Therapeutic Massage on Various Symptoms of A Polio Survivor: A Case Report

Abstract

Background/Objective: Poliomyelitis is a very severe disease, brought on by the Polio virus. Symptoms are “characterized by aseptic meningitis and weakness or paralysis of one or more extremities, along with weakness of one or more muscle groups”.(3) Post Polio Syndrome or PPS (i.e., neurological decline) may arise in “20-75% polio survivors, 15 to more than 60 years after acute paralytic or non-paralytic disease”.(2) The objective of this case report is to make public the effects of massage therapy on the symptoms associated with being a Polio survivor.

Case Presentation: The client is a 68 year old male, diagnosed with Polio in 1950. The clients left leg was greatly affected by the disease, resulting in the deterioration of lower leg musculature and a 23mm structural leg length inequality (corrected with full foot lift). The client presented with diplopia (double vision), aching pain in hips and low back, and pain with abduction of the shoulder.

Intervention: Treatment was provided in 10, one-hour treatments over the course of 5 weeks. A student enrolled in an accredited, 1278-hour massage program provided all treatments. In the beginning of each treatment, the therapist completed an in-depth postural chart of the client, initially displaying multiple cranial and postural distortions. The treatment approach was geared towards reaching postural equilibrium in order to alleviate pain, by treating what is indicated by
inequalities shown on the postural charts and symptoms of the patient. Protocols used for
treatment include manual therapy for muscles, organs, and cranial bone alignment.

**Outcome:** All but one category assessed yielded clinically significant results. Even the
category that wasn't clinically significant, displayed a 68.42% improvement over the course of
the study. Massage therapy should be considered a valid option to assist in alleviating pain and
discomfort associated with being a polio survivor.

**Keywords:** Poliomyelitis; aseptic; meningitis; PPS; diplopia; massage

**Introduction**

Poliomyelitis is a very severe disease, brought on by the Polio virus. “It can affect any age, but
primarily involves children aged less than 5 years and causes paralysis in one out of every 200 to
1000 infected individuals”.(1) The first 3 weeks of the infection, the virus multiplies in the
pharynx and intestines.(2) Over 95% of cases present asymptomatic or characterized with flu-
like symptoms.(2) In 5% of cases the virus gets through the blood-brain barrier, and patients
“may develop a meningitis-like illness characterized by fever with pharyngitis, myalgia,
anorexia, nausea, vomiting, headache, and neck stiffness.”(2) The virus may present itself in the
spine, giving more disabling symptoms “characterized by aseptic meningitis and weakness or
paralysis of one or more extremities, along with weakness of one or more muscle groups”(3).
There was a large movement for the eradication of this poliomyelitis, “Due to the devastating widespread effects of this disease. Cases of paralytic polio had fallen from more than 350,000 in 125 infected countries in 1988 to under 500 in 10 endemic countries in 2001”. (4) Although these results show promise, the disease flared back up again stating in India and spreading out to at least 20 countries by 2006. (4)

Post Polio Syndrome (PPS) is a condition that may arise in polio survivors after partial or complete functional recovery, and affects 15 to 20 million people worldwide. (2) “The late consequences of polio (i.e., bio-mechanical decline such as scoliosis, kyphosis, arthrosis, etc.) can manifest for any survivor of polio, PPS (i.e., neurological decline) may develop in 20-75% polio survivors, 15 to more than 60 years after acute paralytic or non-paralytic disease” (2) These effects present in various ways making the daily lives of polio survivors potentially painful and difficult. In 1979, the Rehabilitation Gazette published a letter by a 57-year-old male polio survivor who wrote, “During the past few years, I find myself being able to do less and less and tire far too easily.” He also experienced difficulty with simple tasks like getting out of bed, walking, and standing up from a sitting position, which made his daily tasks too difficult and ended up leading to an early retirement. (5) This polio survivor was diagnosed with polio 40 years ago, and has been noticing these symptoms over the past few years (5), showing that symptoms can present themselves a very long time after the disease is gone. Results of a study looking at the symptoms of 114 patients with PPS helps to shed more light on the most common symptoms and how they affect their lives. (6) Results of this study are displayed below.

Table II. Reported presence of pain at clinical examination compared with Short-Form 36 (SF-36) health survey and mean visual analogue scale (VAS) results
<table>
<thead>
<tr>
<th></th>
<th>No pain n</th>
<th>Mean (SD)</th>
<th>Pain n</th>
<th>Mean (SD)</th>
<th>Pain–no pain Diff.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAS</td>
<td>37</td>
<td>16 (17)</td>
<td>77</td>
<td>38 (25)</td>
<td>22</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>SF-36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical functioning</td>
<td>36</td>
<td>40 (28)</td>
<td>75</td>
<td>34 (21)</td>
<td>-6</td>
<td>0.369</td>
</tr>
<tr>
<td>Role-Physical</td>
<td>36</td>
<td>42 (38)</td>
<td>75</td>
<td>30 (36)</td>
<td>-12</td>
<td>0.108</td>
</tr>
<tr>
<td>Bodily pain</td>
<td>37</td>
<td>66 (25)</td>
<td>76</td>
<td>41 (20)</td>
<td>-25</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>General health</td>
<td>37</td>
<td>59 (22)</td>
<td>71</td>
<td>45 (23)</td>
<td>-14</td>
<td>0.005</td>
</tr>
<tr>
<td>Vitality</td>
<td>37</td>
<td>46 (20)</td>
<td>75</td>
<td>38 (21)</td>
<td>-9</td>
<td>0.032</td>
</tr>
<tr>
<td>Social functioning</td>
<td>37</td>
<td>72 (24)</td>
<td>76</td>
<td>65 (26)</td>
<td>-7</td>
<td>0.203</td>
</tr>
<tr>
<td>Role-Emotional</td>
<td>37</td>
<td>59 (42)</td>
<td>70</td>
<td>55 (42)</td>
<td>-3</td>
<td>0.744</td>
</tr>
<tr>
<td>Mental health</td>
<td>37</td>
<td>72 (16)</td>
<td>75</td>
<td>67 (23)</td>
<td>-6</td>
<td>0.316</td>
</tr>
<tr>
<td>Physical health</td>
<td>36</td>
<td>34 (9)</td>
<td>64</td>
<td>28 (8)</td>
<td>-6</td>
<td>0.002</td>
</tr>
<tr>
<td>Mental health</td>
<td>36</td>
<td>46 (11)</td>
<td>64</td>
<td>45 (14)</td>
<td>-1</td>
<td>0.682</td>
</tr>
</tbody>
</table>

These results indicate that the majority of patients had pain or problems with all of these tasks.

By comparing the two highlighted columns, the raw number of patients that fall into the pain or no pain category can be seen, with a much higher number always on the side of pain. In a study on polio survivors who have experienced different types of treatment including acupuncture, reflexology, thermotherapy, osteopathy, massage and hydrotherapy were shown to be highly effective, although expensive. These participants expressed that paying for the treatments which they believed would help them, would be a challenge.

The clinical investigator and provider of all treatments in this case, believes that massage therapy would yield clinically significant results in relieving some pain or discomfort associated with the symptoms affecting a polio survivor.
**Case Presentation**

**Client information**

The client is a 5 foot 10 inch, 195 pound, 68 year old male, diagnosed with Polio in 1950. The client’s left leg was greatly affected by the disease, resulting in the deterioration of lower leg musculature and a 23mm structural leg length inequality (corrected with full foot lift in the year 2000). The drastic loss of leg function resulted in the client having a surgery in 1962 fusing the ankle to only dorsiflex and plantar flex, moving muscles responsible for supination into a position responsible for plantar flexion. The client then had to learn how to walk again, reprogramming his brain to activate a new muscle for plantar flexion. Other history involved a car accident in 1985 resulting in whiplash; however no long-term symptoms in the neck were reported. He also had an eye surgery to replace his lenses bilaterally.

The client presented with diplopia (double vision), constant trouble coming up with an image, and his subjective feedback showed perception from both eyes medially rotated, creating a “V-like” pattern with two separate images. Other symptoms included aching pain in hips and low back (especially with internal rotation of the femur), numbness and tingling on the side of his lower legs when standing for a long time without externally rotating at the femur. These symptoms gradually progressed since the late 1990’s. The client also reported that he felt what seemed like tightness or “grabbing” in the lower back (bilaterally but more on the left) when standing up and walking, and feels it “releasing” when he lies down on his back. His right
shoulder felt like it “catches” when abducting into an overhead position, and pain near the humeral head when leaning on his elbow in a side lying position.

The client’s job and working duties include mainly office work, a good amount of sitting per day however, still walking throughout the day within the building. His activities outside of work include varied yard work and household activities (weeding garden, shoveling dirt, cutting vines, painting cabinets, cooking, and cleaning), most of which is on the weekend.

Before starting the case study, the client reported that he would like to have more energy, be free of pain, and not rely on over the counter medications like aspirin.

**Clinical Findings**

Upon the initial postural assessment (8), a lateral shear of the cranium to the left, as well as a rotation of the cranium to the left (both of these measurements remained the same from standing to supine) were noted. The temporal bones showed an obliquity to the right in standing that switched to a left obliquity in supine, as well as an anterior right measurement of the external auditory meatus in the standing and supine positions. The client’s superior orbital ridge of the frontal bone was superior right standing and supine.

The AC joint measured inferior on the right from standing and supine, and the humeral head as well as 3rd costal surface showed to be anterior on the right in standing but anterior left in supine. The left scapulae showed slight upward rotation, while remaining even in the horizontal plane at the inferior angle.

Measurements were consistent with a structural leg length inequality because in supine the greater trochanter of the femur was inferior on the left, making a wedge pattern with the superior
left measurement of the heel pad. In standing, the full foot shoe lift seems to be compensating well because of the greater trochanter measuring only very slightly superior on the left. The client tends to bend his knee on the left (the short side) when standing for measurement, and the tibial tuberosity appears to be superior on the right. When standing, the crest of the Ilium, superior to the ASIS shows anterior on the right, and switches to anterior left when in supine. Other measurement involving the use of a tool to measurement the angle of flexion between the PSIS and ASIS(8) showed 15 degrees bilaterally, higher than the recommended 5-10 degrees for a male patient(8). Many more measurements can be seen on the charts below.
Assessment Measures

All assessments were taken prior to treatment, in a school clinic environment, with a follow up assessment 3 to 4 days after the last treatment. Assessments used include Bournemouth Questionnaire for musculoskeletal pain (BQ), and Shoulder Pain and Disability Index (SPADI).

The Bournemouth Questionnaire for musculoskeletal pain, is a 7 question, 11-point numeric rating scale (NRS), with selection between 0 and 10 (0 being no pain at all, and 10 being the worst pain possible). This is used to obtain numeric data from the client’s perspective in order to determine the clinical significance of any improvement. The Bournemouth Questionnaire comes in a few other varieties but the musculoskeletal was chosen to suit the clients many symptoms. 3 of these questionnaires were taken prior to each treatment, one for symptoms of the hips and low back, one for symptoms related to the eyes, and another for symptoms related to the shoulder. The BQ has been validated for use on patients with back pain(9), as well as neck pain (10). Hurst
and Bolton, determined “In terms of raw score changes, percentage BQ change scores [(raw change score/baseline score) x 100] of 47% and 34% were identified as having the highest sensitivity and specificity in distinguishing clinically significant improvement from non-improvement in back and neck patients, respectively.”(11)

The other assessment chosen was the Shoulder Pain and Disability Index (SPADI). This survey asks more specifically about how much pain is evoked with certain activities and movements of the shoulder. The (SPADI) is an 11-point numeric rating scale (NRS) with 0 being no difficulty or pain, and 10 being worst pain imaginable or so difficult it requires help. The questionnaire is separated into a 5 question pain section and an 8 question disability section, making 130 possible points. One of the (SPADI) questionnaires was taken by the client before every treatment.
According to the scoring sheet, “the two subscales are averaged to produce a total score ranging from 0 (best) to 100 (worst). Minimum Detectable Change referenced in the document suggests (90% confidence) = 13 points (Change less than this may be attributable to measurement error).”

Other studies have shown an 8 point, (22) and 18 point, (23) minimum detectable change to be valid.

### Timeline/Diagnostic Assessment

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Side notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946</td>
<td>Birth of patient</td>
<td>6/23/1946</td>
</tr>
<tr>
<td>1950</td>
<td>Diagnosed with Poliomyelitis</td>
<td>Age 4</td>
</tr>
<tr>
<td>1958</td>
<td>Ankle and foot surgery</td>
<td>Ankle fusion, muscle reattachment for plantar flexion</td>
</tr>
<tr>
<td>1985</td>
<td>Motor vehicle accident (MVA)</td>
<td>Experienced Whiplash</td>
</tr>
<tr>
<td>Year</td>
<td>Event</td>
<td>Details</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2000</td>
<td>Diagnosed with structural leg length inequality</td>
<td>23mm shorter in the left leg, corrected with shoe lift</td>
</tr>
<tr>
<td>2004</td>
<td>First strabismus and lens replacement surgery</td>
<td>Surgery by James Gills MD, at St. Lukes’s cataract and laser institute</td>
</tr>
<tr>
<td>2005</td>
<td>Second strabismus and lens replacement surgery and extracapsular cataract removal</td>
<td>Surgery by James Gills MD, at St. Lukes’s cataract and laser institute</td>
</tr>
<tr>
<td>2015</td>
<td>Administered Massage therapy</td>
<td>2 treatments per week over the course of 5 weeks.</td>
</tr>
</tbody>
</table>

Patient was informed by his optometrist that he had the condition of diplopia before his first eye surgery in 2004, but was able to compensate for it and make an image. After his first eye surgery, the patient was no longer able to compensate, and had had double vision. After trying to live with his diplopia for about a year, the patient had his second eye surgery on his other eye, but was still unable to compensate, leaving him with diplopia since 2004.

**Therapeutic Intervention**

Treatment was provided over the course of 5 weeks, with 2 sessions per week for one hour each. All treatments were in a school clinic environment and provided by a student enrolled in the first half of their second semester in an accredited, 1278-hour program. Serving as the clinical
supervisor, safety and code of conduct of was provided by an experienced massage therapist, and instructor of multiple courses in the school’s course curriculum

In the beginning of each treatment, the therapist completed a postural chart marking how the patient’s boney landmarks line up on the midsagittal, coronal, and transverse planes. These measurements were taken in standing, sitting, and in supine. The measurement procedure used was provided by the school (8).

The approach taken for treatment was geared towards reaching postural equilibrium in order to alleviate pain, by treating what is indicated by inequalities on the postural charts and symptoms of the patient. Protocols used for treatment include thorough treatments of muscles, organs, and cranial bone position, using techniques like compression, compression with opposition, gliding strokes, frictions with and against fiber, pin and stretch, and mobilizations as seen in these manuals(12),(13)(14). Protocols found in these sources were provided to the student by the school and further taught by an instructor primarily during a separate technique course and secondarily one on one instruction of extra techniques for the purpose of this study.

Treatments were one hour long each including about 15 minutes each session for postural assessments, and 45 minutes of manual therapy on the patient. For the client’s hips and back, extensive manual treatment on those areas were used as well as specific stretches for the hips in internal and external rotation. Musculature in the back was treated additionally to assist in postural correction and more efficiency in distribution of gravitational forces. Additional treatment was provided to the extrinsic muscles of the eyes, and some balancing of the cranial bones to relieve any unnecessary pressures on cranial nerves, blood flow, or musculature.
Treatment of the cervical region was also provided for the purpose of postural restoration and relieving any unnecessary strains on the eyes because of the position of the cranium.

**Informed Consent**

Prior to the first treatment, the patient signed a “Client Consent for Publication of Case Report” (15), stating that the patient gives their consent for the release of images, and clinical information for the purpose of this case report, excluding name, initials, and personal information. With this document the client also understands that the report may be published in journals published on the Massage Therapy Foundation’s website.

**Results**

Using the data obtained through the Bournemouth questionnaire for the patients hips/back, eyes, and shoulder, as well as data obtained from the SPADI were compiled into line charts to display the progress of the patients symptoms throughout the study. Two separate charts were made because one question in the BQ stating “Over the past few days, how do you think your work (both inside the home and/or employed work) have affected your painful complaint, on a scale where '0' is 'make it no worse' and '10 is 'make it very much worse'?”, Doesn’t seem to fit the pattern of the rest of the questionnaire. This question is the only one that doesn’t ask for input on the pain or discomfort experienced by the patient, but instead asks how their activities affected the symptoms. Because of the visual spike in the results on treatment #7, another chart was made with all but that question. This was done in order to make sure the results weren’t affected greatly by the fact that the patient may have had a busier week and thought his symptoms would be worse if he had done less physical activity.
Table 1 displays the results of all BQ questions from the first treatment to the last, with table 2 getting rid of question #7 in all 3 Bournemouth questionnaires. In order to use the verified data calculations, sticking to the first chart is necessary to maintain the validity of results. In the raw data of chart 1, the BQ of the patient’s hips/back showed a 57.1% improvement and a 12 point raw change. The BQ for the patient’s eyes showed an 83.33% improvement and 10 point raw change. The BQ for the patient’s shoulder showed a 78.57% improvement with an 11 point raw change.

After adding up each treatment’s SPADI total scores and scoring by percentage of 100, the data improved from 14.6/100 in the first assessment to 4.6/100 in the last, for a 10 point raw change, at 68.42% improvement from start to finish. (Table 3)
Discussion

With the use of specific therapeutic techniques and procedures, massage therapy was able to greatly reduce some pain and discomfort for a Polio survivor, as hypothesized by the clinical investigator. These results support the findings of another study that reports that PPS patients have found massage therapy to be effective in enhancing their quality of life.(7)

Hips/Back: The 57.1% improvement for the patient’s hips and back met the criteria of clinically significant results.(11) The highest score was shown before the 2nd treatment, where the hips and back were not yet addressed. On the second day the patient’s subjective data stated that he had been “working in the yard for the last 3 days and feels very tight in the low back”. After addressing the left and right Tensor Fasciae Latae (TFL), deep hip rotators, Gluteus Maximus, Quadratus Lumborum, and musculature in the lamina groove of the lumbar and thoracic spine, over many treatments, gradual improvement was shown in the data. At the end of the 4th treatment, the patient was provided with a stretch for the external rotators of the hip(16), and instructed to use it after doing any type of strenuous activities like working in the yard, painting, etc. The very next BQ score showed an improvement from 19 points to 10 points. Measurement on the 7th session displayed a pelvic flexion of 14 degrees on the left, and 11 degrees on the right, higher than the recommended 5-10 degrees.(8) During that treatment, the external rotators and piriformis were treated to address hip and low back pain(14). These measurements decreased to 10 degrees of flexion bilaterally in the 8th session, corresponding with an improvement of SPADI scores from 15 to 12 points. A correlation between pelvic flexion and low back pain has been found in multiple studies(17)(18)(19)(20), suggesting the decrease in pelvic flexion may have contributed to relief of symptoms. Overall massage therapy
proved to be an effective way to decrease some of the pain and discomfort this patient has been experiencing in the hips and low back.

**Eyes:** The BQ scores for the patient’s eye symptoms showed an improvement of 83.33%, significantly higher than the baseline of 47%, verifying this as clinically significant improvement.(11) The highest score was shown before the 2nd treatment, when the eyes and cervical musculature had not yet been addressed. The measurements taken from the first 2 treatments displayed that the patient had a fairly large left shear of the cranium. During the second treatment the scalene muscle groups were treated on both sides (because of their pull in lateral flexion of the cervical spine)(13), noting that the lower left portion was very sensitive as well as the upper right portion. (Consistent with left shear of the cranium). The left upper trapezius was treated as well because of its role as an elevator of the shoulder, and its pull on the inferiorly on the left side of the occiput. (AC joint measured superior on the left, with a cranial shear to the same side). After these treatments, measurements before the next session showed a significant decrease in cranial shear, and a drastic drop in the BQ score for the eyes from 25 to 18, showing that the position of the cranium may have been a stressor for the extrinsic muscles of the eyes. Later treatments involved additional treatment for the scalene musculature, sternocleidomastoid (SCM) for correcting cervical rotation(13), Sphenoid bone shear correction(12), frontal bone correction(12), and treatment of the extrinsic musculature of the eyes(12). After treating the SCM and scalene musculature in the 3rd session, measurement showed that the cranial shear was gone before the 4th session, at which point the patient received his first treatment for the extrinsic musculature of the eyes(12). The BQ scores before the next treatment showed another drastic improvement from 19 to 10, suggesting that spasm in the extrinsic eye musculature may have had a large impact on the patient’s vision. Special attention
was given to the superior oblique because of its role in medial rotation of the eye, which was one of the patient’s major complaints. Gradual improvement was displayed over the rest of the study and after 4 more treatments of that musculature, the patients BQ scores were consistent at 2 points for the last 3 sessions. After the study, the patient still was experiencing double vision, (however improved it was) more intervention of a different kind may have been needed in order to reach complete relief.

**Shoulder BQ:** The BQ scores for the patients shoulder displayed a 78.57%, which exceeds the 47% standard, making the results of clinical significance.(11) The scores showed a fairly gradual improvement over time with the highest score before the first treatment, and the lowest score after the last. The greatest improvement was after the 1st treatment, the scores decreased from 14 points to 6 points. This showed a correlation with the treatment of the infraspinatus and supraspinatus(13), the patient received in the first treatment. The supraspinatus was indicated for treatment because of the patients AC joint measuring inferior on that side.(13) There is potential for impingement as the supraspinatus tendon travels under the acromion on the low shoulder side, because the pathway is interrupted.(13) The data had its ups and downs with a noticeable spike from 7 points to 14 points on the 4th treatment. At this treatment the patient reported that he had done a lot of yard work over the weekend, sitting down and rotating his torso to use his arms for the work. One very notable piece of data on this particular score as that 7 of those 14 points came from question #6 stating “over the past few days, how do you think your work (both inside the home and/or employed work) have affected your painful complaint?” This is the question that was removed in order to create (Table 2), this question seemed to be an outlier in the fact that it asked how the patient thought their activities affected their symptoms, regardless of how much discomfort it was actually causing the patient. It is also notable that the scores on that
question for the treatment prior and after, were both 1 point (6 points less). Without that question displayed in the results, the score would have only displayed an increase of 1 point from the 3rd treatment.

**Shoulder SPADI:** The SPADI scores however, showed a 10 point improvement from 14.4/100 to 4.4/100 points, not meeting the standard of 13 point clinically significant minimum detectable change, referenced on the document, but falling within the lines of 8-18 point clinically significant minimum detectable change.(22)(23) Not meeting the 13 point minimum detectable change may have been attributed to a couple of things. For example: One study suggests that after having pain for many years, patients may become so used to the pain that they don’t regard it as a problem.(6) This could be the case for this patient, after being diagnosed with polio at a young age and has had to live with the side effects for a very long time. What this can do to the data is make the starting variables in the data lower, making it much harder to reach a minimum detectable change. This is supported by the fact that the SPADI scores showed a 68.42% improvement even though the change was only documented as 10 points. Another factor that may have affected the scores is that many treatments were focused more on the hips, back, and eyes. With only approximately 45 minutes for hands-on treatment per session, it was difficult to address all symptoms equally during the provided time frame. However, the treatment done elsewhere may have assisted in reinforcing posture and relieving stressors impacting the shoulder. The SPADI scores showed a gradual improvement, with a few ups and downs along the way. There was a small spike from 8 to 11 after the 4th treatment. This may be attributed to the fact that the previous treatment had been focused mostly on the eyes, and a little on the hips. There were a couple data points that showed great improvement along the way. The biggest improvement was a jump from 9 points to 3 points after low back, hip, and eye treatment in the
8\textsuperscript{th} session, some of this may have been attributed to reinforcing posture and removing stressors on the shoulder. Another notable change was an improvement from 13 points to 8 points after Pectoralis Major, Scalene, SCM, and hip treatment in the 3\textsuperscript{rd} session. The Pectoralis Major was indicated for treatment do to the position of the humeral head being anterior on the right, as well as the ac joint being inferior on the same side. The pull of the Pectoralis Major will do just that when in spasm, limiting range of motion and stability of the shoulder.(13)

**Summary of Outcomes:** Massage therapists have reported success in alleviating symptoms in patients with PPS. Dr. Niki Munk stated, “I wish the IJTMB had been available to me ten years ago when a 40-plus year entrenched and significant arm tremor from polio resolved after two months of weekly massage therapy treatments in my client”.(21) The results of this study support this claim, as all but one category yielded clinically significant results. Even the category that wasn’t clinically significant, displayed a 68.42% improvement over the course of the study. Massage therapy should be considered a valid option to assist in alleviating pain and discomfort associated with PPS.

**Patient Perspective:** “I recently participated in a 10 visit research project with (PRINCIPAL INVESTIGATORS NAME OMITTED FOR PEER REVIEW), a student at (NAME OF SCHOOL OMITTED FOR PEER REVIEW). (PRINCIPAL INVESTIGATORS NAME OMITTED FOR PEER REVIEW) did a great job assessing my problems and developing a plan for addressing them. I can say that I have experienced significant relief from the treatment and continue to utilize the stretching exercise to reduce hip/back discomfort. When I was 4 years old, I contracted Polio. I received excellent medical care from Victor Wolkin, MD in Rochester New York. He subsequently lengthened my heel chord, later fused some bones in my foot, and moved
some muscles to maximize the usefulness of what I still had working. I learned to compensate with postural distortions and left side weakness through my younger adult life. In my fifties, I began to experience chronic hip and leg pain, as well as chronic aching in my spinal area. I was diagnosed with a leg length inequality and fitted with a shoe lift. This gave me immediate relief, especially in the hip area. I have utilized built up shoe lifts for about 15 years.

Thanks to (PRINCIPAL INVESTIGATORS NAME OMITTED FOR PEER REVIEW), I am experiencing relief with some of the symptoms that have gradually come with the years.”

References


