

OCCUPATIONAL CARPAL TUNNEL SYNDROME IN A MEAT INDUSTRY WORKER. CASE PRESENTATION.

Lucian Gabriel Tefas^{1*}, Crina Petrescu², Maria Oprețoiu²

¹Occupational Medicine Department, Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca

²Occupational Diseases Hospital, Emergency Clinical County Hospital Cluj, Cluj-Napoca

ABSTRACT

We present the case of a male patient aged 31, who worked for 2 months in a chicken slaughterhouse in England, thus being exposed to repetitive hand motions with high frequency (21 operations per minute), gripping the skin of the chicken carcass with the first three fingers of his right hand and force-peeling it off in the context of repetitive professional movement and skin contact with the frozen carcass of the chicken, in a working environment of 0 degrees Celsius.

KEY WORDS carpal tunnel, high frequency hand motions, compression, low temperature, musculoskeletal straining

INTRODUCTION

The carpal tunnel syndrome (CTS) is a traumatic or compression neuropathy of the median nerve located in the area in which it transients the carpal tunnel at the wrist towards the nine tendons of the flexor muscles. Although until a little while ago idiopathic variants were prevailing, throughout the last years a rising number of cases originating in the professional environment has been observed (Tefas et al., 2004, Cocârlă et al., 2009).

From a pathophysiological point of view the basic lesion (either permanent or transitory) is represented by a process of compression-ischemia, which progressively affects the nervous fibers. In the beginning there is an edema that can develop irreversibly into fibrosis or nervous atrophy. Considering this, the decompression must occur precocious before the installation of the fibrous processes or the nervous atrophy.

At the wrist, the median nerve can be compressed in two manners:

Directly, during the holding of an instrument, with the concomitant and prolonged support of the palm face of the wrist on equipment or another hard surface.

Not directly, during the holding of an instrument or any other object, a grip maintained for prolonged time with the occurrence of a secondary tendonous involvement of the flexor muscles (inflammatory tenosynovitis), which enlarges the volume of the tendons in the carpal tunnel.

The most dangerous positions and gestures are the ones that involve the hyperextension or the hyperflexion of the wrist associated with the flexion of the fingers. These types of gestures are identified in over 20 types of jobs and occupations (Ayob et al., 1989, Seracin et al., 2001). From the jobs at risk for CTS the following ones are quoted frequently: carpenter, bricklayer, lumberer, grinder, wrapper, butcher, PC operator, chef, musicians (piano players), cashiers. This list of occupations is not exhaustive, but only for orientation and must not be compulsory considered for the recognition of CTS as an occupational disease. Even more, the NIOSH (National

Institute for Occupational Safety and Health – USA) criteria does not mention a specific professional field as a basis for diagnostics, but takes into consideration subjective symptoms, clinical objective signs, electrophysiological signs and the professional history. Exposure to cold and vibrations are aggravating factors that increase the risk of the occurrence of CTS.

CASE PRESENTATION

The case of the patient M.A., aged 31, male gender, is presented, originating from urban environment, without musculoskeletal pathologies known beforehand, who is admitted in the Occupational Health Clinic in Cluj-Napoca, presenting a clinical picture characterized by a tingling sensation on the back of the hand of the 1st, 2nd, and 3rd fingers of the right hand, pain in the radio-carpal joints and the right forearm with pricking-burning character, which gets gradually installed, at the end of the working shift and is amplified during nighttime. At the same time, a decrease of the cutaneous sensitivity of the right hand and morning stiffness of the wrist are observed.

The common history data are insignificant, the patient is not a smoker, rarely drinks coffee, very rarely consumes alcohol and never drugs. The occupational history data reveal the following: alumni of the Faculty of History, having as a basic occupation history teaching, travels to an EC country (England), out of purely financial reasons and takes a job as an unskilled worker at a chicken slaughterhouse. The occupational history upon this moment does not identify any musculoskeletal straining. The employment in the chicken slaughterhouse took place at the beginning of October 2009, the health status being a very good one.

The main operation executed by the patient (the one being incriminated for the genesis of the previously mentioned symptoms) was the "skinning" – term translated into Romanian as the peeling of the skin



from the chicken carcass. The operation consists of the following types of gestures:

- Prehension of the chicken carcass with the left hand and forcing it onto a metal spike by striking it with the elbow and pressing it with the hand.
- Almost simultaneously, with the first three fingers of the right hand, grasping the skin and pulling it upwards, thus peeling the skin from the carcass. Then two gestures that have to be executed during an interval of three seconds, the specified work load being of 21 chickens per minute.
- A adjacent operation is that of wrapping the chicken legs in cardboard boxes, a very fast operation that involves gestures like elongating, prehension and twisting the hand.

The activities previously described took place at a warehouse with an ambient temperature of 0 to 5 degrees Celsius, the temperature of the frozen chicken legs being practically below 0 degrees Celsius. The activity took place exclusively in the standing position, 10 to 14 hours a day, 6 days a week. The individual means of protection consisted of a work robe, rubber boots, bonnet and gloves, made out of textile materials and plastic that started to deteriorate after 3-4 hours of activity, a detail that suggests the intensity of the work. The clinical symptoms had their debut in the second half of the shift, increasing progressively towards the end of the shift and having the maximum intensity during the night. Similar symptoms, sometimes worse appeared in the majority of the co-workers, a fact that suggests work-related group pathologies.

From the patient history it is notable that the disease developed at the end of October 2009, a week after the debut of the professional activity. Clinically, the affection presented as a strong paresthesia located at the dorsal face of the 1st, 2nd and 3rd fingers of the right hand, pain situated at the right wrist and the internal face of the right fore-arm, with a pinching and/or burning character. The pain proved to worsen during the night and react only partially to anti-inflammatory drugs. Morning stiffness and diminishing of the cutaneous sensitivity could also be observed.

The clinical exam showed retractile sensitivity located at the back of the right hand, pain located at the right wrist caused by pressure and mobilization. The Tinel sign (percussion of the median nerve at the level of the palmar side of the wrist causing pain and a pinching sensation) and the Phalen sign (maximal flexion of the hand causing paresthesia at the level of the first 3 fingers) were both positive.

The complementary exams showed the following:

- The neurological consult undergone at the Neurology Clinic of Cluj-Napoca reveals hyperesthesia in the right median nerve

territory and the electromyography shows a prolonged motor latency for the right median nerve (8.2ms, as opposed to the normal value of 4.2ms). These inconsistencies were interpreted by a neurologist as CTS.

- The rheumatologic consult at the Rheumatology Clinic of Cluj-Napoca confirms a right CTS.
- The X-ray of the cervical spine excludes the existence of a right cervical rib and shows a minimal subluxation located at the C₅-C₆ level.

Based upon the history of the disease, the occupational history and the complementary exams, the diagnosis of occupational right CTS by exposure to repetitive gestures and cold and wet environment was established. The differential diagnosis for pain included other causes of cervical-brachial neuralgias, a painful neurodystrophy or a Raynaud syndrome, affections that were gradually excluded. Also excluded were other conditions that reduce the diameter or the volume of the carpal tunnel: necrosis of the lunate, fracture of the scaphoid, inflammatory rheumatic diseases, local tumors, specific tenosynovitis (TB), acromegaly, mixedema, diabetes.

The therapeutic approach decided to cease any occupational solicitation of the right hand and maintaining it at rest. To this there have been associated local and systemic non-steroid anti-inflammatory drugs. The stage of the condition did not impose the immobilization of the hand by a cast or decompressing surgery. Upon completing the treatment, associated with total resting of the hand, the symptoms remitted almost completely in an interval of three weeks from the beginning of therapy. At the hospital release the avoidance of any effort or repetitive gestures was recommended for a period of three months. Changing the workplace was indicated and applied following the doctor's specifications in the release form. After three months of relative functional pausing, the symptoms remitted completely. The case could not be declared as a professional disease due to administrative deficiencies, thus depriving the patient of rightful compensations.

DICUSSION

The musculoskeletal diseases are listed among the most frequent and common manifestations, in terms of morbidity and economic cost. The data provided by the US Health and Nutrition Examination Survey (Upton, 1990) showed that 47.8% of the adults examined during a 5-year study presented symptoms or a history of symptoms of chronic bone, muscle or joint injury. More recently, an European study (Niculescu, 2000) shows that almost 30% of the employees accuse pain at the spine level and other 17% have malfunctions of the upper limbs.

People with bone, muscle and joint diseases have a higher grade of temporary work incapacity due to

age, level of associated pathologies and discrepancies between the workplace requirements and the physical limits imposed by the disease. In some countries, musculoskeletal conditions represent the most important category of the occupational diseases, being a common problem for most professions and workplaces. The treatment and rehabilitation are often extremely costly, the results being unsatisfactory in many cases.

Considering the above, we underline that nowadays over three million Romanian citizens work in various states of the European Union. The problem is the fact that the great majority of the workplaces presume straining of the musculoskeletal system. Activities in construction, housekeeping, elderly care, and slaughterhouses assume without exception the straining of the spine and upper limbs. The case we've presented is a typical example of a highly soliciting activity, during prolonged shifts, in standing position, in cold and moist environment, completing a repetitive gesture with high-frequency on the time unit, consisting of prehension by hand and fingers in forced flexion. The sickness required a two week long hospital admission, followed by another 2-3 weeks of rehabilitation and the changing of the workplace. Although the condition initially appeared while the patient was in another country, the treatment and rehabilitation process was undergone in Romania, the costs being supported by the state. The case could not be declared as an occupational disease and the patient could not receive compensation because of the fact that the Work Ministry and the Health Ministry have not established an interstate protocol regarding the signaling and declaring of occupational diseases. This incapacitation of properly declaring an occupational disease is the main feature of this case. The authors are convinced that there are thousands of similar cases of Romanian citizens who get sick in various states of the European Union, with all the medical and financial consequences, as previously shown.

CONCLUSIONS AND RECOMMENDATIONS

Occupational musculoskeletal diseases are heavily underestimated in our country. They tend to increase both in numbers and gravity because of the large number of Romanian citizens that work in harsh conditions in various states of the European Union.

It is highly necessary and urgent to establish a coherent system of mutual reporting and recording for the occupational diseases between Romania and the other countries of EU.

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