Pyloric Stenosis and Scar Tissue: Its Effects on Trunk Mobility

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Abstract

Pyloric Stenosis is a “gastric outlet obstruction” which simply means a blockage from the stomach to the small intestines. It is fairly common in infants and often discovered at 3-5 weeks of age, after episodes of projectile vomiting after feedings. Surgery is performed on the infant to correct this life-threatening condition. Often, once individuals reach adulthood, they have lasting postural deviations that can mimic scoliosis. Adhesions formed by scar tissue can affect the functioning of the diaphragm, as well as alignment of the trunk. Pilates can be a viable treatment that addresses the limitations in trunk mobility and restores balance to the trunk muscles.
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Anatomical Description

Looking between the Stomach and Duodenum is the outlet obstruction where the muscle has grown together to form the blockage in the Pyloric Stenosis.
Following the arrows up from the outlet obstruction Pyloric Stenosis to Stomach up
Esophagus to up and out the mouth to projectile vomiting.
The scar through the infant stage at top to the mature adult stage at bottom is quite
dynamic! You can see in the mature adult stage the shelf like bulge at the top of scar and
how it then indents in. Women are concerned about becoming pregnant and how will the
scar effect carrying & delivery.
The x-ray shows how the Diaphragm and the Rib Cage are in such close proximity to the area of the outlet obstruction of Pyloric Stenosis. I feel the Rib Cage supplies a trellis for the scar tissue to intertwine and grow through out!
Showing surrounding organs starting with #1 Pyloric Stenosis, #2 Stomach, #3 Duodenum and #4 Liver. Compromising organs around site are subjected to Gastroenterology issues such as Acid Reflux, Barretts Esophagus, Colitis, Crohn’s Disease, Diverticulitis/Diverticulosis, Digestive Disorders and Stomach Pain.
Introduction

The incidence of Pyloric Stenosis is 3 babies out of 1,000. The blockage comes from an enlargement of the muscles in the pyloric sphincter of the stomach. Pyloric Stenosis can be severe enough to prevent milk from passing through the pyloric sphincter, and requires a surgical procedure called a Pyloromyotomy to remedy. The surgery used to involve a four-inch incision made vertically or horizontally at the base of the ribcage, and a cutting away of the thickened pyloric sphincter muscle. Now the surgery is done laparoscopically to minimize scar tissue adhesions.

I have decided to focus on Pyloric Stenosis, because I suffered from this condition and had the Pyloromyotomy performed when I was 3 weeks old. I had a horizontal incision made that starts at midline at the base of the ribcage and continues to the right side about four inches in length. As I became an adult, I started to feel a strong pull on my ribcage, and a nagging sense of being out of alignment. When I would work with fellow teachers, I was always asked if I had scoliosis. I was screened as a child for scoliosis and didn’t have it. I began to suspect that perhaps the scar tissue around the surgery site might be the cause of why I looked like I had scoliosis. I did research on the Internet to learn more about the surgery and how others were affected by it as adults. I was happy to find quite a number of other people who’ve had the surgery were posting their experiences in blogs and on Facebook. Many reported the same symptoms I was facing, mis-diagnosis of scoliosis, the scar itself appeared puckered and glued to the lower ribs, trouble with breathing during exercise, intense sensations of pulling and spasms under the scar and
a burning/ripping pain sensation with abdominal exercises. I realized then that the scar tissue was severely restricting the movement of the diaphragm, rib cage and abdominals. This restricted motion was affecting my alignment in the trunk and my posture.
Case Study

Annalisa Pessin, 54 years old.

Limitations:

• Trunk ROM in flexion, extension and rotation
• Trunk appears rotated
• Balance issues due to faulty alignment
• Lack of lateral expansion of rib cage causing pain with “lateral breathing”
• Hyperlordosis with the lower ribs being lifted off the mat when supine
• Kyphosis in the thoracic spine.

Rehabilitation/Treatment:

• Moist heat (hot water bottle)
• Vibration (standing on Vibration plate, or using a hand-held vibration massager over scar tissue area)
• Conditioning Program with Pilates
Conditioning Program with Pilates Block System

Warm-Up: Cadillac

- body scan roll down (standing)
- classic fundamental warm up on cadillac
- pelvic curl
- spine twist supine
- chest lift
- chest lift with rotation

Starting off with a lovely body scan roll down looking for imbalances, tightness and asymmetries etc. Followed by a classic fundamental warm up on the cadillac. Warming up with a pelvic curl exploring neutral pelvis an ever searching process to establish. Spinal twist with holding on to the poles at cadillac for stabilization while exploring twist with ribcage, torso and TA’s rotating together. Adding on chest lift to warm up flexion and chest lift with rotation trying to lift off the mat a little more with challenging rotation on ribcage. While including challenging “lateral breathing” expanding ribcage with lower ribs down not lifting off the mat and trying to relax the lower back is easier said then done!
Footwork: Reformer

-parallel heels
-parallel toes
-v position toes
-open v heels
-open v toes
-calf raises
-prances
-single leg heel
-single leg toes

To continue with challenging “lateral breathing” and adding on movement! Working compromised diaphragm and clueing in on alignment with attention on joints lined up, working resistance both ways and resistance behind knees not to hyperextend or slam knees down. Trying to school the lower ribs not to lift off the bed of the reformer. Along with not pushing the reformer with your shoulders but with “lateral breathing” upper thoracic. Don’t forget your neutral pelvis too! Wow! Awesome awareness to keep threading throughout the whole program.
**Abdominal Work:Avalon**

- mini roll up
- mini roll up with oblique
- mini roll up with round about

Abdominal work on the avalon with combination of springs in hands and foot contact supplies a push and pull resistance to drive lower ribs down. I think I found my TA’s, obliques and rectus abdominis! This mini roll up family is nothing but a 360 degree movement party around my entire ribcage!

**Hip Work:Avalon**

- circles down
- circles up
- frog extended
- frog extended reverse
- scissors
- bicycle
- bicycle reverse
- helicopter

Well rounded hip work on the avalon is a combo of hip work from the reformer & cadillac but even more! By adding circumduction to the hip socket with helicopter/circle 360 degree awareness around my rib cage and now my hip socket! The hands and ribcage have help by the handles that are on each side of the avalon by supplying lower ribs staying connected to the mat for stability. Also finding TA stability so the pelvis doesn’t flip flop. Frog extended/reverse and bicycle/reverse are contributing to mind body connection. So much ROM to gain here I love it!
**Spinal Articulation:Reformer**

- short spine

  A powerful combo of unlocking each vertebrae with dual action of opposition while rolling down and pulling up with feet in straps. Adding on to the rib cage with “lateral breathing” for width and length opposition. Seeking out clued areas from scar tissue. A multitasking adventure!

**Stretches:Ladder Barrel**

- gluteals
- hamstrings
- hip flexors

  All 3 stretches are important to loosen up the locking webbing of scar tissue that feels like a body suit I’m wearing from head to toe. These stretches help connect to the Pilates length every one desires. Trying to ungrip the gluts, unload hamstrings & hip flexors which feels like they are all pulling the pelvis out of neutral.
**Full Body Integration:Reformer**

-stomach massage round back

-stomach massage flat back

Stomach massage round back feels great after the stretches I just did, helping the lower back to melt open. While stomach massage flat back helps to lift & open internally rotated shoulders and open upper thoracic. Both helping with hyperlordosis & kyphosis posture.

**Arm Work:Reformer**

-side arms kneeling series:

-deltoid reach

-cross arm pull

-triceps

-arms overhead

Side arms kneeling series is made for the Pyloric Stenosis rib cage, working laterally finding trunk stabilization and symmetry as in deltoid reach & arms overhead. To working diagonals in a zig zag and zipping up the core before each move with cross arm pull. And trunk in lateral flexion supplying a great stretch with movement with triceps.
**Leg Work: Cadillac**

single leg side series:
- changes
- scissors
- circles (forward, back)

Moving on to side lying pelvic stabilization without flip flopping the pelvis. Changes are working diagonals challenging not to flip flop. Scissors is working symmetry, while imagining a plumb line stacking for ideal alignment. And circles exploring ROM with managing pelvic lumbar stabilization. With compromised rib cage side lying is challenged with movement.

**Lateral Flexion/Rotation: Avalon**

-side lift

Very interesting to top it off with a lift & lowering combo of lateral flexor strength & stretch and working an antagonist co-contraction of abdominals and back extensors. A lot of food for thought here of what the heck is lifting and lowering me? Powerful side head to toe awareness!

**Back Extension: Cadillac**

-hanging series

-hanging back

To top it off with a horizontal cat cow gravity pulling stretch! Mindfully passing through the movement, feeling in space, where neutral comes in for the pelvis, rib cage & head.
Ending: Body Scan Roll Down

Into a standing cat cow like roll down, off the equipment, exploring neutral on many different planes while internally exam the feeling of changes you made today!
Results

All exercises where selected for all symptoms of a pyloric stenosis surgery. Due to having this surgery at such a young age the scar tissue was cement like. The challenge is unlocking the vise grip of scar tissue. To start, applying heat and vibration before hand helps to loosen up the scar tissue. Then adding on a well thought out Pilates BASI block system work out. Continually working on gaining awareness of compensatory patterns, movement patterns and postural deviations. To find balance between antagonist muscle groups to functional exercise, strength and flexibility. Always looking out for the “the weakest link” and reaching for the goal of efficient movement. Ending in a mind, body and spirit peacefulness of harmony through alignment. The “results” I long for of a 360 degree ribcage awareness I can control instead of it controlling me. This is the journey!
Conclusion

The bottom line is if this regime is not kept up on a daily BASIs the relentless scar tissue is always there taking an endless hold on the ribcage. Discipline is the key to long term relief. The formula of the block system allows you to plug in the right exercises that helps your client with their special needs and avoid over working one area. For instance, one side of a pyloric stenosis ribcage is hypermobile while the other side is not. This is a agonist and antagonist relationship to explore, but it is also connected to other parts of the body which need help too. To help achieve that over all mind, body and spirit connection, the entire body needs to be involved. Such as posture, gait, muscle, flexibility, strength, movement patterns and asymmetries. “People tend to practice what they enjoy and they generally enjoy what they are good at or feel comfortable with.” To explore beyond that comfort zone is challenging to both student and teacher. As a teacher to have the finesse to make uncomfortable comfy. What excites me is the combination of all those elements and unlocking the puzzle together with your client and putting it together in a light bulb moment of discovery. Goals are made to challenge what you may not find today and to remember it’s a journey paved with a will to be brave enough to explore.
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