CASE REPORT

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The Use of Osteopathic Manipulative Treatment for a Case of Constipation in Childhood

Abstract

Constipation is a common problem in children, accounting for 3-5% of general pediatric office visits and 25-30% of pediatric gastroenterologist visits.[1,2,3,4] In addition, it has a worldwide prevalence of 3-30%.[2,3] The chronic nature of constipation frequently leads to frustrating experiences for young patients and families as treatment typically requires many months and sometimes years of medication and behavior modification.[2] In addition, relapse of symptoms is common with 40% of pediatric patients still experiencing symptoms after 6-12 months of laxative use.[2]

The current case report demonstrates the impact of a somatic dysfunction component on bowel function in a pediatric patient and suggests that somatic dysfunction may be a primary cause of functional constipation in some cases. Following 8 weeks of osteopathic manipulative treatment (OMT), the patient's symptoms resolved, and laxative maintenance medications were discontinued at 12 weeks. This author recommends consideration of osteopathic evaluation and management in addition to other accepted management guidelines in cases of constipation to remove somatic dysfunction components and allow patients' systems to function optimally.

Introduction

Childhood constipation is rarely a serious disease process, but it is a common problem in children.[1,2,3,4] It frequently has a negative effect on parental and child quality of life and can lead to multiple office visits, emergency department visits, and unnecessary diagnostic testing.[2] Treatment over many months and sometimes years with medication, behavior modification, and close follow up evaluation is generally required.[2] Current data suggests that only 60% of children with constipation are successfully treated.[4] Furthermore, studies show 25-50% of children with constipation continue to have symptoms of constipation into adulthood.[2,5] In the case below, following 5 visits with osteopathic manipulative treatment over 8 weeks, the patient's symptoms of constipation resolved. Cases in the osteopathic literature of patients with constipation further support the use of osteopathic manipulative treatment in addition to management as outlined below.

Clinical Aspects

Functional constipation is defined as constipation without objective evidence of organic pathology, including neurologic, obstructive, endocrine or

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Editor's Note

This case history was completed by Dr. Heineman as part of the requirement toward earning the designation of Fellow in the American Academy of Osteopathy. Opinions expressed in this article are those of the author and do not necessarily reflect the viewpoint or official policy of the American Academy of Osteopathy. The article was edited to conform to AAOJ style guidelines.

Informed Consent

The patient's parent provided consent prior to publication.

Keywords

Constipation; OMT; Osteopathic Medicine; Pediatric Constipation; Functional Constipation; Childhood Constipation; Chronic Constipation; Miralax; BLT; MFR.

metabolic.[6] Evidence-based recommendations for the evaluation and treatment of functional constipation were published in 2014 by the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition and the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition.[6] The guidelines use ROME III criteria to define functional constipation as the presence of 2 or more of the following, occurring at least weekly for 2 months, in a child with developmental age < 4 years: < 2 defecations per week, at least 1 incontinence per week after acquiring toileting skills, history of excessive stool retention, history of painful or hard stools, presence of large fecal mass in the rectum, and/or history of large-diameter stools that may obstruct the toilet.[5,6] Effective management of constipation is widely thought to include an understanding of physiology, behavior and psychology.[2]

History and Physical

Generally, a thorough history and physical are sufficient to determine a diagnosis of functional constipation in children.[5] The clinical history should include a description of stool frequency, quality and consistency, as well as associated symptoms including abdominal pain, fecal soiling/overflow incontinence, rectal bleeding, toileting refusal, psychosocial stressors, growth and development progress.[2,3] Physical examination should look to determine the severity of the constipation and any underlying causes. Growth parameters including height and weight are ideally compared with prior records. A targeted abdominal exam should check for abdominal distension, tenderness to palpation, bowel sounds, and palpable stool. An external perianal examination can assess for fissures, anal appearance, skin tags, or external hemorrhoids. A digital rectal examination (DRE) is important in specific cases; however, it is not routinely indicated in children, as the DRE may reinforce anxiety or fear in children with a past history of painful stool passage.[2,3] Muscle tone and reflexes of the lower extremities should be examined to assess for potential neurological etiology.[3] A focused osteopathic structural exam should include examination of the thoracic and lumbar spine for viscerosomatic changes, the sacrum and pelvis to assess mobility of the bones as the outlet of the pelvic splanchnic nerves (S2-4), general motion of the abdomen and facilitation of the collateral sympathetic ganglia, motion of the thoracoabdominal diaphragm, Sibson's fascia/thoracic inlet and the occipitoatlantal joint.[7] Other important elements of the physical exam include observation of the interaction between the patient and the caregiver.[2] Abdominal radiographs are not routinely indicated, as the history and physical are generally sufficient for diagnosis. At times, an abdominal x-ray can help parents' understanding of fecal/overflow incontinence by visualizing retained stool; however, although a single abdominal radiograph is low-risk and inexpensive, it is not sensitive or specific for determining stool burden.[2,3,5]

Management

The general management approach for functional constipation includes: 1) parental education and follow up, 2) disimpaction or cleanout of stool, 3) laxative therapy to establish regular bowel movements, 4) behavior modifications to support daily toileting behaviors.[2,6] A full discussion of treatment for functional constipation including a medical-behavioral approach is beyond the scope of this case report, but can be found in UpToDate and the current literature.[2,6,8] Despite acceptance of the above guidelines for evaluation and treatment, the results of a prospective study by Borowitz et al in 2005 found that although primary care physicians felt they successfully treated >80% of their childhood constipation cases, following 2 months of treatment, nearly 40% of constipated children were still experiencing symptoms.[4] The study also found that pediatricians were no more likely to successfully treat constipation over their family physician colleagues.[4] These statistics support the fact that the overall prognosis for functional constipation is not fully established. This author would suggest that we can do better as a medical profession if 40% of children with functional constipation remain symptomatic and 25-50% continue experiencing symptoms into adulthood.[2]

Report of Case

History of Present Illness

A 21-month-old male, M.S., presented for evaluation of constipation with weekly vomiting of 3 months duration. His mother accompanied him and provided the history of the patient. The patient had no prior issues with constipation before this initiation 3 months earlier. Mother denied significant changes to their daily life at the onset of the constipation, however, she did note that M.S. had an episode of norovirus around the time the constipation began. He was not given any antibiotics over the past 6 months.

Mother stated that after 2-3 weeks of initial constipation

with weekly vomiting, she presented to the pediatrician. The pediatrician took a 1-view abdominal radiograph which showed mild to moderate formed stool throughout the colon and a nonobstructive bowel gas pattern, determining no acute intra-abdominal process. Polyethylene glycol (Miralax) 17g was started daily; however, the patient continued to vomit weekly. When mother tried to decrease the Miralax dosage after 3-4 weeks of 17g daily, her son experienced increased vomiting. Mother noted that M.S. was having decreased interest in food. In addition, she stated his stomach would frequently get quite distended and he would complain of his stomach hurting. Mother reported the patient did have a daily watery, small volume stool. M.S. was otherwise meeting developmental milestones and was not showing signs of failure to thrive or weight loss. Mother provided him a well-balanced diet of fruits, vegetables and whole grains, although, again, his appetite recently was poor. He napped 3 hours every afternoon and slept 10-12 hours every night.

Medical History

Birth History: Normal spontaneous vaginal delivery at 38 weeks gestation. Mother received an epidural. Spontaneous initial cry. Birth weight 7#12oz.

Developmental Milestones: Rolled over at 3 months, sat up by 6 months, crawled by 9 months, first steps by 1 year, first words by 1 year, currently able to state name. Not toilet trained.

Surgical History: Circumcision.

Trauma History: Normal falls and play of toddler age.

Past Medical History: Chronic constipation, eczema.

Vaccinations: Up to date.

Family History: Father with environmental allergies; maternal grandfather with an enlarged abdominal aorta and environmental allergies; maternal aunt with history of asthma; brother with Joubert Syndrome; paternal uncle with history of mental illness.

Social History: Lives with biological parents and 3.5-year-old brother. No smoke exposure in the home. No pets in the home. No daycare.

Allergies: No known drug allergies.

Medications: Miralax 17g/dose oral powder daily, probiotic (Nordic Naturals) 1 daily, multivitamin gummies (Juice Plus) 4 daily.

Review of Systems

Patient's mother reported for her son symptoms of abdominal pain and vomiting but no difficulty swallowing and no blood in his stools or rectal bleeding. Mother reported a poor appetite and chronic constipation, but no significant weight change, no fever, and no abnormal fatigue. There was no blood in his urine. He was experiencing some itchiness of dry skin but no skin lesions. Mother reported no sneezing, no runny nose, no cough, no wheezing, and normal respiration. She reported no known chest pain and normal heart rate. M.S. had no joint swelling, no previous injuries, and no trauma. There was no known numbness, no weakness, no tingling, no burning, and no loss of consciousness.

Physical Exam

Vital Signs: Height 2ft 8.5in (82 cm, 16th percentile), Weight 27.6.4 lbs (12.43 kg, 73rd percentile), BMI 18.2, Pulse 142 bpm

Constitutional: Healthy-appearing. No acute distress. Ambulating normally for his age.

Psychiatric: Normal mood and affect for his age. Active and alert.

Head: Normocephalic and atraumatic.

ENMT: Ears: no lesions on external ear. Nose: no lesions on external nose. Oropharynx: moist mucous membranes.

Lungs: Respiratory effort of respiration rhythm and depth was normal.

Cardiovascular: No edema on inspection or palpation of right or left lower extremities.

Abdomen: Inspection and palpation: no guarding or rebound tenderness and soft. Normal bowel sounds in all quadrants.

Musculoskeletal: Motor Strength and Tone: normal tone. Right Upper Extremity: normal bulk. Left Upper Extremity: normal bulk. Normal movement of all extremities.

Neurologic: Normal gait for age. Cranial Nerves were grossly intact.

Skin: No rash on inspection on exposure of hands, face and abdomen.

Rectal exam: Deferred.

Osteopathic Structural Exam

Sacral sag of sacrum with no flexion or extension of sacral motion; ropy tissue texture changes with no rotational motion or flexion/extension of T12-L2; right posterior thoracoabdominal diaphragm with decreased excursion of motion throughout; pelvic diaphragm without ascension/descension; OA ES_RR_L.

Assessment

1. Constipation
2. Vomiting
3. Segmental and somatic dysfunction of head, thoracic region, lumbar region, sacral region, and abdomen

Recommendations:

Based on the physical examination findings, OMT was offered to address the somatic dysfunction findings (see procedure note below). The patient was instructed to continue Miralax 17g daily, as well as probiotic and multivitamin, and maintain adequate hydration and nutrition. He was scheduled to return for further evaluation in 1 week.

Initial Treatment

Procedure Note: After careful consideration of history and physical findings, osteopathic manipulation was offered to the patient's mother for the patient as a modality to potentially improve the above areas of somatic dysfunction. The somatic dysfunctions present were found to be related to the patient's symptoms/condition. Following appropriate verbal consent by mother, the patient was treated with gentle osteopathic manipulation to the above-mentioned areas of somatic dysfunction by the author. Treatment techniques included: balanced ligamentous tension (BLT) and myofascial release (MFR) to sacrum, thoracic region, lumbar region, abdomen and head. The patient tolerated the treatment well without complication. Somatic dysfunctions were notably improved as evidenced by an increased range of motion. The patient's mother was advised regarding post-treatment concerns (usually experienced in children as a nice long nap) and encouraged to increase hydration and rest for the next 24-48 hrs. He was to return to his usual activity following this time.

Continued Course of Treatment

The patient returned 5 days after the initial visit for further evaluation accompanied by his mother. Mother stated following the treatment at 1pm on his initial visit that he slept until 8pm that day. The following day (1 day after treatment), the patient had 4 large bowel movements, the first of which was much more solid in nature than his usual soft, liquid stools. On post-treatment days 3 and 4, he had softer bowel movements. Mom noted that his appetite was improved as well. He had remained on the Miralax 17g daily and nutritional supplementation.

Second Treatment

Osteopathic Structural Exam findings at the second visit revealed improved flexion and extension of the sacrum with less sacral sag, although compression was noted at the level of S2; facilitated changes of the celiac, superior mesenteric and inferior mesenteric ganglion were noted as restriction of motion through the superior to inferior line of all 3 ganglia. Decreased excursion of the left posterior thoracoabdominal diaphragm was noted, although there was improved connection of respiration between the thoracoabdominal and pelvic diaphragms. Some compression of left occipital condyle was noted and T12-L2 preferred flexion. Somatic dysfunctions were treated to resolution using BLT and MFR to the sacrum, abdomen, pelvis, head and lumbar regions. The mother was instructed to decrease Miralax dose to ½ (8.5g), continue probiotic and multivitamin, and begin Natural Calm magnesium (magnesium malate and magnesium glycinate) 0.5g daily.

Additional Treatments

The patient returned for a third visit with his mother, 2 weeks after the initial evaluation. He had done very well through the week. Mother noted that these 2 past weeks had been the longest length of time M.S. had gone without an episode of vomiting for the past 3 months. She had decreased the Miralax to 8.5g and started magnesium 0.5g daily. M.S. was having a bowel movement every other day which was more solid in nature (described as soft serve), over the prior noted watery stools. Mother reported a continued improvement with appetite and that M.S. was not complaining of stomach pains.

Osteopathic Structural Exam findings at the third visit revealed acute, boggy tissue texture changes of T10-L2; again, facilitated changes of celiac, superior mesenteric and interior mesenteric ganglion; left on left forward sacral torsion; thoracoabdominal diaphragm flattened anteriorly; OA ES_RR_L. Somatic dysfunctions were again treated to resolution using BLT and MFR to the thoracic, lumbar, abdomen, sacrum and head regions.

The patient was to continue on Miralax 8.5g and magnesium 0.5g daily, as well as the probiotic and multivitamin.

The patient returned for a fourth visit, 3.5 weeks following the initial evaluation and treatment. Mom stated M.S. was having an every other day, large and formed bowel movement. He had 1 episode of vomiting that she stated was very likely related to a virus that her other son had first. Mother had further decreased the Miralax to ¼ the initial dose (4.25g) and continued on magnesium 0.5g daily, as well as nutritional supplementation.

Osteopathic Structural Exam findings at the fourth visit revealed notably improved flexion, extension and rotation through T10-L2; improved flexion and extension of sacrum with a slight left on left forward sacral torsion; thoracoabdominal diaphragm rotated right; good motion noted at OA; clockwise motion of general abdomen. Somatic dysfunctions were treated using BLT and MFR to sacrum and abdomen. Recommendation was to continue on Miralax 4.25g, magnesium 0.5g daily, nutritional supplementation, and adequate hydration.

The patient and mother returned for a fifth and final visit, 8 weeks following the initial evaluation and treatment. Mother reported the patient was having a nearly every day bowel movement, large and formed. She had continued on the Miralax 4.25g and magnesium 0.5g, but was wanting to start a transition off the Miralax first, then off magnesium as well.

Osteopathic Structural Exam findings at the fifth and final visit revealed again good flexion, extension and rotation through lower thoracic and upper lumbar spinal segments; good flexion and extension of the sacrum with a slight left on left forward sacral torsion; slight right anterior innominate rotation; otherwise great motion noted at OA; strong clockwise motion of the general abdomen; and a strong PRM connection throughout the body was noted. Somatic dysfunctions were treated using BLT and MFR to sacrum and pelvic regions. Recommendation included support of a transition down and off Miralax and magnesium as tolerated by the patient; nutritional supplementation was to be continued.

The patient's mother was seen 16 weeks after the initial visit, as mother brought her other son to the clinic for evaluation. Upon questioning how M.S. was doing, mother reported he was doing very well. She had discontinued both Miralax and magnesium at 12 weeks and the constipation remained resolved.

Discussion

The current guidelines as noted above for general management of functional constipation do not include recommendation for osteopathic evaluation and treatment; however, this author would put forward a call to include osteopathic evaluation and treatment as a critical part of the medical management for both pediatric and adult patients. Andrew T. Still, MD, DO argued that "a detailed physical examination, followed by a well-designed manipulative treatment often removes impediments to motion and function." He felt this approach should be used for any patient's concern before deciding that the body has failed in its own efforts.[9]

There are unfortunately only a few reports in the current literature looking to determine the effectiveness of osteopathic manipulative treatment (OMT) on functional constipation, and fewer still current reports that assess OMT on functional constipation in children. A case report by Aquino et al in 2017 described the effects of OMT on a 10-year-old patient with Pitt-Hopkins Syndrome, a rare genetic disorder involving developmental delay and frequently presenting with severe constipation. OMT was found to improve defecation frequency and reduce enema administration in the patient.[10] A pilot study of 13 children with cerebral palsy (CP) between ages 2 and 16 was designed to determine effectiveness of OMT on chronic constipation, as occurrence of constipation in children with CP is estimated at 74%. The study found treatment with OMT to be as effective as OMT with an additional drug regimen (lactulose) in decreasing symptoms of constipation in children with CP.[11] A second pilot study in 2017 aimed to evaluate the effects of OMT on 21 adult females (ages 18 to 70 years old) with functional constipation. The results showed improved symptoms associated with constipation, including bloating and perceived quality of life, and stated that OMT could be considered as an alternative to laxatives for treatment.[12] A systematic review evaluated 5 randomized controlled trials (204 patients) using OMT in adults with irritable bowel syndrome (IBS) diagnosed with Rome (I-III) criteria. The studies suggested that OMT could be beneficial for patients with IBS, as OMT reduced IBS symptoms including abdominal pain, constipation, and diarrhea, and improved overall well-being. In addition, no significant adverse events were reported in any of the studies.[13]

The patient in this case report presented with classic features of functional constipation, including complaints of constipation, abdominal pain, decreased appetite, and fecal incontinence for 3 months duration. The patient's presenting osteopathic structural exam included chronic, facilitated changes at the viscerosomatic levels of T12-L2, correlating to increased and prolonged sympathetic innervation to the lower gastrointestinal tract (ascending and transverse colon T10-12, descending colon and rectum L1-2).[7] Sacral motion was decreased, likely impacting parasympathetic innervation to the descending colon and rectum via pelvic splanchnic nerves (S2-4).[7,14] The pelvic diaphragm did not ascend/descend well with the patient's breathing, potentially contributing to congestion in the pelvis and resulting in increased difficulty with defecation. In addition, there was decreased excursion of the thoracoabdominal diaphragm, further contributing to lack of mechanical pumping of the of the gastrointestinal arterial and lymphatic fluids.[7,14,15,16] The patient's occipitoatlantal (OA) joint had an extended somatic dysfunction, which likely compressed the jugular foramen and affected nerve flow of the vagus nerve. Decreased parasympathetic output and input from compression on vagus nerve fibers may contribute to decreased and slowed GI motility.[7,14] As the patient returned for subsequent visits, these somatic dysfunctions were found to change and improve. By his final visit, all initial somatic dysfunctions were resolved, and gastrointestinal motility and function was restored. In addition, the mother was grateful not to have a need for laxative or prokinetic medication.

Conclusion

The goal of any osteopathic treatment is to look for a more efficient and effective way to bring about health in the patient. The current case describes the impact that osteopathic manipulative treatment can have on a pediatric patient who presented with functional constipation. Constipation is a common problem in childhood, yet current guidelines for medical management of functional constipation are lacking for short- and long-term prognosis and resolution. By including osteopathic evaluation and treatment in the medical management for constipation, the practitioner can help eliminate the somatic dysfunction components with the related effect on neural, lymphatic and vascular elements, and the patient's system may begin to function optimally.

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