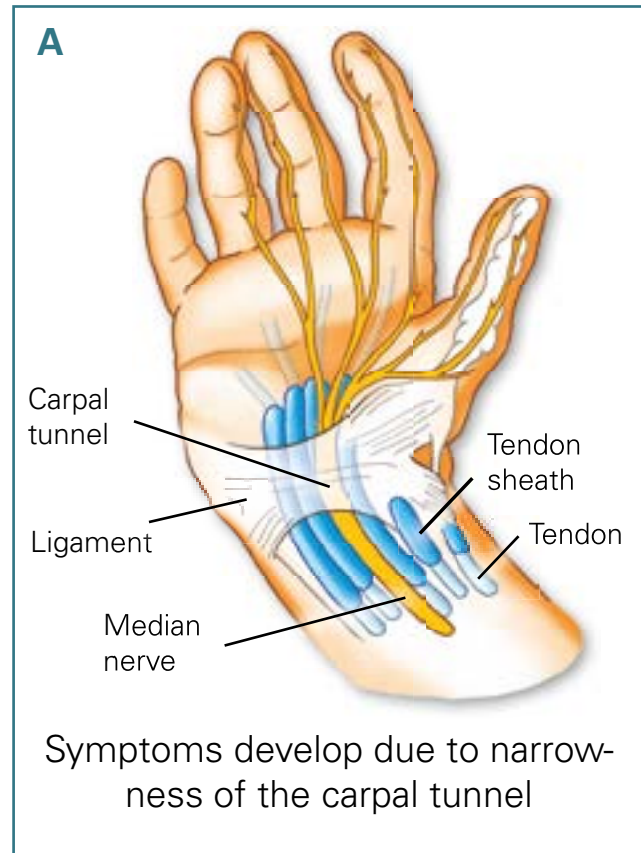


Bottleneck syndromes (example: carpal tunnel syndrome) [1]

The carpal tunnel [1] (1)



Causes of carpal tunnel syndrome [1]

- B**
- Congenital narrow carpal tunnel
 - Injuries
 - Fractures close to wrist
 - Recurrent mechanical loads on wrist
 - Tenosynovitis
 - Age-related wear
 - Benign tumours (e.g. lipoma)
 - Rheumatic diseases
 - Pregnancy

Signs and symptoms [1]



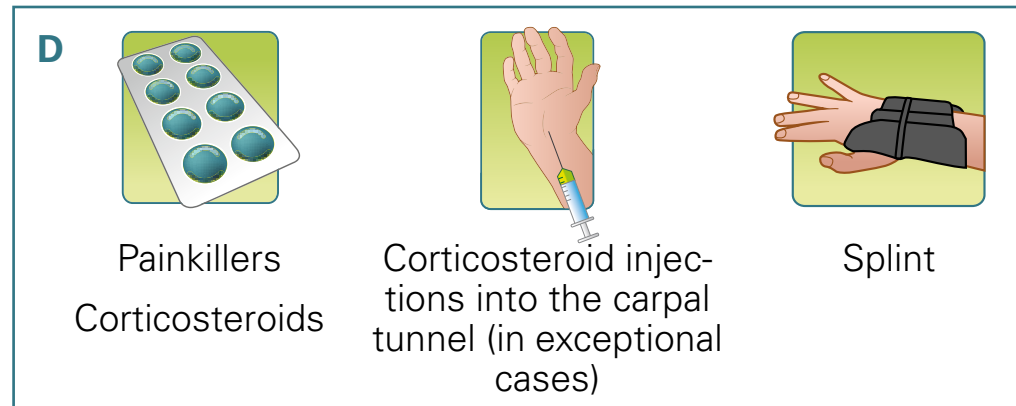
In advanced carpal tunnel syndrome:

Wasting of the muscle of the ball of the thumb



Nocturnal pain due to increased swelling in the carpal tunnel when lying down

Conservative treatment [1, 2, 3]



Surgical procedures [1, 3] (2)

E

Severing of the carpal ligament by OCTR or ECTR to widen the tunnel and relieve pressure on the nerve



(1) modified from: <http://www.jena-paxisklinik.de/Informationen/karpaltunnelsyndrom.php>. Accessed February 2013.

(2) <http://www.iatrum.de/karpaltunnelsyndrom.html>. Accessed February 2013.

Bottleneck syndromes (example: carpal tunnel syndrome) [1]

A The carpal tunnel [1]

The carpal tunnel is a passage for muscles, tendons and the median nerve, which supplies the thumb, index finger, middle finger and the part of the ring finger on the thumb side. The carpal ligament forms the “roof” of the tunnel.

Symptoms are caused by narrowness of the carpal tunnel, which can lead to pressure damage to the nerve.

B Causes of carpal tunnel syndrome [1]

Narrowness may be congenital, but there are **numerous other causes**. Inflammatory processes with swelling which narrow the tunnel often play a role.

Causes include injuries, fractures close to the wrist, recurrent mechanical loads on the wrist, tenosynovitis (inflammation of the tendon sheath), age-related wear and benign tumours (e.g. lipoma). Rheumatoid arthritis can also lead to tenosynovitis. In pregnancy, narrowness of the carpal tunnel may develop as a result of weight gain and water accumulation.

C Signs and symptoms [1]

Typical symptoms are **numbness and tingling** in the area supplied by the median nerve.

The sometimes **severe nocturnal pain is the consequence of increased swelling in the carpal tunnel when lying down**.

The pain can occasionally radiate into the shoulders or even into the neck.

In advanced carpal tunnel syndrome the muscle of the ball of the thumb generally recedes, so that gripping function is restricted. In addition, numbness and tingling may become continuous.

D Conservative treatment [1, 2, 3]

In the early phase: painkillers and where appropriate corticosteroids, as well use of a **nocturnal wrist splint**.

In severe pain attacks: injection of a glucocorticoid solution in the vicinity of the nerve. Because of the danger of nerve or tendon damage, this technique should only be performed in exceptional cases.

E Surgical procedures [1, 3]

Severing of the carpal ligament by open carpal tunnel release (OCTR) or endoscopic carpal tunnel release (ECTR: minimally invasive). As a result the carpal tunnel is widened so that the nerve is relieved and can recover.

[1] Uchiyama S et al. J Orthop Sci (2010) 15:1-13.

[2] Carlson H et al. Int J Clin Rheumatol (2010) 5(1): 129- 142.

[3] American Academy of Orthopaedic Surgeons. Clinical practice guideline on the treatment of carpal tunnel syndrome. Rosemont IL: American Academy of Orthopaedic Surgeons, 2008.