Acta Salus Vitae, Vol 12, No 1 (2024)
ISSN 1805-8787 actasalus@palestra.cz

THE IMPORTANCE OF INITIAL DIAGNOSIS AND INTERVENTIONAL EXCERCISES ON POSTURE

Eva NECHLEBOVÁ a Monika VAN ROOIJ

Abstract

The article describes the importance of diagnosing differences in lower limb length and the impact on overall musculoskeletal stability and the effectiveness of regular interventional exercise. A case report of one person is used in the article. An analysis of the length of the lower limbs was performed using radiographs, anthropometric measurements and photodocumentation. Based on the results, an intervention program was designed, which included the Dorn method and Spiral Spinal Stabilization exercise for 3 months at a frequency of 2-3 times a day for 15 minutes. The exercises were continuously modified to always meet the current need for correction of the area. Exit examination shows that the foot position has improved as well as muscle corset and posture. The client continues to exercise and is without difficulties.

Keywords:

Initial diagnosis, intervention exercises, posture, unstable lower limb length, unilateral loading

1 INTRODUCTION

Postural functions are the main prerequisite for any movement, especially in locomotor activities. Posture does not improve during sport, but can be impaired by unilateral loading. Postural impairment leads to so-called faulty posture, which occurs especially in individuals with infrequent postural and movement changes or in individuals who are passive in movement. Therefore, comprehensive initial diagnosis and subsequent interventional training is very important and effective.

When checking the foot position, we take into account whether it is primary or secondary - very often this position is the result of incorrect loading of other joints.

Primary position requires intensive therapy to avoid further affecting the overall posture and the development of incorrect movement patterns and dysfunctions in the ankle, knee, hip, pelvis, spine and craniovertebral junction.

In secondary position, it is advisable to look for possible causes in dysfunction of the pelvis, hip joints, lumbar spine, etc. The priority is to find and heal the source of the difficulties rather than fix it with supportive devices (e.g. orthopaedic insoles).

The Dorn Therapy - a gentle form of manual therapy for reversible dysfunctions of the spine and all peripheral joints - deals with joint connections and their proper function. This method can be used as early as infancy and is based on the importance of equal length of the lower limbs. Otherwise, the uneven loading of the lower limbs creates undesirable effects on trunk statics, head position and overall spinal alignment (Burgath, 2006).

The unequal length of the lower limbs can be congenital, post-traumatic or caused by, among other things, incorrect hip joint seating. The difference in the length of the lower limbs has a significant impact on the development of flatfoot as one of the

compensatory mechanisms. Dysfunctions in the pelvis, the entire spine and the shoulders develop from unequal limb length.

2 AIM

The aim of the work was to identify the causes of the client's difficulties and to find a long-term solution to improve her mobility and relieve her pain.

3 METHODOLOGY

The case report of one client was used for this work, which included analysis of the length of the lower limbs using radiographs in collaboration with the physician, comparison of the photographs and subsequent measurement of the umbilical measurements. Based on the results of the measurements, an exercise and therapy plan was developed using the Dorn Method and Spiral Spinal Stabilization exercises. The exercises were continuously modified to always meet the current need for correction of the area. The intervention lasted a total of three months and is ongoing.

Defective posture

Faulty posture is defined as a posture which differs from the correct posture by various deviations which are not due to a structural change. It is a functional disorder of postural function (Čermák, Chválová, 2008).

In clinical practice, we most often encounter excessive curvature of the thoracic spine (thoracic hyperkyphosis), weakening of the interscapular region, excessive sagging in the lumbar region (lumbar hyperlordosis) with an overextended pelvis and other defective postures. As a rule, these disabilities are correctable and require corrective rehabilitation exercises (Repko, 2017).

SPS method (Spiral Spinal Stabilisation)

The Spiral Stabilisation Method (SPS) is a comprehensive exercise that compensates for musculoskeletal problems, stretches shortened muscles, strengthens weakened muscles and corrects posture. At the same time, this exercise affects the control and coordination of movement, which are necessary conditions for the functioning of correct movement stereotypes. Smíšek (2005) described four spiral chains, the activation of which leads to the alignment and traction of the spine. The alternation of spiral and vertical chains in the intervertebral spaces leads to traction and subsequent compression of the intervertebral discs. The term muscular chain is used to describe the connection between muscle units, joints and bones that is formed to allow movement and its stabilisation. Different parts of the muscle chain may be involved in different muscle chains, and almost always more than one muscle chain is involved in the execution of the movement and its stabilisation. The proportional involvement of the chains also changes during the movement (Smíšek, 2005).

The author of the SPS method (Smíšek, 2019) divides muscle chains into vertical and spiral chains, with both types having their own importance and role in different activities.

Smíšek (2019) describes 4 muscle spiral chains:

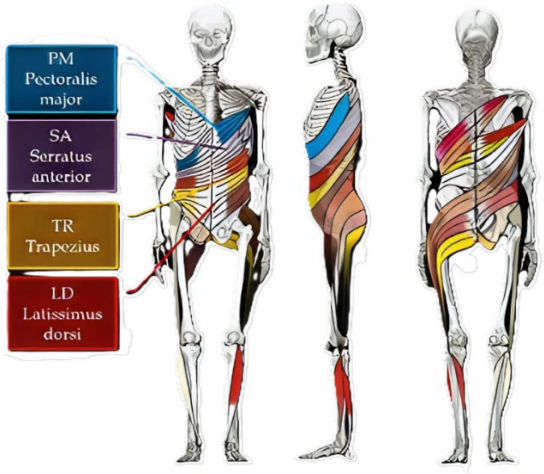
LD - latissimus dorzi;

TR - trapezius;

SA - stratus anterior;

PM - pectoralis major.

Figure 1 Spiral muscle chains



(Source: Smíšek, 2019)

and 4 vertical muscle chains:

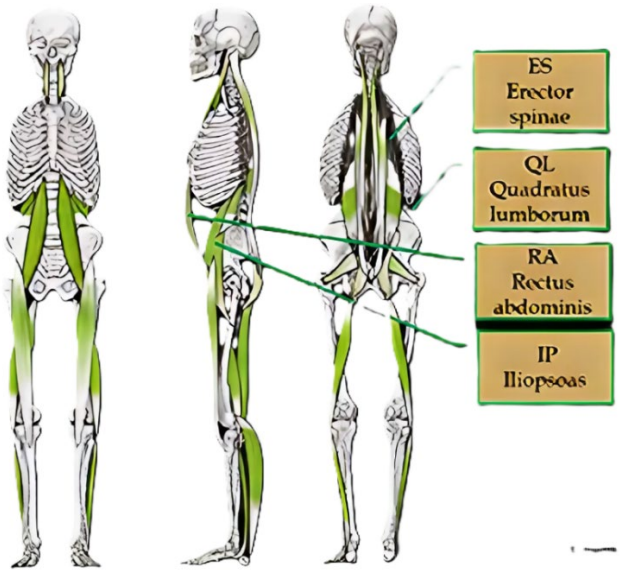
ES – erector spinae;

QL – quadratus lumborum;

IP – iliopsoas;

RA – rectus abdominis

Figure 2 Vertical muscle chains



(Source: Smíšek, 2019)

4 CASE REPORT

Medical history:

Personal history
Gender: female
Age: 46 years old

History of falls - frequent falls from horses. Last big one was 10 years ago when she fell on her left side and couldn't walk for several weeks.

After discovering the different lengths of her lower legs, she recalled going to the doctor as a child with scoliosis and having her left leg put under during scans.

Work history
She works 6-8 hours a day at a computer.

Social history
She and her husband live in the family home and care for 7 horses.
Sports history
Earlier horse riding. Now yoga.

History of current disease
Bilateral flatfoot, pain in lumbar spine, SI joint and left hip joint. Occasional pain in left knee.

Examination of Aspects
The weight of the body is significantly to the left with a slight tilt of the lumbar spine to the right. Scoliotic curvature of the spine. Left hip joint lower. Gluteal grooves and popliteal fossae unequally high. The thoracic spine has a physiological curvature. Measurements show a 1.5 cm shorter left lower limb. Furthermore, a shift of the left iliac blade towards the centre of the sacrum - most probably after the last fall from the horse to the left side. Feet concave, right arch more reduced. Valgosity of knees, left knee more significantly.

The definitive confirmation of scoliosis is a digital image of the entire spine, including the dens axis, shoulders and the entire pelvis, in both anteroposterior and lateral projection, taken in the standing position. The radiograph should include the following structures:

- Both hip joints;
- The entire pelvis;
- The entire spine, including the lumbar, thoracic and cervical regions;
- The lower half of the skull;
- The brachial plexus (Smíšek, 2019).

Description of the intervention
The first therapy focused on checking and possibly correcting the relative position of all the joints using the Dorn method.

During the second therapy, which took place one week later, a diagnostic check was carried out and a Spiral Spinal Stabilisation therapy was added, focusing on the scoliotic spinal position.

Subsequent therapies continued on a weekly basis and were aimed at training the correct performance of exercises from the Spiral Spinal Stabilisation stack according to the method of Richard Smíšek, MD. During each session, the musculoskeletal system was assessed and the exercises were adapted to the current situation.

Interventions according to the SPS
Principles of exercise:

- Standing exercises;
- Barefoot exercise;
- Alternating active and passive postures;
- Coordination of movement (from bottom to top);
- Use of low force and wide range of motion;
- Performing exercises slowly and smoothly;
- Check the correctness and execution of the exercises;
- Didactic progression from simple to complex;
- Intensity adapted to the current condition of the user.

Division of exercises
The SPS exercises are divided into four groups

- Symmetrical exercises SY;
- Asymmetric exercises ASp;
- Asymmetric single leg exercises ASn;
- Stretching exercises P.

Figure 3
View from the back

(source: authors)

Figure 4
View from the back

(source: authors)

Figure 5
Detail of lower legs

(source: authors)

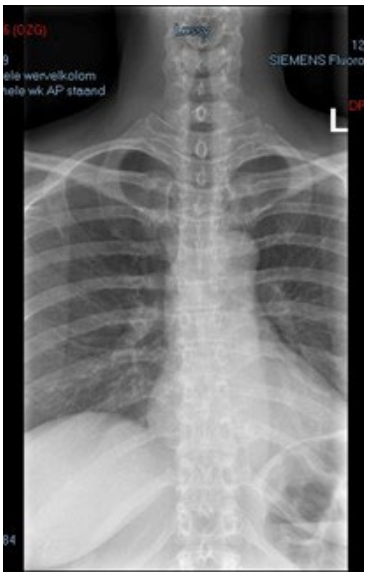
Figure 6
X-ray examination

(source: authors)

Figure 7
Continuous X-ray examination

(source: authors)

Figure 8
final X-ray examination



(source: authors)

All exercises were performed asymmetrically, with one leg resting on the mat, in order to account for the different lengths of the lower limbs. The asymmetric exercise performed with either one upper limb or lower limb is considered to be the essence of the functionality and effectiveness of the SPS method. When performing this exercise, the muscle spirals are activated, and the action of these muscles leads to the activation of the oblique abdominal muscles and the transverse abdominis muscle. This results in a reduction in waist circumference and subsequent upward force. The asymmetrical movement of the

shoulders assists in the mobilisation of the spine and brachial plexus. In the asymmetrical lower limb exercise, the focus is on stabilising the pelvis, mobilising the hip joints, and strengthening the muscles involved in stabilising the pelvis during gait.

This exercise strengthens the abdominal muscles, gluteal muscles, broad back muscles, mid trapezius, and lower scapular fixators. It also stretches and relaxes the neck muscles, upper scapular fixators, spinal extensors, and hip flexors. Following this, a stretching section is performed, which is part of each exercise unit. These exercises target muscles prone to shortening according to muscle imbalance syndromes.

During the execution of the exercises, the participants were instructed to maintain a regular and continuous respiratory pattern. The number of repetitions was selected based on the individual's current physical condition, with a total of eight repetitions for each exercise.

The following excerpt is taken from the SPS upper limb exercises, which include asymmetrical exercises.

Figure 9
Starting Position

(source: authors)

Figure 10
Target Position

(source: authors)

Figure 11
Starting Position

(source: authors)

Figure 12
Target Position

(source: authors)

Output diagnostics

A comparison of the photographs at the beginning of the intervention (Fig. 1) and at the end of the intervention (Figs. 2 and 3) of the three-month therapy demonstrates an overall improvement in statics, pelvic position and more symmetrical loading of the lower limbs. A change in posture was already evident after the second therapy session, as illustrated in Figure 5 in comparison to Figure 4 (baseline).

Figure 13
Before intervention

(source: authors)

Figure 14
After the intervention

(source: authors)

Figure 15
Before intervention

(source: authors)

Figure 16
After 2 the intervention

(source: authors)

Figure 17
Before intervention

source: authors)

Figure 18
After the intervention

source: authors)

5 DISCUSSION AND CONCLUSION

The objective of this thesis was to identify the underlying causes of the client's difficulties and to propose a long-term solution to improve her mobility and relieve her pain. A robust muscular corset was devised to reinforce correct posture through the implementation of appropriate exercises and a meticulous diagnosis. In the case of a diagnosed congenital limb length discrepancy, it was also necessary to collaborate with a podiatrist and produce an orthotic insert for the left leg measuring 0.5 cm.

The client engaged in two to three daily sessions of 10 to 15 minutes each, comprising a series of exercises from the Spiral Stabilization program. They also attended regular follow-up appointments and received continuous therapy in accordance with the Dorn method. Following three months of exercise, there was a discernible improvement in foot position and greater stability of the left leg

knee. The client is currently experiencing no significant difficulties and will continue to engage in exercise. The subsequent exercise phase will encompass supplementary balance training, with the objective of enhancing foot functionality.

6 REFERENCES

Burgath, I. (2016). Dornova terapie u kojenců a dětí. Poznání.

Čermák, J., & Chválová, O. (2008). Záda už mě nebolí (4. vyd). Jan Vašut.

(nd). www.dornova-metoda.com. (2023, 30. listopadu). https://www.dornova-metoda.com/

(nd). Spirální stabilizace páteře. www.spiralstabilization.com. (2023, 10. listopadu) https://www.spiralstabilization.com/metoda/

Repko, M. (2017). Nejčastější potíže s páteří školních dětí. Pediatrie pro Praxi, 18 (4), 212–218. https://doi.org/10.36290/ped.2017.040

Smíšek, R., & Smíšková, K. (2011). Spirální stabilizace. 12 cviků pro regeneraci páteře. Prevence a léčba bolestí zad. Richard Smíšek.

CONTACTS:

Mgr. Eva Nechlebová, Ph.D.

VŠTVS Palestra – Katedra biomedicíny
E-mail: nechlebova@palestra.cz

Monika van Rooij, MsC.

Holistic Body Therapist, Kromme-elleboog 2e laan 1A, Finsterwolde, Nederland
E-mail: monika@monikavanrooij.nl
www.monikavanrooij.nl