

# CUMULATIVE STRESS INJURIES OF THE HAND

## CARPAL TUNNEL SYNDROME (CTS)

Carpal tunnel syndrome is the most well-known and common stress injury occurring in the hand and upper arm. It is an occupational or hobby related so-called cumulative trauma which can lead to damage to the median nerve and consequently to a number of functional disorders of the hand. In the worst case it can result in permanent loss of hand function.

## ETIOLOGY

Continuous, repeated wrist flexion and extension and simultaneous forceful finger pressure over a long period of time results in mechanical injury to the median nerve due to irritation of the flexor tendons.

## SUSCEPTIBILITY

Many illnesses predispose the system to changes of this type, but individuals differ widely in sensitivity to this condition.

## SYMPTOMS

Symptoms develop gradually. Tingling, burning pain and numbness in the fingers increase during the initial stages. Later, the pain and discomfort, accompanied by weakened hand grip, radiate upwards to the forearm, elbow, upper arm, shoulder and neck.

## CONSEQUENCES

Tissue wearing resulting from mechanical strain leads to inflammation, swelling and stiffening of the wrist, increased pressure in the carpal tunnel and entrapment of the median nerve. Circulatory disorders and muscular atrophy lead to weakened ability to grasp and exert pressure. The skin around the palm becomes dry and translucent.

## FREQUENCY

The syndrome is also fairly common in dental care professionals. According to health studies carried out, one in three dentists and dental hygienists experience symptoms in the hand or upper arm which interfere the performance of their profession. Between 6 and 7 % have suffered from carpal tunnel syndrome.

## RISK FACTORS

Risk factors include unergonomic instruments and work methods, poor organisation of work and inappropriate working conditions, cold, vibration and tight gloves.



Non-slip, light and natural grip



A thin, hard handle strains the hand and can lead to strain injuries

## TREATMENT

Treatment is rest, immobilisation of the wrist with a bandage or splint, reduction of inflammation with hydrocortisone injections, prescription of vitamin B to improve nerve function and a low-salt diet to reduce the swelling. If relief cannot be obtained by any other means, the nerve is freed surgically by dividing the transverse carpal ligament and opening the carpal tunnel. It is often necessary to repeat surgery and some 10 % of patients are not cured. This means that the patient is faced with premature disability pension or retraining. The prognosis is characterised by prolonged sickness leave and the disorder is stressful for the individual and expensive for the society.

## PREVENTION

Prevention is the most important and best solution before the onset of initial symptoms. Unergonomic instruments and work methods should first be changed. Thin, slippery instruments should be replaced with large-diameter, slip-free handles with yielding surfaces. Reduction in the amount of pressure used leads to new working methods and less strain. A lighter grip and the minimisation of extreme movements relieve repetitive strain and thereby the symptoms of CTS.

Pekka Kangasniemi, D.D.S.  
Turku Finland