OCCUPATIONAL THERAPY INTERVENTIONS ON A PATIENT WITH CARPAL TUNNEL SYNDROME

OCCUPATIONAL THERAPY

An occupational therapist's main job is to work with their patients so that they will be able to return to their occupation. An "occupation" can include hobbies, jobs, activities, or simply looking after themselves.

Occupational therapy is holistic, meaning it considers each patient's life individually. It adds quality back into each person's life. Treatment plans in OT are made by the therapist in order to best prepare their patient to return back to doing what they love—whatever that may be.

CARPAL TUNNEL SYNDROME

Carpal Tunnel Syndrome (CTS) is a painful problem associated with the hand and wrist. It is caused by "compression of the median nerve at the wrist" (American Association of Neurological Surgeons, 2022). CTS is fairly common, especially in individuals who do an excessive amount of work with their hands in their day-to-day life. The symptoms of CTS are usually very painful and uncomfortable. It can be treated by therapy, surgery, or both. Like any other injury, each person heals differently. Age, level of activity, and mindset of the patient can all have an effect on the healing process of CTS.

In this case, the treatment plan made is for a patient who will be using occupational therapy along with surgery to treat their CTS. The plan features a 6-week-program involving pre- surgery OT, along with post-surgery OT to ensure the patient will heal completely from their CTS.

PATIENT INFORMATION

The "patient" in this case is a 50-year-old Caucasian female. She has spent the last 27 years as a professional hairstylist. Throughout her career, she has used her hands, fingers and wrists fulfilling her job duties daily. She started showing symptoms of CTS a few months ago. Her symptoms started as numbness, tingling, and weakness. Later, they progressively got worse and she is now experiencing stiffness, soreness, and swelling, along with the previous symptoms. She rates her average pain on a scale from one to ten at about a six when resting, but an eight while moving. Since she is unable to work under these conditions, she decided to turn to OT and surgery.

PRE-SURGERY

Stretching

Stretching can help release tension in the muscles of the forearm and wrist. It can also work to maintain the range of motion in the wrist, as the patient is experiencing stiffness and a loss of complete range of motion as a result of the pressure on the median nerve. In the treatment plan, there are carefully selected stretches that will stretch specific muscles needed to maintain the range of motion until surgery. The "prayer stretch" (see Figure 1) and the "wrist flexion stretch" (see Figure 2) work on the flexor muscles of the wrist: "flexor carpi radialis, flexor carpi ulnaris, [and] flexor digitorum" (Walden, 2022). The "wrist extension stretch" (see Figure 3) mainly stretches the "extensor carpi radialis brevis, extensor carpi radialis longus, [and] extensor carpi ulnaris" (Walden, 2022). The "tendon glides" (see Figures 4-5) are used to work out the flexor tendons in the hand, which are the tendons affected by CTS.

Bracing

Wearing a brace or splint prior to surgery can help with pain temporarily. By doing this, the wrist is being held in place, rather than allowing it to bend and twist. According to WebMD research, "most people sleep with their wrists bent, which causes pressure on the median nerve" (WebMD, 2021). Even if the patient just wears a brace at night or during resting periods throughout the day, it can prevent that nerve from being strained further. This can potentially lessen some of the symptoms, such as tingling, stiffness and pain, that would otherwise be heavily evident the morning after.

SURGERY

This surgery involves the doctor making an incision to "divide the transverse carpal ligament" (OrthoInfo, 2021). Dividing this ligament in surgery will increase the size of the tunnel and in turn, release the pressure on the median nerve. The pressure on the nerve is what causes the symptoms in the first place, so the surgery will relieve this constant pressure.

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DAYS 7-13: POST-SURGERY OT

The week following surgery is used for recovery and resting for the patient. The patient will likely be experiencing a lot of pain, so it is important for them to take time to rest and heal. This week would be appropriate for a meeting with the patient to go over the plans for treatment. Some patients may have never had surgery or a procedure, so they will have no idea what to expect from post-surgery OT. This meeting should be used for obtaining expectations from both parties, along with determining the baseline ROM and strength that the patient is starting with. Also at this meeting, the patient can expect some sort of modalities for pain management. This can include ice packs for pain or heat packs for stiffness.

DAYS 14-20: BEGINNING EXERCISES

Range of Motion Exercises

Range of motion exercises are very important for ensuring the patient can return to their daily life with no setbacks or further symptoms from their procedure. To perform average tasks of daily living, “54 degrees was found to be the required threshold of wrist flexion..., [while] wrist extension to perform most daily tasks is 60 degrees” (Muller et al., 2021). Knowing this, it is critical that the patient gets back to at least 50-60 degrees of painless motion in order to function properly. “Thumb opposition” and “finger opposition” (see Figures 8-9) have many functions, but ultimately help to work out the “opponens pollicis” (Nguyen & Duong, 2022) muscles. The “active range of motion” (see Figures 10-13) exercises work the muscles not only in the wrist, but over 15 muscles in the forearm, which affects the wrist majorly. Also, stretching the wrist in all directions helps fluid flow through the wrist, which is helpful in decreasing stiffness in joints.

Strengthening Exercises

Prior to surgery, the patient was feeling weak and painful symptoms in her affected hand. Therefore, she avoided using that hand to do anything. On top of this, she has been minimally using it after surgery just to be careful. In doing these things, she has lost a lot of strength in that hand, wrist and fingers. Strengthening exercises can help to gain that strength back. Since she wants to return back to work, her normal strength is something she will need. The “grip ball squeeze” (see Figure 14) works the flexor muscles mentioned in the “wrist flexion stretch” when gripping the ball, but the extensor muscles mentioned in the “wrist extension stretch” when releasing the grip. The “putty pull” (see Figures 15-16) exercise uses a multitude of muscles in the hand, including the opponens pollicis, flexor pollicis brevis, lumbricals and abductor pollicis.

DAYS 21-27: ACTIVITIES OF DAILY LIVING (ADLS)

When thinking about activities that a hairstylist might do, the first things that come to mind are cutting hair and brushing hair. When cutting hair, she will need to move fingers and thumbs apart and back together quickly in the shears. The “rubber band stretch” ((see Figure 17) mimics this exact activity. It uses the opponens and abductor pollicis muscles, along with many others. When brushing hair, she will need to make strokes up and down a client’s head of hair. She will be flexing and extending her wrist over and over. The “wrist curls” (see Figures 18-19) exercise mimics brushing hair. This exercise works the flexor and extensors of the wrist, along with strengthening them as weight gets added. The “pronation and supination” (see Figures 20-21) exercise is a similar motion to picking items up off of a table to get ready to use them. It is working not only the flexor carpi radialis, but also the biceps brachii all the way up the forearm. This will help her get used to making those same motions, resulting in eventually getting her back into the salon doing what she loves.

DAY 28+: RETURNING TO WORK

Scar desensitization is a light massage using lotion around the incision site of surgery. Since there will likely be a lot of tenderness around the scar, massages can help to soothe the pain and make sure the scar tissue is healing correctly. Massages around the scar can also help “milk” some of the swelling out, meaning to distribute the swelling instead of allowing it to build up right around the scar.

After completing the 6-week treatment plan, the patient is expected to be mostly healed from surgery, back to normal range of motion, and completing their normal activities with little to no pain. She should continue stretching and exercises from the home-exercise-program provided by her OT.

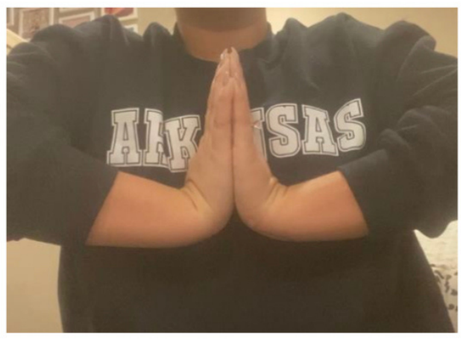

Figure 1. Prayer Stretch (own photo)

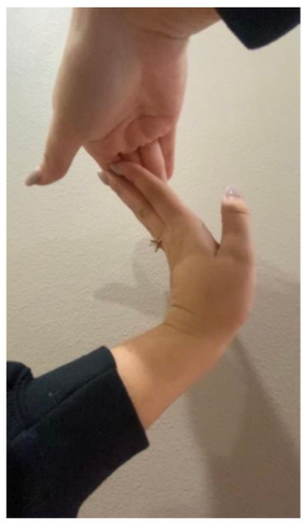

Figure 2. Wrist Extension Stretch (own photo).

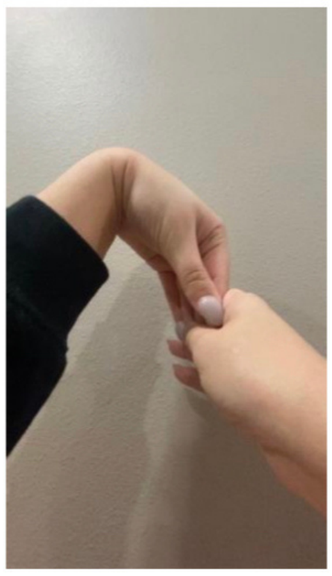

Figure 3. Wrist Flexion Stretch (own photo).

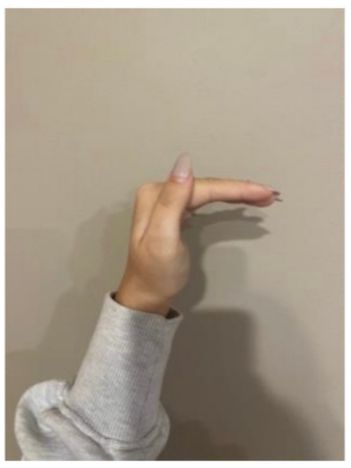

Figure 4. Tendon Glide Step 2. (own photo).

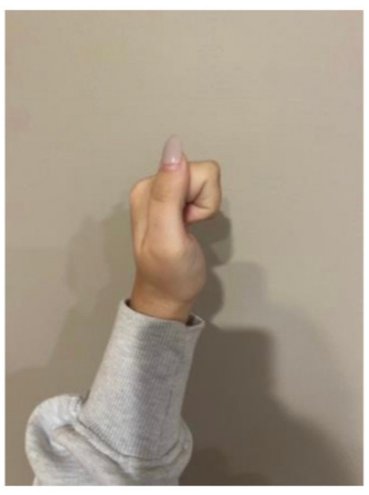

Figure 5. Tendon Glide Step 3. (own photo).

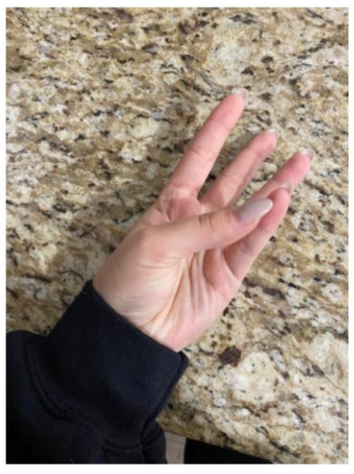

Figure 8. Thumb Opposition Stretch (own photo).

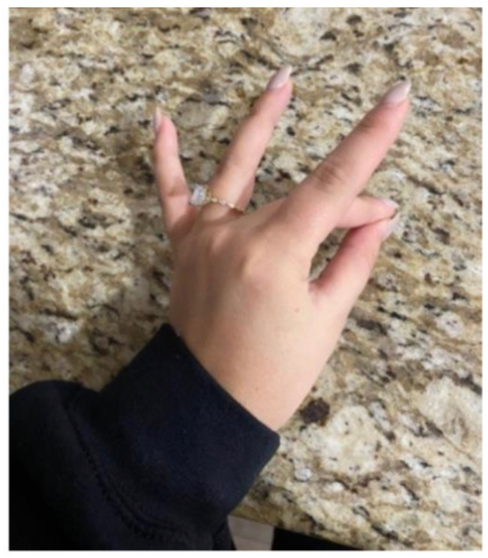

Figure 9. Finger Opposition Stretch (own photo).

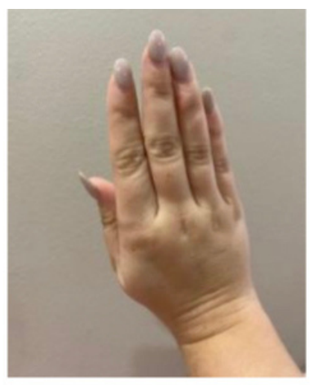

Figure 10. Wrist Extension (own photo).

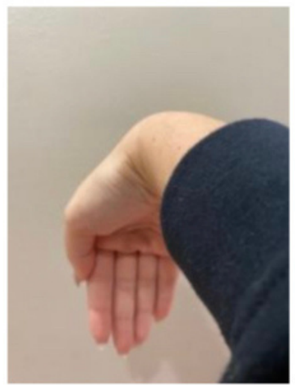

Figure 11. Wrist Flexion (own photo).

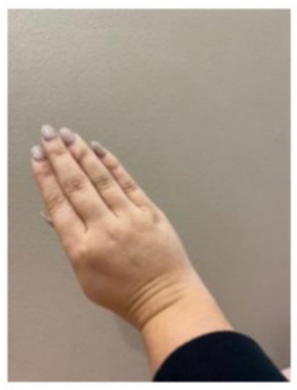

Figure 12. Radial Deviation (own photo).

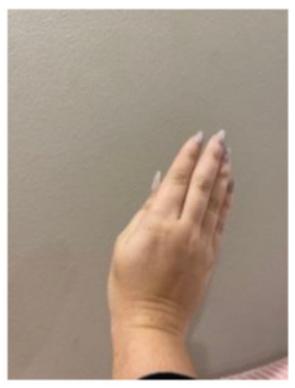

Figure 13. Ulnar Deviation (own photo).

Figure 14. Grip Ball Squeeze (own photo)

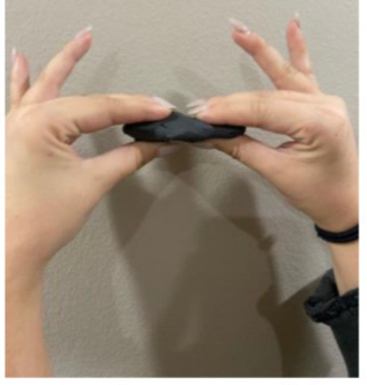

Figure 15. Putty Pull Step 4 (own photo)

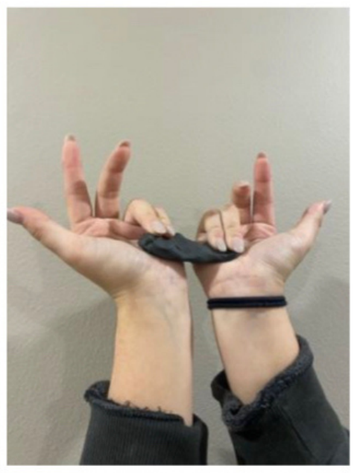

Figure 16. Putty Pull Step 6 (own photo)

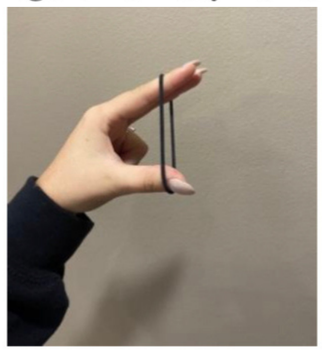

Figure 17. Rubber Band Stretch (own photo)

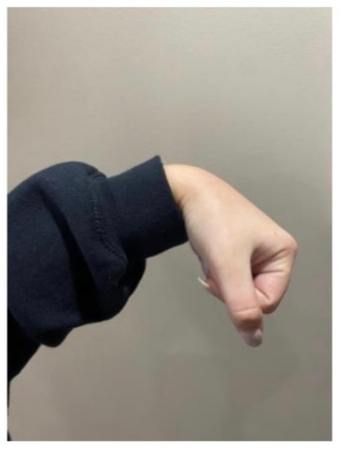

Figure 18. Wrist Curl Flexion (own photo)

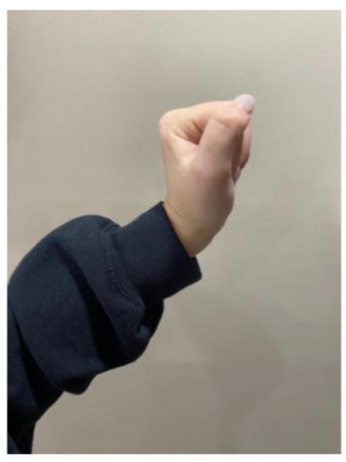

Figure 19. Wrist Curl Extension (own photo)

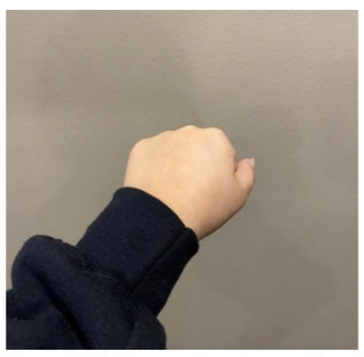

Figure 20. Pronation (own photo)

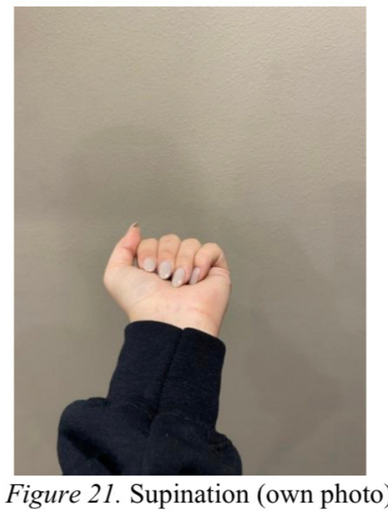

Figure 21. Supination (own photo)