Pilates for Post Lumbar Discectomy Surgery

Pinling Lin
May 16, 2015
Course Year 2015
Balanced Bodies – Herndon, VA
Abstract

After discectomy surgery on the lumbar spine, the patient is encouraged to get out of bed and walk as soon as the anaesthesia wears off. After a couple weeks of recovery, the patient may be required to do some physical therapy work in order to regain the basic strength to resume daily activities. Once body strength for daily activities is regained, most people neglect the continuation of strengthening maintenance; therefore, post surgical pain reappears and usually the surgery is considered a failure. A thoughtfully structured Pilates regimen can play a significant role in continued strengthening maintenance that can reduce and prevent back pain return. The case study in this paper describes a Pilates program for an individual who ended up with lower back pain after seemingly successful discectomy surgery of the lumbar spine. The program entails the following: 1) observing and assessing the individual’s pain, strength, and movement quality; 2) 10 sessions of mat work with an introduction to the Step Barrel; 3) 10 sessions of fundamental work on Reformer, Cadillac, and Chair exercises; 4) 10 sessions of intermediate work on Reformer, Cadillac, and Chair exercises.
Anatomical Descriptions of Spinal Column and Herniated Disc

The human spine is formed by 7 cervical vertebrae (C1-C7), 12 thoracic vertebrae (T1-T12), 5 lumbar vertebrae (L1-L5), 5 fused sacral vertebrae (S1-S5) and 4 fused vertebrae in the coccyx. The vertebrae are bones that protect and support the spinal cord, and also act as the pillar that supports your body, keeping it upright. (Figure 1)

Just like other bones in the body, each vertebra is connected together by ligaments, and surrounding the spinal column are layers of muscles that are connected to each vertebra by tendons. In between each vertebra, there is a gel-like cushion called an intervertebral disc that keeps the vertebrae from rubbing against each other, and also acts as a shock absorber.

A healthy spinal column’s vertebral discs will have a good height in between each vertebra. However, as aging or injuries occur, one can start to lose fluid in the disc and the disc height can start narrowing, which then shortens the distance between each vertebra, causing the spine to become inflexible. As a result, the body’s shock absorber starts to lose its function, and disc degeneration occurs.
Once a disc is degenerated and damaged, the gel-like center of the disc may bulge or leak out, a condition called a herniated disc. Most of herniated discs occur in the lower back. As seen in the images below, the gel leaks out of the “jelly donut”-like disc; as a result, the gel may press on the surrounding spinal cord causing back pain, nerve-pinch pain and numbness down to the lower limbs, and weakness all around the lower back area.

(Examples of a herniated disc pressing on nerves)
Discectomy for Lumbar Herniated Disc

Discectomy (Microdiscectomy) is a surgical procedure to remove the disc material (the gel) that has broken through and is pressing on the surrounding nerves or spinal cord. During the surgery, depending on the situation, the doctor may have to cut away a small piece of bone in order to get a better view of the herniated disc.

The surgery is not necessarily recommended to everyone with a herniated disc issue. The surgery is only recommended if the herniated disc has pressed against the spinal cord badly enough to cause one or more of the following conditions: serious leg pain; numbness that prevents one from performing daily activities and results in the loss of quality of life, in addition to the loss of bowel or bladder control; and tingling in the buttocks and lower limbs.

The goal of the discectomy is to remove the herniated gel-like material. Once it is removed, the pinching pressure on the nerves is relieved and the back pain should be eliminated.
Introduction

Our spine, the backbone, acts like the main pillar in a house, which we can compare to our entire body. The pillar in a house supports the house and keeps it standing upright. If the pillar is damaged, the supported roof may collapse, and the roof may then compress the furniture in the house, and the house itself will start to go out of square. With this same analogy, the spine acts as the pillar to support the entire human body to be upright. If it is damaged, just like the house furniture, the surrounding nerves may be pinched, and muscles may collapse to compress other organs.

On the other hand, the roof and the wall of the house are just like all the muscles that wrap around the spine to protect the pillar. If the owner of a house does not keep up with its maintenance, the strong roof and wall (the muscles) may start to lose their function to protect the pillar (the spine), and more weight is then placed on the pillar trying to hold the whole house upright. As days go on, the heavy weight load will start to press on the pillar and eventually weaken and shorten it. Similarly, other parts of the house can also be affected and damaged.

To maintain a healthy spine, one needs to ensure that constant protection for the spine is always in place, and that is the part of the work we can do for ourselves before we reach out to a surgeon. Even if surgery has been done to the spine, the constant maintenance should never stop. After surgery, several weeks of physical therapy may be prescribed by the surgeon to regain strength and get the patient back to a functional state. However, how do you keep a spine that has been operated on remaining in a
strong and functional state for the rest of your life? Personally, I believe that it is where Pilates comes in.

**Case Study Introduction**

After a 5-year battle with lower back pain as a result of my herniated L1-S5 disc, I finally gave in to discectomy surgery because I had become weakened, immobilized, and had pretty much lost the quality of my life. Amazingly, all the pain went away the moment the surgical procedure was completed, and also amazingly, physical therapy was not even recommended or provided to me by my surgeon afterward. As a dancer for the past twenty years, I was stubborn and thought to myself that, considering how physically fit I was, I could just keep dancing and keep pain free from there. Predictably, my back pain returned within a couple years of the surgery, and stole my quality of life again. This time, the pain was not just on the spine, I was very weak and always in pain somewhere, and the symptoms were not easy to diagnose and explain. After a year of pain like that, depression started to kick in, and a fearful mind took away my confidence and trust in my own physical abilities, even for simple movements for everyday life.

Pilates was eventually recommended to me by a BASI qualified instructor. I was very fearful of every movement: even a Rest Position hurt. With the encouragement I received from my Pilates instructors and classmates, I now feel very strong with extremely minimal pain in my body. I still have the flexibility I gained as a dancer, and yet, I have a very strong stability and trust in my movement now.
Based on the experience I have had, I will develop a Pilates program for “Lynn”, a 38-year old who also has long-term post-surgical spinal pain and is also dealing with fear of moving her body. I will first help gain the person’s trust, and allow the person to move well without any doubt of their ability to move. After the person removes the fear of moving, I can then start developing a full conditioning program to strengthen overall body awareness with an emphasis on their core muscles.

**Conditioning Program for Lynn Who Suffers from Post Surgical Spine Pain**

**Meet and Greet** - Upon meeting Lynn for the first time and understanding that she is dealing with the same issue I had in the past, I spent part of the session listening to her describing her situation and allowing her to feel that someone else is with her to share the experience. I also spent some time to introduce Pilates to her, to explain its benefits and potential importance to her. The next part of the session I start her out with some very fundamental mat exercises for me to observe her movement to understand what needs to be addressed. From this first session, it is very obvious to me that Lynn has a strong fear of moving her body because of the pain that she expects to experience in her back after the discectomy surgery. The basic Roll Down allows me to observe that she is not able to let go of her weight in her head and shoulders, and her fear then causes her to hold her body weight in a way that impedes her ability to breathe naturally and thoroughly with her body. She complains of pain when performing trunk flexion, and the tension she is holding then creates an elevated hike of her right hip and creates an imbalance throughout her body.

I set a goal for Lynn and explain to her what to expect for future sessions:
Sessions 1-10 - focus on mat work, with the introduction of Step Barrel

After 10 sessions - introduce fundamental Reformer, Cadillac, and Chair exercises

After 20 sessions - introduce intermediate Reformer, Cadillac, and Chair exercises

Sessions 1-10 - Since Lynn is unsure of her own movement ability, I want her to focus on just mat and some Step Barrel work so I do not introduce any distractions; rather, she will just focus on her own body weight without worrying about working with additional resistance.

<table>
<thead>
<tr>
<th>Exercises</th>
<th>Explanation</th>
<th>Session Introduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvic Curl</td>
<td>For her to warm up and get familiar with the neutral spine and pelvis position.</td>
<td>1-10</td>
</tr>
<tr>
<td>Spine Twist Supine</td>
<td>Spine rotation allows her to reduce the fear of moving through the spine.</td>
<td>1-10</td>
</tr>
<tr>
<td>Leg Lift</td>
<td>To give her the sensation of engaging her abdominal muscles when performing daily activities.</td>
<td>1-10</td>
</tr>
<tr>
<td>Chest Lift, Chest Lift with Rotation, Hundred Prep (Chest Lift, Reach, and Overhead Reach on Step Barrel)</td>
<td>To strengthen her abdominal muscles, and to deviate her pain on her spine</td>
<td>1-10</td>
</tr>
<tr>
<td>Roll Up, Hundred, Double Leg Stretch, Single Leg Stretch, Criss Cross</td>
<td>Start to add more challenge by adding her own body weight (holding her leg in a diagonal line).</td>
<td>3-10</td>
</tr>
<tr>
<td>Roll-Like-A-Ball, Spine Stretch</td>
<td>Allow her to get the sense of articulating her spine more.</td>
<td>1-10</td>
</tr>
</tbody>
</table>
### Leg Circle
Circling within the range of pelvic control can help her be aware of and correct her hip hike problem 1-10

### Side Lift
**Side Lift (Step Barrel)**
To enhance the spine from the abdominal and oblique muscles 1-10

### Back Extension
With her abdominal muscles’ support, she can start strengthening her back extensors so the spinal column is well protected to prevent further disc injuries. 1-10

### Swan Prep, Swan (Step Barrel)
Allow her to further focus the work on her back muscles 3-10

### Rest Position
After the whole session of exercises, this final cool down position gives her the chance to breathe fully and deeply. Ending with calm time should give her the opportunity to do a final scan of her body, and to stretch and increase the space between each lumbar vertebra. 1-10

---

**After 10 sessions** - Once Lynn is more comfortable with movement, less fearful about pain, and has also gained some strength in her abdominal muscles which will reduce her use of the spine to do the work that creates stress, we can start adding more resistance in her exercises by using various apparatus. The program will now be designed based on BASI's Block System.

**After 20 sessions** - As Lynn progressively becomes stronger, more challenging exercises will be added for her. At this point, she should not have any more fear of moving, and should be able to perform more challenging exercise with the support of her own body strength.

<table>
<thead>
<tr>
<th>BASI Block</th>
<th>Exercises</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm Up</td>
<td>(Mat on Cadillac) -</td>
<td>To continue to observe Lynn and assess her ability to articulate her spine by doing</td>
</tr>
<tr>
<td><strong>Foot Work</strong></td>
<td>(Cadillac) - Parallel Heels, Parallel Toes, V Position Toes, Open V Heels, Open V Toes, Calf Raises, Prances, Single Leg Heel, Single Leg Toes</td>
<td>As Lynn has an imbalance in her hip area after the surgery, I think it is important to also train her body’s foundation so she can be well grounded from bottom up.</td>
</tr>
<tr>
<td>---------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Abdominal Work</strong></td>
<td>(Reformer) - Hundred Prep, Hundred</td>
<td>As she has experienced these two abdominal exercises from the first 10 mat sessions, we can now introduce the reformer to her and add a bit of extra resistance for her to further engage her abdominal muscles.</td>
</tr>
</tbody>
</table>
| **Hip Work** | (Reformer) - Frog, Circle Down, Circle Up, Openings
Extended Frog and Extended Frog Reverse (After 20 sessions) | Due to the fact that muscle was cut during the surgery, Lynn's right QL muscle is shorter and always tight, therefore she is always fighting with the hip hike and back spasm problem. These hip exercises require Lynn to stabilize her lumbar pelvis to do the work, and afterward, her hip will get stronger and be able to hold itself in place to prevent the hiking problem. |
| **Spinal Articulation** | (Reformer) - Bottom Lift
Bottom Lift with Extension (After 20 sessions) | Continue to have her articulate her spine and reduce her fear from moving after surgery. This will also help her reduce stiffness in the spine area due to the lack of movement and nutrition supplied through the spinal column. |
| **Stretches** | (Ladder Barrel) - Shoulder Stretch 1 | This stretch is good for people like Lynn who can get a great stretch in the shoulders, as well as the traction stretch on her spine, which creates more space in between each spinal vertebra. |
| **Full Body Integration** | (Cadillac) - Sitting Forward and Side Reach Saw (After 20 sessions) | Continue to articulate and stretch her spine. These exercises are chosen for her because she is also required to square her hips and anchor her sit bones while doing the work. This essentially can train her hips not to be hiked at all times. |
| Arm Work | (Cadillac) - Shoulder Adduction Sitting Side and Shoulder Adduction Sitting Forward  
Chest Expansion, Circle Up, Circle Down, Hug-A-Tree, Punching, and Biceps (After 20 sessions) | At the beginning, I would like Lynn to continue to have the sense of bringing body awareness toward to the center of her body, her spine. After 20 sessions, I will let her work on the co-contraction sense on her abdominals and back extensors while performing the Arm Standing Series. |
|----------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Leg Work | (Wunda Chair) - Leg Press Standing and Hamstring Curl  
Frog Front (After 20 sessions) | Continue the trunk and hip stabilization work. |
| Lateral Flexion/Rotation | (Wunda Chair) - Kneeling Side Stretch  
Side Stretch (After 20 sessions) | Train the muscles that wrap around the core, which includes the obliques and QLs. These two muscles can keep her hips from hiking if they are well strengthened. |
| Back Extension | (Wunda Chair) - Swan on the Floor and Swan Basic  
Back Extension Single Arm (After 20 sessions) | These exercises are chosen for Lynn to strengthen her back muscles while keeping her hips squared with the support of the floor and chair. |
Conclusion

It is very important to understand the spine structure in order to understand how it plays a significant role in supporting our entire body and holding it upright. Sometimes, it can be traumatic for someone who has had surgery done to their spine to have to deal with their fear of movement. As a Pilates instructor, I believe it is important to observe such a client’s needs not just physically, but also psychologically. It is our goal to help a client to gain trust in their body to move, and in the long term, to move safely, correctly, and strongly.
Bibliography


