A CASE STUDY ON THE OSTEOPATHIC APPROACH TO CHRONIC LOW BACK PAIN AND RADICULOPATHY:

What are the influencing factors and does an osteopathic treatment have a positive influence on symptoms and compliance of the patient in a short period of time?

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1 INTRODUCTION

From my experience, low back pain in general is probably one of the most common reasons for patients to consult an osteopath. One of the reasons might be the large variety of causes and their complex correlation that lead to pain and limited range of movement in the lumbar spine.

A clear diagnosis leading to a specific therapy in conventional medicine can rarely be stated and most patients are diagnosed with unspecific low back pain where an exact patho-anatomical diagnosis not possible. This leads to a huge number of new therapy forms and minimal invasive techniques of which most are not proved to efficient.[1]

For patients with low back pain the diagnosis discus prolaps, disc herniation, or disc protrusion seems like the worst-case. Reasons for that might be a high incidence of discopathies in today's society (possibly caused by the invention and numerous implementation of CT and MRI scan) and their, from the patients' point of view, associated consequences like having to undergo surgery and a complete change of lifestyle. [2]

Working as a physiotherapist and osteopath, dealing with patients suffering from low back pain is a daily issue and rarely solved easily and in a short period of time, often resulting from a comprehensive medical history and the state of chronification. I did experience positive effects of my osteopathic treatment in patients with disc defects and recurrent chronic low back pain after surgical interventions but in my daily practise it is often not possible to keep track of the treatment outcome in between the appointments. Further on I think that the patient's lacking physical „consciousness" and a missing self-reflection on the

[1] Gerdesmeye1 L., Haake M., Goebel1 M., Wagner K.: Der Rückenschmerz ; Notfall & Hausarztmedizin 2004; 30: 319–324

[2] Hildebrandt J.: Gibt es einen unspezifischen Rückenschmerz?; Z Orthop 2004; 142; 139- 145

negatively influencing factors concerning his health often affects the success of the osteopathic treatment.

The aim of my thesis on the basis of a case study is, to present the osteopathic approach to chronic low back pain with subsisting disc defects and radiculopathy and to find out which parameters have the largest influence on the outcome of an osteopathic treatment. Further information I was interested in is whether a positive trend of symptomatic improvement can be perceived in a quite short period of time and if the osteopathic work has an impact on the patient's self-reflection and compliance.

I chose the method of a single-subject design selecting a patient with persisting chronic low back pain and a complex medical history including disc herniation and surgical intervention who has not had osteopathic treatment before.

2 FUNDAMENTALS

The basic anatomy in this section is reduced to the lumbar spine although the osteopathic approach postulates the consideration of all anatomical structures in the body. In order to provide the anatomical and physiological background to the osteopathic principles and approaches I will refer to important anatomical and physiological facts in detail in section 2.2 (Functional anatomy, physiology and pathology of the spine) and the case study section.

2.1 Basic Anatomy of the Lumbar spine

2.1.1 Vertebrae

The lumbar spine consists of normally five lumbar vertebrae. Each of them has an anterior vertebral body, which consists of a very compact anular epiphysis surrounding the spongiosa, a dorsal vertebral arch, whose pedicles and laminae are relatively short but strong and extend into an almost horizontal quadrangular spinosous process. The vertebral foramen lying within the arch is triangularly shaped. The transverse process is small and thin. The angle of the inferior border may represent the tip of a costal element and the lateral end the tip of the true transverse process. The inferior articular process, with vertical convex articular facets, faces anterolaterally. The superior articular process, with vertical concave articular facets facing posteriormedially, has a rough mamillary process on its posterior border. The superior vertebral notch lies in between the vertebral body and the superior articular process, building, together with the inferior vertebral notch of the articulating upper vertebrae, the intervertebral foramen: the passage for the radix, the nerve root of each segment.[3, 4]

[3] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005
[4] Platzer, W.: Taschenatles der Anatomie: Bewegungsapparat; Thieme Verlag 1991

2.1.2 Discus

The intervertebral disc lies in between two corpuses and consists of the anulus fibrosus, a ring containing collagene fibres on the outside and mostly fibrous cartilage on the inside, which centres the nucleus pulposus. [5]
Absorbing compression and shock forces and the disc allows motion in the spine. It retains tension in all ligaments of the vertebral bodies and increases the stability of the spine. Both longitudinal ligaments, which also support the discus' position, build a functional unit together with the discus, being tightly connected with the posterior longitudinal ligament and in lose contact with the anterior longitudinal ligament, and are referred to as intervertebral symphysis. [6, 7]

2.1.3 Ligaments of the spine

Anterior/posterior longitudinal ligament

The anterior longitudinal ligament (ALL) and posterior longitudinal ligament (PLL) run anteriorly respectively posteriorly along the surfaces of the vertebral bodies. The ALL broadens towards the lumbar spine and attaches on anterior surface of the vertebral bodies. The PLL divides into a superficial layer, which originates at the body of the second cervical spine (axis) as a prolongation of the membrana tectoria and reaches down to the intervertebral disc between the third lumbar vertebrae (L3) and L4, and a deep part depicting prolongation of the cruciform ligament of the atlas reaching down the sacral canal. In adults the lumbar PLL is fused to the annulus fibrosus of the vertebral disc and gives room for veins coming out of the vertebral bodies.[8]

[5] van den Berg, F.: Angewandte Physiologie: Band 1-Das Bindegewebe des Bewegungsapparates verstehen und beeinflussen; Thieme Verlag1999
[6] van den Berg, F.: Angewandte Physiologie: Band 1-Das Bindegewebe des Bewegungsapparates verstehen und beeinflussen; Thieme Verlag 1999
[7] Platzer, W.: Taschenatlas der Anatomie: Bewegungsapparat; Thieme Verlag 1991
[8] Platzer, W.: Taschenatlas der Anatomie: Bewegungsapparat; Thieme Verlag 1991

Ligamenta flava

The ligamenta flava attach on the vertebral arches and consist of elastic fibres, delimiting the intervertebral foramen medially and dorsally. They extend from the facet joint capsules to the spines posteriorly where the ligaments from both sides unite partially, leaving spaces in between for veins connecting the internal and posterior external vertebral venous plexus. They limit the flexion and assist erecting the spine from a flexed position.[9] [10]

Interspinous ligaments

The short interspinous ligaments connect the spinous processes, attaching along each spine from the root to the apex. In the lumbar region they are broader and thicker than at other levels of the spine.[11]

Supraspinous ligament

The supraspinous ligament connects the tips of the spinous processes from C7 to the sacrum, consisting of superficial fibres, extending over three to four, and deep fibres extending over two to three vertebraes. It is only lightly attached to the spines at the levels of L3-5 but thicker and broader in the lumbar spine and fuses with neighbouring lumbar fascia.[12]

Iliolumbal ligament

The iliolumbal ligament attach on the transverse process of L4 and L5. The posterior part of the ligament connects L4 with the posterior border of the iliac crest. The posterior part runs form L5 to the anterior border of the iliac crest, the linea terminalis of the ilium and has connections to the quadratus lumborum muscle. [13]

[9] Platzer, W.: Taschenatlas der Anatomie: Bewegungsapparat; Thieme Verlag 1991
[10] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005
[11] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005
[12] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005
[13] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005

2.1.4 Muscles

The back muscle complex attaching on the lumbar spine can be primarily consist of a series of layers. Only the deeper back muscles are true intrinsic and characterized by the innervation of the posterior rami of the spinal nerves- therefore termed as erector spinae. Those intrinsic muscles can be also divided into deep, sometimes termed as erector spinae (Gray's 2005)and superficial layers, sometimes termed as transversospinalis (Gray's 2005).The superficial muscle group consists of the iliocostalis, longissimus and in some literature also spinalis (Gray's 2005) , which act in extending and laterally flexing the vertebral column. The deeper muscle group consists of an oblique and a straight system. Oblique muscles are the semispinalis, multifidus and rotator muscles and act single-side innervated rotating and innervated on both sides extending. The straight muscles are the interspinales, intertransversarii and spinalis and act innervated on one side as side benders and innervated on both sides as extensors. [14]

Important muscles, concerning the biomechanics of the spine and low back pain, attaching on the lumbar spine are also the psoas major flexing the hips respectively erecting the trunk from a lying position and slightly helping in sidebending the vertebral column, the quadratus lumborum lowering the 12th rib and sidebending the trunk, the posterior inferior serratus lowering the ribs and not less important the posterior part of the diaphragm.[15]

2.1.5 Fascia

The fascial layers in the lumbar region consist of the thoarcolumbar fascia and the continous prevertebral plane. The thoracolumbar fascia sourrounds the whole intrinsic muscle group and consist of three layers. Posteriorly it is attached to the spines of the lumbar and sacral vertebrae and the supraspinous ligaments whereas the middle layer is attached to the tips of the transvers processes of the lumbar

[14] Platzer, W.: Taschenatlas der Anatomie: Bewegungsapparat; Thieme Verlag 1991
[15] Platzer, W.: Taschenatlas der Anatomie: Bewegungsapparat; Thieme Verlag 1991

vertebrae, the intertransvers ligaments, the iliac crest and the lower border of the twelfth rib and the lumbocostal ligament. The anterior part of the thoracolumbar fascia is attached to the anterior surfaces of the lumbar transverse processes behind the psoas major, the iliolumbar ligament and the iliac crest and covers the quadratus lumborum. Since the all fascial layers build a system it is important to mention the psoas, iliac, renal and lateroconal fascia which are closely related and attached to the lumbar vertebrae.[16]

2.1.6 Neural structures

The spinal cord (medulla) with all its nerve and blood supply is covered by the dura mater arachnoid and pia mater which extend form the foramen magnum to the second sacral vertebra where it extends to the as a fine cord, the filum terminale, and finally fuses with the posterior periosteum of the first coccygeal segment. The spinal dura mater builds the epidural space together with the tissues of the vertebral canal. The outer layer of the arachnoid mater is closely applied to the inner dura mater and encloses the spinal cord with the and its nerve roots to the point where they pass through the intervertebral foramina. The subarachnoid space cointains intermediate layers of the arachnoid and the cerebrospinal fluid (CSF) which is built by the choroids plexuses in the lateral, third and fourth ventricles in the brain and flows from the ventricular system down into the subarachnoid space and along the spinal cord. The closest layer to the spinal cord itself is the pia mater. Whereas the medulla ends at he level of L2 in the conus medullaris and is continued by the filum terminale, the nerve roots of each segment below run within the cover of all three mater layers to the segment where they pass through the intervertebral foramina. From there on the nerves are covered with the epineurium, which fuses with the dural sheaths.[17]

The peripheral nerve branches of the lumbar spine, building the lumbar plexus, are: iliohypogastric and ilioinguinal (L1), genitofemoral (L1/2), lateral femoral cutaneus (L2/3), femoral and obturator (L2-4 dorsal and ventral) and the

[16] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005
[17] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005

accessory obturator nerve (L2/3).[18] The sacral plexus is built of: the superior gluteal (L4-S1), inferior gluteal (L5-S2), posterior femoral cutaneous (S1-3),perforating cutaneous (S2-3),sciatic (L4-S2), common peroneal (L4-S1), tibial (L5-S1) and pudendal nerve (S2-S4). [19]

2.1.7 Vascular supply

Concerning the osteopathic approach the arterial supply and venous and lymphatic drainage are a very important factor since it influences the quality of the tissues and the potency of the body to self-healing.

Arteries

The arterial supply of the lumbar vertebral column is provided by paired branches of the aorta, the lumbar arteries, passing around the vertebral bodies, first giving off periosteal and equatorial branches to the body itself, then continuing into a major dorsal branch and giving off a spinal branch (the spinal artery) which enters the intervertebral foramen (Fig.1). The ongoing dorsal branch supplies the facet joints, the posterior surface of the laminae and the overlying muscles and skin of the back. The spinal branch divides again into a postcentral, prelaminar and radicular branch of which the first mainly supplies the vertebral bodies and periphery of the intervertebral disc. Postcentral branches of adjacent levels anastomose beneath the PLL and supply the anterior epidural tissues and dura. The prelaminar branches build a posterior anastomotic plexus on the wall of the vertebral canal and supply the majority of the vertebral arch, the posterior epidural tissues and dura, and the ligamnetum flavum. The radicular branches supply the nerve roots and the spinal cord.[20]

Veins

Equally to the artery systems the vessels of the venous plexus of the vertebral column anastomose segmentally and longitudinally to build the anterior and

[18] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005
[19] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005
[20] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005

posterior external vertebral plexus and the anterior and posterior internal vertebral plexus and finally drain, as well as the spinal cord, to the intervertebral veins which accompany the nerve roots through the intervertebral foramina. The lumbar veins either meet with ascending lumbar veins in front of the transverse processes or, running around the vertebral bodies, directly end into the inferior vena cava.[21]

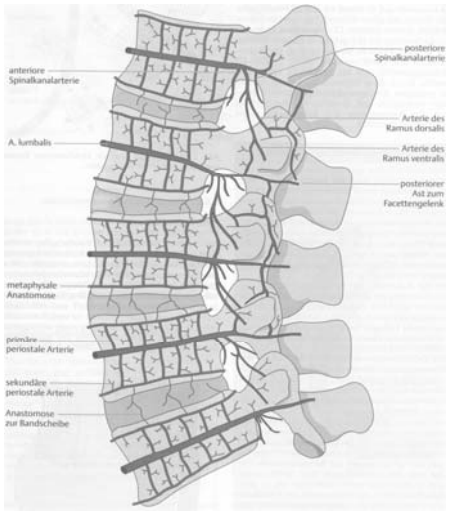


Fig. 1 Artery system of the lumbar spine[22]

2.1.8 Lymphatic drainage

Most of the lymphatic vessels of the lumbar vertebral column follow the arteries and drain to the lateral aortic and retro-aortic nodes. The sacral part drains to the lateral sacral and internal iliac nodes. The lymphatic system upwards the vertebral column continues in the thoracic duct extending from the level of the second lumbar vertebra to the base of the neck. At the first and second lumbar level lies the confluence of the lymph- the cysterna chyli at the level of the thoracolumbar vertebrae.[23]

[21] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring, S.: ElsevierChurchill Livingston 2005
[22] figure taken out of: van den Berg, F.: Angewandte Physiologie: Band 1-Das Bindegewebe des Bewegungsapparates verstehen und beeinflussen; Thieme Verlag 1999: 116
[23] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring, S.: ElsevierChurchill Livingston 2005

2.2 Functional anatomy, biomechanical considerations and their osteopathic relevance

The possible movements of the spine are flexion, extension, sidebending and rotation. The largest range of motion in the lumbar spine is by far flexion/extension (60°/35° according to Allbrook and David) and sidebending (20° according to Tanz). The rotatory movement in this region is clearly the smallest with only 5° (Gregerson and Lucas).

Within the lumbar spine, the largest amplitude of flexion and extension is found in the segments of L4/L5 and L5/S1 [24], causing a maximum of pressure and strain forces onto the discs, which might be on of the reasons for the high incidence of discopathies in this region.

In the function of the spine Schmorl differentiates between a passive segment and moving segment built by the vertebra. The intervertebral discus, the intervertebrale foramen, the intervertebral joints, the ligamenta flava and the interspinal ligaments build the moving segment. The vertebra can be seen as a lever with the intervertebral joint building its centre of rotation. In this function the pedicle build the link between the anterior and posterior pillar. This system allows absorbing and transferring the axial pressure forces, which are directly and passively absorbed by the discus and indirectly and actively absorbed by the intrinsic back muscles.[25]

2.2.1 The pelvis

The pelvis consists of the sacrum and the two iliac bones, each of them articulating with the sacrum in the sacro-iliac joint (SI), and should be seen as a part of spine. The symphysis builds the anterior articulation of the pubic bones. The two iliac bones are considered to be functionally assigned to the lower extremities whereas the sacrum builds the prolongation of the spine.

[24] White A A, Panjabi M.M.:Clinical biomechanics of the spine. JB Lippincott 1978, Philadelphia
[25] Schmorl G.: Zur pathologischen Anatomie der Lendenbandscheiben; Klin. Wschr. 2 (1932), Über Verlagerungen von Bandscheibengewebe und ihre Folgen.; Langenbecks Arch. Klein. Chir. 172(1932)

The whole pelvic ring is a strongly ligament-stabilised structure, inducing the importance of these structures in treating lumbar and pelvic dysfunctions (Fig. 2). Although the strong ligamentous attachment in the SI joint and the symphysis does not allow a large range of movement, the mobility in these joints is functional vital for the whole pelvis and lumbar spine region. The terms nutation / contra-nutation name the anterior / posterior movement of the base of the sacrum versus the ilium and imply functionally the sacro-iliac movement and possible dyfunctions according to Greenman, in the sense of a single / bilateral nutation anterior / posterior or torsion anterior / posterior. The movements of the ilium are anterior / posterior rotation around a transversal axis and internal / external rotation around a transversal axis implying possible dysfunctions of the ileum according to Greenman in the sense of an ileum anterior / posterior, inflare / outflare and shear dysfunctions (ilium superior / inferior).[26]

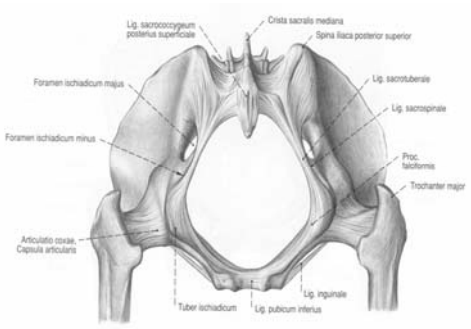


Fig. 2 Ligaments of the pelvis [27]

The pelvic girdle is part of the shock-absorbing system in the body and has static and dynamic functions. The static system lies within the clever osseous architecture of the ilium, sacrum and hip joint. The dynamic system (in the pelvis) is built by the myofascial system: the muscles of the pelvis and hip (pelvic floor, obturator muscles, pififormis muscle), the ligaments (sacroiliac ligaments, sacrotuberal ligament, sacrospinal ligament, iliolumbal ligament) (Fig.3) and the fascial system. Defects in the connective tissue activate theses myofascial chains

[26] Greenman P.E.: Lehrbuch der osteopathischen Medizin; Haug Verlag 2003
[27] figure taken out of: Sobotta: Atlas der Anatomie – Band 2 Rumpf, Eingeweide, untere Extremität; Herausgegeben von R. Putz und R. Pabst; Urban & Fischer Verlag 2000: 272

through neuronal signals to protect the injured tissue with the aim to balance the body.[28]

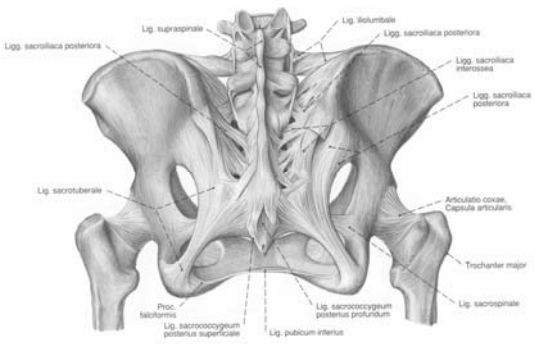


Fig. 3 Ligaments of the pelvis [29]

2.2.2 The foot

Regarding biomechanical influence factors of the lumbar spine it is indispensable to take the lower limb into count. I think, the fact that that myofascial chains are the basis for all static and dynamic functions in the body marks the importance of assessing all anatomical structures involved, which is in the case of lumbar pain also the lower limb.

In static and dynamic, the foot is the first structure to be confronted with the mission to reduce on coming shock forces and dispense it onto the whole body, so that, provided the fact that the myofascial system is in balance, the stress onto a single region is diminished. The foot arch is held up by the plantar aponeurosis, ligaments and muscles and demands a [30]

My conclusion is that in this sense a good function of the foot arch predetermines the balance of the knee, hip, pelvis and therefore also the lumbar spine.

[28] Meert G.F.: Das Becken aus osteopathischer Sicht; Urban & Fischer Verlag 2003
[29] figure taken out of: Sobotta: Atlas der Anatomie – Band 2 Rumpf, Eingeweide, untere Extremität; Herausgegeben von R. Putz und R. Pabst; Urban & Fischer Verlag 2000: 272
[30] Meert G.F.: Das Becken aus osteopathischer Sicht; Urban & Fischer Verlag 2003

2.2.3 The fascial system

Although anatomists define fascia as dissectible fibro-elastic tissue, from an osteopathic point of view fascial layers are the sustentacular part of the connective tissue and involve ligaments, tendons, meninges, and all tissues queuing the body cavities. They coat every muscle, the inner structures of the cranium, cervical, thorax, nerves, vessels, all organs and delimit them. Fascia blends into the pleura, pericard and peritoneum and connects bones, muscles and tendons. As part of the fascial system count also the horizontal diaphragms (plantar aponeurosis, pelvic diaphragm, respiratoric diaphragm, cervico-thoracal diaphragm, tentorium cerebelli) (Fig.4). Therefore it can be seen as one continuing structure throughout the whole body and can create dysfunctions or pass on restrictions to adjacent or distant regions, causing not only immobility, but also compression of blood/ lymphatic vessels and nerves that are passing through, along or in between fascial layers, inducing poor metabolism in other tissues. There is also a close relationship to the central nervous system through the Vater-Pacini bodies, which give afferent information and have great influence on neuromuscular reflex-mechanisms.[31]

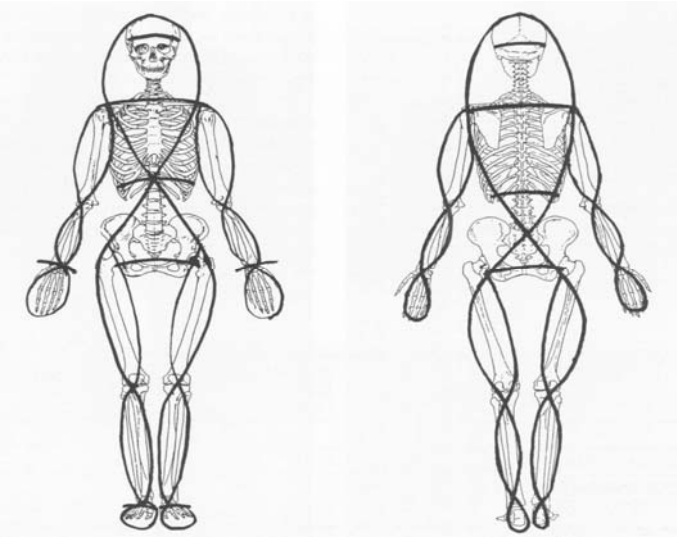


Fig. 4 Scheme of the myofascial chains and horizontal diaphragms [32]

[31] Debroux J.-J.: Faszienbehandlung in der Osteopathie; Hippokrates Verlag 2004
[32] figure taken out of: Debroux J.-J.: Faszienbehandlung in der Osteopathie; Hippokrates Verlag 2004: 93

I think the close relation of all fascial layers in the body makes it easier for me to understand how dysfunctions can passed on into further regions. Figure 5 schematically shows the fascial connections of the lower extremity, which provides a picture of possible dysfunctional behaviour caused by lesions in the lower extremity.

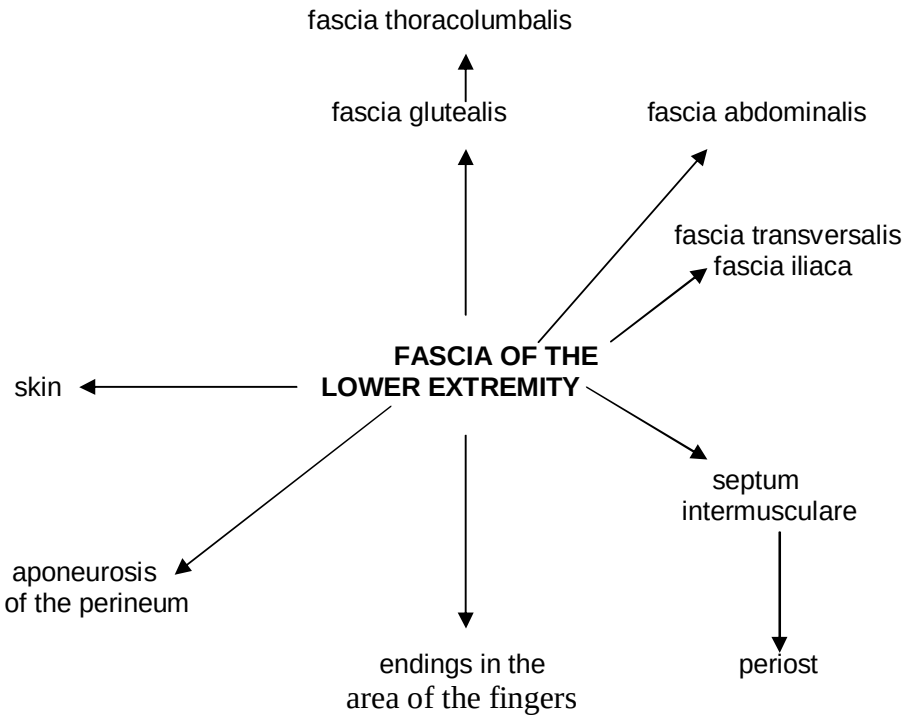


Fig. 5 Fascial connections of the lower extremity [33]

2.2.4 Attachments of the spinal dura

Present literature concerning the attachments of the spinal dura has quite large osteopathic relevance, regarding the fact that craniosacral osteopathy is supposed to influence dura tension.

[33] figure taken and translated from german out of: Paoletti S.: Faszien – Anatomie, Strukturen, Techniken, Spezielle Osteopathie; Urban & Fischer Verlag 2001: 49

The ligamentum nuchae is part of the functional region of the cervical spine and is an intermuscular septum, which runs from the external occipital protuberance to the spinous process of C7.[34] Although Platzer mentions a continuation of the ligamentum nuchae into the thoracic and lumbar spine by the supraspinous and intraspinous ligaments Gray's Anatomy rules out the structural distinction.
The more interesting aspect concerning the lumbar spine is probably the fact that Dean and Mitchell (2002) found direct fibrous attachments between the ligamentum nuchae und the spinal dura on the atlanto-occipital and atlanto-axial level.[35]

Interesting, concerning dural fixations and their potential role in low back pain, are Trolard's ligament, a link between the dura mater and the posterior longitudinal ligament on lumbar and sacral levels, Hoffman's ligamenta dorso-lateralia, linking the anterior radix and the anterior vertebral canal, and the opercula of Forestier, covering the intervertebral foramina laterally from the spinal ganglion and having contact with laminae and disci, rarely found in the newer literature but verified by Van Dun and Girardin (2006). They concluded that 'the attachments perceived between spinal dura and its surroundings may be considered to be the remains of an original unitary tissue, which will differentiate into full-grown ligamentous structures according to the unique functional heritage of the individual'.[36]

[34] Gray's Anatomy: the anatomical basis of clinical practice; Ed.-in-chief: Standring S.: ElsevierChurchill Livingston 2005
[35] Dean N.A., Mitchell B.S.: Anatomic relation between the nuchal ligament (ligamentum nuchae) and the spinal dura mater in the craniocervical region; Clinical Anatomy 2002May; 15 (3): 182-185
[36] van Dun Patrick L.S. Girardin M.R.G.: Embryological study of the spinal dura and its attachment into the vertebral canal; International Journal of Osteopathic Medicine Vol.9; Issue 3; Sept. 2006: 85-93

3 DEFINITION OF LOW BACK PAIN

3.1 Definition

In modern medical literature low back pain is defined in a non-specific and specific and an acute and chronic form. Whereas the specific low back pain (SLBP) is defined by a morphologically detectable aetiology (i.e. vertebral fractures, tumours, disc herniations, spinal stenosis, spondylolisthesis or inflammatory processes), the non-specific low back pain (NLBP) covers the large group of LBP syndromes without clear aetiology. Acute low back pain is defined by less than 4 weeks and chronic low back pain by persisting symptoms over a time frame of more than 3 months.[37]

3.1.1 Radiculopathy

Radicular low back pain is defined as nerve-root compression with irradiation into the pelvis/leg. Further clinical signs are the loss of sensibility in the corresponding dermatome, paresis of the characteristic muscle of the affected segment, reflex deficits, a positive Lasegue-sign and pain triggering through compression, sneezing and coughing. The differentiation to a pseudo-radiculopathy lies mainly in the neurogenic deficits.[38]

3.1.2 Non-specific low back pain

Scientists still debate about the term ‘unspecific low back pain’ because it only describes the fact that, at this stage, most of the back pain syndromes cannot clearly be assigned to a certain structures and therefore a specific therapy is precluded. Therefore a new trend in medical science, represented for example by Bodguk and Aprill, is to assign this group to a specified source of pain, like

[37] Weiland W., Wessel K.: Therapie des Rückenschmerzes- Was ist durch Studien belegt?; Fortschr Neurol Psychiat 2004; 72: 344-350
[38] Gerdesmeye1 L., Haake M., Goebel1 M., Wagner K.: Der Rückenschmerz ; Notfall & Hausarztmedizin 2004; 30: 319-324

discogenic pain, facet syndrome and sacroiliac joint pain, using higher differentiated diagnostic methods.[39]

Discogenic pain is defined as a nociceptive pain syndrome with its source in the outer part of the annulus of the intervertebral disc- an internal disc disruption (IDD). The MRI scan in this case shows a so-called high-intensity zone (HIZ) in the dorsal annulus, which is of unknown content and is speculated to be degraded nucleus material or an inflammatory process in an annulus fissure.[40]
Studies have shown that discogenic pain is quite common (40%) but degeneration of the discus is apparently more of genetic origin than of hard physical work or a constant sitting-position at work. HIZ are also frequent in persons without back pain and do not state whether the disc causes pain.[41]

The facet syndrome is defined as pain caused by the facets of the zygapophysial joints through an incarcerated or stretched capsule, an inflammation of the capsule or synovia, a subluxation of the joint, restricted range of movement caused by muscle-hypertension and degenerative changes. However, like most of all other unspecific low back pain syndromes a clear assignment of certain back pain symptoms to these joints is not possible. Degenerative changes in the joint frequently occur in elderly people but are often also verifiable in asymptomatic patients and clinical consequences out of an evidence of a facet joint related pain syndrome are rare.[42]

Sacro-iliac joint pain is quite common cause for back pain although there are no valid and reliable clinical tests and anamnestic indication for existing SIJ pain. The distinct diagnosis can only be through radiological-controlled blocks of the joint and are also quite successful for therapeutic intervention, as is in this case also manual therapy.[43]

[39] Hildebrandt J.: Gibt es einen unspezifischen Rückenschmerz?; Z Orthop 2004; 142: 139-145
[40] Kniesel B.: Diskogene lumbale Rückenschmerzen; Z Orhop 2004; 142: 709-715
[41] Hildebrandt J.: Gibt es einen unspezifischen Rückenschmerz?; Z Orthop 2004; 142: 139-145
[42] Hildebrandt J.: Gibt es einen unspezifischen Rückenschmerz?; Z Orthop 2004; 142: 139-145
[43] Hildebrandt J.: Gibt es einen unspezifischen Rückenschmerz?; Z Orthop 2004; 142: 139-145

Nachemson, Waddell and Bigos represent the majority of scientists opposing the this structural specifications, alluding to their opinion that in most cases a clear differentiation is neither possible nor useful and being labelled with a damaged structure can negatively influence the patient handling his situation. These strongly structure orientated diagnoses often rather describe radiological findings and therefore, especially if they do not imply any therapeutic or prognostic consequences, bear the risk that the patient gets caught in sorrow and grieve concerning his personal and professional future.[44]

In my opinion, to label low back pain by assigning it to a defect structure does only make sense if it entails a clear therapeutic intervention with a good outcome on a long term base and although patients mostly ask for a diagnose that names their problem, their only intent is to have someone finding a way to treat the structure causing the pain. In my osteopathic work a structure-defined diagnose according to radiological findings, like degeneration of the vertebrae or disc, is an important factor concerning containdications for certain osteopathic techniques but does not automatically indicate a certain treatment procedure, because even if it really is the pain causing structure (which is according to the mentioned studies above often not proved) the arising question is: what caused the degeneration and how can I help the patients body getting back into balance to cope with the degenerated structure?

3.2 The mental factor

In the anamnesis of low back pain patients, my questions concerning their private and professional situation and triggering events of acute pain phases often refer to a significant correlation between emotional stress and a worsening of the patients physical condition which gives reason to conclude that poor mental condition negatively influences the physical state of the patient or even the other way around, a chronic physical handicap impairs the mental state.

[44] Hildebrandt J.: Gibt es einen unspezifischen Rückenschmerz?; Z Orthop 2004; 142: 139-145

Studies have shown that in patients with chronic low back pain the fear of pain triggers a high incidence of motion and weight loading avoidance resulting in a constant progress of negative conditioning and over a long term leading to immobilisation.[45] The patients are then caught in a pathological behaviour pattern concerning their problems and the body's attempt of self-healing fails. The importance of psychological factors and their influence on chronic pain has been a frequent issue in studies in the last years. Turk and Okifuji[46] point out the importance especially the patient's appraisal of his symptoms and the ability of a self-management concerning the pain.

3.3 Low back pain- a complex clinical picture

The reason for the fact that low back pain still brings up so many controversial opinions about the sources of pain in conventional medicine might lie in the complexity of this clinical picture. From my point of view the structural findings described in literature are often the result of many influencing factors onto the patients body over a long period of time.

Acute pain very often disappears after a few days or weeks and is, if treated at all, mostly quite responsive to conservative therapy like pain medication and physical applications.[47]

In my experience, patients with chronic low back pain have a long history of acute episodes, which they only mention when they are explicitly asked for because a connection between these episodes in a time frame of years and the chronic pain now is often not taken into consideration.

Even in patients with a lumbar disc herniation and neurogenic symptoms, undergoing invasive nerve-root decompression, the rate of relapse (postnucleotomy-syndrome) is, with 10-30% (Fritsch et al. 1996), high. Zöllner et al. have shown that a nucleotomy has an influence on the biomechanical

[45] Weiland W., Wessel K.: Therapie des Rückenschmerzes- Was ist durch Studien belegt?; Fortschr Neurol Psychiat 2004; 72: 344-350

[46] Turk D.C., Okifuji A.: Psychological factors in chronic pain: evolution and revolution; J Consult Clin Psychol.; Jun 2002; 70 (3): 678-90

[47] Weiland W., Wessel K.: Therapie des Rückenschmerzes- Was ist durch Studien belegt?; Fortschr Neurol Psychiat 2004; 72: 344-350

behaviour of the lumbar motion segment in the sense of an increased range of motion, possibly leading to instability of the segment.[48]
Defined risk factors for chronic pain are a higher age, negative attitude of the patient to his disease, professional overload, poor bodily condition and the fact that the multi-causal genesis is often ignored from the physician.[49]

I think these facts already imply that low back pain is of a complex functional genesis and even if there is a defect stucture involved, from my osteopathic point of view the key to help the patient lies within treating the whole system including functional imbalances on structual and fluidic levels and certainly paying attention to his emotional and professional situation.

[48] Zöllner et al.: Der Einfluss einer Nukleotomieauf die biomechanischenEigenschaftendes lumbalen Bewegungssegmentes; Zentralbl Neurochir 2000; 61: 138-142
[49] Schumacher M.: Schmerztherapie der Wirbelsäule; Radiologie up2date 2002; 2: 263-278

4 PRINCIPLES OF OSTEOPATHY

The history of osteopathy goes back to Andrew Taylor Still in the 19th century who found the American School of Osteopathy in Kirksville. His autobiography tells us how osteopathy began and how his philosophy of osteopathy evolved out of the political and medical circumstances in the time back then. Still lost his belief in the effectiveness of medicine and drugs due to the loss of his children in a meningitis epidemic. Out of his grieve he tried to find a way to understand how the human body functions and which fundamentals build base to keep them in balance and help the body to heal itself. Stills considerations and observations formed the principles of osteopathy, which, even after the development of osteopathy all over the world, all cultural and historical changes, the huge progress of medicine, are still inevitable. The circumstances under which Still lived might have changed but the human body's own concept to self-healing has not.[50, 51]

Swope (1938) outlined the basic principle of osteopathy as so: 'A diagnosis is an opinion, that is the result of a comparison of abnormal findings with in literature described symptoms in the therapists' mind. The osteopath should never be satisfied with a named disease. He should be interested in the patient's whole picture of health. The main principle of osteopathy does not lie within the treatment of symptoms that are based on a pathological state. We try to find their cause.'[52]

4.1 The five principles

For me these principles are, even though the time and medical circumstances that influenced their development have changed dramatically, still appropriate and the fact that medicine at the time back then was lacking of technical and

[50] Still, A.T.: Das große Still-Kompendium; Jolandos Verlag 2002
[51] Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002
[52] I translatet it from the german quote in: Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002, 75

pharmaceutical opportunities saved the holistic appraisal of physiological and patho-physiological processes, which I think provides, in combination with the results of modern science, a good therapeutic outcome.

The five principles of osteopathy [53] [54] according to A.T. Still are:

- First principle: *Structure and function*

It bases on the fact that the structural conditions of tissue govern its function and the function of tissue governs their structure, meaning a healthy structure fulfils all functions that it is designed for and all functions are only as good as the structure is. For example, the functions of a joint are based on its shape and the tissue it is surrounded with. If the structure in the joint changes the functions will change. Or if the functions are not used to its whole extend over a period of time, the joint structures will change.

- Second principle: *Self-Healing*

Osteopathy believes in the natural power of the body to overcome diseases. If for some reason the body cannot get back into balance, the osteopath tries to support the patients' self-healing power by finding and resolving the restriction that blocks the healing process or to help the body adapting to new structural conditions if a tissue defect is irreversible.

- Third principle: *The body as a unit*

The body must be seen as a unit and cannot be subdivided. Although dividing the body into sections simplifies the analysis of structures and function, so done in allopathy, the complexity and correlation of bodily functions as a whole gets lost. For example, a disease or dysfunction is the weakest link and often resolves out of an imbalance in the body that started somewhere else. If we only try to treat the obvious dysfunction we might neglect the chance to find the source of the problem.

[53] Still A.T.: Das große Still-Kompendium; Jolandos- Verlag, 2002
[54] Liem T. Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002

- Fourth principle: *Rule of the artery*

The rule of the artery can also be altered in ‘ life is motion’ meaning the vital fluid of our body is the blood. Poor blood flow causes stagnation and fermentation in the tissues and therefore weak structure. Improving the blood circulation brings the body back to his self-healing power.

- Fifth principle: *The patient, not the disease*

The patient has to be seen as individual who impersonates all his genetic inherent and his life story. An osteopath should rather concentrate on the nature of the invalid and his functional behaviour than onto the attempt to label the patient regarding his symptoms. Disease is the bodies attempt to adapt in order to survive, therefore the osteopath must comprehend its total function.

4.2 Dysfunction

A dysfunction is defined as functional disorder developing out of anatomical or structural changes. [55]

4.3 The somatic dysfunction

According to Willard the somatic dysfunction (osteopathic lesion) is a term in osteopathy, used to describe a structural significant finding, a palpable, pathological change in the tissue quality, representing pathologies in the neuromuscular system but also in the visceral organs. Characteristics are: T.A.R.T. - tenderness, asymmetry, restricted range of motion, tissue texture changes and P.R.A.T. – pain, restricted range of motion, alignment, tissue texture changes.[56]

[55] Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002
[56] Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002

The osteopathic lesion is, from my point of view either of physiologic or unphysiologic origin. For me a physiologic osteopathic lesion is a dysfunction defined by imbalance of the tissue whereas the unphysiologic osteopathic lesion involves pathologies that cannot be changed through osteopathic techniques, which does not mean that that it precludes a treatment in order to help the body to cope in a better way with this pathology.

4.4 The osteopathic diagnosis

The osteopathic treatment is based on a comprehensive examination and holistic interpretation of the patient's situation and condition. The anamnesis, medical history, test results and radiological findings have to be taken into count for a clear differential diagnosis and to preclude life-threatening processes or tissue defects in the body which contraindicate certain osteopathic actions. Dysfunctions and lesions can be found through observation, palpation, active and passive movement, global and specific testing in certain regions or joints, global listening from the feet, head and sacrum in the levels of bones, membranes and fluids.[57]

For me personally, the osteopathic diagnosis is a 'snapshot' of the patient in the moment of his visit. It states his physiologic condition at this very moment and his potency to cope with all environmental influences and functional imbalances affecting his health.

4.5 Osteopathic techniques

Out of Stills philosophy and its resulting principles and their experience osteopaths all over the world developed numerous models to explain lesion patterns and find techniques to treat them. Some of them are disproved by

[57] Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002

biomechanical studies and therefore osteopaths are often criticized to cling to their myths in osteopathic treatment.[58]

In this section I will give a quick view on osteopathic treatment methods in order to understand the intention of the treatment actions in the case presentation.

4.5.1 Direct and indirect techniques

Dysfunctions in general can be treated with direct and indirect techniques. Direct means a correction into the direction of the restriction whereas in indirect techniques the osteopath follows the tissues into the direction of the least resistance until the body releases this pattern.[59]

4.5.2 Structural osteopathy

Joint mobilisation (direct)

The aim of this technique is to regain the full range of movement by a slow and repetitive mobilisation of the restricted joint into the restricted direction of the motion and thereby to improve the circulatory processes of blood and lymph system and reprogram the proprioceptors in the joint and surrounding tissues.[60]

HVLA (direct)

High velocity low amplitude thrusts have the purpose to regain full range of movement in the joint, to normalise the muscles-tonus by reconstituting the physiological activity of the proprioceptors and to improve the intra- and extra vascular fluid transport, with a short specific impulse into the restricted direction.[61]

[58] Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002
[59] Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002
[60] Greenman .P..E: Lehrbuch der osteopathischen Medizin; Haug Verlag 2003
[61] Greenman P.E.: Lehrbuch der osteopathischen Medizin; Haug Verlag 2003

Recoil Techniques (direct)

In recoil techniques the osteopath gives a short and quick impulse onto the area of the most resistance with compression and vibrations.[62]

MET (direct)

The Muscle energy techniques of Mitchell[63] aim at a rebalancing of the muscular system by applying post-isometric relaxation, isotonic contraction or isolytic contraction techniques.

Strain-counterstrain (indirect)

Jones (1981) found out that a restricted joint can be released by passively leading it to a pain-free position and maintaining this position for 90 seconds before the osteopath brings it back into neutral. The base model for this treatment is also a reprogramming of proprioceptors. Tender points in the muscles serve the diagnostic and treatment-control.[64]

Functional release technique (indirect)

The base of this technique goes back to Still and was later formed into a concept by Bowles and Johnston. The aim is to reach a release in the treated lesion through inducing motion and reacting on the body's' resistance with a change of the direction of the movement to ease the tension until all restrictions are loosened.[65]

Fascial and ligamentous release techniques

W.G. Sutherland's concept of direct and indirect techniques to treat dysfunctions that are mainly of traumatic origin is based on ligamentous, articular release (indirect) and myofascial release (direct). The principle is to give compression/decompression into the joint or fascia until the joint/fascia is easy to move, exaggerating the distortion to the point of the least resistance of the tissue

[62] Debroux J.-J.: Faszienbehandlung in der Osteopathie; Hippokrates Verlag 2004
[63] Mitchell F.: Handbuch der MuskelEnergieTechnik Band 1; Hippokrates Verlag 2004
[64] Jones L.H.: Strain-counterstrain; Urban & Fischer Verlag 2001
[65] Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002

and then, holding this position, balancing the bones, membranes and fluids until the cranial rhythm (tide) returns to the traumatised region.[66]

4.5.3 Visceral osteopathy

The aim is to treat the mobility and motility of the abdominal organs and its surrounding tissue, especially the abdominal fascial system- the suspension of the organs. Hereby direct and indirect techniques are required to improve the circulatory quality in the abdominal tissues and consequently the function of the organ.[67]

4.5.4 Craniosacral osteopathy

The principles of the craniosacral osteopathy are the motility of the brain and spinal cord, fluctuation of the cerebrospinal liquor, mobility of intracranial and intraspinal membranes, mobility of the cranial bones and the involuntary mobility of the sacrum. The aim of these techniques is a balance of the primary respiratory mechanism, whose physiologically cycle is 6-10 (Sutherland) times per minute, and release dysfunctions in the cranial bones, membranes and fluids and so revitalise the system.[68] In this case study the midline plays a major role in the assessment and treatment of the patient. James S. Jealous defines it as a bioelectric potency, developing out of the chorda dorsalis, building a primary line of orientation for the orientation of structure and function in an organism.[69] In practise it is a good way for me to locate the point of imbalance in the body and can be transferred to structural, fluidic, metabolic and energetic levels to balance the organism and support the patients potency of self-healing.

[66] Speece C.A., Crow W.T., Simmons S.L.: Osteopathische Körpertechniken nach W.G. Sutherland; Hippokrates Verlag 2003
[67] Liem T., Dobler T.K.: Leitfaden der Osteopathie – Parietale Techniken; Urban & Fischer Verlag 2002
[68] Liem T.: Kranisosakrale Osteopathie; Hippokrates Verlag 2001
[69] Liem T.: Morphodynamik in der Osteopathie; Hippokrates Verlag 2006

5 MANAGEMENT OF LBP IN OSTEOPATHY

The management of low back pain (LBP) in osteopathy cannot be stated generally since the approach to every patient is individual. However I think, according to the principles of osteopathy the multi-causality of low back pain, as described in section 3.2, is probably the key to a successful treatment. Handling psychological factors like professional and/or private stress, the personal attitude to the body's reaction on stress and the compliance of the patient in therapeutic actions are for me just as important as dealing with the structural and circulatory lesions.

5.1 Expert interview with an osteopath

For an expert opinion concerning low back pain in general and in particular as presented in this case study, I took an interview with Dr. Christian Wutzl, D.O., an experienced osteopath and physician, to get a statement on his personal point of view on this topic out of his experience (original interview in German see appendix)

1. How long have you been working as an osteopath and how did you get to become an osteopath?

   I finished courses for kinesiology (Physioenergetik) and A.O.R.T. (Jones techniques) and then i started the course for osteopathy, finishing in 1997 at the WSO.

2. You are also a medical practitioner. Do you mainly work osteopathic or do you apply other therapeutic interventions as well? If so, what are they?

   Personally I only work as an osteopath but in my practise holopathy, which is based on the energetic measurement and therapy on electro-accupunctur-points, is offered as well.

3. Due to the low number of studies proving the efficiency of osteopathic treatments, osteopathy is quite often contentious in medical spheres. What is your opinion about it?

   I personally do not care about it at all, since the reputation of osteopathy among all techniques in holistic medicine is excellent.

4. Concerning the treatment of chronic therapy-resistant low back pain in general: Do you think that an osteopathic treatment can help the patient and why?

   Provided the fact that we are dealing with a 'physiologic' lesion (= osteopathic lesion), osteopathy is the treatment of choice because it involves not only structural but also functional techniques (key word: 'fluid in the fluid'). For 'unphysiologic' lesions (i.e. listhesis) the prognosis is markedly adverse.

5. In your experience, what are the most common mistakes in an osteopathic treatment of patients with low back pain?

   When the treatment is 'narrowly' fixated on the structural level.

6. You have supervised the treatments of this case study. How would you estimate the presupposition of the patient for a successful treatment?

   Good, in combination with 'discipline', meaning physiotherapeutic exercises and prevention of one-sided physical load. The problem lies within the duration of the pain (negative conditioning) and the lack of discipline (relapsing into old patterns for example through the moving).

7. From your point of view, what are the main causes for the symptoms of the patient?

   A poor midline and the inability to equalize the imbalance of the shifted weight-bearing axis on a long-term basis like for example in the case of the foot lesion (!!!).

8. What status in the osteopathic treatment do you think has the existing disc lesion and ensued back surgery?

   The 'unphysiologic' lesion can be quite good balanced through fluid techniques. From my point of view it is not superficial.

9. What do you think are the factors influencing the symptoms of the patient the most in her daily life?

   The mental conditioning on the lesion and the physical overload.

10. In your opinion, was the success of the osteopathic treatment satisfying within this period of time?

    Yes, because many levels were treated.

11. How would you estimate the patient's prognosis and do you think that an osteopathic treatment can lead the patient to be free of pain?

    In order to reach this the patient would have to be focused on the 'potency'. Otherwise 'the half glass stays half-empty instead of half-full'.

6 METHOD

This thesis is based on a single subject design. One patient with persisting low back pain was evaluated and treated osteopathicly. The time frame of the whole treatment process was 2 ½ months. Number and interval where not set in advance to keep up the normal procedure of an osteopathic treatment process. The treatment outcome was recorded with two life quality scores and a for this study designed pain diary including a visual analogue scale.

In order to maintain the standard and reduce the error source due to lacking experienced, all treatments were supervised by the experienced osteopath Dr. Christian Wutzl D.O..

6.1 Life quality scores

As an outcome measurement of an osteopathic treatment in this case study the most reliable and effective way was to use a life quality score to capture the symptomatic changes in between the treatments.
Two validated and reliable scores were chosen to present the evaluation of the patients' life quality and changes in between the osteopathic treatment. The patient completed both prior to each appointment.

6.1.1 SF-36® Health survey (German version)

The SF36® is a 36-item questionnaire valid[70, 71, 72, 73] and reliable[74, 75, 76] to measure health status (Ware and Sherbourne 1992).

[70] Brazier J. E., Harper R., Jones,N.M.B., O'Cathain A., Usherwood T., Westlake, J. : Validating the SF-36 Health survey questionnaire: new outcome measure for primary care; British Medical Journal 1992; 305: 160-164
[71] Anderson C., Laubscher S., Burns R: Validation of the short form 36 (SF-36) health survey questionnaire among stroke patients; Stroke 1996; 27 (10): 1812 –1816
[72] Ware J. E.: The MOS 36-Item Short Form Health Survey (SF-36). In Sederer, L. I & Dickey, B (1996). Outcomes Assessment in Clinical Practice; Baltimore: Williams and Wilkins
[73] Ware J. E, (1993) SF-36 Health Survey: Manual and Interpretation Guide. Boston: The Health Institute, New England Medical Center

The 36 items give an algorithm score in 8 scales in numbers from 0 (poor) to 100 (good). The scales are:

- PF = physical functioning (10 items)
- RP = role limitations due to physical problems (4 items)
- BP = bodily pain (2 items)
- GH = general medical health (6 items)
- VT = vitality (4 items)
- SF = social functioning (2items)
- RE = role limitations due to emotional problems (3 items)
- MH = mental health (5 items)

A second score, the component summary score, is built by summarizing the scales concerning the physical condition (PF, RP, BP and GH) = Physical component summary (PCS), and concerning the mental condition (VT, SF, RE and MH) = Mental Component Summary (MCS).

6.1.2 Owestry-disability-index (ODI), German version

The ODI (German translation) is a valid, condition-specific questionnaire, recommended for use with back pain patients.[77]

In 10 sections pain intensity, personal care, lifting, walking, sitting, standing, sleeping, sex life, social life and travelling are interrogated. Each section has 6 answering possibilities, which are rated 0 (no pain/vitiation) to 5 (maximum pain/vitiation). The score ranges from 0% (no pain/derogation) to 100% (maximum pain/vitiation). The ODI score is calculated as so: the sum of all scores

[74] Ware J. E and Sherbourne C. D . The MOS 36-item short form health survey (SF-36): I. Conceptual framework and item selection; Medical Care 1992 Jun; 30: 473-483

[75] Scott K. M., Tobias M. I., Sarfati D., Haslett S: SF-36 health survey reliability, validity and norms for New Zealand Australian and New Zealand Journal of Public Health 1999; 23:, 401-406

[76] Brazier, J. E., Harper, R., Jones, N.M.B., O'Cathain, A., Usherwood, T., & Westlake, J.: Validating the SF-36 Health survey questionnaire: new outcome measure for primary care. British Medical Journal 1992; 3 05: 160-164

[77] Mannion A.F. et al: Development of a German version of the Oswestry Disability Index. Part 1: cross-cultural adaptation, reliability, and validity; Eur Spine J. 2006 Jan;15 (1): 55-65

(0-5 in each section) builds the total score and is then divided by: 5 x the number of completed sections and then multiplied by 100 to receive a percentage.[78]

6.2 Pain diary

In addition to the acknowledged scores, a pain diary was created to observe the patient's daily state of health. Therefore the diary was structured into 4 sections: night before, morning, afternoon and evening. In each section any observed physical discomfort was recorded, defining the location and type of sensation and activities that have taken place beforehand. The pain intensity of each day and section was recorded using the visual analogue scale (VAS [79]). The VAS asses the momentary state of pain on a line 10 cm long with only two definitions at the beginning and the end of the line: no pain and most possible pain. The non-scaled form of the VAS was used to prevent the patient from being visually affected by scaling. The pain extend was captured in a millimetre measured value.

The diary was continued daily and started 6 weeks before the first appointment in order to capture the changes during the period of regular treatments.

6.3 Osteopathic assessment and treatment

The osteopathic evaluation and treatment was run like in my daily osteopathic practise. A set of evaluation factors was build and observed throughout the whole treating period.
The first evaluation was more comprehensive in the anamnesis and global testing.

First evaluation factors where:

- Anamnesis

[78] www.orthosurg.org.uk/odi/
[79] De Boer A.G.E.M. et al: Is a single-item visual analogue scale as valid, reliable and responsive as multi-item scales in measuring quality of life?; Biomedical and Life Sciences, 2004 Mar; 13 (2): 311-320

- Observation of the patient in standing position, active and passive movement of the spine (bending forward, backward, side-bending, rotation) in standing and sitting position

- Palpation/scanning of the tissue texture along the spine

- Global listening and craniosacral assessment of the midline, sacrum and cranium (on fluid, membranous and structural level)

- Global testing of joint motion, viscera and soft tissue such as fascia and muscle

- Specific testing of joint motion in all dysfunction-related joints (spine, pelvis, foot, hip, knee and ankle)

- Safety tests (Lasegue, Valsalva, vertebral artery test, palpation of the abdominal aorta)

Before each following treatment the patient was assessed through observation of the spontaneous movement and positioning, a short anamnesis on changes since the last treatment or occurring symptoms, global listening, assessing the midline and specific testing in the designated dysfunction-area. Then a treatment plan was set and recorded with all parameters that would be worked on and that changed within this session. All new necessary treatment-steps that resulted out of tissue changes within the treatment where recorded as well. At the end the new status was compared to the beginning and a new plan and interval for the next session was set. The following appointment was again started with an assessment of the patient and comparing the new status after the treatment-interval with the plan made at the end of the last treatment (Fig.2). In this way the most conspicuous

dysfunction in the body in this specific moment was captured and all alterations that had been started in the body where being taken in account too.

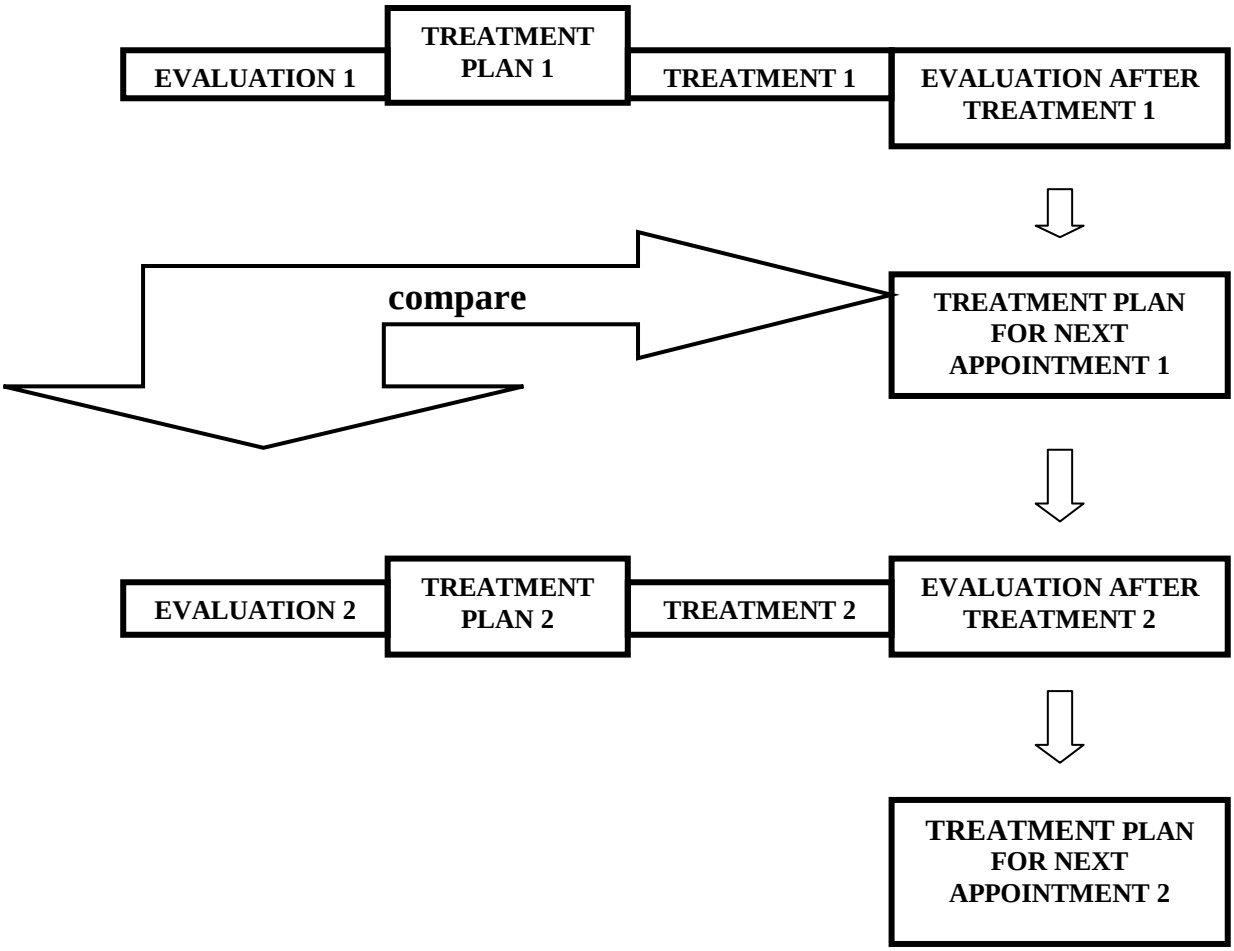


Fig. 6 Scheme of the treatment process

7 CASE PRESENTATION

7.1 The patients case history

7.1.1 Anamnesis

Date of Birth: 26.07.1951
Sex: female
Family status: divorced, 2 sons (34 and 30)
Profession: retired since 1 year, worked as a shop assistant

1.What is your reason for an osteopathic treatment?
Lumbar pain and giving way symptoms in the left leg which have led to tumbles, without obvious reason, in the last couple of months

2.When did those complaints start?
Pain in the lumbar and cervical spine have been present on and off during the last couple of years. It came to a peak end of 2005.

3.What kind of pain do you have?
Lumbar pain, occurring especially after static behaviour like sitting and standing for a while but also after a long walk including irradiations into the left leg and sharp, tearing pain from the lumbar spine irradiating in a girdle sensation to the stomach.

4. Do you have any other pain or discomfort?
Yes. Pain in the cervical spine over years and the left foot is swollen most of the time and feels different than the other.

5. What kind of treatments did you have for these problems?

I had physical therapy for the cervical and lumbar spine a few times and pain medication. In autumn last year a periradicular infiltration in my lower lumbar spine was done twice. I felt a little bit better after the first one but the pain came back so I had a second one which did not bring any relieve, so that end of last December I decided to have the surgery done. After that I felt quite good for a while. I had physical therapy in the beginning but could not quite keep up the daily training. And then the symptoms started again and I fell twice within 2 weeks in spring 2006 because my left leg gave way. And now I am afraid that I will get back to the point where the pain gets unbearable.

6. Did you have any traumas?

I had my leg ankle broken twice. Once 16 years ago and the second time 2 ½ years ago, both without surgery.

7. Does your left leg still give you trouble?

Yes it is swollen quite a lot- mostly in the calf down into the foot

8. What kind of surgeries did you have done?

Appendectomy seven years ago, ovariectomy left 16 years ago shortly after my foot fracture, a laryngeal tumour and vein stripping in both legs.

9. How many pregnancies did you have?

I had 3 pregnancies. I gave birth to two children and had one abort.

10. Did you have any problems during your pregnancies or delivering?

I didn’t have problems during my pregnancies. My first son was delivered with a forceps. My second son came in breech presentation but I did not have any major problems.

11. How was your cycle?
I did not have any problems when I was young. When I had my ovariectomy the surgeon found out that my second ovary didn't work and I was prescribed hormones that I took for 10 years.

12. Do you take any medication right now?
Yes I am on medication easing my high blood pressure and my asthma.

13. How is your digestion?
I did have diarrhoea on and off and had enteroscopy and gastroscopy without any significant result.

14. Do you smoke and how much?
Yes 20-30 cigarettes a day.

7.1.2 Medical history

18.11.1999	*MRI cervical spine:* Chondrosis C5/C6 paramedian left with prolapse and stenosis of the foramen. Slight changes on the right side.
4.03.2001	*MRI lumbar spine:* malpositioning of the lumbar spine, slight osteochondrosis L3 to L5 with moderate median to paramedian left pointed protrusions. In these segments the radix is already affected in
22.06.2002	radical recurrent varices surgery with crossectomy, right proximal stripping v.saphena magna, left distal stripping v.saphena magna, ligation of insufficient perforans veins both sides

17.02.2003 duplex-sonography of the big cervical arteries: 3mm plaque on the right bifurcation, all other vessel parts show regular stream

14.06.2004 abruptio ossea apices mall. lat. sin., contusion mall.med.sin – lower leg scotchcast

22.02.2005-24.02.2005 final report stationary examinations because of retrosternal pain with irradiation to both shoulders paired with anxieties and state of tension, all cardiovascular tests negative, recommendation of an orthopaedic evaluation of the cervical and thoracic spine

09.08.2004 densitometry: moderate diminution of bone density in the lumbar spine and femoral shaft

09.08.2005 duplex-sonography of the big cervical arteries: no significant changes in comparison to the assessment in 02.2003

17.08.2004 cystectomy right larynx

06.09.2005 *esophago-gastro-duodenoscopy*: small esophageal hernia, mucosa of the stomach shows patchy erythema, subtle granulation and pointy exudates in the antrum, 3mm ulcus prepylory, obvious signs of an acute duodenitis

06.09.2005 colonoscopy: hemorrhoids gradeII, proctopolypus

05.10.2005 CT-controlled periradicular infiltration: radix L4 left

21.11.2005 CT-controlled periradicular infiltration: radix L4 left

27.12.2005 microsurgical discusextraction- sequestrectomy: L4/5 left

24.03.2006 *epigastric sonography:* spleen cysts, no pathological findings

05.04.2006 *colonoscopy:* hemorrhoids grade II, no otherpathological findings, anatomical facts make the colon transvers not completely accessable via endoscopy

14.04.2006 *hypogastric sonography:* no pathological findings

7.1.3 Aim and expectations of the patient

The patients' daily life is affected by pain in the lumbar spine and by occasional giving way symptoms in her left leg. She fears that her problems will add to the point where unbearable pain forces her to have another surgery. Her aim and expectation is to avert a second operation and to get back to a stable daily situation without pain to get back her life quality.

7.2 The osteopathic treatment

7.2.1 First appointment – October 2nd

Osteopathic evaluation 1

Observation:
In standing position the patient shows a compensating pelvic shift to the left with the left ileum superior. Bending forward is very good in general (the finger-floor-distance can not be taken into count in this case because the patient reaches the floor easily) but a poor flexing in the lumbar spine is mostly compensated in flexing the hips and the thoracic spine and quite flexible dorsal leg muscles. Extension is good. The patient describes pain in her left sacroiliac (SI) and lumbar region in both movements. The quality of side bending is poor on both sides although the range of movement seems quite good.

Tests:
All standing neurological tests (heel and tip walking, single leg stance) are negative. The Vorlauf-phenomenon is positive both standing and sitting position on the left side. Rotation in the thoracic spine is diminished by a quarter to the

right sitting also rotation in the cervical spine by a third to the left. L3 and L5 in flexion lesion, C2 posterior left, C3 posterior right, C5 posterior left, C6 posterior left. The occipitoatlantic joint is compressed on the left side with the occiput posterior.
The left ileum is in an anterior position, the left SI joint in compression. Both hips have a good range of motion although the left hip joint is compressed.
Lasegue, reflex and resistance tests in both lower extremities are negative.
The left talocrural articulation is in inversion lesion, talocalcanean joint and the superior and inferior talofibular joints are in compression, the left fibula is inferior and the talus anterior.
All safety tests (Valsalva, vertebral artery, abdominal aorta) are negative.

Craniosacral findings:
Feet: In prone position the patient shows a midline shift to the left side with a fulcrum in the left pelvic area, a fluid lesion in both legs (more in the left) and pelvic region, prominent vertebraes in a sense of poor fluid flow: L2/3, L4-5, T12, T4 and C2, C5-6 are compressed as well as the left calcaneus and talus.
Cranium: The cranium shows compression in the spheno basilaris suture (SBS) and ethmoid, poor lateral fluctuation, a dural compression and congestion in the cysterna chyli.
Sacrum: The sacrum shows an intraosseous lesion in the fluid level with a fulcrum in the ovarial and sigmoidal region, intraosseous density in the left ramus pubis. The midline is shifted to the left side.

Visceral findings:
Poor motility of the descendend colon and sigmoid as well as in the uterus, fulcrum in the deep left pelvic tissues. There is poor mobility and motility of the left rein.

Summary and interpretation of the findings

The patient presents an ascending lesion pattern on the left side starting from the left foot to the left occipitoatlantic joint. Key points are the dysfunction in L2/3,

Th10-12, the descendend colon and the left pelvic region. Important relations of vertebrae and innervations of abdominal organs in this case are the sympathic innervation of the lower extremity (Th 10- L2). Related organs of the restricted vertebrae are: Th12 (peritoneum, small intestine, lymphatic circulation and reins), L2 (bladder, colon) and L3 (ovaries, uterus). The restricted vertebral segments match with the visceral findings.

From this first evaluation and the medical history and anamnesis a complex lesion pattern of the whole left side is quite prominent. The injury of the left foot and ankle 20 years ago seems to have played a major roll in the development of the present imbalance of the body. It will be vital to treat the foot and ankle joints and to balance the weight-bearing axis of the whole left leg in order to change the massive overload on the lumbar segments and tissues. The visceral findings (colon left and rein) and peritoneal tension in the left pelvis might be partly origin of the presented lesion pattern as well as the restricted scar of the ovariectomy (fascial lesion pattern).
My impression of the patient is that mental stress in combination with physical overload and the metabolic situation (smoking, nutrition) also seem to affect the patients' overall condition.

Treatment Plan 1

All of the evaluated dysfunctions in this moment show a highly fluid-related lesion pattern. So the first step will be to balance all fluids through craniosacral techniques, which are probably partly a compensation for structural lesions especially of the left foot and ankle. The sacrum will be the first region to start with because all dysfunctions seem to be related to the left pelvic area. Further on it will be necessary to work on all joints in the left foot, tibia and fibula on a fluid, interosseous and membranous level (structural techniques onto the joints seem to be to early at this stage considering the long maintained lesion pattern and its resulting compensations) and balancing the SBS.

Treatment 1 (Fig.7)

Starting the treatment with the sacrum (1) induced balancing the SBS (2) to stabilize the fluids. After that the ankle was treated with balanced ligamentous techniques, the restriction in the fibula was treated using a recoil technique onto the superior and inferior joints and an interosseous release technique as well as a deep fascial release of the interosseous membrane (3).
After the treatment the midline was much more integrated and the cervical dysfunctions diminished.

Treatment plan for the next appointment

The next appointment will be in about one week to prevent the patient falling back into her old lesion pattern. The focus will be onto the treatment of the descendend colon, left pelvic region, and the foot. The SBS and occipitoatlantic joint will be under survey.

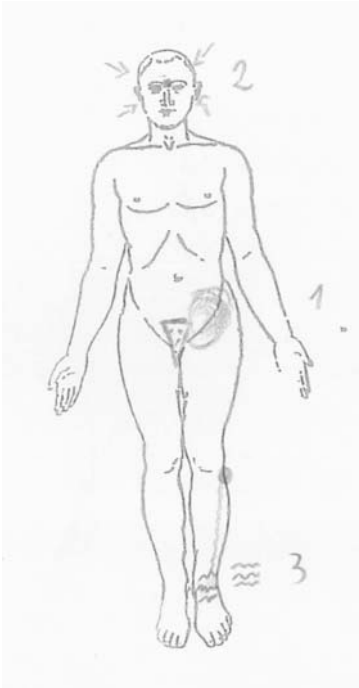


Fig. 7 Scheme of treatment 1

7.2.2 Second appointment – October 10th

Osteopathic evaluation 2

The overall impression is that the result of the first treatment has been maintained. The dysfunction in the left ileum and pelvic (restricted SI joint, compressed ileum, compressed pubis, tension in the peritoneum and the ovarial region) area is accented. A slight compression in the SBS is palpable. The patient reports a tearing sensation in the left wrist joint but does not show any restrictions.

Treatment plan 2

The plan for today is to start again with balancing the SBS, then work on the pelvis starting with a fluid technique on the sacrum, balancing the left pelvis and again working on the foot.

Treatment 2 (Fig.8)

The SBS reacts much faster than a week ago loosening the compression, presenting a compression of the dura and ethmoid, not fully releasing in the treatment (1). The balancing of the SI joint through the sacrum and ileum results in an accented fascial dysfunction around the scar of the ovariectomy and therefore followed by an indirect fascial technique on he scar, which takes quite a long time to release (2). After working on the peritoneum und the colon descendens and a MET on the psoas and the left ileum (posteriorising,) the fluid system in the pelvis seems to improve (2). The treatment of the foot and ankle is focused on the calcaneus and talus with interosseous techniques (3). A re-evaluation of the whole system indicates a decompression of Th12 (4) through a HVLA technique, also giving input onto the cysterna chyli. A global fluid balancing closes this session.

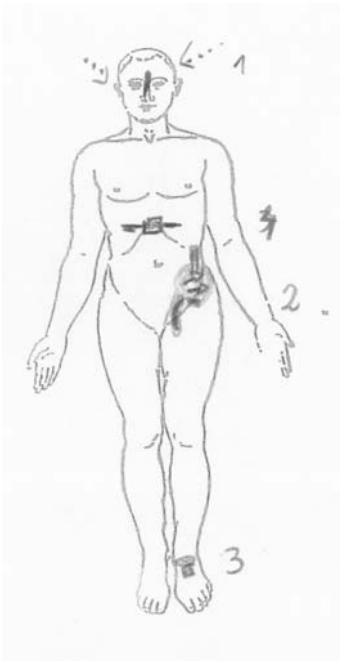


Fig. 8 Scheme of treatment 2

Treatment plan for the next appointment

The focus will be on the cysterna chyli and sacral plexus, foot and ankle and the scar.

7.2.3 Third appointment – October 18th

Osteopathic evaluation 3

The reported pain in the left wrist joint are gone since the last treatment. In the global evaluation the restricted region in the left pelvis is still prominent as is the fascial dysfunction around the scar. The restriction in the left ankle and foot has improved as well as the fluidal situation. The state global fluid circulatory is quite well. The SBS is quite well balanced.

Treatment plan 3

Today's focus will be again on the left pelvic region, scar and on the foot/ankle as well as on the alignment of the left leg in sense of the weight bearing axis. The next appointment should be scheduled in about one week.

Treatment 3 (Fig.9)

The treatment begins again with the sacrum and then balancing the ileum and the sacrum to release the pelvic tension, then a fascial release of the scar, which reacts very quick (1). The work on the weight bearing of the leg starts with myofascial realease techniques on the upper leg (hereby especially the region of the adductor muscles) (2), lower leg (3) and foot (4), and the thoraco-lumbar fascia. The system seems to integrate the structural changes very well. The treatment finishes with the global fluid balancing.

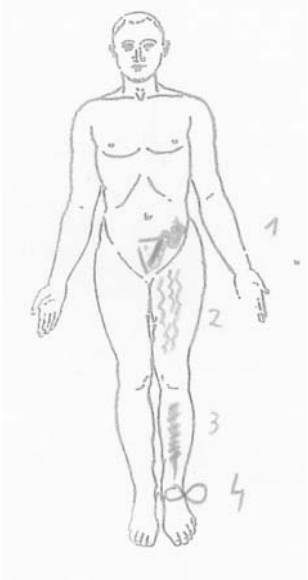


Fig. 9 Scheme of treatment 3

Treatment plan for next appointment

Working on the foot and ankle structurally including the knee and hip and a new appointment in one week is scheduled.

7.2.4 Fourth appointment – October 24th

Osteopathic evaluation 4

The patient reports of the diagnosis of a beginning cataract in the left eye but doesn't seem to upset about it. In general her bodily condition is much better on a global fluid circulatory level as well as in the standing position, where the weight bearing is much more centred, the pelvic shift decreased and the active movement in the lumbar spine seems to be smoother.

Treatment Plan 4

Structural release techniques on the foot, ankle, knee and hip and the next appointment in about one week are scheduled.

Treatment 4 (Fig.10)

This treatment is started with a HVLA technique to release the compression of the talocrural articulation and to bring the talus back into its position (1) and a myofascial release of the plantar fascia (2). The knee reacts quite well on a global dynamic fascia technique. Then a myofascial technique to decompress the hip is applied (3) and supported by balancing the scarum and ileum (4). The treatment finishes with a craniosacral treatment with focus on a centralising of the midline and improving the circulation around the cysterna chyli (5).

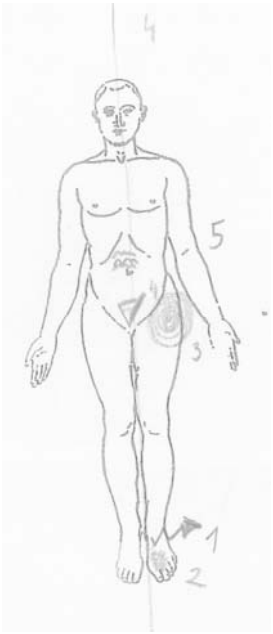


Fig. 10 Scheme of treatment 4

Treatment plan for the next appointment

The re-evaluation will show how the body integrated the changes through the treatment. The system seems quite stable and therefore a time frame of three weeks until the next appointment is suggested.

7.2.5. Fifth appointment – November 14th

Osteopathic evaluation 5

The patient reports persisting vertigo, the blood pressure is normal. She claims to be stressed resulting from the impending moving to a new apartment and leaving her old home after 30 years and to feel ‘not centred’ and instable, which gets better towards the evening. From the osteopathic point of view a slight stagnation of the fluid circulation is palpable as well as compression in the SBS. The left pelvic dysfunction has diminished. Colon and rein have poor mobility and the left occipitoatlantic joint is in dysfunction (occiput posterior). The foot and ankle are quite good apart from the talonavicular joint.

Treatment plan 5

Local myofascial release in the left pelvis, mobilisation o the left rein and the descendend colon. Structural release techniques on the talonavicular joint.

Treatment 5 (Fig.11)

Starting with the sacrum and the ileum with a craniosacral treatment (1), hypertension in the pelvic floor appears to be accented. Therefore a myofascial release on the pelvic floor through the obturator foramen and at the same time a inhibition on the scar are applied (2). Then the talonavicular joint is treated with a balanced ligamentous technique and after the release easily corrected with a HVLA onto the navicular (3). At the end of the treatment the occipitoatlantic joint is the most prominent dysfunction and is corrected with a HVLA technique (4) and then the fluid system is balanced (5) until the patient is stable.

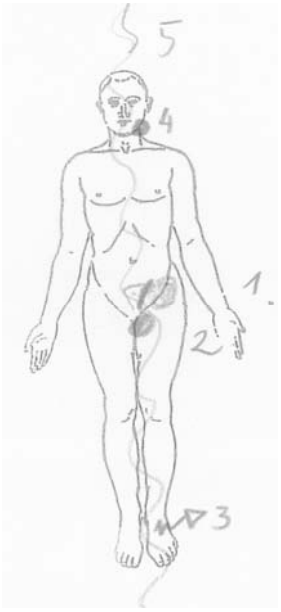


Fig. 11 Scheme of treatment 5

Treatment plan for the next appointment

The plan for the next treatment will be developed out of the findings at the beginning of the next appointment, which will be scheduled in about 3-4 weeks.

7.2.6 Final appointment – December 18th

The scheduled appointment on December 5th was cancelled deferred by the patient due to being busy moving although the lifting of heavy boxes and the physical and psychological stress has kicked the patient back into massive pain. A final evaluation and interview was then held 6 weeks after the last treatment.

Final evaluation

Due to the patients moving to a new flat the patient is physically exhausted and complains about pain in the back, arms and neck. From an osteopathic point of view the patient has fallen back into her old pattern but is still more balanced than before the first appointment. Structural dysfunctions are found in the talocalcanean joint, the sacrum and ileum, the SI joint, TH12, TH4, C6/7, C2/3, and the occipitoatlantic joint left. From a craniosacral point of view the dura is strongly compressed but reacts quite good on a fluid balancing. The midline is slightly shifted to the left, as is the weight-bearing axis in the left leg.

Final interview with the patient

- How did you experience the osteopathic treatments?
I think it is very good. I felt comfortable in the treatment and have trust in your techniques. And although you have explained what you are doing it is impossible for me to understand how those techniques are able to improve my physical problems. I was quite hard for me to lie still when I cannot feel a technique that you are applying.

- Do you think the treatment helped your symptoms to get better?

At the moment I cannot really say anything about it because the moving really did damage to my physical condition and again raised the level of pain. Before that I realized small improvements but I am not able to state whether this was because of the treatment or not.

- What do you think causes your recurrent physical problems?

I think it is mostly physical overload and during the time I had to fill in the pain diary I realised that mental stress might worsen the symptoms as well.

- Would you consider further osteopathic treatment and why?

Yes, because I have tried so many ways to get better and nothing really helped. I tried physiotherapy too but have to admit that I stopped doing the exercise program at home because the exercises were too complicated and I didn't really know what they were aiming at. I think the osteopathic treatment and a few exercises that are not too complicated would help me a lot.

8 RESULTS

8.1 SF-36 score

All SF-36 results are presented in numbers from 0 (poor) to 100 (good).

8.1.1 SF-36 total results

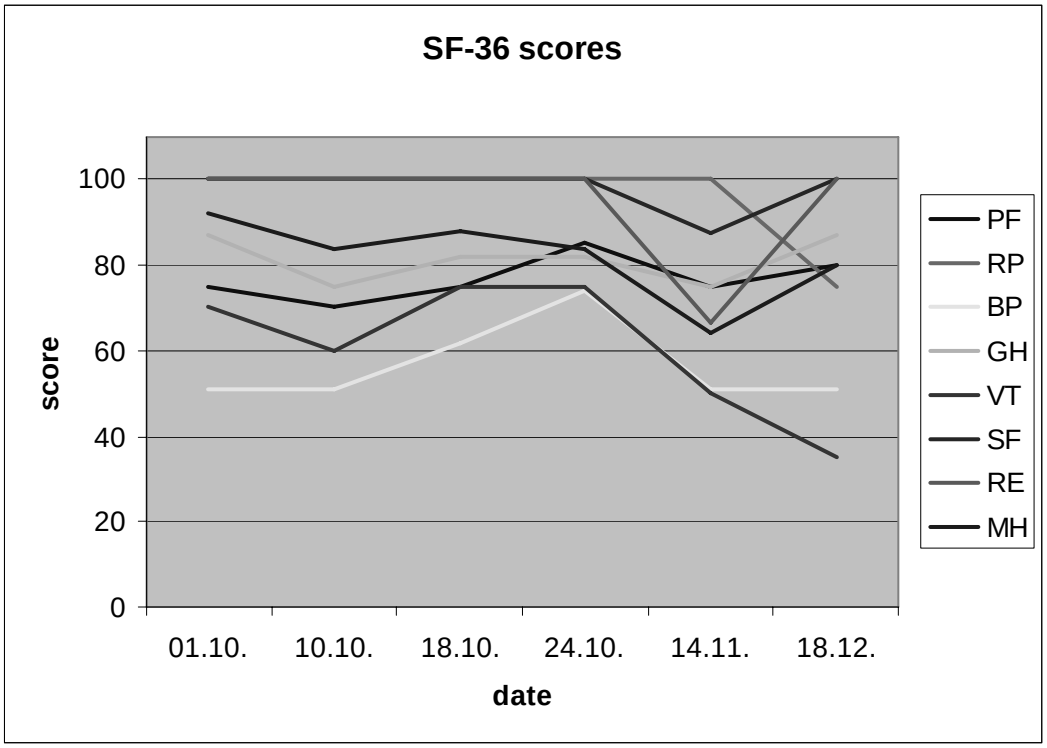
The health status scores of each testing, subdivided in the eight scales, are presented in Tab. 1. The first testing was done before the first osteopathic treatment so it represents the initial condition at the beginning of the treatment process.

SF-36® Health status scales	01.10.	10.10.	18.10.	24.10.	14.11.	18.12.
Physical functioning (PF)	75	70	75	85	75	80
Role limitations - physical (RP)	100	100	100	100	100	75
Bodily pain (BP)	51	51	62	74	51	51
General medical health (GH)	87	75	82	82	75	87
Vitality (VT)	70	60	75	75	50	35
Social functioning (SF)	100	100	100	100	87,5	100
Role limitations - emotional (RE)	100	100	100	100	66,7	100
Mental health (MH)	92	84	88	84	64	80

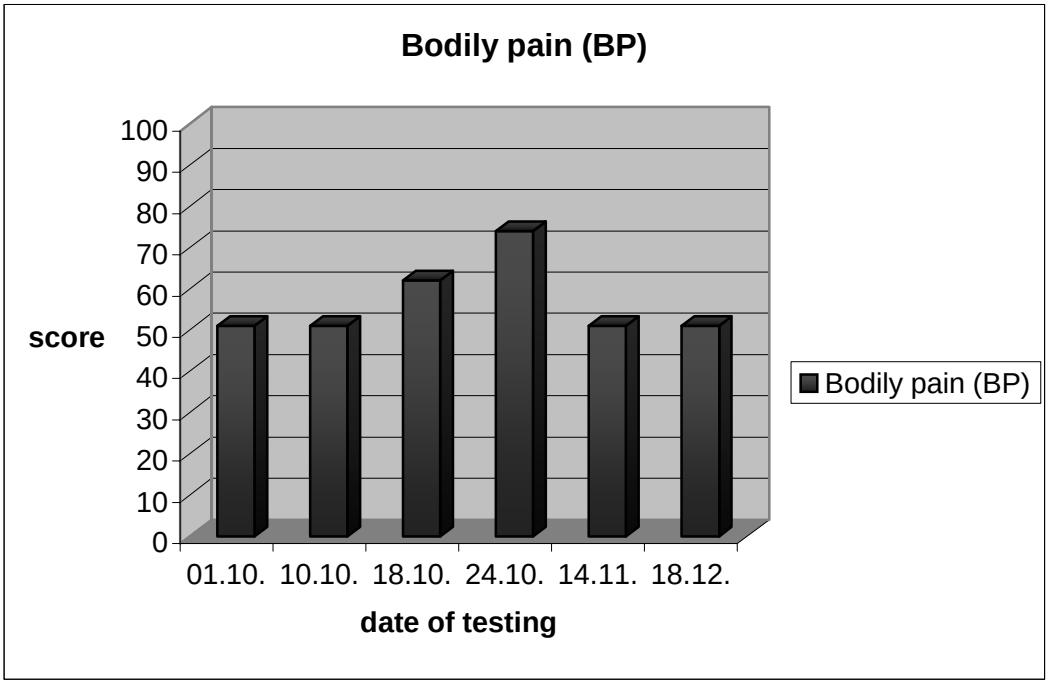
Tab. 1 Sf-36® health status scores

The scores in average show a light increase towards the fourth testing (24.10. = before the third treatment) followed by a significant drop in the fifth testing (14.11.) as displayed in Diag.1.

Social functioning, and role limitations emotional seem to be quite steady at a high of 100 points, with the exception of the fifth testing. Role limitations due to physical problems are steadily at a high of 100 points and only drop at the last testing. Vitality rises is highest at the third and fourth testing but drops significantly in the last two tests. The bodily pain scale shows an improvement of 23 points (or 23%) between the first and fourth testing and drops then back to the initial score (Diag.2). General medical health and physical functioning fluctuate steadily in a range of 12 and 10 points.



Diag. 1 SF-36® scale scores



Diag. 2 Range of the bodily pain scores (0 = poor, 100 = good)

8.1.2 Component summary score

The PCS (PF, RP, BP, GH) shows a light increase of 5, 4 points towards the fourth testing and then drops back again to the initial score. The MCS does not show any significant trend, apart from a significant drop at the fifth testing, which is in the time before the patients moving.

Component summary score	01.10.	10.10.	18.10.	24.10.	14.11.	18.12.
Physical component summary (PCS)	45,6	44	47	51	49,2	45,8
Mental component summary (MCS)	61,2	58,5	60,3	57,7	45,6	54

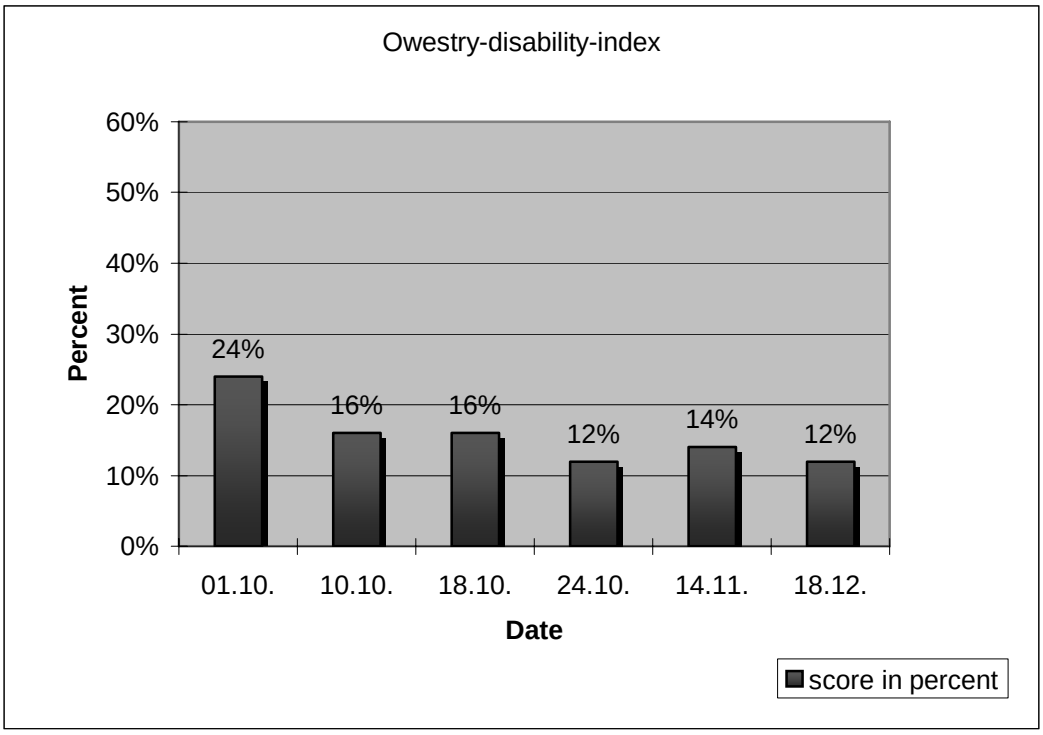
Tab. 2 Component summary scores of PCS and MCS

8.2 ODI score

The Owestry-disability-index shows a drop about 12% towards the fourth testing, a light increase of 2 % in the fifth testing, to then drop back to 12% (Tab.3/Diag.3).

Section	01.10.2006	10.10.2006	18.10.2006	24.10.2006	14.11.2006	18.12.2006
1	2	2	1	1	2	1
2	0	0	0	0	0	0
3	2	1	2	1	1	1
4	2	0	0	0	0	0
5	2	1	2	2	2	2
6	2	1	1	0	1	1
7	1	1	1	1	1	1
8	0	1	1	1	0	0
9	0	0	0	0	0	0
10	1	1	0	0	0	0
Total	12	8	8	6	7	6
Index	**24%**	**16%**	**16%**	**12%**	**14%**	**12%**

Tab. 3 ODI score

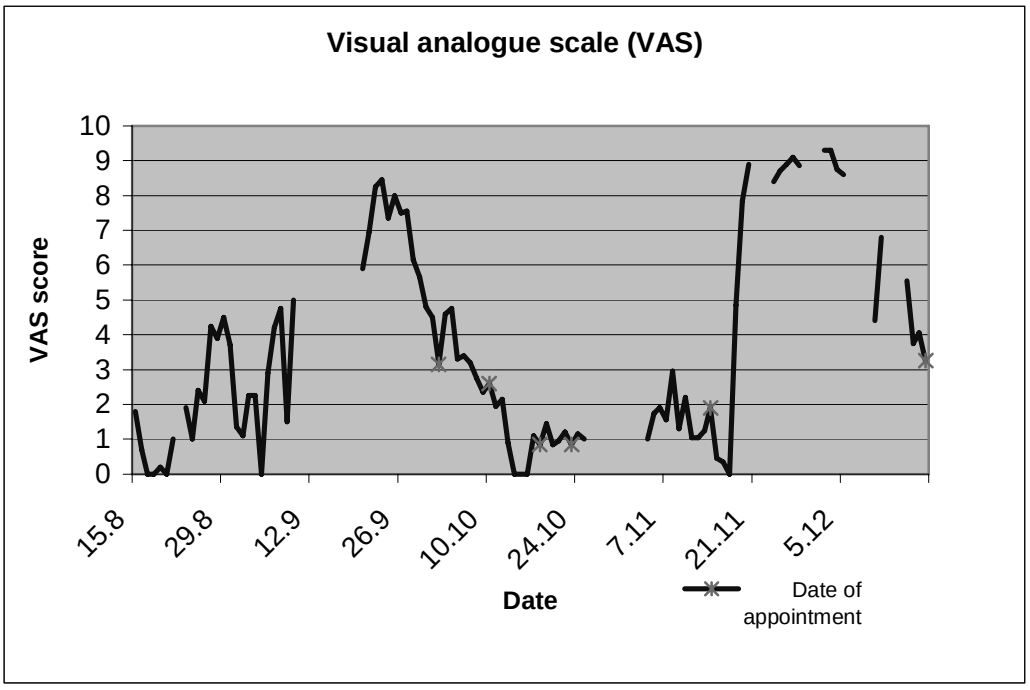


Diag. 3 ODI score

8.3 VAS – pain scores

The overall trend of the results of the VAS-scores shows a significant, steady drop of daily reported pain from the first until a day before the third treatment. The two days after the first treatment show an increase of 1,15. After the fifth treatment the score drops again to zero before exploding to 8,9 and above, around the time of the patients increased physical and mental stress due to moving.

The daily VAS scores were measured by hand on the non-scaled line of 10 centimetres with a degree of precision of 0,05 cm. The days when the patient forgot to mark the pain on the VAS where left blank but the dates where taken into the diagram (Diag.4). In these periods the line in the diagram is broken.
The dates of the osteopathic treatments are highlighted in pink.



Diag. 4 VAS scores

8.4 Pain diary

The patient specified apart from the time during the day (night, morning, afternoon and evening) the localisation of the occurring pain.
The most occurring pain localisation was back pain in combination with the left leg (38 %), pain in the left gluteus (25%), pain in left wrist (13%) and only in the back (11%). The time of the most pain was the afternoon (31%), followed by the morning (28%) and evening (27%).

Table 4 shows the results of the pain localisation and daytime of the occurrence.

PAIN LOCATION	night	morning	afternoon	evening	Total	In %(rounded)
scar (back surgery)	0	1	0	1	2	0.59%
back and left leg	20	37	37	34	128	**37.76%**
left leg	2	16	12	3	33	9.74%
back	7	7	11	11	36	**10.62%**
left leg and foot	0	1	1	0	2	0.59%
back and stomach	1	0	1	2	4	1.18%
left foot	0	1	1	2	4	1.18%
left wrist	1	14	15	14	44	**12.97%**
Left gluteus	16	19	28	21	84	**24.78%**
swelling in the legs	0	0	0	2	2	0.59%
Total	47	96	106	90		

Tab. 4 specified pain locations and number of occurrence

9 DISCUSSION

A case study must not lead to the conclusion that the results are representative for other similar cases but I think it can give important information about the effects of a treatment and the factors influencing it.

It was important to me to keep the design of the treatment process as realistic as possible in order to capture the influencing factors on to the patient and the osteopathic management of the problem. This gave an interesting view on the effect of the patient's compliance, time management and coping with her problem within a therapy-process. The results show a significant worsening of the symptoms in times of mental stress and physical overload and a lack of compliance in the sense of forgetting to fill in the pain diary and postponing appointments in periods of stress, which points out the importance of the patient's compliance for the success of the treatment.

Overall the results of this case study show a positive trend of improvement concerning the patient's pain syndrome. From an osteopathic point of view positive changes in the patient's tissue quality (especially in the foot and ankle), vitality and balance after two treatments can be stated, which leads to the conclusion that an osteopathic treatment in this case is indicated.

The final interview with the patient gave me the impression that she did develop more understanding for the nature of her problem and her body's reaction on physical and mental overload which is inevitable for the accomplishment of her chronic pain syndrome.

Concerning the method, I have to say that the SF-36®, which I chose for the fact that the average appointment interval in my daily practise is 4 to 6 weeks, was not representative in this case study because it is designed for the use of a 4 weeks interval and might therefore not me sensitive enough for physical and mental changes within a shorter period of time. Therefore, although it only contains 10

questions, the more valuable life quality score was the ODI. I think it the best impression of all affecters and the state of health in the patient's life gave the pain diary and especially the VAS. For a more objective presentation of the progress it might have been interesting to take pictures of the standing position and especially the swelling and colouring of the left foot and ankle of the patient.

Concluding, I think that this case study objectifies my daily experience in practising osteopathy and dealing with patients with chronic back pain syndromes. In this case, according to the results of the study, the chances for a successful osteopathic treatment seem good and although this is not transferable to other cases, I was able to draw interesting information about the osteopathic treatment process out of this study.

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APPENDIX

ODI Version 2.1

German ODI Translation

Bitte füllen Sie diesen Fragebogen aus. Er soll uns darüber informieren, wie Ihre Rücken- (oder Bein-) Probleme Ihre Fähigkeit beeinflussen, den Alltag zu bewältigen. Wir bitten Sie, jeden Abschnitt zu beantworten. Kreuzen Sie in jedem Abschnitt nur die Aussage an, die Sie heute am besten beschreibt.

Abschnitt 1: Schmerzstärke

- Ich habe momentan keine Schmerzen
- Die Schmerzen sind momentan sehr schwach
- Die Schmerzen sind momentan mässig
- Die Schmerzen sind momentan ziemlich stark
- Die Schmerzen sind momentan sehr stark
- Die Schmerzen sind momentan so schlimm wie nur vorstellbar

Abschnitt 2: Körperpflege (Waschen, Anziehen etc.)

- Ich kann meine Körperpflege normal durchführen, ohne dass die Schmerzen dadurch stärker werden
- Ich kann meine Körperpflege normal durchführen, aber es ist schmerzhaft
- Meine Körperpflege durchzuführen ist schmerzhaft, und ich bin langsam und vorsichtig
- Ich brauche bei der Körperpflege etwas Hilfe, bewältige das meiste aber selbst
- Ich brauche täglich Hilfe bei den meisten Aspekten der Körperpflege
- Ich kann mich nicht selbst anziehen, wasche mich mit Mühe und bleibe im Bett

Abschnitt 3: Heben

- Ich kann schwere Gegenstände heben, ohne dass die Schmerzen dadurch stärker werden
- Ich kann schwere Gegenstände heben, aber die Schmerzen werden dadurch stärker
- Schmerzen hindern mich daran, schwere Gegenstände vom Boden zu heben, aber es geht, wenn sie geeignet stehen (z.B. auf einem Tisch)
- Schmerzen hindern mich daran, schwere Gegenstände zu heben, aber ich kann leichte bis mittelschwere Gegenstände heben, wenn sie geeignet stehen
- Ich kann nur sehr leichte Gegenstände heben
- Ich kann überhaupt nichts heben oder tragen

Abschnitt 4: Gehen

- Schmerzen hindern mich nicht daran, so weit zu gehen, wie ich möchte
- Schmerzen hindern mich daran, mehr als 1-2 km zu gehen
- Schmerzen hindern mich daran, mehr als 0.5 km zu gehen
- Schmerzen hindern mich daran, mehr als 100 m zu gehen
- Ich kann nur mit einem Stock oder Krücken gehen
- Ich bin die meiste Zeit im Bett und muss mich zur Toilette schleppen

Abschnitt 5: Sitzen

- Ich kann auf jedem Stuhl so lange sitzen wie ich möchte
- Ich kann auf meinem Lieblingsstuhl so lange sitzen wie ich möchte
- Schmerzen hindern mich daran, länger als 1 Stunde zu sitzen
- Schmerzen hindern mich daran, länger als eine halbe Stunde zu sitzen
- Schmerzen hindern mich daran, länger als 10 Minuten zu sitzen
- Schmerzen hindern mich daran, überhaupt zu sitzen

Abschnitt 6: Stehen

- Ich kann so lange stehen wie ich möchte, ohne dass die Schmerzen dadurch stärker werden
- Ich kann so lange stehen wie ich möchte, aber die Schmerzen werden dadurch stärker
- Schmerzen hindern mich daran, länger als 1 Stunde zu stehen
- Schmerzen hindern mich daran, länger als eine halbe Stunde zu stehen
- Schmerzen hindern mich daran, länger als 10 Minuten zu stehen
- Schmerzen hindern mich daran, überhaupt zu stehen

Abschnitt 7: Schlafen

- Mein Schlaf ist nie durch Schmerzen gestört
- Mein Schlaf ist gelegentlich durch Schmerzen gestört
- Ich schlafe auf Grund von Schmerzen weniger als 6 Stunden
- Ich schlafe auf Grund von Schmerzen weniger als 4 Stunden
- Ich schlafe auf Grund von Schmerzen weniger als 2 Stunden
- Schmerzen hindern mich daran, überhaupt zu schlafen

Abschnitt 8: Sexualleben (falls zutreffend)

- Mein Sexualleben ist normal, und die Schmerzen werden dadurch nicht stärker
- Mein Sexualleben ist normal, aber die Schmerzen werden dadurch stärker
- Mein Sexualleben ist nahezu normal, aber sehr schmerzhaft
- Mein Sexualleben ist durch Schmerzen stark eingeschränkt

- Ich habe auf Grund von Schmerzen fast kein Sexualleben
- Schmerzen verhindern jegliches Sexualleben

Abschnitt 9: Sozialleben

- Mein Sozialleben ist normal, und die Schmerzen werden dadurch nicht stärker
- Mein Sozialleben ist normal, aber die Schmerzen werden dadurch stärker
- Schmerzen haben keinen wesentlichen Einfluss auf mein Sozialleben, ausser dass sie meine eher aktiven Interessen, z.B. Sport einschränken
- Schmerzen schränken mein Sozialleben ein, und ich gehe nicht mehr so oft aus
- Schmerzen schränken mein Sozialleben auf mein Zuhause ein
- Ich habe auf Grund von Schmerzen kein Sozialleben

Abschnitt 10: Reisen

- Ich kann überallhin reisen, und die Schmerzen werden dadurch nicht stärker
- Ich kann überallhin reisen, aber die Schmerzen werden dadurch stärker
- Trotz starker Schmerzen kann ich länger als 2 Stunden unterwegs sein
- Ich kann auf Grund von Schmerzen höchstens 1 Stunde unterwegs sein
- Ich kann auf Grund von Schmerzen nur kurze notwendige Fahrten unter 30 Minuten machen
- Schmerzen hindern mich daran, Fahrten zu machen, ausser zur medizinischen Behandlung

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INTERVIEW MIT DR. CHRISTIAN WUTZL, D.O.

1. Seit wann sind sie Osteopath und wie kamen sie zur Osteopathie?

   Ich habe vorher eine kinesiologische Ausbildung (Physioenergetik) und einen Kurs über A.O.R.T. (Autonome Osteopathische Repositionstechnik) absolviert und habe dann die Osteopathieausbildung mit dem Abschluss 1997 an der WSO gemacht.

2. Sie sind ja auch praktischer Arzt. Arbeiten sie hauptsächlich osteopathisch oder wenden sie auch andere Therapieformen an? Wenn ja welche?

   Ich persönlich arbeite nur noch osteopathisch. In meiner Ordination wird aber auch Holopathie praktiziert, die auf der energetischen Messung und Therapie von Elektro-Akkupunktur-Punkten basiert.

3. Da es bisher wenige Studien und Beweise gibt, die die Wirksamkeit osteopathischer Behandlungen belegen, ist die Osteopathie in medizinischen Fachkreisen oft umstritten. Wie stehen sie dazu?

   Mir persönlich ist das völlig egal, zumal unter „ganzheitsmedizinischen" Techniken die Osteopathie sicher auch unter „Schulmedizinern" einen besonders guten Ruf hat.

4. Bezüglich der Behandlung von chronischen, therapieresistenten Rückenschmerzen allgemein: Glauben sie, dass eine osteopathische Behandlung für den Patienten hilfreich sein kann und wenn ja warum?

   Sofern es sich um eine „physiologische" = osteopathische Läsion handelt, ist die Osteopathie die Therapie der Wahl, weil ja nicht nur strukturelle, sondern auch funktionelle Techniken angewendet werden können (Stichwort: „fluid in the fluid").
   Bei „unphysiologischen" Läsionen (z. B. Listhesen) ist die Prognsose deutlich ungünstiger.

5. Was sind Ihrer Meinung nach häufige Fehler bei der osteopathischen Behandlung von Patienten mit Rückenschmerzen?

   Eine zu „enge" Fixierung auf die strukturelle Ebene.

6. Sie haben die Behandlungen in dieser Studie supervidiert. Wie schätzen sie die Vorraussetzungen der Patientin für eine erfolgreiche Behandlung ein?

   In der Kombination mit „Disziplin“, das bedeutet physiotherapeutische Übungen und Vermeidung einseitiger körperlicher Belastungen gut. Das Problem liegt in der Dauer der Schmerzen (negative Konditionierung) und der mangelnden Disziplin (Rückfall in alte Muster durch Wohnungsumzug zum Beispiel)

7. Worin lagen Ihrer Meinung nach die Hauptursachen der von der Patientin angegebenen Symptomatik?

   In einer schlechten Midline und dem Unvermögen, das Ungleichgewicht der verschobenen Gravitationslinie auf Dauer auszugleichen wie zum Beispiel im Falle der Fußläsion (!!!!).

8. Welchen Stellenwert hat Ihrer Meinung nach die bereits vorliegende Bandscheibenläsion und die erfolgte Bandscheibenoperation in der osteopathischen Behandlung?

   Die „unphysiologische“ Läsion ist recht gut über Flüssigkeitstechniken auszugleichen. Sie ist meiner Meinung nach nicht vordergründig.

9. Welche Faktoren beeinflussen die Symptomatik der Patientin im täglichen Leben Ihrer Meinung nach am meisten?

   Die mentale Konditionierung auf „Läsion“ und die körperliche Überbeanspruchung.

10. War der Fortschritt der osteopathischen Behandlung in diesem Zeitraum Ihrer Meinung nach zufriedenstellend? Und warum?

    Ja, weil viele Ebenen mitbehandelt wurden. Mit viel Geduld von beiden Seiten ist noch viel Verbesserung möglich.

11. Wie schätzen Sie die Prognose der Patientin ein und kann Ihrer Meinung nach eine osteopathische Behandlung zielführend sein um eine Schmerzfreiheit zu erreichen?

    Dazu müsste der Fokus der Patientin ganz auf die „potency“ gerichtet werden, sonst bleibt das „ halbe Glas halbleer“ anstatt „halbvoll“.