Clinical Osteopathic Approaches to Emotions

- Kenneth Lossing DO
- AAO Convocation 2016
What are/what happens in Emotions?

- In emotional states, our physiology changes.
- Happiness, for example, tends to involve the heart, cardiac plexus, the limbic system of the brain, and the 4th ventricle.
- The key point here is that these areas are more metabolically active during happiness.
- 3 Components: behavioral, neurological, and hormonal.
Goals of Lecture

• Explore traditional osteopathic concepts (facilitation, somatic dysfunction, visceral dysfunction, shock, pelvic-thyroid-adrenal syndrome, recto-respiratory reflex,) in relationship to the diagnosis and treatment of emotional “dysfunction”, and the current scientific evidence about respiration.
The State of the Patient

• Persistent
• Shock/overwhelm
• Depression
• Grief
• Recurrent
• Anxiety
• Fear
• Anger

• Retained
• Grief
• Overwhelming grief
• Something you can’t swallow
• Stress
• Anger
• Trauma
• Violence
• Mother issues
Diagnostic Approaches

- History
- Physical exam: palpation, motion testing, listening, manual thermal diagnosis, inherent motions, respiratory excursion.
Manual Thermal Diagnosis

- We can use our hand, or a machine, to find the hottest areas.
- The most troublesome areas show with the most intense heat.
Dr. Fulford talked about this reflex in terms of the tailbone moving with the respiratory diaphragm and the thoracic inlet, and it’s connection with proper lymphatic drainage.
Pelvic-Thyroid-Adrenal Syndrome
From Frank Chapman D.O.

- Finds a definite connection between the hormonal system, sacral motion, the celiac ganglion, and the lymphatic's.
The CNS as a regulator

- Ostheopathically, we have traditionally thought that facilitation only occurs in the spinal cord. In the MD world, they talk about central sensitization, and peripheral sensitization. Clinically speaking, I find sensitization at the level of the brain, the cord, the nerve ganglion, peripheral nerves, and the viscera.
Shock From Dr. Fulford

• When a “shocking” incident happens to a person, that “shock” can stay lodged in the nervous system, particularly the celiac plexus (but also the cardiac plexus, superior mesenteric plexus, inferior mesenteric plexus, and the hypo gastric plexus).
Shock, from Dr. Fulford

• It can stay a lifetime if not released. If the nervous system is in shock, it cannot heal itself or respond to other treatments, no matter how good they are.

• You will be able to palpate a “divot” and tissue drag over the plexus, and also a lack of respiratory excursion.
Sibson fascia, dome of Lung

- **Thoracic inlet** - Pt. supine-place your thumbs on the **pleural dome**, have pt. take deep breath. Do both domes go inferior with inhalation? (posterior to clavicle, lateral to spine, anterior to the posterior portion of the first rib).

- Worst pathology is superior with inhalation.
Respiratory Diaphragm

- **Respiratory Diaphragm** - Patient supine - place your thumbs 2-3 cm below the costal margin on each side of the abdomen, have the patient take a deep breath. Do both sides go inferior with inhalation, superior with exhalation?

- Worst pathology is superior with inhalation.
Pelvic Floor

- The Patient is prone, place your thumbs in pelvic floor, have the patient take deep breath. Does floor go more than a centimeter inferior with inhalation and superior with exhalation? Your thumbs are medial to ischial tuberosity, medial/anterior to the sacrotuberous ligaments, and anterior to coccyx.
- Worst pathology is superior with inhalation.
What Happens During “Normal” Inhalation?

- The respiratory diaphragm descends (1.5cm tidal to 7-13cm forced)
- The pericardium and all the abdominal visceral descend
- The tension of the pulmonary ligaments and vessels increase and the tension in the lung parenchyma.
Normal Respiration

- In 1954 Wade et al did a study to look at the motions of the thoracic cage, respiratory diaphragm, and ventilation, in both quiet and deep respiration.

- In quiet respiration the diaphragm moves about 1.5cm, the chest circumference changes 1.2 cm when erect and 0.7 cm when supine.

- In deep respiration the diaphragm moves from 7-13 cm, and the chest circumference changes between 5-11cm.

- In a full vital capacity breath, one quarter of the ventilation is due to chest expansion and three quarters to diaphragm displacement.
Deep breathing

**Fig. 1.** Magnetic resonance imaging of tumor mobility during breathing cycle in coronal plane. After quiet respiration, patients were instructed to perform a vital capacity maneuver (deep inspiration followed by deep expiration). Note, small metal artifact from metal clip in tumor region.
Respiratory Excursion
Diaphragm Motion

Diaphragmatic Motion: Fast Gradient-recalled Echo MR Imaging in Healthy Subjects, Gierrada, Radiology 1995

Figure 4. (a) End-expiratory and (b) end-inspiratory sagittal fast GRE images from a dynamic sequence at the level of the right midhemi-diaphragm illustrate increasing maximum excursion of the diaphragm from anterior to posterior. Points A', D', and P' are at the same anterior-posterior locations as points A, D, and P, respectively.
Pelvic Floor and Resp. Diaphragm MRI

- 8 cases
- Right and left diaphragm, 1.5cm in quiet breathing, 3.2 and 2.8 during forced breathing and coughing.
- Both Respiratory diaphragm and pelvic floor moved caudally during inhalation and cephalic during exhalation.

Phase Locked parallel movement of diaphragm and pelvic floor during breathing and coughing- a dynamic MRI investigation in healthy females, Talasz, Int Urogynecol J 2011
Pelvic floor moves about .48 cm in quiet breathing, and .51 in forced, more in coughing.

Fig. 2 Movement amplitudes of the diaphragm, the PF and the abdominal wall during quiet and forced expiration and during coughing, expressed in millimeters (mm). Starting point (expressed as 0 mm) is the maximum inspiration position, defined as the breathing or coughing phase with the most caudal position of the diaphragmatic cupola. Movement of diaphragmatic cupula and PF, as well as changes in waist diameter are measured in coronal planes, movement of the puborectalis muscle sling (PRS) along the M-line in the mid-sagittal plane. Reference point for measuring cranio-caudal displacements in coronal planes is the basis of the intervertebral disc L4/5 (Fig. 1a). Movement amplitudes in cranial direction of diaphragmatic cupolae, PF and PRS are defined as positive, decreases in waist diameter as negative, increases as positive values. Results are presented as mean values ± SD. One-factor analysis of variance and post-hoc Bonferroni testing was used to demonstrate differences across conditions. *P<0.05; **P<0.01.
Shock and Emotions

• In shock, chronic pain, multiple medical problems, Lyme’s disease, and overwhelming emotions the respiratory diaphragm and pelvic floor move way less than normal, sometimes even in a reverse direction!
“Listening” at the Top of the Head

• Listening while engaging the tissues tells about mechanical things.
• Listening with a lighter pressure gives emotional information.
• Listening with more pressure and layer palpation takes you to the contents of the skull.
“Normal” Emotional Listening

- Light pressure
- Pulls in the middle line, anteriorly, large amplitude and strong intensity.
- (Barral)
At the bow of a ship, facing forward
New Day
Self/Ego Problem

- Listening is to the right, person has stress with self, maybe doesn’t feel good enough. Problem started earlier in life, before the middle. Associated with solid organs, the lungs, kidney, pancreas, liver, etc.
Seeing the self, often earlier in life

- The conflict is internal, with the self.
Social Problem

- Listening is to the left, has a tension with external environment, job, relationship, money, living in difficult area.
- Could be associated with nerve plexus stomach, gall bladder, duodenum, small intestine, large intestine.
- Started near middle of life.
In Near/External World
Relationship Problem
When Did Something/the Event Happen?
“Dating” When Something Changed

- Near the coronal suture is the current time.
- Near the occiput is the birth time.
- % of distance from posterior to anterior is the % of current age when something happened.
Common Listening in Overwhelmed Patients

- Listening is posterior
- Poor/small amplitude
Emotional areas of Head

- 1) Left Frontal - social self, nerve plexus, stomach, duodenum, gall bladder
- 2) Right Frontal - ego, liver, kidney, lung, pancreas
Location of Major Thermal Projections

- All of the viscera have documented thermal projections when dysfunctional.
- The emotional projection in the lungs tends to be grief.
Emotional Locations

- Lungs: Grief
- Heart: Sadness
- Liver: Anger
- Stomach: Aggression
- Esophagus: Something difficult to swallow
- Adrenals: Anxiety
- Kidneys: Fear
- Pancreas: Overwhelming Grief
- Small intestine: difficulty sorting things out
Visceral Respiratory Motion

• The radiological literature has established that:
  • all of the visceral move during respiration
  • in 3 dimensions (the largest being caudal/cranial)
  • with normal excursion in tidal and deep breaths
  • the motion is decreased in visceral problems.
Emotional Visceral Dysfunction

• Emotional dysfunctions stored in the organs restrict motion in a similar way as tumors, the viscera tend to be “frozen” in all directions, similar to a frozen shoulder.

• Motion testing is greatly restricted in all directions.
Visceral Tidal Respiratory Norms

- **Heart/Pericardium**: 1.5-1.81 cm inferior, .24 cm anterior
- **Lungs**: inferior lobe .95-2.5 cm (5cm in forced)
- **Stomach**: Fundus displacement measures 2.9 cm inferior, 2 cm anterior, right shift .6 cm
- **Liver**: Superior/inferior-US
  - 1-4 cm shallow
  - (2.1-8 cm deep)
- **Duodenum**: .97cm inferior
- **Small Intestine**: less than 1cm
- **Large Intestine**: 1cm or less
- **Kidneys**: 1-4 cm shallow breathing
  - 2-7 cm deep breathing
- **Spleen**: 1-2cm
- **Pancreas**: 2.5 cm shallow breathing (1-4), and 4.3 cm deep breathing, (2-8) by CT, Ultrasound

As measured by various radiological means
Cardiac Motion

• The inferior wall of the heart was found to move 1.5 cm during tidal (normal) respiration, in the coronal plane.

• Left pictures: during exhalation, top: end systole, bottom: end diastole

• Right pictures: During inhalation

Figure 3. Coronal MR images of an area through the heart in a healthy volunteer, with resolution of both cardiac and respiratory motion (16 and eight frames, respectively). Imaging parameters were 33/12, 30° flip angle, 30-cm field of view, 5-mm-thick sections, 256 × 128 matrix, and one excitation. Images on the left represent expiration and images on the right inspiration. The top images represent end systole and the bottom images end diastole. In this coronal plane, the diaphragm moves approximately 1.5 cm during the course of respiration.

Simultaneous temporal resolution of Cardiac and Respiratory Motion in MR Imaging, Radiology 1995, Fredrickson
Respiratory Blood Circulation

- Not only do the viscera move with respiration, it also affects arterial and venous circulation!
- Blood flow in the descending aorta and superior vena cava increases during inspiration because the increased negative pressure increases venous return, and decreases during exhalation.
- In the abdomen, blood flow in the portal vein is highest during expiration, lowest during inhalation, due to increased positive pressure reducing blood flow.
- In healthy subjects, cardiac pulsatility of portal venous flow is usually minimal, with larger flow variations seen with respiration!
Portal Vein

- **Pulsatility** or cardiac inter-cycle variability is the difference between the minimum and maximum values during a cycle. This study shows a average flow rate of the portal vein to be about 970 mL/min, with the respiration varying the flow on average 539mL/minute, and cardiac cycle varying an average of 296mL/minute. In other words over half of portal vein blood flow is respiration dependent.

*Figure 6. Typical portal venous flow pattern in a healthy volunteer as a function of both cardiac and respiratory cycles (16 and eight frames, respectively). The dashed lines separate the data into the eight respiratory time frames. Within each respiratory time frame are 16 points of representative cardiac cycles that occurred during respiration. Flow is highest during expiration and decreases*
Cardiac Output

• During free breathing, the right side of the heart maximizes cardiac output during peak inspiration (1.36) of breath hold), and the left heart maximizes CO during expiration (1.22)
The Lungs

- Change volume 10-25% in shallow breathing, but 3-4X more with deep respiration
- Mobility measured by CT, MRI, Fluoroscopy in 11 studies
## Tidal Breathing

**3 dimensional mobility**

Fig. 5. Mobility vectors and range of mobility (in brackets) for tumors in different lung regions (upper, middle, lower) during quiet respiration.
Deep Breathing

Used Dynamic MRI

During Deep vital capacity breathing, the motion of the lung regions was significantly greater in the lower regions than in the upper regions (5±0.2 cm vs. 0.9±0.4 cm).

Tumor bearing lung regions showed a significantly lower mobility than the corresponding non-involved regions.
Prefrontal Cortex

- DL = dorsolateral prefrontal cortex, working memory, focused attention
- VM = ventromedial prefrontal cortex, emotions, suppression of environmentally cued responses
Limbic System - Emotional Brain

- Amygdala
- Hippocampus
- Cingulate gyrus (adaptability, helps you to go with the flow)
- Insula
- Sets the emotional tone of the mind.
- Filters external events through internal states.
- Tags events as internally important.
- Stores highly charged emotional memories.
Limbic system to Brainstem

Septal area: receive afferent fibers from the cortex of the limbic system and from the hypothalamus, and project to all areas of the cerebral neocortex, hippocampus, and amygdala.

Thalamus-relays and integrates sensory information.

Hypothalamus-regulates entire CNS, hormones, and some limbic functions.
The Adrenals

- The adrenals are connected with the sympathetic nervous system.
- When overactive, they are connected with anxiety.
- Palpate: Brain, cervical/cranial junction, 11th and 12th ribs, excursion of crus, lymphatic drainage of adrenals, kidneys.
Kidney Motion with Respiration, Ultrasound

Normal: 4.4-5.9 cm with deep respiration

With visceral dysfunction
pre treatment: 3.5-4.5 cm

Post treatment: 4.5-6.5 CM

Rainer Heller, Motion characteristics of kidneys with visceral somatic dysfunction, Manual Medicine 2013 (Germany)
Normal Right Kidney    Post Manipulation
The Kidneys

- The kidneys are associated with fear.
- Check: T10-11 for sympathetic (also T7-Barral), thermic projection, mobility (5-9 cm), motility, chapman’s points near umbilicus, renal ganglion, artery and nodes, viscoelasticity, lymphatic drainage, kidney meridian, and connection with brain.
Esophagus/Stomach

• Most common problem is GERD.
• Something you can’t swallow, job, relationship or money problems.
• T5-9, cranial/brain connections, celiac artery, ganglion and nodes, mobility, motility, viscoelasticity.
Clinical Algorithms For Treatment

• “First, do no harm”
• Osteopathic Treatment
• Psychotherapy
• Pharmacotherapy
• Psychiatry
• Hospitalization
• Local authorities
The State of the Practitioner

• We are now seeing some evidence that the “empathy” of the physician can affect patient outcomes.
• This begs the question “What is our role as a physician”, Is it only to fix busted parts?
• A warm smile can go a long way.