Title	The Benefits of Osteopathic Treatment for Individuals who have undergone Thoracic Spine Scoliosis Surgery
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A. Introduction

The prevalence of scoliosis is approximately 3% of people worldwide. Postoperative complications are common of any type of spinal surgery, including spinal fusion for the treatment of scoliosis. The postoperative osteopathic care can improve recovery as well as quality of life for individuals who have undergone thoracic spine scoliosis surgery.

B. Literature Review

Definition and the causes of Scoliosis

Scoliosis is a disorder that causes an abnormal curve of the spine. The word Scoliosis comes from the Greek word meaning 'crooked'. The spine has normal curves when looking from the side, but it should appear straight when looking from the front. Kyphosis is a curve in the spine seen from the side in which the spine is bent forward. There is a normal kyphosis in the middle (thoracic) spine. Lordosis is a curve seen from the side in which the spine is bent backward. There is a normal lordosis in the upper (cervical) spine and the lower (lumbar) spine. People with scoliosis develop additional curves to either side of body, and the bones of the spine twist on each other, forming a 'C' or an 'S' shape in the spine.

Scoliosis is a three-dimensional deformity of spine and trunk, which may deteriorate quickly during the periods of rapid growth. The scoliosis risk factors include age (9- to 15-yearolds), female sex and family history. However, there is no correlation between the severity of the curves from one generation to the next. Although scoliosis may be an expression or a symptom of certain diseases (e.g. neuromuscular, congenital, due to certain syndromes or tumours), more than 80% of people with scoliosis are 'idiopathic' as an underlying cause is unknown. However, there are three other main types of scoliosis: Functional, Neuromuscular and Degenerative. For functional scoliosis, the spine is normal, but an abnormal curve develops as a result of a problem somewhere else in the body. This could be caused by muscle tightness and imbalances, poor posture or uneven use. For neuromuscular scoliosis, there is problem when the bones of the spine formed. Either the bones of the spine fail to form completely or they fail to separate from each other during fatal development. This type of scoliosis develops in people with other disorders including birth defects, muscular dystrophy, cerebral palsy and they often develop a long Cshaped curve and have weak muscles that are unable to hold them up straight. If the curve is present at birth, it is called congenital. Unlike other forms of scoliosis that are found in children and teens, degenerative scoliosis occurs in older adults. It is caused by changes in the spine due to arthritis known as spondylosis. Weakening of the normal ligaments and other soft tissues of the spine combined with abnormal bone spurs can lead to an abnormal curvature of the spine. The spine can also be affected by osteoporosis, vertebral compression fractures and disc degeneration.

The Benefits of Osteopathic Treatment for Individuals who have undergone Thoracic Spine Scoliosis Surgery



. HEALTHY SPINE AND SYMPTOMS OF SCOLIC BY <u>ORTHONERO.COM</u>

PIC B. THE COBB METHOD OF ANGLE MEASUREMENT BY FPNOTEBOOK.COM

Diagnosis and Treatment of Scoliosis

Early diagnosis is important as scoliosis is usually a painless disorder with no decreased strength or range of motion. The mild change maybe first noticed by a family member or physician doing routine screening for children for school or sports. The most common symptom of scoliosis is an abnormal curve of the spine. Those affected may be noticed by shoulder asymmetry (shoulders at different heights), waist line asymmetry or tilt (uneven waist) and leg length inequality (pant legs are longer on one side than the other). Scoliosis may cause the head to appear off centre, leaning to one side or notice one hip to be higher than the opposite side. Someone may have a more obvious curve on one side of the rib cage on their back from twisting of the vertebrae and ribs.

If there are signs of scoliosis, see health care professionals for an examination. Measurements are made to determine the type of curve and its severity by the physical exam (Adam's Forward Bending Test) and by imaging techniques such as X-rays, CT scans, or MRI. Treatment of scoliosis is based on the severity of the curve (the curve in degrees by measuring the Cobb Angle) and the chances of the curve getting worse (the likelihood of progression). Except Manual treatments and exercises, scoliosis can be treated by three main categories of treatment: Observation, Bracing and Surgery. Observation is needed if the curve or Cobb Angle stays below 20-25 degrees and followed with routine X-rays and measurements to check for any worsening of the curve. If the curve is between 25-40 degrees and the patient is still growing, a brace may be recommended. Bracing is not recommended for people who have finished growing. Surgery is usually recommended when a patient have a curve over 40 degrees which is likely to get worse by1-2 degrees each year for the rest of the person's life. If this is not prevented, the person could eventually be at risk for heart and lung problems.

Overview of Surgical Intervention for Thoracic Spine Scoliosis

Scoliosis of the thoracic spine, which curves in the upper back and ribs, is the most common. The severity of the curvature will interfere with the ability of organs near the spine, particularly the lungs and heart. Serve spine curvature can cause rib and chest pain or even difficulty in breathing, surgery can alleviate the conditions.

The goal of surgery for scoliosis are correcting and stabilising the curve, reducing pain, and restoring a more normal curve and appearance to the spinal column. Surgery involves correcting the curve back to as close to normal as possible and performing a spinal fusion to hold them in place. This is done with a combination of screws, hooks and rods that are attached to the bones of the spine. The surgeon places bone graft around the bones to be fused (spinal fusion) to get them to grow together and become solid. This prevents any further curvature in that portion of the spine. In most cases, the screws and rods will remain in the spine and no need to be removed. Spine surgery especially thoracic spine surgery itself is fairly complex and it usually takes several hours to complete.

Common Postoperative Complications and the Importance of Postoperative Care

Postoperative pain management is a challenge in individuals undergone spine surgery due to increased incidence of both pre-existing chronic pain conditions and post surgical pain. Postoperative complications includes wound healing disorders, rebreeding, CSF leakage, urinary tract infection, novel back pain, abscess, material dislocation, motor deficit, screw mispositioning, novel leg pain, persistent stenosis, pulmonary embolism, renal insufficiency, adjacent segment degeneration, pneumonia, bloodstream infection, new dysesthesia, drain demolition, cardiac event, dysphagia and psychiatric disorders. These complications in spine surgery can emerge in the immediate postoperative period or in a delayed manner post discharge so that may lead to severe or even permanent morbidities if left unrecognised and untreated.

In addition, surgery involves an extensive amount of tissue and bone trauma that can result in significant preoperative pain. Surgery recovery and scar formation varies some from person to person. However, chronic or persistent pain is increasing recognised as a consequence of surgery in a number of different surgical procedures. The most important is Surgery itself, however minimally invasive, still causes damage that like any other injury needs treatment. Less invasive treatments are often sought by patients although it is unable to draw any conclusions on the effectiveness of manual therapy.

Therefore, develop strategies for prevention and to ensure the maintenance of high quality of postoperative care is essential. Postoperative care is important to improve recovery and the quality of patient's life after spine surgery.

C. Benefits of Osteopathic Manipulative Treatment (OMT) in Postoperative Recovery

Osteopathic Philosophy and Principles

Osteopathy was founded in the United States in 1874 by Andrew Taylor Still, a frontier doctor in the Midwest. A.T. Still embraced two major elements within his new system of healing. These comprised the restoration of bodily structure and function through palpatory assessment and manipulative treatment, and a holistic view that included physical, mental and spiritual health.

The key principles of osteopathic philosophy are: the human body is a dynamic unit of functions; the body possesses self-regulatory mechanisms that are healing in nature; structure and function are interrelated at all levels; and rational treatment is based on these principles.

Osteopathic Approaches to Diagnosis and Treatment

Osteopaths look at the body in a holistic way and can be an alternative to other manual therapists like chiropractors, physiotherapists and massage therapists. They take a whole body approach and do not just focus on the part. Osteopaths look at how the body is being influenced biochemically from other body regions like the head, shoulder, hip and the spine as an example. This whole body approach means osteopaths able to reduce pain and improve mobility more efficiently. Osteopaths can also treat both acute and chronic pain. As osteopathy is a holistic therapeutic approach, osteopathic treatments benefit for the people after scoliosis surgery in the thoracic spine which is the most important part related to organs and the whole body.

Osteopathy offers a wide range of treatments for the people after scoliosis spine surgery.

OMT's Role in promoting Tissue Healing and Postoperative Recovery

"The fascia is the place to look for the cause of disease and the place to consult and begin the action of remedies in all diseases," - - A.T.Still

Fascia is a soft tissue of the body and is a form of connective tissue. Connective tissues include the subcutaneous and deep fascias as well as the skin, connective tissues, muscles, tendons and ligaments. These tissues have a very important function in the health and wellness of the patient. Fascia is around every cell, every muscle fibre, every organ and it anchors itself to bony structures and fascias form the pathways for all nerves, blood vessels and lymphatic vessels.

For the patient after scoliosis surgery, their bodies recover from surgery may try to compensate for the original scoliosis by changing the way they move or rest. In Osteopathy, scoliosis patients can receive individualised treatment by using hands on techniques (fascia release) to normalise the strains in various tissue structures such as soft tissue, muscles, joints and connective tissue caused by the surgery. The symptoms of fascial dysfunction of the people after scoliosis surgery such as tenderness, poor circulation, limitation of motion, scar formation (thickened fascias), muscle cramps could be benefited.

OMT for Postoperative Pain Management and swelling Reduction

OMT focuses on patient centred care and utilises hands-on diagnosis and treatment rooted in a deep understanding of anatomy and physiology. Osteopathy emphasises evaluating not only the painful region of the patient, but also the 'person who is in pain'. The OMT techniques including soft tissue(STT), high velocity or low amplitude thrust, muscle energy(MET), direct and indirect myofascial release(MRT), Counter strain, Cranial treatment and Visceral Manipulation are commonly used to treat chronic pain and reduce swelling after spine surgery.

Soft tissue pain is, by default, an entity of most of the other structures in the body besides bone are commonly resulted after spine surgery. This includes muscle, fascia, tendons, ligaments, cartilage, fibrous capsules, organs and nerves. Osteopathic Soft Tissue Therapy refers to mechanical methods of treatment involving passive kneading, pressing and stretching of pathologically tense tissues in supporting the process of recovery after spine surgery or operative trauma to the musculoskeletal system. SST has a significance impact on reducing soft tissue pain, increasing muscle activity and flexibility thus increasing patient's physical function and quality of life.

OMT for Respiratory and Cardiovascular Function Improvement

Health of organs for the patient after scoliosis surgery is also important especially the thoracic part. Osteopaths can apply the thorax visceral techniques on the individual cases of patient to help their organs function well. As the tensions on the fascia from the original curve retain even after the surgery in the thoracic spine, the following Osteopathic treatments can benefit the patient after scoliosis spine surgery well.

The curve over 50 degrees at a risk of lung problem will be recommended to have scoliosis surgery. Therefore, osteopaths performs **Pleural Dome** Palpation and Treatment which can release the tensions from scoliosis and spine surgery. Osteopathic Diaphragmatic Recess Technique gives release of the tensions caused by original curve and benefit to the Thoracic Skeleton.

Osteopaths can restore the **Lungs**' motility and mobility, free up the **Bronchi and Trachea** as well by osteopathic manipulation, which can fascinate the breathing of the patient after scoliosis surgery. It benefit the respiratory system of the entire body.

The **Heart** and the roots of the great vessels occupy the pericardium which is located in the middle mediastinum. The heart is a powerful muscular pump. The curve of scoliosis usually affect the mobility and motility of the heart even after surgery. Osteopaths can release the pericardial ligaments by doing osteopathic test and treatments on them. Moreover, osteopaths can regulate the inspire and expire of heart motility as well as the heart mobility. It benefit to the patient to maintain a regular heart beat and pressure after the scoliosis surgery.

The **Oesophagus** has a projection onto the thoracic skeleton and actually they are corelated. Osteopathic treatment can release the oesophagus. It also free up the lymphatic drainage site located at the lower oesophagus. Patients after scoliosis surgery can be benefited from better lymphatic circulation and balance the upper and lower pressure of the diaphragm. It also prevent digestive or gastrointestinal symptoms after thoracic spine surgery.

"It is on the smaller arteries that the sympathetic system has its greatest effect." "Every nerve must be free to act and do its part." - - A.T.Still

When osteopaths manipulate an artery, it affects blood flow. Improved flow affects the health of the organs due to the support of the metabolism. The vascular system is often the axis of movement for the organs. Osteopaths use vascular manipulation on the patients affects the axis of movement and induces changes in the general movement of their organ. A goal of vascular manipulation is to balance the axis which is most significant to scoliosis. All arteries are surrounded by nerves of the Autonomic Nervous System (ANS). With vascular manipulation, osteopaths affect the tension in these nerve fibres innervating the arteries.

Osteopaths can use vascular manipulation techniques of heart, aortic arch, subclavian artery and brachial artery on the patients after scoliosis surgery, it can affect the elastic fibres through elongation with precision to have a central affect on the patient's brain's messages or feedback to the arteries. Small arteries are more muscular, they have rich innervation in their medial layer so osteopaths can release patient's spasms by affecting the ANS which benefits the scoliosis patient's uneven body structure. With the help of releasing the thoracic tension, osteopathic treatments can help increasing the viscoelasticity of lungs.

When osteopaths performing visceral manipulation, the work often begins with the mobilisation of a specific organ such as heart and lungs mentioned above. When the mobility has been normalised, then go to the motility of that organ. Then, osteopaths can use the plexuses to spread the effect through the body. Nerves from these plexuses innate the viscera. The autonomic plexus are treated by a form of induction. Osteopaths can use nerve plexuses treatment for the thoracic cavity of the patient after scoliosis surgery in order to balance cardiac plexus to celiac plexus, frontal to cardiac plexus and frontal to celiac plexus.

These treatment is most commonly used at the end of the treatment session in order to balance the body's energy. When the plexus is in a state of hyperactivity, it will discharge its excess energy in order to regain its balance. The discharge can affect the patient's musculoskeletal system, the cranio-sacral system of the visceral system. Osteopaths release the superficial cardiac plexus and the celiac plexus through osteopathic treatment on scoliosis patient as these two plexuses are the most important plexuses affecting thoracic function.

Osteopathic Care in Postoperative Recovery and Rehabilitation

Scoliosis is defined as a sideways curvature in the spine with rotation that causes the spine to twist and bend. The asymmetry and rotation caused by abnormal sideways spinal curvature can lead to rib humps. Scoliosis surgery can stabilise the curvature of the spine and halt progression but the surgeon can't cure scoliosis. Osteopathic care can perform spinal manipulation and mobilisation for alignment and mobility improvement on the rest abnormal spine and balance the surgical spine section with the original body structure in patient's postoperative recovery.

Osteopaths can adjust the body parts to fit the new postoperative spine structure in many aspects for rehabilitation as well. A horizontal rotation lesion of the **Dome of the Cranium** coupled with an asymmetry of the base of cranium in the opposite direction may result in a torsion mechanism of the vertebral axis in case of scoliosis. In cranial osteopathy, osteopaths can recoil the torsion of the dome of the cranium in order to improve the whole body and spinal alignment.

From an osteopathic point of view, a positional asymmetry of the petrous parts of the temporal bones can be found in most scoliosis. In most common case, thoracic scoliosis with right convexity, an interior left mastoid compared to the right with an asymmetric torsion between the right and left tympanic parts of the temporal bones. Osteopathic treatments can restore the **Vestibular** imbalance on the lesions of the mastoid process of the temporal bone and the tympanic bone significantly improves the patient's postural balance.

The Benefits of Osteopathic Treatment for Individuals who have undergone Thoracic Spine Scoliosis Surgery

Articular and particularly intraosseous osteopathic lesions of the different parts of the craniocervical junction constitute an essential cause of scoliosis. In case of right thoracic scoliosis, the fundamental pattern are a right anterior and inferior occiput, a right translation of the atlas and a left intraosseous torsion of the axis. Osteopathic care can recoil the **Craniocervical** lesions and improve the alignment between occiput and the apex of the odontoid process (C0-C2 junction).

Scoliosis is characterised by a rotation of the vertebrae which is maximal in the apical zone and results in the appearance of rib protrusion at the thoracic level on the side convex to the curvature. Osteopathic treatment can restore the both surgical and non-surgical part of **Spinal** torsion and **Rib** Distortion. Treatment of the thoracic vertebral torsion using the recoil technique, is performed with a point of contact on the side of the spinous process towards the convexity and a counter pressure applied to the posterior tubercle of the corresponding rib. On the side of the thoracic gibbosity, OMT should applied on two commonly associated osteopathic lesions: the diastasis of the apex of the scapula and the tension of the corresponding intercostal nerve.

For Scoliosis, before or after surgery, **Rib cages** are at different heights. Osteopaths use Sternochondral Mobility Test and conduct Posterior and Anterior Sternochondral Treatment. It can help free up the cartilage and ligament connected to the rib and reduce rib cage pain of the patient after scoliosis surgery together with Costotransverse/ Costovertebral Joint Treatment. **Sternum** is on the anterior wall of thoracic hard frame. Osteopaths can conduct Sternum Compression/DecompressionTest and follow with Transverse Thoracic Treatment. It can help in release the tension of patient's muscles connected to sternum. It benefits to the patient with scoliosis which the original sternum didn't line in the middle by increasing its flexibility.

Asymmetric fixation of the **Diaphragm** (crura, domes or phrenic centre) often accompany scoliosis. The key point of the diaphragm located in the 7th intercostal space, incidentally almost always presents a positive test on the side of the thoracic gibbosity. After surgery, equilibration of the diaphragm however remains relevant in order to finalise the osteopathic treatment and promote proper integration of the corrections that performed.

An imbalance of the **Pelvis** as a result of a difference in **Leg** length are common in scoliosis. During rehabilitation period, osteopathic treatment consists of regulating the femur and the tibia by neutralising lesions of intraosseous lines of force, while stimulating cartilage and normalising tension on the peripheral nerves and reduce coxal torsion by sacroiliac manipulations in the presence of a leg difference. OMT works on tense **filum terminale** is important after surgery as excessive tension on the filum terminale in scoliosis may induce increased traction to the spinal cord and accentuate vertebral curvatures in the frontal plane with a reduction of thoracic kyphosis in the sagittal plane.

Regular osteopathic care can definitely benefits on fascial dysfunction, restores and improves organ and system function, re-equilibrates the spine after surgery, stabilises the post-surgical scoliosis and gives relief to patients in postoperative recovery and rehabilitation.

D. Case Studies and Clinical Experiences

Patient Name:LEE Man Fei, Faye, Female, ChinesePatient D.O.B:28/03/2006 (Approved by patient to disclose in this thesis paper)Patient Background:Faye was a top young swimmer of backstroke in Hong Kong at age 8.Clinic Name:Sens Fontaine Osteopathy Centre, Hong Kong



1. 03/2016 Faye was diagnosed as idiopathic scoliosis at age 10. (Above apex 26.8; Below apex 17.1)



2. 11/2016 Faye was suggested wearing brace to control curve progression.(Above apex 35.5; Below apex 27.3)



3. 08/2017 The curve under control with longer hours of brace wear. (Above apex 38.2 ; Below apex 29.7)



4. **04/2018** The curve got worse due to rapid grow during puberty at age 12. (Above apex 51.2; Below apex 50.6)



5. 05/2018 Surgery was recommended as Faye experienced respiratory difficulty while swimming. Surgeon suggested **Thoracic Spine Fusion Surgery** only in order to maintain the lumber flexibility of movement for a potential swimmer. (Above apex 53.0; Below apex 47.4)



7. 07/2018 OMT/STT benefits on fascial dysfunction and significantly works on scar formation and muscle cramps. Faye felt relief from postoperative pain.



6. 06/2018 Faye came to our clinic to seek for Postoperative Osteopathic Care. Although Faye only aimed at "Swim again", Osteopathic holistic approach are focusing on the whole body structure recovery and rehabilitation. (Above apex 24.5; Below apex 39.9)



8. 10/2018 Faye suffered from pulmonary complications after surgery. OMT specialised in restoring the function of her cardiovascular and respiratory function and improving the thoracic alignment.

The Benefits of Osteopathic Treatment for Individuals who have undergone Thoracic Spine Scoliosis Surgery



9. 02/2019 Overall structure improvement within 8-months regular weekly OMT. (Above apex 25.9; Below apex 27.5)



11. 02/2020 The past 12-months biweekly follow up rehabilitation, evidence on curvature sustained improvement proved that OMT benefits on re-equilibrate the spine and stabilises post-surgical scoliosis. (Above apex 28.2; Below apex 23.2)



10. 03/2019 OMT has a significance impact on increasing muscle activity and flexibility thus increasing Faye's physical function. Faye recovered and back to swimming training 9-months after surgery.



12. 03/2020 Postoperative thoracic spine surgery complications keep challenge to osteopathic care. Faye experienced pain from protruding screw and metal plates implication, regular OMT helps monitor and release the discomfort once happen.

<u>The Benefits of Osteopathic Treatment for Individuals who have undergone</u> <u>Thoracic Spine Scoliosis Surgery</u>



13. 06/2021 3-years after surgery, Faye, age 14, past 1 year monthly OMT targeted on controlling scoliosis' curvature progression counteract with the rapid puberty growth and eventually work well. (Above apex 25.2; Below apex 20.8)



15. 06/2022 Under past 1 year trimonthly OMT, more symmetrical and stabilised body structure especially pelvis evidence-based resulted compared with 2018. (Above apex 25.9; Below apex 19.3)



14. 07/2021 OMT can restore the balance of pelvis benefit to minimise leg length difference and regulate Fays's irregular mensuration cycle and health of uterus.



16. 07/2022 Faye's height 165cm at age 15 and she was fully recovered as well as educated under osteopathic care. Awareness of her body condition made her life back to "Normal" like others teenager.

Wai Lam, WONG (S2109035) Doctor of Osteopath

E. Conclusion

Theory Behind Osteopathic Care in Postoperative Recovery

Osteopathy was indeed among the first medical disciplines to emphasis the importance of person-centred care. Osteopathic care in postoperative recovery based on the key principles that the patient's organ systems are interrelated and any dysfunction before or after surgery caused by scoliosis or surgery itself would influence patient's overall health and function. When structural issues are corrected and balance is restored in postoperative recovery, patient's body has the ability to heal itself. Osteopathic Treatment is rationally based upon an understanding of the basic principles of body unity, self-regulation and the interrelationship of structure and function. OMT for recovery aims to align the body structure likes bones and muscles to achieve balance and encourage the body to begin the healing process during rehabilitation.

Potential of Osteopathic Treatment Enhancing Patient Outcomes in Postoperative Care

Osteopathic approach to patient care can be explained by the five models: biomedicalstructural, respiratory-circulatory, metabolic-nutrition, neurological and behaviouralpsychosocial, which an individuals who have undergone surgery condition can be evaluated, understood and treated. As espoused in the biomedical-structural model, osteopathic palpatory diagnosis and OMT are used to alleviate somatic dysfunction after surgery and thereby restore normal motion and function throughout the body to improve recovery. In the respiratorycirculatory and metabolic-nutrition model, the symptoms of fascia dysfunction after surgery can be benefit and support homeostasis. In neurological model, OMT helps individuals recover and optimise their control of movement musculoskeletal surgery, pain conditions and enhance central nervous system function. In behavioural-psychosocial model, holistic approach of osteopathic care involves physical, psychological, social, cultural, behavioural and spiritual aspects of recovery cares so that a collaborative patient-physician relationship can be established. Patient characteristics and preferences should be considered when selecting appropriate OMT technique thus allow physicians to actively engage patients in their treatment plan and promotes shared decision-making. Education of self-awareness to patient through the involvement in treatment plan is important in rehabilitation in order to moving patient towards self-health maintenance and better quality of life.

Quality research and education are viewed as pillars the ongoing sustainability of the osteopathic professions although there are different perspectives among osteopaths regarding the perceived value of generalist and specialist osteopathic practice. Increased public awareness of osteopathy can improve the visibility of the potential of osteopathic practice in postoperative care.

Osteopathic Treatment to Improve Recovery and Quality of Life for Individuals who have undergone Thoracic Spine Scoliosis Surgery

Thoracic spine surgery affected the entirety of the body and its ability to heal itself based on the osteopathic principle of body unity, so osteopathic treatment that is delivered is measured accordingly, to take into account and work the entire body. As a result, osteopathic care benefited on all five models: biomedical-structural, respiratory-circulatory, metabolic-nutrition, neurological and behavioural-psychosocial.

The benefits of osteopathic treatment such as structural, visceral, vascular, cranio-sacral techniques for the people after scoliosis surgery in the thoracic spine not only to reduce persistent pain by reducing the rigidity of the original scoliosis and the surgery itself, but also balance out unbalances caused by strain in myofascial, ligament and membrane tissues, harmonise crania-sacral dysfunctions and improve the metabolism, blood and lymphatic circulation and thus help improving the postoperative recovery.

Another major holistic benefits of osteopathic treatment is the overall positive effects on the immune system. With the osteopathic principle that the structure and function of the body are interconnected, OMT improves thoracic mobility and increases lymphatic drainage, which in turn helps to better regulate the body's organ functions and its overall immunity.

Osteopathy can help also with patient's mental health and plays a part in promoting a feeling of overall wellbeing. Patient normally under stress after surgery, the sympathetic nervous system, which essentially controls respiratory and cardiac activity and the body's fight or flight mechanism, goes into overdrive. OMT and cranial osteopathic treatment can help to better regulation of the sympathetic nervous system and this will not lead to adrenal stress. OMT/ cranial osteopathic treatment on the patients after thoracic spine surgery can help to deactivate trigger points, promote relaxation and correct muscle imbalance as well.

Although osteopathic treatment are not a cure for scoliosis and even will not able to correct the abnormal curve to normal after surgery. Osteopaths can also play an important role in the health and wellness of the patient after thoracic spine scoliosis surgery with person-centred care. The collaborative patient-physician relationship established in treatment and goal planning helps big steps in recovery. Patient's involvement, communication and education of self-awareness and self health maintenances in osteopathic care are extremely important for individuals to obtain better quality of life even having undergone thoracic spine scoliosis surgery.

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