PILATES for SCOLIOSIS

Case Study and Program of Exercises

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Abstract

Scoliosis is abnormal curvature of the spine with three-dimensional deviations, which are affecting the whole body balance and posture - causing uneven shoulder line, uneven hips, arms and legs being one longer than another. Although it is not a disease and many otherwise healthy people have it quite often not even being aware of having it, scoliosis can affect physical and mental health over time.

As long as our body is an integrated whole and spine is literally its main “highway”, deviations in the main road will cause imbalances in other systems, and we are not talking of musculoskeletal solely. Our bodies were created to move, lack of movement leads to stagnation and atrophy. For people with scoliosis conscious movement, which pilates method is standing on, has double more sense as it helps them to get rid of everyday pains and tension caused by their spinal condition.

This case study explores how BASI Pilates Block System can help particular person with idiopathic scoliosis to bring more balance and awareness in everyday life, get relief from regular neck tension, fix muscular imbalance and create strong lean muscles.
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Anatomy of the Spine and Scoliosis

The spine is divided into five regions: cervical (7 vertebrae), thoracic (12 vertebrae), lumbar (5 vertebrae), sacrum (5 vertebrae fused together) and coccyx. Apart of vertebrae - its bony building blocks - spinal complex includes nerves, muscles, tendons and ligaments. Bones of the spine surround and protect spinal cord - important part of central nervous system connecting brain with peripheral nervous system. Between vertebrae intervertebral discs are located and serve to facilitate movement of the spine. Damage of any of these parts can cause back pain, loss of mobility, muscular imbalance or neurological symptoms.

Normal spine has four curvatures - cervical lordosis, thoracic kyphosis, lumbar lordosis and sacral kyphosis, - which are important for stress absorption and correct weight distribution during body movements, and essential for body balance. Scoliosis is abnormal twisting and sideways curvature of the spine, usually C or S shaped.
Types of scoliosis vary by cause, location along the spine, nature of its appearance and development, and number of curves. Very common type of scoliosis with “unknown” cause - idiopathic, it’s the type of structural scoliosis (usually has a combination of rotation and lateral curvatures in vertebrae). It can develop from very young age and then take progressive form during teenage period because of rapid growth of the spine. Since spinal complex engage many interconnected systems all the deviations from normal curvatures will affect the whole body. When it comes to idiopathic scoliosis, rotation of the vertebrae along longitudinal axis and its shift in coronal plane results abnormal position of the ribcage, which affects biomechanics of muscles and connective tissues, and joints mobility not only around deviated area, but also spiralling up and down from it, causing deviations in pelvic area, upper and lower limbs and quite often - affecting breathing cycle.

Depending on shape of scoliosis and its severity the condition of the spine can worsening over time if not take care of it. Although there is no proper cure for scoliosis, treatment for adult scoliotic people includes bracing, surgery, painkilling medication and exercise. Pilates has all tools needed to give people with scoliosis good body awareness, pain relief, natural alignment (at least its possible form for every particular case) and strength.
Case Study of Anina

My client Anina is 47 years old woman, Indonesian Chinese. She was never doing any sports or regular fitness; she is housewife spending quite a lot of time in front of a laptop and TV. She was never diagnosed with scoliosis until her first visit to Her Best - pilates and yoga studio in Medan, opened since August 2016.

Anina ever noticed her hips are uneven, and knows that her mother has scoliosis, but she never paid too much attention to herself. She was suffering from chronic neck tension and chronic fatigue. For Medanese people these symptoms, along with lower back pain, in general are very common - in this city no one is walking by the streets, and I mean it, - there are no sidewalks and the city considered as unsafe, so at least Chinese part of population is moving around by cars; in everyday life they are using their legs mostly inside of shopping malls, and rarely in fitness clubs.

I started to work in Her Best two months after opening and became Anina's first instructor. She has amazing natural body awareness and it took her only about 5 sessions to see and feel her body from different perspective and decrease neck tension. After 3 months of doing pilates in Reformer group classes she feels stronger and younger, and decided to move forward by jumping into one on one work. I designed special program for her and she is following it since beginning of February twice per week. Program includes Fundamental and Intermediate levels exercises on Reformer, Cadillac and Wunda Chair.

Anina has slight thoracolumbar spinal curve to the right side (and I guess it won’t be mistake to consider her curves as S-shape scoliosis, with cervical spine engaged), and most probably rotation in thorasic spine, judging on her posture observed from the right side. She has hyperlordotic posture with anterior tilt of the pelvis, which causes weak abdominals and tight lower back extensors along with tight hip flexors. Anina never had any lower back issues and pains, but her main stress
absorber became neck area - due to the head position forward from the plumb line. Her knees and elbows joints are slightly hyper extended - typical feature of Asian bodies. Photos below were taken in the beginning of February, before we started her program.

Front/Back (coronal) View

Whole right side higher than the left - right shoulder and right hip, accordingly right side is stronger, shorter and tighter than the left. Feet pronated, shoulders rolled forward. Legs slightly bowed (genu varum, knees are separated while feet touch).

Side (saggital) View

Head is moved forward from plumb line, tight neck muscles. Right shoulder rolled forward more than the left, so there might be rotation in thoracic spine. Pelvis tilted forward, lumbar spine has hyperlordosis, thoracic spine has characteristics of fatigue posture - upper back
extensors need to be strengthened. Due to the rotation of the thoracic spine, hips are twisted, too, not only in coronal plane, but also in transversal: in lying supine position right ASIS is lower than left.

To get Anina back to muscular balance her exercising program includes unilateral work (to make her work evenly with both sides without relying on stronger right part of the body), rotation/flexion and combination of flexion and rotation (as it is her main gateway to safe and full extension), deep abdominal work (to achieve both abdominal strength and lower back extensors stretch, plus increase pelvic-lumbar stability), hip flexors stretch, shoulders stretch and back extension with emphasis on thoracic spine.
BASI Block System Exercises Program

**Warm Up** block starts with few *Roll Downs* - just to allow Anina to concentrate on her body, on alignment, and TA engagement. Then BASI Intermediate Warm Up on the mat follows: *Roll Up, Spine Twist Supine, Double Leg Stretch, Single Leg Stretch, Criss Cross*. Her abdominals already strong enough so I can cue her through deep lumbar flexion in Roll Up without neck strain with main focus on the centre. Since Anina has no major issues with spinal articulation - we are concentrated on increasing her lumbar spine stretch and abdominal strength. For Double Leg Stretch and Single Leg Stretch depending on her current condition I cue her to do these exercises with modification - head and shoulders relaxed on the mat.

**Foot Work on Reformer:** *Parallel Heels, Parallel Toes, V Position Toes, Open V Heels, Open V Toes, Calf Raises, Prances, Single Leg Heel, Single Leg Toes*. Done with 3 red springs. The whole series is a powerful start to the class, helps to work on pelvic-lumbar stability (I used to put a small pillow made of towel under Anina’s right hip to make her ASIS levelled, but since she’s learning more pelvic-lumbar stability and becoming more aware of now to hold her alignment - pillow more often stays on the side), warm up the body, work on feet alignment and ankles plantar flexors strength. Since Anina’s legs have slight genu varum effect, Foot Work is essential for her to learn ankles-knees-hip joints alignment - for this block I always keep head supporter up to accommodate my client’s head so she can observe her feet and knees and make adjustments as moving through series. Single Leg Heels and Toes are the most important part of Foot Work - unilateral work helps to define dominant side and to work on adjustments of asymmetries in pelvic area.

**Abdominal Work on Reformer:** *Hundred Prep + Coordination*. Done with 1 red and 1 blue springs. When Anina just started to do pilates I cued her to do these exercises without curling head and chest up - it helped her to connect to the centre without excessive tension in the neck. But since
her abdominals got stronger and she learned how to get off the neck and concentrate all attention and power in the powerhouse - Anina can easily get to Chest Lift position without neck strain. After two first abdominal exercises are done - we moving to Short Box Series (all exercises except Climb-A-Tree: Round Back, Flat Back, Tilt, Twist, Round About). This series give her an opportunity to work 3-dimensionally, feel difference between her sides and adjust her movements accordingly. Plus this series allow me to be very touchy with client and easily keep my hands on her whenever she needs. Slow motion is crucial in that part of work as well as deep breathing - so she can play deeper with ROM in order to get more challenge for abdominals.

**Hip Work on Cadillac:** Single Leg Supine Series (Frog, Circles Down/Up, Hip Extension, Bicycle). Done with 1 yellow spring. Unilateral work when it comes to hip block is a great challenge for pelvic-lumbar stability, especially for Anina’s twisted and uneven hips. While doing the work she can concentrate on keeping deep abdominal control in order to stabilise her pelvis, and at the same time work on ROM improvement in hip joints. Plus, knees hyper extension control is slightly easier for her to achieve with unilateral work.

**Spinal Articulation on Mat and Reformer:** Even though Anina has no major issues with spinal articulation I am very careful with any kind of exercises with excessive load of cervical spine, and/or weighted flexion. As she is still on beginner level, I do not want to put any excessive pressure on shifted and twisted vertebrae of her spine. So we start with safest Spine Stretch on the mat, concentrating on sensation of lengthening and flexion over and forward, with precise position of neutral shoulders and neutral pelvis. Then we move to Reformer to perform Bottom Lift and Bottom Lift with Extension (done with 2 red and 1 blue springs), working on deep lumbar flexion and bone by bone articulation as she moves her bottoms up, and hamstrings strength as she moves the carriage out and in polishing pelvic-lumbar stability.
Stretches on Reformer: *Kneeling Lunge* helps Anina to get more flexibility in hip flexors and hamstrings (done with 1 red spring). Plus she is doing *Stretches Series with pole*, sitting on fitness ball (*Shoulder Stretch, Overhead Stretch, Side Stretch, Spine Twist*), to get more freedom in her upper trunk and increase its mobility in coronal and transverse planes. All these blocks are helping us to get the spine prepared on all levels for effective back extension at the end of session.

**Full Body Integration F/I on Cadillac:** We continue to increase Anina’s spine flexibility and mobility through some flexion in sagittal plane and rotation with shoulder stretch by performing *Sitting Forward* and *Side Reach* (done with 1 blue spring top loaded). She can feel the difference between her left and right side and get some extra effort when rotating to the right. Hip flexors get extra stretch with *Thigh Stretch with Roll up Bar*.

**Arm Work on Cadillac:** *Arms Standing Series* (*Chest Expansion, Hug-A-Tree, Circles Up/Down, Punches, Biceps*, done with arm springs) allow her to disassociate the arms from spine and rib cage and to keep the rib cage soft as arms move. Anina can concentrate on trunk and scapular stability while her arms need to move evenly, which is more challenging with independent springs on Cadillac rather than more stable straps on Reformer.

**Leg Work on Wunda Chair:** Fundamental exercise *Leg Press Standing* (done with 1 red spring on top of cactus) helps Anina to feel deep abdominal work while she keeps her hips and trunk stable, and then this challenge goes further with *Backward Step Down* (done with 2 springs on top of the cactus).

**Lateral Flexion/Rotation on Reformer:** *Mermaid* is one of the best exercises for people with scoliosis as it provides perfect combination of
lateral flexion and rotation on its highest levels (done with 1 red spring). Spinal mobility and scapular stability are both important objectives for Anina and she feels really great after doing this exercise, with more freedom in her movements and more space between vertebrae.

**Back Extension on Wunda Chair:** Now her spine well prepared for good extension and we are doing few repetitions of *Swan Basic* first (done with 1 red spring on top of the cactus), followed by *Back Extension Single Arm* - and this is great time to try to feel both sides lengthening, and a great challenge at the same time. We finish with 3 more *Swan Basic*, to bring Anina back to work with whole body as one unit. Rest position - standing behind the Chair, arms are pulling sides of Chair, back is rounded in deep lumbar flexion.

Session is concluded with few very slow *Roll Downs* to cool Anina down and to allow her to compare the alignment and the sensations inside the body before and after session.
Conclusion

Despite some days are missed sometimes, despite mood swings, despite days when neck tension is coming back, Anina is going so well through her pilates journey, and her progress makes me so proud of her. She is getting stronger, leaner, “younger and more fresh” (according to her own words), and what is the most important - she is learning great sensation of being aware of her body not solely during the class - but in everyday life, which is helping her to get massive relief from any tension in her spine and whole body.

Holistic approach of Pilates method in general and BASI Block System in particular are great tools in work with scoliotic clients. What I admire the most of BASI approach is great combination of carefully and precisely organised progression of exercises and big athletic challenges on each level, as well as overall athletic approach to exercising routine. It helps to keep clients not only on track towards pain relief and greater awareness, but to keep them entertained, although they repeat same routine over and over again for weeks and months. Practice makes perfect - deep sense of this motto opens to them as they progress. Block System is extremely helpful for instructor and works perfectly - helps quickly and easy to create totally balanced workout for any level, yet leaving space for freedom and creative modifications.
Bibliography

Web:
“Spine Health”

Books:


