BASI Student Paper

Knee recovery

after partial meniscectomy

Frederique Pellerin

June 2016

Bahrain
This paper is about the use of Pilates to assist the recovery process of a client who just had a partial meniscectomy on his right knee. The meniscus tear was due to a series of small traumas on that knee while practicing tennis and running.

Like a lot of knee injuries, a meniscus tear can be painful and debilitating. Unfortunately, it's quite common. In fact, a meniscal tear is one of the most frequently occurring cartilage injuries of the knee.

This paper includes an anatomical description of the knee and a description of the recovery after a torn meniscus, followed by a Basi Pilates program adapted to the case study.
Contents

ABSTRACT ........................................................................................................................................ 2

1 – INTRODUCTION TO THE KNEE ......................................................................................... 4

2 - A TORN MENISCUS ............................................................................................................. 6

3– RECOVERY .......................................................................................................................... 8

4 – CASE-STUDY ..................................................................................................................... 9

5 – BASI PILATES PROGRAM ................................................................................................. 9

6 – CONCLUSION .................................................................................................................. 12

7 – BIBLIOGRAPHY / REFERENCES ..................................................................................... 12
1 - INTRODUCTION TO THE KNEE

The knee is the largest joint in the body. The knee allows the leg to bend where the femur (thighbone) attaches to the tibia (shinbone). The knee flexes and extends, allowing the body to perform many activities, from walking and running to climbing and squatting. There are a variety of structures that surround the knee and allow it to bend and that protect the knee joint from injury.

The quadriceps and hamstring muscles are responsible for moving the knee joint. When the quadriceps muscles (located on the front the thigh) contract, the knee extends or straightens. The hamstring muscles, located on the back of the thigh, are responsible for flexing or bending the knee. These muscles are also important in protecting the knee from being injured by acting to stabilize the knee and preventing it from being pushed in directions that it isn't meant to go.

There are four ligaments that stabilize the knee joint at rest and during movement: the medical and lateral collateral ligaments (MCL, LCL) and the anterior and posterior cruciate ligaments (ACL, PCL).

Cartilage within the joint provides the cushioning to protect the bones from the routine stresses of walking, running, and climbing. The medial and lateral meniscus are two thicker wedge-shaped pads of cartilage attached to top of the tibia (shin bone), called the tibial plateau. Each meniscus is curved in a C-shape, with the front part of the cartilage called the anterior horn and the back part
called the posterior horn.

There is also articular cartilage that lines the joint surfaces of the bones within the knee, including the tibia, femur, and kneecap (patella). The terminology torn knee cartilage refers to damage to one of the C-shaped menisci of the knee between the femur and tibia.

As with any injury in the body, when the meniscus is damaged, irritation occurs. If the surface that allows the bones to glide over each other in the knee joint is no longer smooth, pain can occur with each flexion or extension. The meniscus can be damaged because of a single event or it can gradually wear out because of age and overuse.
A torn meniscus is damage from a tear in the cartilage that is positioned on top of the tibia and allows the femur to glide when the knee joint moves. Tears are usually described by where they are located anatomically in the C shape and by their appearance (for example, "bucket handle" tear, longitudinal, parrot beak, and transverse). While physical examination may predict whether it is the medial or lateral meniscus that is damaged, a diagnostic procedure, like an MRI or knee arthroscopy, can locate the specific part of the cartilage anatomy that is torn and its appearance.

Because the blood supply is different to each part of the meniscus, knowing where the tear is located may help decide how easily an injury might heal (with or without surgery). The better the blood supply, the better the potential for recovery. The outside rim of cartilage has better blood supply than the central part of the "C." Blood supply to knee cartilage also decreases with age, and up to 20% of normal blood supply is lost by age 40.

CAUSE OF TORN MENISCUS

A forceful twist or sudden stop can cause the end of the femur to grind into the top of the tibia, pinching and potentially tearing the cartilage of the meniscus. This injury can also occur with deep squatting or kneeling, especially when lifting a heavy weight. Meniscus tear injuries often occur during athletic activities, especially in contact sports like football and hockey. Motions that require pivoting and sudden stops, in sports like tennis, basketball, and golf, can also cause meniscus damage.
The risk of developing a torn meniscus increases with age because cartilage begins to gradually wear out, losing its blood supply and its resilience. Increasing body weight also puts more stress on the meniscus. Routine daily activities like walking and climbing stairs increase the potential for wear, degeneration, and tearing. It is estimated that six out of 10 patients older than 65 years have a degenerative meniscus tear. Many of these tears may never cause problems. Because some of the fibers of the cartilage are interconnected with those of the ligaments that surround the knee, meniscus injuries may be associated with tears of the collateral and cruciate ligaments, depending upon the mechanism of injury.

While the normal cartilage is "C" or crescent shaped, there is a variant shape that is oval or discoid. This meniscus is thicker and more prone to injury and tearing.

Meniscectomy for a Meniscus Tear:

Meniscectomy is the surgical removal of all or part of a torn meniscus. Surgeons who perform meniscectomies (orthopedic surgeons) will make surgical decisions based on the meniscus's ability to heal as well as your age, health, and activity level.

How it is done:

The choice of type of surgery is based on the size and location of the tear, your age and activity level, the surgeon's experience, and your preferences. Orthopedic surgeons most often perform meniscus surgery with arthroscopy, a
procedure used to both examine and repair the inside of a joint. A thin tube (arthroscopy) containing a camera and light is inserted through small incisions near the joint. Surgical instruments are inserted through other small incisions. Arthroscopic surgery may limit knee damage from surgery and may promote fuller recovery. But some tears may require open knee surgery.

In a total meniscectomy, the entire meniscus is removed. In a partial meniscectomy, the surgeon removes as little of the meniscus as possible. Unstable meniscal fragments are removed, and the remaining meniscus edges are smoothed so that there are no frayed ends.

You may have general or regional anesthesia for a meniscectomy. Arthroscopic partial meniscectomy is commonly done in an outpatient surgical center.

**3 - RECOVERY**

After a knee arthroscopy is performed, the rehabilitation process balances swelling and healing. The goal is to return range of motion to the knee as soon as possible. Physical therapy is an important part of the surgery process, and most therapists work with the orthopedic surgeon to return the patient to full function as soon as possible. Since the procedure is planned in advance, some health-care professionals advocate pre-hab. With rehabilitation prior to the procedure, the patient begins strengthening exercises for the quadriceps and hamstring muscles before surgery to prevent the routine muscle weakness that may occur immediately after an operation.

Once the swelling in the knee joint resolves, the goal of therapy is to increase the strength of the muscles surrounding the knee, return range of motion to normal, and promote and preserve stability of the joint.

Elite athletes return to practice within one to two weeks after surgery, but they are a motivated group of people who spend hours each day in rehabilitation. For most other patients, return to mild routine activity occurs in less than six weeks. Most patients do well after surgery. The prognosis for return to normal activity is good but depends upon the motivation of the patient to work hard with their physical therapist and to continue that work after formal therapy has been completed.
4 – CASE-STUDY

Stephane is 45 years old, he plays tennis and run every week. Following a series of small trauma on the knee he had to have a partial meniscectomy by arthroscopy. His surgeon had him keep his knee straight for 1 week in order for the menisci to heal and after 4 weeks of the surgery he now have the authorization from his doctor to start pilates exercises.

In the first few weeks of pilates training, a particular care will be given to the loss of muscle on the injured leg. Which means that little by little the exercises should re-balance the strength of both legs as well as returning the knee full range of motion. In addition, as Stephane main activities are tennis and running which both put a lot of strength on the knees a particular attention will be given to strengthening of the muscles all around the knee to gain a better stabilization and avoid further injuries.

Exercises to reinforce the knee proprioception are very important in each cession.

5 – BASI PILATES PROGRAM

Short term goals: (full recovery after the surgery)
- Balance the strength of both legs (Particular care on the knee alignment is important)
- Return to full range of motion on the recovering knee

Long term goals : (to prevent from new injury or pain knowing that the main physical activities of Stephane is tennis and running)

- Strengthen knees stabilizers
- Strengthen hips stabilizers
- Improve core strengthen

PROGRAM :

Prior to Warm up on the mat, few standing roll down/up can be perform followed by a proprioception exercise: either standing on 1 leg roll down, touch
the floor and up, then on the other leg or after 10 cessions lean against a ball on a wall : lift one leg up and squat down and up.

<table>
<thead>
<tr>
<th>Warm up</th>
<th>Pelvic Curl, Spine twist supine, Chest lift, Chest lift (add rotation), Leg changes</th>
<th>Pelvic Curl perform only when knee can bent with no pain, with particular care of alignment. Option to add a ball between knees for bottom lift in order to work on the inner legs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot Work</td>
<td>Parallel Heels / Toes, V position Toes, Open V Heels/Toes, Calf Raises, Prances</td>
<td>Placing emphasis on extending the knee completely (patella going up) and bending slowly until full recovery. Increasing the resistance with the recovery.</td>
</tr>
</tbody>
</table>
| Abdominals | Hundred Prep  
Short Box Series : Round Back, Flat Back, Tilt, Twist, Round About. | Climb a Tree might be to intense in the first few weeks so it has been taken out for now and can be add on after 10 cessions. |
<p>| Hip Work | Supine Leg series : Frog, Circles Down/Up, Openings, Extended Frog, Extended Frog Reverse | Knee should be extended fully with patella up to activate totally the knee’ muscles. Increasing the resistance with the recovery |
| Spinal Articulation | Short Spine, Long Spine | Spinal Articulation should be included after 10 sessions. |
| Stretches | Standing Lunge |</p>
<table>
<thead>
<tr>
<th>Full Body Integration On Reformer</th>
<th>Up stretch 1, Elephant, Up stretch 2</th>
<th>Long Stretch (after 10 sessions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leg Work On Wunda Chair</td>
<td>Leg Press Standing, Hamstring curl</td>
<td>After 10 sessions that can be replace by Jumping series on Reformer.</td>
</tr>
<tr>
<td>Lateral Flexion/Rotation On Wunda Chair</td>
<td>Side Stretch</td>
<td></td>
</tr>
<tr>
<td>Back Extension On Cadillac</td>
<td>Prone 1 Prone 2</td>
<td></td>
</tr>
</tbody>
</table>

It is recommended to take 10 more minutes to do a complete stretch using the Ladder Barrel (Gluteal, Hamstrings, Adductors and Hip Flexors)
6 – CONCLUSION

A year after his partial meniscectomy, Stephane is back to playing tennis and running regularly. By doing regular pilates classes, Stephane built a body awareness that allow him to practice physical activities with the correct position of the body to minimize strain and avoid injury.

Partial meniscectomy is more and more common as well as knee pain in general nowadays. We have demonstrated that with a program using BASI Pilates block system we can rehabilitate quickly and in the correct way, allowing the client to go back to his usual activities and sports. Furthermore, the practice of such a program associate to sport like tennis and running could help the prevention of the injuries.

7 – BIBLIOGRAPHY / REFERENCES

Books :

Body Arts and Science International Study Guide, Comprehensive Course

Body Arts and Science International Movement Analysis Workbook

Website :

Medecinenet.com

Webmd.com

Healthpages.org