

## Facilitator's Guide

### Case Presentation

**Chief Complaint:** Protracted nausea and vomiting.

**History:** A 79-year-old Caucasian female with a 4-year history of gastroesophageal reflux disease (GERD). She has had multiple esophagogastroduodenoscopies (EGDs) and colonoscopies to investigate similar gastrointestinal complaints, all of which have been negative. The patient states that for the past year she has also had uncontrolled flatus for which she has also gone through a battery of tests and studies all of which have been negative. However, 6 months ago an EGD performed by a local surgeon revealed that she had a hiatal hernia. The patient has been taking over-the-counter medications as well as prescription medications to control her reflux symptoms. She failed these therapies. It is her understanding that she was being prepared for a hiatal hernia repair when it was discovered that she had a pneumoperitoneum. While investigating the pneumoperitoneum, it was discovered that she had a duodenal ulcer. The ulcer was suspected for being the most likely cause of the air. Obtained from old records, the patient has had a CT scan of the abdomen, which showed some free air in the wall of the small intestines, and she was taken to surgery for a resection of this area and for further investigation. The pathology report of that resection of bowel showed "subserosal variant of pneumatosis cystoides intestinalis". The patient was released to home, and then returned after developing increasing nausea and vomiting. She has now been hospitalized for six days and continues to have nausea, which improved significantly with nasogastric tube placement. Internal medicine and OMM are being consulted regarding ileus.

**Meds:** HOME MEDICATIONS = Levothyroxine (*Synthroid*) 0.05 mg daily, Multi-Vitamin supplement, and Vitamin C supplement; HOSPITAL MEDICATIONS = Piperacillin/Tazobactam (*Zosyn*) 3.375 g IV q6h, Albuterol (*Proventil*) 2.5 mg NEB qid, Bisacodyl Rectal (*Dulcolax Suppository*) 10 mg PR qday, Calcium Carbonate (*Tums*) 1 g PO qid

**Past Medical History:** Hypothyroidism; gastroesophageal reflux disease; osteoarthritis of the spine; hiatal hernia; duodenal ulcer; history of pneumoperitoneum.

**Past Surgical History:** Bowel resection; tonsillectomy; appendectomy.

**Review of Systems:** Has decreased appetite and weight loss of 20 pounds over the last year. She has upper dentures. She has one cataract. Has never had a cardiac stress test. Pulmonary function test in the past that was unremarkable. Abdomen is soft, but tender secondary to surgery. Bowel sounds are present but distant. The patient has a Foley catheter in place. There is normal rectal tone. No masses are palpable. No frank blood is noted. External hemorrhoids are present. There is an increase in the thoracic kyphotic curve. There are scoliotic changes apparent, and the patient states that these have been present most of her life. Cranial nerves II through XII are grossly intact without lateralizing signs. There are no focal sensory or motor deficits noted. Deep tendon reflexes are bilaterally symmetrical in the upper and lower extremities.

**Physical Exam:**

**Vital signs:** Blood Pressure 105/66; Heart Rate 84; Respiratory Rate 20; Temperature 97°F

**General:** This is a 79-year-old Caucasian female who appears her stated age. She is alert and oriented to person, place, and time. She is pleasant and appropriate in conversation. She is in no acute distress.

**HEENT:** Head is atraumatic and normocephalic without evidence of masses or bruising. Pupils are equal, round, and reactive to light and accommodation. Extraocular muscles are intact. There is no evidence of scleral icterus or ptosis. Hearing intact, as are the

**Osteopathic Structural Exam:** Paraspinal muscle tissue texture changes are evident at the levels of T9 through L1, especially on the right side. The corresponding vertebrae are all sidebent right, rotated left, and have an extension preference. The thoracoabdominal diaphragm fascia is restricted on the right. The thoracic inlet is rotated right, sidebent left, and flexed. Ribs 5 through 9 on the right are restricted in exhalation.  
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tympanic membranes. Nares are patent without evidence of drainage or congestion. A nasogastric tube is in place. The patient is edentulous for the upper dentition, and possesses her own teeth for the lower dentition. Mucous membranes are dry. The oropharynx is otherwise unremarkable. The neck is supple without evidence of thyromegaly or lymphadenopathy. Carotid bruits are not auscultated. No jugulovenous distention is appreciated.

**Cardio/Pulm:** Heart has a regular rate and rhythm with S1 and S2 distinct

**Respiratory:** The lungs are clear to auscultation bilaterally without rales or rhonchi.

**Abd:** There is diffuse ecchymosis, most prominent on the right abdomen. Crossing midline there are two incision sites wrapping around to her back and flank. Her abdomen is soft, but tender secondary to surgery. Bowel sounds are present but distant

**Neuro:** Cranial nerves II through XII are grossly intact without lateralizing signs. There are no focal sensory or motor deficits noted. Deep tendon reflexes are bilaterally symmetrical in the upper and lower extremities.

There is significant restriction at the right sacroiliac joint. Chapman's points are present in the iliotibial band on the left, the left upper thigh, and the right mid thigh. At the head, the OA is sidebent right, rotated left, and flexed. In the cervical spine C3 through C5 are extended, rotated and sidebent right.

**Assessment:**

Be prepared to discuss this at the OMM session. Indicate the primary Medical Diagnosis based upon the international Classification of Diseases (ICD-9). This justifies the Evaluation and Management (E&M) coding portion of the visit.

List all secondary comorbid and complicating factor diagnoses, in order of importance. Itemize somatic dysfunction diagnosis for each body region treated using OMT. This justifies reimbursement for OMT.

Be prepared to discuss management of typical comorbid and complicating factors associated with the patient's diagnosis and how management and treatment would be modified with each comorbid and complicating factor.

## Section II: Mini-Lecture/Discussion (approximate time 20–30 minutes)

### Discussion Questions

### Teaching Points

<p>1. Propose an appropriate differential diagnosis / assessment</p>	<p><b>Differential Diagnoses:</b> Abdominopelvic Abscess, Anastomotic Leaks, Antihistamines, Appendicitis, Paralytic Postoperative Ileus, Small Bowel Obstruction, Hemoperitoneum, Cholecystitis / Cholelithiasis, Hypo-(kalemia / magnesemia), Pancreatitis, Chronic Intestinal Pseudoobstruction, Volvulus, Opiates, Myxedema, Sepsis, and Uremia. <b>Primary Diagnosis:</b> Post-op Ileus.</p>
<p>2. How do you explain the current structural findings in the context of this case?</p> <ul style="list-style-type: none"> <li>• Are any relevant structural findings missing?</li> <li>• What would you do differently? Why?</li> </ul>	<p>The parasympathetic reflex as far as the mid transverse colon is from vagal input Dysfunction at the occiput, C1, and C2 can adversely affect vagus function.</p> <p>C3,4,5- compromised diaphragm function.</p> <p>The sympathetic viscerosomatic reflex from the small intestine can manifest at T8 to T10, bilaterally (possibly right greater than left).</p> <p>The vermiform appendix and cecum result in reflex tissue texture change from T9 to T12 on the right. The ascending colon results in reflex tissue texture change from T11 to L1 on the right.</p> <p>At the level of the mid transverse colon, the parasympathetic viscerosomatic reflex shifts from vagal to pelvic splanchnic, S2 to S4, resulting in sacro-pelvic tissue change and tenderness.</p>

<p>2. Continued...</p>	<p>Pathology affecting the descending colon to the rectum results in reflex tissue texture changes from L1 to L3 on the left.” (<i>Somatic Dysfunction in Osteopathic Family Medicine</i>, p.43).</p> <p>Comorbid factors may also contribute to the patient's increased thoracic kyphosis, and, in turn, the scoliosis noted could be a contributing element to the postoperative complications.</p> <p>Additional Chapman's reflex points were not identified in this patient, but would be very helpful in narrowing the differential diagnosis and focusing treatment.</p>
<p>3. What pathophysiology &amp; functional anatomy knowledge is pertinent for diagnosing/treating this patient</p>	<p>Vagal afferents are thought to be important in the coordinated integration of motility, secretion, and absorption while spinal afferents are thought to be responsible for the transmission of noxious stimuli and inflammation. Visceral motor efferent outflow consists of the sympathetic thoracolumbar and parasympathetic cranial-sacral arms of the autonomic nervous system (ANS). Sympathetic activity is generally inhibitory to smooth muscle activity, while parasympathetic input can be excitatory or inhibitory. The enteric nervous system (ENS) also has the basic circuitry necessary to run independently through local circuits that rely on signals from intrinsic sensory neurons and neurohumoral peptides, such as substance P, vasoactive intestinal peptide (VIP), and nitric oxide (NO), which can act either in a paracrine or endocrine fashion.” (<i>Uptodate.com</i>, “Postoperative Ileus”)</p> <p><b>Metabolic and electrolyte derangements (e.g., hypokalemia, hyponatremia, hypomagnesemia, uremia, diabetic coma); Drugs (e.g., opiates, psychotropic agents, anticholinergic agents); Intra-abdominal inflammation; Retroperitoneal hemorrhage or inflammation; Intestinal ischemia; Systemic sepsis;</b> These are all comorbid factors that in and of themselves can cause ileus and/or alter the body's physiologic and/or anatomic makeup.</p>
<p>4. Which 1 or 2 of the aspects below has the greatest influence on the patient complaint?</p> <ul style="list-style-type: none"> <li>• Pain</li> <li>• Fluid congestion</li> <li>• Hyper-sympathetic influence</li> <li>• Parasympathetic influence</li> </ul>	<ul style="list-style-type: none"> <li>• Pain</li> <li>• Hyper-sympathetic influence</li> </ul>
<p>5. Devise an appropriate treatment plan based on musculoskeletal components involved in the patient complaint</p>	<p><b>Goals for OMM Management:</b></p> <p>Balance Autonomic nervous system. Decrease hyper-sympathetic tone. Remove restrictions to improve parasympathetic tone.</p> <ol style="list-style-type: none"> <li>1) Improve/increase fluid movement.</li> <li>2) Improve diaphragm motion.</li> </ol> <p><b>The treatment plan could include:</b></p> <ol style="list-style-type: none"> <li>1) Paravertebral muscle inhibitory pressure (rib raising); specifically at the thoracolumbar junction.</li> <li>2) Pectoral traction.</li> </ol>

5. Continued...	<ol style="list-style-type: none"> <li>3) Abdominal diaphragm fascial release.</li> <li>4) Gentle abdominal visceral manipulation.</li> <li>5) Sacroiliac gapping bilaterally.</li> <li>6) Sacral rocking.</li> <li>7) Cervical soft tissue and articulation (ME, S-CS, MFR, Still).</li> <li>8) Suboccipital condylar decompression.</li> </ol> <p>When treating the postoperative patient, it is necessary to be cognizant of the surgical sites, dressings, and patient comfort/pain level.</p>
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Procedure Services: Osteopathic Manipulative Treatment						
		Code	Description			
		98925	Manipulation, 1-2 areas			
		98926	Manipulation, 3-4 areas			
		98927	Manipulation, 5-6 areas			
		98928	Manipulation, 7-8 areas			
		98929	Manipulation, 9-10 areas			
CPT Diagnostic Codes: Rank in order of Importance						
Diagnosis			Somatic Dysfunction			
Code	Description		Code	Description		
			739.0	Head	739.5	Hip/Pelvis
			739.1	Cervical	739.6	Lower Extremity
			739.2	Thoracic	739.7	Upper Extremity
			739.3	Lumbar	739.8	Rib
			739.4	Sacrum/Sacroiliac	739.9	Abdomen