

Endoscopic Carpal Tunnel Release Post Operative Protocol

Overview

Endoscopic carpal tunnel release (CTR) is a minimally invasive surgical procedure to decompress the median nerve by cutting the transverse carpal ligament within the carpal tunnel. Because the endoscopic approach generally involves smaller incisions and less soft tissue disruption compared to the open technique, patients can often progress more quickly with post-operative rehabilitation. However, careful adherence to protective measures is still crucial for optimal outcomes.

Rehabilitation Goals

1. **Protect the surgical site** and allow for adequate incision healing.
 2. **Minimize postoperative pain and swelling** through appropriate modalities and exercises.
 3. **Restore range of motion (ROM)** in the wrist and fingers without stressing the surgical area.
 4. **Gradually regain grip strength and hand function** for daily activities.
 5. **Prevent scar adhesions** and maintain nerve/tendon mobility.
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Phase 1: Immediate Post-Operative (Days 0–7)

Objectives

- Protect the incision and healing structures
- Control edema (swelling) and pain
- Initiate gentle hand and finger movement to prevent stiffness

Guidelines

1. **Dressing/Casting:**
 - Typically, a light dressing or bandage is applied post-operatively. A bulky dressing may be used for the first 4 days.
 - Remove the bandage post op day 4.
2. **Pain and Edema Management:**
 - Elevate the hand above heart level, especially in the first 48 hours, to reduce swelling.
 - Use ice packs or cold therapy around the wrist/forearm (not directly on the incision) for 10–15 minutes multiple times a day to help with pain and swelling.
3. **Range of Motion (ROM) Exercises:**

- Begin gentle finger flexion and extension exercises (finger tendon glides) several times per day to reduce stiffness and promote circulation.
 - Gentle wrist active range of motion (AROM) within a comfortable range, but **avoid extremes of extension or flexion** in the very early phase if discomfort is noted.
4. **Activity:**
- Light activities of daily living (ADLs) with the hand supported or protected as tolerated.
 - Increase activity levels as tolerated.
5. **Wound Care:**
- Keep the incision clean and dry for the first 4 days.
 - Start showering 4 days, post surgery, avoid soaking in hot tubs, baths, etc until stitch is removed.
 - Monitor for signs of infection (redness, excessive swelling, drainage).
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Phase 2: Early Recovery (Weeks 1–3)

Objectives

- Continue protecting the incision site, while allowing progressive use of the hand
- Initiate gentle exercises for tendon and nerve mobilization
- Begin gradual restoration of functional use

Guidelines

1. **Suture Removal:**
 - Sutures (if present) are typically removed around 10–14 days post-op.
2. **Pain and Edema Control:**
 - Continue elevation if swelling persists.
 - Continue using ice or cold therapy as needed.
3. **Exercises:**
 - **Finger Tendon Gliding:** Continue 4–6 times per day to prevent adhesions and maintain digital flexibility.
 - **Nerve Gliding** (Median nerve glides): May be introduced by the hand therapist if tolerated.
 - **Wrist AROM:** Progress to comfortable flexion/extension, radial/ulnar deviation, and gentle forearm rotation (pronation/supination).
 - **Light Grip and Pinch:** Begin gentle isometric exercises (squeezing a soft ball or putty) if no pain is noted.
4. **Activity Level:**
 - Continue light ADLs (e.g., dressing, eating, typing) as tolerated, ensuring you are not placing excessive force on the wrist or palm.
 - Avoid repetitive gripping, forceful wrist motions, and heavy lifting (>5 pounds).
5. **Scar Management** (as incision heals):
 - Begin gentle scar massage once the incision is fully closed and healing well (usually around 2 weeks post-op).
 - Use a non-irritating lotion or silicone gel/sheeting to help soften scar tissue and minimize adhesion.
6. **Splinting (if prescribed):**

- Typically, no formal splint is required after endoscopic CTR, but some surgeons may recommend a wrist brace at night or for comfort if the patient experiences significant pain or to remind them to avoid extreme positions.
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Phase 3: Progressive Strengthening (Weeks 3–6)

Objectives

- Continue to improve wrist and hand ROM
- Gradually restore functional strength and dexterity
- Continue to protect the healing incision and underlying structures from excessive loading

Guidelines

1. **Strengthening Exercises:**
 - Progressive grip and pinch strengthening with therapy putty or soft foam ball.
 - Light resistance exercises for wrist flexors, extensors, and forearm rotators (e.g., using light elastic bands or small hand weights) as tolerated.
 - Proprioceptive and dexterity exercises (finger coordination tasks, simple skill-based activities) can be introduced.
 2. **ROM Maintenance:**
 - Continue with wrist and finger AROM exercises, nerve glides, and tendon glides to maintain mobility.
 - Emphasize good posture/alignment of wrist during exercises.
 3. **Activity Level:**
 - Gradually increase use of the hand for ADLs, including light to moderate household chores.
 - Avoid heavy or forceful gripping or sustained repetitive tasks (e.g., prolonged typing without breaks) if pain or swelling occurs.
 4. **Pain Management:**
 - Decrease reliance on pain medications as tissues heal and pain subsides.
 - Continue with ice or contrast baths if swelling or discomfort returns after exercise.
 5. **Scar Management:**
 - Continue scar massage and any recommended silicone products for scar maturity.
 - Monitor for scar hypersensitivity or adhesions and address with desensitization techniques if needed.
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Phase 4: Advanced Strengthening and Return to Full Activity (Weeks 6–12+)

Objectives

- Achieve full, pain-free ROM
- Restore normal strength, endurance, and hand function

- Safely return to work or sports

Guidelines

1. Strengthening Progression:

- Increase resistance for grip, pinch, and wrist exercises as tolerated.
- Incorporate functional tasks relevant to work or daily life (e.g., lifting, carrying, fine motor tasks).
- If returning to a heavy manual job, use graded progression and consider a work-hardening program if indicated.

2. Work/Sports Activities:

- Patients with sedentary/desk jobs can often return to work within 1–2 weeks post-endoscopic CTR, possibly with modifications such as wrist supports and frequent breaks.
- Those with physically demanding jobs may require 6–10 weeks or longer before full duty, depending on surgeon and therapist recommendations.
- Athletes can gradually resume activities, focusing on sport-specific exercises that do not overload the healing tissues prematurely.

3. Ongoing Joint and Soft Tissue Mobility:

- Continue nerve/tendon gliding exercises if any residual stiffness or nerve symptoms persist.
- Maintain or advance scar management techniques if the scar is still maturing.

4. Monitoring and Follow-Up:

- Regular check-ins with the surgeon or therapist to assess progress, monitor for complications, and update the exercise plan.
 - Electrophysiological testing (nerve conduction study) is occasionally repeated if nerve symptoms persist or to confirm improvement in severe cases.
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Potential Complications to Watch For

- **Infection:** Redness, increased pain, drainage, or fever.
 - **Excessive Swelling or Pain:** May indicate overuse, hematoma, or infection.
 - **Nerve Irritation or Persistent Numbness:** Could point to incomplete release, nerve injury, or scar tissue formation around the median nerve.
 - **Scar Adhesions:** Stiffness or “caught” feeling in tendon glide; address with increased therapy interventions and scar management.
 - **CRPS (Complex Regional Pain Syndrome):** Unexplained severe pain, swelling, color, or temperature changes in the hand or wrist.
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Summary

A successful post-operative rehab program for endoscopic carpal tunnel release focuses on **early mobilization** with protection, **gradual strengthening**, and **progressive return to daily tasks** and occupational/sport demands. **Team coordination** between the surgeon, hand therapist, and patient ensures an optimal outcome. Adherence to recommended activity modifications, exercise progression, and vigilant monitoring for complications will help promote a timely and full recovery.

Disclaimer: This protocol provides general guidelines. Individual protocols may vary based on surgeon preference, patient comorbidities, and intra-operative findings. Always follow the personalized instructions provided by the treating surgeon and certified hand therapist.