

# Thesis

## Osteopathy For Tennis Players

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## Abstract

Even in the early 1990s, professional tennis players usually peaked in early-20s and faded away at around their 30s. Nonetheless, tennis players are competing at a professional level long after passing 30s as legends like Roger Federer alongside Nadal and Djokovic are still swinging their rackets with full strengths. All of them are above 33 and Federal is closing in 40. While there could be several reasons behind this unprecedented prolongation in career lengths in tennis players over recent years, though, 'sports physiology'-based training, nutrition alongside treatment modalities have been significantly reducing the risk of injury on tennis players. The motto of this paper is to illustrate the role of physical treatment with manual osteopathy for injuries in tennis players.

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## 1.0. What is Osteopathy

Dr. Andrew Taylor invented Osteopathy and actually practiced manual osteopathy in the US back in the 1874s [Medical registration for Adair County, MO dated 28 July 1883, 2013].

When it comes to define Osteopathy, it could be referred to a drug-free, manual and non-invasive therapeutic approach to yield positive health across the musculoskeletal system of the while maintaining homeostasis across multiple organs [Felman, A., 2017].

Osteopathy uses a wide array of manual “hands-on” techniques to restore blood circulation in any affected myofibril, thus improving the symptoms of a clinical illustration. Besides, often the method is claimed to be successful in correcting any abnormal changes in biomechanics without use of drugs.

Osteopathy harbors a holistic as well as whole-body approach in order to improve health and might not just be confined into the area of concern. Instead, the system could balance all of the systems of a human body and generate a better living and well-being.

Osteopathic techniques might include stretching, resistance as well as gentle pressure, which are being branded as manipulative medicine.

When it comes to Northern America, in particular Canada, low-amplitude high-velocity methods are not allowed in manual osteopathic curative procedure, hence helping in reducing side effects histrionically.

Manual Osteopathy is based on a clutch of hands-on physical treatment procedures including joint mobilization, osteoarticular osteopathy, cranial osteopathy, soft tissue therapy, strain-counter strain technique, muscle energy techniques (MET), manual mechanotherapy, visceral osteopathy, lymphatic drainage, facilitated positional release, balanced ligamentous tension, myofascial release techniques and trigger point therapy and a many more.

As all of those procedures mentioned above superlatively gentle and targeted at allaying any kind of

dysfunction in musculoskeletal system such as joints, spines, ligaments, muscles, tendons alongside fascia. Manual osteopathy takes care of individual needs of each patient, too [Felman, A., 2017].

## 2.0. Tennis & injury

In terms of stress on a human's musculoskeletal system, tennis is one of the most strenuous sports, while the sports require a tremendous scale of hand-eye coordination as well as a full-body participation.

Surprisingly, many tennis injuries could be minimized or prevented using osteopathic treatment, Osteopathy also could enhance a human's functioning by assisting in recovery as well as aiding in prevention of re-injury.

Osteopathic management is capable of equipping an individual with advice on how he or she could be able to enhance flexibility as well as muscle condition. Counselling on usage of appropriate equipment is practiced as well.

Commonest form of injuries in tennis are tennis elbows, Achilles tendon rupture, torn rotator cuff, stress fracture, patellar tendonitis. Osteopathy has been ideal to treat abovementioned injuries as well as a many more related to strenuous sports like of tennis [*osteopathy treats tennis injuries*].

## 3.0. Categories of Sports Injury

### Acute injury

Acute injury could be caused from a single incident, while the injury could be a strain or a sprain. The injury might also be resulted from a fall or a contortion of the body into an unnatural position. Acute injuries will lead to sudden and severe pain in the affected area in most cases.

## **Chronic injury**

Chronic injury could be developed over times, as these kinds of injuries are resulted from continuation of improper use of abnormal or overuse of certain body parts. Nonetheless, these symptoms often include swelling as well as lasting pain [*5 common tennis injuries how to treat them*].

## **4.0. Common Tennis Injuries**

### **4.1. Tennis Elbow**

When it comes to a common tennis injury, tennis elbow could take place when tennis players need to flex and bend their elbows frequently and quickly. Repeating the move would lead to inflammation of tendons connecting forearm muscles to elbow.

Tennis elbow could get inflamed and sometimes could be called as lateral epicondylitis. Tennis elbow primarily occurs due to excessive use of muscles of forearm.

Patients with tennis elbow might present with symptoms such as pain or burning sensation in or around the elbow as well as a weakening up of grip. Eventually, forearm muscles also get weaker.

### **General treatment for tennis elbow**

General treatment for tennis elbow allows tendon to heal. In tandem, physical and occupation therapy are significant in sports medicine, in particular for those who are tennis elbow patients. If the patient could learn how he or she could rest the elbow in a pain-free position, the process could also provide a solution to mitigate pain.

If sports medicine is ineffective, invasive procedures like of tendon debridement as well as release procedures might help reduce the symptoms while treating the conditions.

## 4.2. Torn rotator cuff

Muscles attached to shoulder joint are often central to operating the arm, hence overuse of the muscles could lead to a torn rotator cuff. Even a torn rotator cuff could turn out to be a chronic injury stemming from long-term overuse. Nonetheless, torn rotator cuff could be an acute injury as well caused by sudden stress.

Patients with torn rotator cuff will feel extreme weakness around the shoulder. The injury could lead to tenderness as well as a limitation of movement of the arm.

### **General treatment of torn rotator cuff**

While diagnosing torn rotator cuff, range of movement or limitation of movement is usually assessed. The primary mode of treatment of a torn rotator cuff is physical or occupational therapy. The Treatment methods would rebuild muscle strength. On top of that, in order to treat inflammation, often steroid medication is used. For regaining strength, several exercises could be recommended. If non-invasive treatment modalities are not successful in any point, the patient will obviously look for change and arthroscopic repair is appreciated as the next treatment method. By capitalizing on small cameras, the affected area is examined and treated.

## 4.3. Achilles tendon rupture

The Achilles tendon adjoins heel as well as calf muscles, allowing human to accomplish activities that requires a higher level of energy while taking a substantial scale of body weight according to the body's physical axis.

It is very critical in tennis for players to jump and leap to reach the ball. Recurrence of acute Achilles tendon rupture will lead to inflammation.

Besides, the injury is highly dangerous for people who are suddenly launching their frequent tennis routine.

If truth is to be spoken, resuming a workout all on a sudden, without proper conditional activities could be disastrous and could lead to Achilles tendon rupture.

Patients with Achilles tendon rupture is presented with pain just above the heel.

General treatment for Achilles tendon rupture

In invasive and surgical procedures, reattachment of tendons is the most effective method. However, modern advancement has helped minimize the impacts of post-operative complications.

#### **4.4. Patellar tendonitis**

Patellar tendonitis is often called as jumper's knee, which usually impact tennis players. In case of jumping and landing repectively, tennis players could experience extreme stress on knee. Besides, landing on rough surfaces could lead to patellar tendonitis. Patellar tendonitis could be resulted from changing posture to a crouched position from an upright position.

Patients with patellar tendonitis will be presented with pain and swelling right bellow the knee.

##### **General Treatment for patellar tendonitis**

Patellar tendonitis, in simple words, could be treated by assessing the scale of inflammation as well as tenderness alongside the array of motion affected by the injury.

Taking care of the inflammation is the primary priority, which could be obtained by collectively fostering a restful lifestyle as well as a precise immobilization and elevation of the knee. This will result in a faster recovery. Followed by the initial treatment, light stretching could be prescribed to regain muscle strength. These flexible exercises could help resume more extreme activities. On top of that, educating and counselling a patient about the condition could reduce the chances of developing the similar incidence. Sometimes, arthroscopic surgery helps patient reduce pain by restoring blood flow.

#### **4.5. Stress fractures in the back**

In case of a tennis player, serving could incline severe stress on the back. Hyperextension of the back as well as the bending usually put a tremendous scale of stress on lower back.

If an abnormal serving position persists for a longer duration, a tennis player will develop spondylolisthesis or spondylolysis, meaning that the player's vertebrae are not actually held firmly in place. This condition could be eased in rest.

However, patients with stress fracture in the back will be presented with pain or stiffness in back.

### **General treatment for stress fractures in back**

Non-invasive approaches could involve immobilizing the patient's spine. Commonest options could be back braces as well as casts. Maintaining a similar level of light activity is highly critical after initial phase of treatment. However, lifting is prohibited until a certain level of mobility could be reached in patients with stress fractures of back.

Physical therapy is used in stress fracture of the back. As the success to risk ratio of minimally invasive surgery is questionable, it is always preferred physical therapy in patients with stress fractures of the back.

A sedentary lifestyle is not recommended following an entire recovery. The patient should be gradually back to normal activities and should practice lifestyle rehabilitation.

Proper counselling about the disease will help prevent future injuries [*5 common tennis injuries how to treat them*].

## **5.0. Three main manual osteopathic techniques for injuries in tennis players**

### **5.1. Myofascial release**

Myofascial release could be defined as a type of physical therapy which is often used for treating patients with myofascial pain syndrome, as myofascial pain syndrome could be referred to a clinical

condition characterized by chronic pain resulting from an increase in sensitivity as well as tightening up of the myofascial tissue, the wrapper of human muscles.

In particular, pain in myofascial tissues originates in the NMJs (Neuromuscular Junction) within and around the myofibrils, normally named as trigger points.

Nerve impulses and generation of action potentials have active roles in thick and thin filaments of myofibrils and in splitting the actin-myosin complex and resulting in a contraction.

In the matter of the fact, myofascial release declines pain by relieving tension in trigger points, thereby reducing the chances of activating a mechanoreceptor, which in turn would have triggered a mechanical action potential and sent stimulation into myofibril through NMJ.

Besides, localizing a specific trigger point might be nearly impossible, since a group of myofibril is usually innervated by a web of nerve endings, which are branches of a particular nerve and a particular nerve could innervate many regions and could be contemplated as referred pain while identifying a trigger point.

A conventional example of referred muscle pain from joints could be pain in knee in patients with osteoarthritis [Vecchiet et al., 1999].

If the pain is deep and non-localizing, a group of muscle could be affected and walking could be difficult. That is why myofascial releases often are used over a broad area or a group of muscles rather than a single point. [Guide to Physical Therapist Practice 3.0., 2014].

## **5.2. Joint mobilization**

Joint mobilization could simply be defined as a passive movement of skeletal joint where arthrokinematics joint motions or joint gliding take place instead osteokinematic joint motion. It is generally targeted at a particular ‘synovial joint’ to achieve a therapeutic effect and this method is widely used among a number of health care professionals, however, specific training in manual therapy

assessment alongside training on treatment techniques are required before performing such therapeutic approach.

In factually, joint mobilization is divided into five grades with each grade of manipulation producing selective activation of different mechanoreceptors in the joint [Maitland, G.D., 1977].

- Grade I: These are rhythmically oscillating and low amplitude joint gliding close to resting position of available arthrokinematics joints that activates type-I mechanoreceptors and inhibits nociception or pain sensation while offering information regarding a joint's position. These types of gliding have a low threshold. They usually respond to a lower level of tension, such as a pressure of a few grams and activates mechanoreceptors in the superficial layer of the joint capsule.
- Grade II: These are rhythmically oscillating and relatively larger amplitude joint gliding that wave into the available arthrokinematics joint and activate Type II mechanoreceptor which in effect inhibit nociception or pain while proffering sufficient intel regarding joint acceleration. These also have a low threshold level and frequently respond to a few grams of pressure or tension which activate the mechanoreceptors lying in the deep layer a joint capsule.
- Grade III: These are rhythmically oscillating and relatively larger amplitude joint gliding which ripple towards the end of the available arthrokinematics joint and physically stretch the joint capsule.
- Grade IV: These are rhythmically oscillating and low amplitude joint gliding which is conducted at the end of the available arthrokinematics joints and physically stretch the joint capsule.
- Grade V: This grade could be defined as the use of a single low-amplitude, high-velocity thrust executed at the end of an available joint, eventually activating muscle Golgi tendon-like endings and inhibiting muscle tone. These have a higher threshold level and require kilograms of tensions or pressures to be activated [Maitland, G.D. (1977)].

### 5.3. Muscle Energy Technique (MET)

Muscle Energy Technique or MET is a type of stretching in a manual therapy where gentle muscle contractions are used to relax alongside elongate the muscle fibers while normalizing a joint's range of motion. However, in order to define MET or Muscle Energy Technique more specifically, it could be referred to “a direct manipulative procedure that uses a voluntary contraction of the patient's muscles against a distinctly controlled counterforce from a precise position and in a specific direction.”

Apart from that, an active technique, which is entirely opposite to the passive technique, requires a therapist who performs the procedures. Although, it is believed that the MET could be particularly helpful to elongate and relax postural muscles, which are easily contracted, an active contraction performed against a resistance generated by the therapist would lead to an isometric contraction and eventually help strengthening the muscles.

On top of that, since contraction of a group of muscle could decrease the tone in a group of muscles exerting an opposite function, MET could be beneficial to treat muscle cramps [Manual Therapy, February 2016].

## 6.0. Conclusion

Manual Osteopathic techniques in tennis players with particular clinical conditions could offer immediate relief by releasing contracted muscles, eventually restoring physical mobility.

To conclude it could be said that the acute injuries is always difficult to avoid as those are unexpected occurrences. Though, the five common injuries mentioned above that frequently occur in tennis players could become chronic with times. However, using manual osteopathic techniques to release taut bands of myofibrils could prevent injury effectively and it is found to be highly effective in using manual osteopathic techniques to prevent injuries.

Chronic severe pain in any athlete is also preventable with frequent use of osteopathic treatment or by regularly visiting an osteopath. In such circumstances, the chances of developing chronic cases are depreciated by a substantial scale. Visiting manual osteopaths or pursuing manual osteopathic techniques could prolong the athletes' career significantly.

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