Pilates for the Rehabilitation of Iliopsoas Tendonitis and Low Back Pain

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Abstract

Iliopsoas Tendonitis is irritation and inflammation of the iliopsoas tendon, characterized by pain in the groin when walking and often low back pain. The main purpose of the iliopsoas is hip flexion, bringing the leg out in front of the body as in kicking a ball. It lies deep within the lower abdomen, in front of the hip joint. Iliopsoas tendonitis or Iliopsoas Syndrome is an under reported and under diagnosed condition, affecting primarily runners, ballet dancers, hurdlers, high jumpers, cyclists, and many other athletes, whose activity involves repetitive hip flexion.¹ The diagnosis is often missed and the only therapy recommended is rest. This research paper proposes a Pilates conditioning program that emphasizes stretching the tight tendons of the hip flexors and core strengthening to overcome muscle imbalances due to the injury.
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Anatomical Description

The iliopsoas muscle is comprised of the iliacus which attaches to the inner surface of the ilium and Lesser trochanter; the Psoas Major attached to the vertebral column at the L1-L5 vertebrae and the Lesser trochanter; and Psoas Minor which attaches to the L1 vertebra and the Superior Ramus of the pubis.
Case Study

The client is a 57-year-old male, in generally good health. He has an active lifestyle, regularly engaging in cycling, swimming, and weightlifting and up until recently, running. He has good upper body strength. The hip flexors, hamstrings, calves and Iliotibial (IT) Bands are highly developed on both legs due to cycling. A VA health manager suggested he try Pilates to manage chronic low back pain, from an injury while in the service. The client suffered an asymmetric left-sided disc bulge at the L5-S1 vertebral level. An MRI revealed there is mild narrowing of the medial aspect of the left neural foramen and spinal stenosis. He has suffered chronic low back pain for many years.

A postural assessment revealed that the client has tight and weak low back muscles, frequent back spasms and sciatic nerve pain down the left leg to the foot. Long distance cycling resulted in the overdevelopment of the hip flexors, hamstrings, quadriceps, and IT band. This also resulted in the weakness of key muscle groups required for core strength, maintaining stabilization of the lower spine and alleviating pressure off the injured disc: the transverse abdominus, side obliques, multifidi, upper and lower back extensors.

Addressing the muscle imbalances was further complicated by an earlier injury that the client suffered while in college to the iliopsoas muscle group followed by abdominal surgery for an emergency appendectomy a few years earlier. Both had to be addressed while developing a conditioning program to improve the client’s core strength and correct the muscle imbalances in his body. The client has been following a physical therapy regimen designed to stretch the hip flexors and loosen the hamstrings. Also exercises were followed to strengthen the iliopsoas.
## Conditioning Program

### Client Progressive Protocol for Rehabilitating Injured Illiopsoas.xlsx

<table>
<thead>
<tr>
<th>Level</th>
<th>Sessions: 1-10</th>
<th>Sessions: 11-20</th>
<th>Sessions: 21 Onwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLOCK</td>
<td><strong>Fundamental</strong></td>
<td><strong>Fundamental +</strong></td>
<td><strong>Intermediate</strong></td>
</tr>
<tr>
<td></td>
<td>Mat/Reformer</td>
<td>Mat/Reformer</td>
<td>Mat/Reformer/Cadillac/Wunda Chair</td>
</tr>
<tr>
<td>Warm Up</td>
<td><strong>Mat:</strong> Pelvic Tilts; Pelvic Curls, Supine Spine Twist, Chest Lift, Chest Lift w/Rotation</td>
<td><strong>Mat:</strong> Pelvic Tilts; Pelvic Curls, Supine Spine Twist, Chest Lift, Chest Lift w/Rotation; Roll Up; Double Leg Stretch; Single Leg Stretch; Criss cross</td>
<td><strong>Mat:</strong> Pelvic Tilts; Pelvic Curls, Supine Spine Twist, Chest Lift, Chest Lift w/Rotation; Roll Up w/Roll Up Bar</td>
</tr>
<tr>
<td>Foot Work Series</td>
<td><strong>Reformer:</strong> Parallel Heels; Parallel Toes; Small V Toe; Open V Heels; Open V Toes; Single Leg Series; Calf Raises; Prances; Prehensile</td>
<td><strong>Reformer Foot Work Series;</strong></td>
<td><strong>Reformer Foot Work Series;</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Cadillac:</strong> Foot Work Series</td>
</tr>
<tr>
<td>Abdominal Work</td>
<td><strong>Reformer:</strong> Hundred Prep;</td>
<td><strong>Reformer:</strong> Hundred Prep; Hundred</td>
<td><strong>Reformer:</strong> Hundred; Coordination; Double Leg (legs in straps); Double Legs w/rotation <strong>Cadillac:</strong> Mini Rollups; Mini Roll Up Obliques</td>
</tr>
<tr>
<td>Hip Work Series</td>
<td><strong>Reformer:</strong> Supine Leg Series: Frog; Circles (down, up); Openings;</td>
<td><strong>Reformer:</strong> Supine Leg Series; Frog; Circles (down, up); Extended Frog; Extended Frog reverse</td>
<td><strong>Reformer:</strong> Supine Leg Series; Frog; Circles (down, up); Extended Frog; Extended Frog reverse <strong>Cadillac:</strong> Frog; Leg Circles (Up/Down); Walking; Bicycle</td>
</tr>
<tr>
<td>Spinal Articulation</td>
<td><strong>Reformer:</strong> Bottom Lift</td>
<td><strong>Reformer:</strong> Bottom Lift; Bottom lift w/extension</td>
<td><strong>Reformer:</strong> Bottom Lift; Bottom lift w/extension; Short spine; Long spine; Semicircle <strong>Cadillac:</strong> Monkey; Tower prep; Tower</td>
</tr>
</tbody>
</table>
| Stretches | **Reformer:** Standing lunge | **Reformer:** Standing lunge; Kneeling lunge | **Reformer:** Kneeling lunge
*Cadillac:* Kneeling lunge with Push Through Bar |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Full Body Integration (fundamental/intermediate)</td>
<td><strong>Reformer:</strong> Scooter</td>
<td><strong>Reformer:</strong> Upstretch Series: Up Stretch 1; Elephant; Reverse knee stretch; Splits</td>
<td><strong>Reformer:</strong> Down Stretch; Up Stretch 2; Long Stretch; Up Stretch 3; Stomach massage round back; Stomach massage flat back</td>
</tr>
<tr>
<td>Arm Work</td>
<td><strong>Reformer:</strong> Supine Arm Series: Extension; Adduction; Up Circles; Down Circles; Triceps;</td>
<td><strong>Reformer:</strong> Arms Sitting Series: Chest expansion; Biceps; Rhomboids; Hug a Tree; Salute; Shoulder push</td>
<td><strong>Reformer:</strong> (Arms Kneeling Series) - Chest Expansion; Up Circles; Down Circles; Triceps; Biceps; Salute</td>
</tr>
<tr>
<td>Full Body Integration (advanced/masters)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Leg Work</td>
<td>N/A</td>
<td><strong>Reformer:</strong> Hamstring curls (Long Box Series); Single leg skating;</td>
<td><strong>Mat:</strong> Gluteal Side Lying Series</td>
</tr>
</tbody>
</table>
| Lateral Flexion | **Mat:** Side Lifts | **Reformer:** Mermaid; Side Over on Box (Short Box Series)
*Cadillac:* Side Lift | **Reformer:** Mermaid; Side Over on Box (Short Box Series)
*Wunda Chair:* Side Stretch |
| Back Extension | **Reformer:** Breaststroke Prep
**Ladder Barrel:** Swan Prep | **Reformer:** (Long Box Series) - Breaststroke; Pulling Straps 1; Pulling Straps 2
*Cadillac:* Prone 1; Prone 2 | **Reformer:** (Long Box Series) - Breaststroke; Pulling Straps 1; Pulling Straps 2
*Cadillac:* Prone 1; Prone 2 |
The client’s history of injuries, surgeries and activities gives clues to the types of muscle imbalances that are present in his body and the appropriate conditioning program needed.

1. In college he suffered a severe blow to the lower abdomen while playing Frisbee and ran into a picnic table. It is likely that this impact injured the iliopsoas muscle. Since there did not appear to be any injury to the internal organs, doctors did not investigate the injury further. The client mentioned that he suffered internal pain in the abdomen for about 1 year afterwards.

2. Several years later the client underwent an emergency appendectomy, before the development of microsurgery commonly used today. He was left with a 3” horizontal surgical scar in his lower right abdomen. This likely contributed to weak abdominal muscles and an imbalance between the right and left abdominal muscles.

3. He then injured his L5-S1 disk which lifting a heavy object and then setting it down while his spine was flexed and twisted to the left. He has suffered low back pain and muscles spasms for years.

4. Being an active runner for years caused pain in the L5-S1 disk and aggravated his left sciatic nerve causing numbness and pain down the leg. Cycling was less traumatic to the disk. Unfortunately, the riding position of the cyclists did not provide support for the core, resulting in tight low back muscles, hamstrings, and hip flexors.
His strong hip flexors, developed through cycling and running, over-activate when performing hip flexion to compensate for the weak abdominals and iliopsoas.

The conditioning program is designed to re-educate the body through stretching the muscles groups which have been habitually over-activated – the hip flexors and hamstrings - and strengthen the core muscles involved in pelvic spinal stabilization – transverse abdominus, multifidi and back extensors.

All the Pilates sessions begin with a standard mat warm-up of pelvic tilts and pelvic curls. During the mat warm-up special emphasis is placed on the client learning the proper breathing and the importance of tying the breath to the movements. This will encourage the client to focus more on abdominal engagement and less on other muscle groups involved in executing a move. The mat warm-up movements will develop the core strength needed to free up the movement in the hips and legs.

Reformer hip work will develop the inner thigh muscles and overcome the imbalance between the quadriceps, IT-Band and hip adductors commonly seen in runners and cyclists. The spinal articulation movements will help stretch and strengthen the low back and encourage flexibility in the spine. The client has weak obliques, and back extensors due to the rounded shoulder position of riding and sitting at a desk. Lateral flexion and back movements will aid in correcting these problems.
Conclusion:

The client has been practicing Pilates at least twice per week for over five years. The training had to be modified early in the training due his low back pain. Abdominal work was also painful due to scar tissue from his surgery. Engagement of the muscles was not smooth due to uneven activation on the left and right sides of the trunk.

Once the client became comfortable with using the breath with the movement he began to improve dramatically. There is increased flexibility in the hamstrings and hip flexors. Hip flexion is achieved without the over-activation of the hip flexors. The client has expressed improvement in the incidence and duration of low back pain. Recovery from episodes of back spasms is also faster. The greatest benefit has been that the client has gained a deeper understanding of his body.
Bibliography


