal Resection: A Case Report

Abstract

Crohn's disease is a form of inflammatory bowel disease (IBD) that chronically damages the lining of the digestive tract. The symptoms of Crohn's disease can vary secondary to its severity, ranging from asymptomatic patients to those suffering from constant abdominal pain, diarrhea, blood loss, and fatigue. Patients with Crohn's disease endure a decreased quality of life depending on the extent of their symptoms. Crohn's disease can be differentiated from other forms of IBD by its location in the gastrointestinal (GI) tract and distinct gross and microscopic morphology. This disease can affect any portion of the GI tract, but most commonly affects the terminal ileum and colon. The affected portion exhibits transmural inflammation, where all layers of the bowel are damaged, leading to strictures and fistulas. In this case of a patient with fistulizing fibro-stenotic Crohn's disease, ileocecal resection was required. 1-week post-surgery, the patient suffered from continuous pain and discomfort with sympathetic nervous system overactivity. The somatic dysfunctions diagnosed on osteopathic structural examination were addressed with osteopathic manipulative treatment (OMT) and directed to restore the functionality of her sympathetic and parasympathetic nervous systems. The patient's symptoms were found to have improved after the application of OMT. The results of this case study suggest that treating post-surgery patients using osteopathic techniques, specifically following ileocecal resection, can improve their post-op symptoms and reduce the need for post operative oral pain medications. Patient's consent for this case report was obtained in written and verbal form.

Introduction

Crohn's disease, a form of inflammatory bowel disease (IBD), is a chronic inflammatory disease that damages the lining of the digestive tract. Symptoms may vary in severity, and patients can present with abdominal pain, fever, and signs of diarrhea or obstruction. The passage of blood or mucus, or both, may also be present.[1] Crohn's disease can be differentiated from its IBD counterpart, ulcerative colitis, by the characteristics of its symptoms. Crohn's disease can manifest at any portion of the GI tract, from the mouth to the anus, but is most commonly found at the terminal ileum and colon. The distinguishing features include transmural inflammation, which can cause strictures and fistulas. The current standard treatment for Crohn's disease includes aminosalicylates (eg; sulfasalazine, mesalazine), steroids (eg; prednisolone, budesonide),

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Keywords

Crohn's Disease, Inflammatory Bowel Disease, Ileocecal Resection, Osteopathic Manipulative Treatment, Gastroenterology, Pain Management, Physical Medicine and Rehabilitation, Osteopathic Medicine

purine synthesis inhibitors (eg; azathioprine, mercaptopurine), folate antagonists (eg; methotrexate), and/or TNF inhibitors (eg; infliximab, adalimumab). Current literature demonstrates that patients with Crohn's disease experience significantly improved quality of life following treatment with soft tissue techniques such as myofascial and visceral treatment.[8] In the United States, IBD affects approximately 400 to 600 individuals out of 100,000 persons, afflicting about 0.5% of the population.[2] Patients with severe Crohn's disease resulting in strictures and fistulas require surgical resection of the affected bowel. About 50% of patients with Crohn's disease require surgery within 10 years after diagnosis and the risk of postoperative recurrence is 44–55% after 10 years.[1] As with most other surgical procedures, post-operative pain and complications may be experienced.

Case Presentation

A 25-year-old female presented with a past medical history significant for fistulizing fibro-stenotic Crohn's disease. Patient was diagnosed at the age of 24. She was treated with Infliximab infusions and Methotrexate. Her symptoms persisted and surgical resection of the affected segment was recommended. Part of the ileocecal intestine was removed on 5/5/2021.

Operation

Laparoscopic ileocolic resection with diverting end ileostomy + sigmoid repair

Indication

This is a 25-year-old female patient who has a history of fibrostenotic fistulizing Crohn's ileitis presenting with partial small bowel obstruction due to fibrostenotic disease and an ileosigmoid fistula. The patient's symptoms failed to improve after maximal medical treatment. Laparoscopic ileocolic resection was recommended. Risks and benefits of the surgery were discussed with the patient. The patient consented for surgery.

Findings

Partial small bowel obstruction of the terminal ileum due to Crohn's disease with a very large proximal distention of small bowel and an ileosigmoid fistula.

She presents to the clinic 1-week status post ileocecal resection surgery. The patient's complaints included diffuse abdominal pain which is more severe in the right lower quadrant, back pain, nausea, food intolerance, dizziness, headache, and lethargy. She reported that these symptoms have been persistent since her surgery and states she had difficulties with activities of daily living. Her abdominal pain was constant, mild, and present at rest while her back pain was more severe while standing. The patient had been taking 5 mg of Oxycodone every 8-10 hours, approximately twice a day. Past medical history is also significant for mild asthma.

Osteopathic structural exam findings and corresponding OMT are presented in the Table 1. Physical exam, as seen in full in Table 2, showed diminished bowel sounds throughout her GI tract with right lower quadrant tenderness to palpation.

Course of Treatment

The patient was treated by an osteopathic medical student under the supervision of an Osteopathic Manipulative Medicine faculty member at their College of Osteopathic Medicine. One week following OMT (21st of May 2021), the patient's symptoms improved, and she was able to decrease her pain medication, as indicated in Table 3. Her pain level was graded by the scale from 0 to 10 with 0 indicating complete absence of pain, whereas 10 represented the most excruciating pain she ever felt. Her symptoms continued to gradually improve and by the second week following OMT (28th of May 2021), the patient no longer needed her pain medication. By the third week following OMT (4th of June 2021), the patient was no longer feeling constant pain throughout her abdomen and felt her discomfort intermittently. During these subsequent visits following her initial visit with OMT, her physical examination revealed more evident abdominal sounds and gas/bowel movement production from the stoma. No complications were seen, such as obstruction with output or with her stoma. She continuously reported improved quality of life with less difficulties with activities of daily living, including her ability to walk with more ease and comfort. She stated her improvements were exponential with each passing day.

One month following her OMT, she denied back pain, nausea, food intolerance, dizziness, headache, or lethargy. Her right lower abdominal quadrant pain became minimally intermittent and reproducible with deep palpation. She reports her quality of life has reverted to when she was pain free and is able to ambulate without any concern.

Table 1. *Analysis of free-text responses from students who preferred the in-person demonstration setting (n= 70). One free-text response could contain more than one theme.*

Region	Severity (1-5)	Pertinent Somatic Dysfunction	OMT
Head	3	OA E SlRr; Bilateral occipital condyle compression L>R; ROM suture compressed	Suboccipital traction; BLT, condyles, and OM decompression
Cervical Spine	2	C3-C5 RlSl	ME
Thoracic Spine	4	Exaggerated kyphosis, L hypertonic erector spinae T5-T8 N RrSl Viscerosomatic changes at T5-T10.	Rib-raising
Lumbar Spine	3	L2 F RrSr	BLT
Sacrum	1	L/R torsion	BLT
Innominate	2	L anterior innominate	ME
Diaphragm	4	Decreased excursion, L hemidiaphragm restricted posteriorly	Myofascial diaphragm release
Ribs	4	L 12th rib inhalation SD, Decreased cage compliance.	ME, Rib-raising
Abdomen	5	Palpable tender celiac ganglion	Inhibition
Additional findings	4	Chapman's points 5th ICS on L and T5 TP	Inhibition

Abbreviations: BLT - balanced ligamentous tension technique; ME - muscle energy technique; ICS - intercostal space, SD - somatic dysfunction

Somatic Dysfunction Abbreviation: S_R_ or R_S_ (depending on type of somatic dysfunction; Rotated right/left Side-bent right/left)

Table 2. *Part 1*

System	Findings
General	Awake, alert, and oriented. Well developed, hydrated, and nourished. Appears stated age.
Skin	Skin is warm, dry, and intact without rashes or lesions. Appropriate color for ethnicity. Nail beds pink with no cyanosis or clubbing.
Head	The head is normocephalic and atraumatic without tenderness, visible or palpable masses, depressions, or scarring.
Eyes	Conjunctivae are clear without exudates or hemorrhage. Sclera is non-icteric. EOM are intact, PERRLA. No signs of nystagmus. Eyelids are normal in appearance without swelling or lesions.
Nose	Nasal mucosa is pink and moist. The nasal septum is midline. Nares are patent bilaterally.
Throat	Oral mucosa is pink and moist with good dentition. Tongue normal in appearance without lesions and with good symmetrical movement. No buccal nodules or lesions are noted. The pharynx is normal in appearance without tonsillar swelling or exudates.
Neck	The neck is supple without adenopathy. Trachea is midline. Thyroid gland is normal without masses. Carotid pulse 2+ bilaterally without bruit. No JVD.
Cardiac	The external chest is normal in appearance without lifts, heaves, or thrills. PMI is not visible and is palpated in the 5th intercostal space at the midclavicular line. Heart rate and rhythm are normal. No murmurs, gallops, or rubs are auscultated. S1 and S2 are heard and are of normal intensity.
Respiratory	The chest wall is symmetric and without deformity. Chest wall is non-tender. No signs of respiratory distress. Shallow breathing due to back pain. Lung sounds are clear in all lobes bilaterally without rales, rhonchi, or wheezes. Resonance is normal upon percussion of all lung fields.
Abdominal	Abdomen is non-symmetric with an ileostomy created in the RLQ. Pain on palpation in the RLQ without rebound. The aorta is midline without bruit or visible pulsation. Umbilicus is midline without herniation. Bowel sounds are diminished in all four quadrants. No masses, hepatomegaly, or splenomegaly are noted.
Genital/Rectal	A few external anal skin tags are present. Stool from ileostomy is normal in appearance. Stool from ileostomy guaiac negative.
Spine	Neck and back are without deformity, external skin changes, or signs of trauma. Curvature of the cervical and lumbar spine are within normal limits. Thoracic spine is hyperkyphotic with slight scoliosis. Bony features of the shoulders and hips are of equal height bilaterally. Posture is kyphotic with pain on standing up straight. Gait is smooth, steady, and within normal limits. No tenderness noted on palpation of the spinous processes. Spinous processes are midline. Cervical, thoracic, and lumbar paraspinal muscles are slightly tender and are spasmed throughout. No discomfort is noted with flexion, extension, and side-to-side rotation of the cervical spine, full range of motion is noted. Limited range of motion in extension of the thoracic and lumbar spine with significant back pain. Full range of motion in flexion, and side-to-side rotation of the thoracic and lumbar spine are noted with slight pain. Straight leg raise test is negative bilaterally. Sensation to the upper and lower extremities is normal bilaterally. No clonus is noted. Grip strength is normal bilaterally. Dorsi/plantar flexion is normal bilaterally.

Table 2. *Continued from Part 1*

System	Findings
Extremities	Upper and lower extremities are atraumatic in appearance without tenderness or deformity. No swelling or erythema. Full range of motion is noted to all joints. Muscle strength is 5/5 bilaterally. Tendon function is normal. Capillary refill is less than 3 seconds in all extremities. Pulses palpable
Neurological	The patient is awake, alert and oriented to person, place, and time with normal speech. Motor function is normal with muscle strength 5/5 bilaterally to upper and lower extremities. Sensation is intact bilaterally. Reflexes 2+ bilaterally. Cranial nerves are intact. Cerebellar function is intact. Memory is normal and thought process is intact.
Psychiatric	Appropriate mood and affect. Good judgment and insight. No visual or auditory hallucinations. No suicidal or homicidal ideation.

Table 3. *Patient's subjective pain with subsequent pain medication use.*

OMT status	Abdominal Pain*	Back Pain (while standing)*	Medication
Pre-OMT	4/10 at rest	7/10	5 mg Oxycodone every 8-10 hours (twice/day)
1-week post-OMT	3/10 at rest	4/10	5 mg Oxycodone every 24 hours (once/day)
2-weeks post-OMT	3/10 at rest	3/10	No Oxycodone
3-weeks post-OMT	1/10 intermittent at rest	1/10 intermittent	No Oxycodone

Pain scale: 0 - no pain, 10 - worst pain of her life

Discussion

The decision to proceed with ileocecal resection must be considered after carefully weighing the benefits versus risks of either delaying or proceeding with surgery. The main indications for resection include intractability (68.4%), obstruction (25.9%), enteric fistula (15.5%), perforation (9.2%), intra-abdominal abscess (4.0%), and hemorrhage (2.9%). Patients are made aware of the postoperative risks and complications of ileocecal resections before committing to the surgery, which includes prolonged ileus (7.5%), pneumonia/atelectasis (8.6%), wound infection (6.3%), urinary tract infections (5.7%), intra-abdominal abscess (4.0), and wound dehiscence (0.6%).[3] As evident with our patient, direct trauma secondary to the nature of the surgery can directly overstimulate the sympathetic nervous system, causing inhibition of GI motility and constricted sphincters. The sympathetic nervous system predominantly exhibits an inhibitory effect on the GI symptom, leading to decreases in mucosal secretion and motility.[4]

The OMT plan based on the somatic dysfunctions of this patient focused on balancing the autonomic nervous system, mainly normalizing (decrease) sympathetic activity. The rib raising technique was utilized with the

Figure 1. *Stoma, 2 days post-surgery (No treatment).*

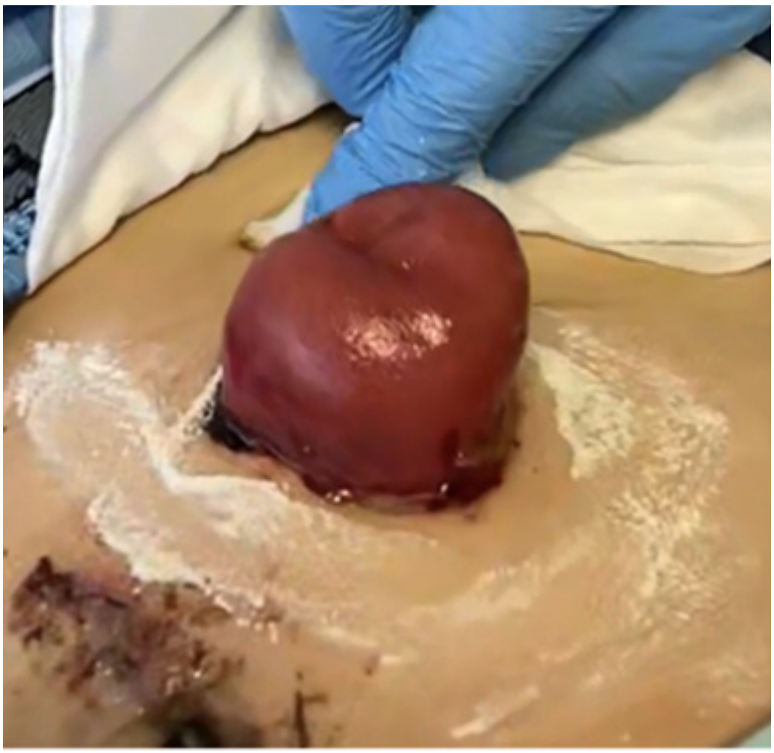

Figure 1. *Stoma with Ostomy Bag and Surgical Scars, 5 weeks post-surgery (4 weeks post-OMT).*

Figure 1. *Healing Stoma with Surgical Scars, (3 months post-reversal surgery).*

goal of allowing the body to better regulate and decrease sympathetic stimulation, resulting in increased gastric and intestinal motility, as well as modulating lymphatic drainage.[4] Abiding by the osteopathic philosophy that the body possesses the inherent capacity to repair itself, OMT was aimed at accelerating the body's natural healing process.

Rib raising techniques beneficially affect the sympathetic innervation at the chain ganglia by articulating the rib heads by lifting and rotating them through its fascia attachments. For this technique, gentle anterior pressure is applied on the ganglia that lie anterior to their corresponding ribs as the patient lies supine. This produces a short-lived initial increase in sympathetic activity but is followed by a long-lasting sympathetic inhibitory effect. As our patient has a past medical history significant for mild asthma as well, rib raising has also been shown to improve the negative thoracic pressure for maximum inhalation and improve breathing. According to a pilot study, sympathetic nervous system activity may decrease after rib raising, but parasympathetic activity is not altered by this technique.[5] The increased bowel sounds and the increased gas/output production from the stoma following OMT could signify relaxation of the sympathetic nervous system. This could be a result of celiac ganglion release and inhibition of Chapman's points as well. The sub-occipital traction technique, occipitomastoid suture release, occipital condyles release, and atlanto-occipital joint balancing were utilized to help balance the parasympathetic nervous system by release of the vagus nerve compressed by hypertonic muscles. This contributes to inducing motion of the intestines (peristalsis) as well as optimally activating anti-inflammatory pathways. The vagus nerve carries mainly parasympathetic fibers with both sensory and motor functions. As cervical region tightness is hypothesized to cause intestinal problems through the vagus nerve, relaxation of the hypertonic tissues of the cervical region may be a promising treatment for abdominal discomfort and symptoms.[7] Myofascial release is a treatment technique that engages continual palpatory feedback to achieve release of myofascial tissues.[6] Balanced ligamentous tension (BLT) was used to address ligamentous articular strains. Muscle energy treatment was applied to resolve the reflex maintaining corresponding somatic dysfunction.

Conclusion

Application of appropriate osteopathic treatment techniques regulates the autonomic nervous system, especially the combination of rib raising and vagal release as evidenced in our case and could accelerate the healing process by addressing all somatic dysfunction responsible for the patient's symptoms post-operative ileocecal resection. The goal of OMT was to restore normal nervous system function and improve lymphatic circulation. OMT would accelerate the healing process by modulating subjective pain, increasing intestinal motility, and facilitating lymphatic drainage. No additional medications were prescribed.

If OMT is correctly applied following a thorough and comprehensive osteopathic physical assessment, it could potentially be a useful form of treatment for all post-operative surgeries and could be added to the standard treatment regimen. It would especially be useful in patients that are debilitated. The results indicate that OMT can be useful to restore the patient's health and well-being to a baseline level prior to the onset of symptoms, while decreasing the need for pain medications. Limitations of this study, including the number of participants and age of the patient. This indicates that larger studies may be needed to provide statistically significant evidence for the effectiveness of OMT in post-ileocecal resection patients.

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