Al-Nahrian University

Collage of Medicine

Department of Orthopaedics Surgery

Follow up of patients with carpal tunnel syndrome after surgery

Supervised By: Dr.Ahmed Sabeeh

Department of surgery orthopaedic and truma

Done By: Murtadha Haider

2018- 2019

Abstract

Background: Carpal tunnel syndrome is a hand and arm condition that causes numbness, tingling and other symptoms . Diagnosis of Carpal tunnel syndrome is mainly clinical based on suggestive history and physical examination . The objectives of these study are to follow up patients after their surgeries for the results and benefits.

Patient and method: This study was prospective study of 30 patients diagnosed with Carpal tunnel syndrome and were scheduled for surgery . period from December 2018 to march 2019 . At al_Imamian Alkadhimian teaching hospital ; from orthopedic consultant; Baghdad Iraq. data including age;sex;diagnosis criteria which include ((symptom ; recurrence, complication, weak grip)).

Result: the number of patient was 30 patients found that 3.33% needed another surgery and 96.77% had a successful surgery

Conclusion: The gold standard treatment for severe carpal tunnel syndrome is surgery

Keyword: Carpal tunnel syndrome

Acknowledgement:

I would like to express my gratefulness to my supervisor Dr.Ahmed Sabeeh for his encouragement; and helpfulness and my very appreciation for giving me his time generously and the information that provided to me .

Contents:

Aim of Study :

Follow up patients after carpal tunnel surgery

Introduction:

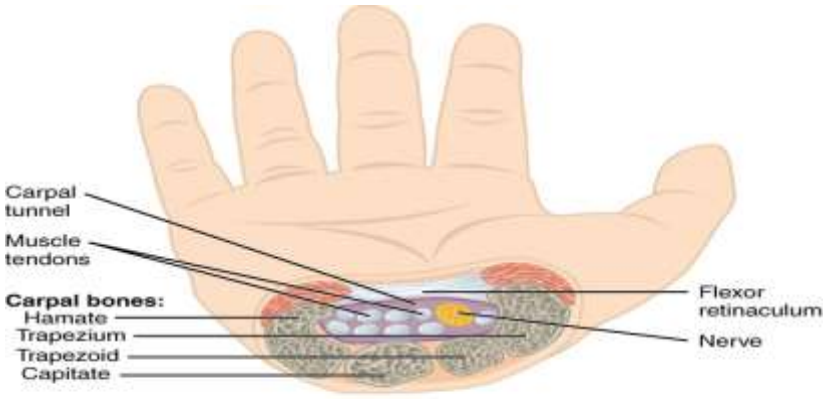
Definition

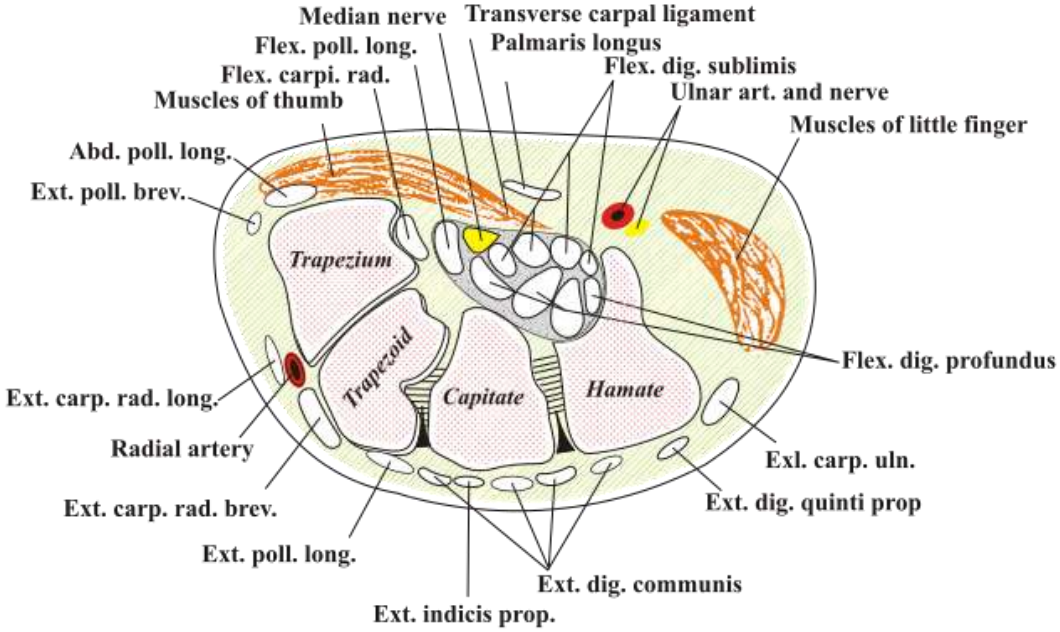
Carpal tunnel syndrome is a hand and arm condition that causes numbness, tingling and other symptoms. Carpal tunnel syndrome is caused by a pinched nerve in the wrist. A number of factors can contribute to carpal tunnel syndrome, including the anatomy of the wrist, certain underlying health problems. The carpal tunnel is a narrow passage way located on the palm side of the wrist. This tunnel protects a main nerve to the hand. Compression of the nerve produces the numbness, tingling and weakness that characterize carpal tunnel syndrome

Anatomy:

It is a passage way that is bounded by the concave arch of the carpal bones dorsally, and the flexor retinaculum (FR) palmary[1]. The hook of the hamate, triquetrum, and pisiform form the ulnar border, while the radial border consists of the scaphoid, trapezium, and the fascial septum overlying the FCR. The FR consists of 3 zones:[2] a proximal zone that is continuous with the deep forearm fascia, a central zone that is composed of the transverse carpal ligament (TCL) , and a third zone

that consists of the aponeurosis between the thenar and hypothenar muscles.
Nine flexor tendons pass through the carpal tunnel: flexor digitorum profundus flexor digitorum superficialis flexor pollicis longus flexor carpi radialis A single nerve passes through the tunnel: the median nerve between tendons of flexor digitorum profundus and flexor digitorum superficialis [3]





Diagnosis

Signs and symptoms:

People with Carpal tunnel syndrome experience numbness, tingling, or burning sensations in the thumb and fingers, in particular the index and middle fingers and radial half of the ring finger, because these receive their sensory and motor function (muscle control) from the median nerve Ache and discomfort can possibly be felt more proximally in the forearm or even the upper arm. Less-specific symptoms may include pain in the wrists or hands, loss of grip strength Weakness and atrophy of the thumb muscles may occur if the condition remains untreated, because the muscles are not receiving sufficient nerve stimulation. Discomfort is usually worse at night and in the morning. [4] There are many causes of carpal tunnel syndrome including: obesity; hypothyroidis; arthritis; diabetes; truma; occupational stress and during pregnancy due to hormonal change. .

Causes

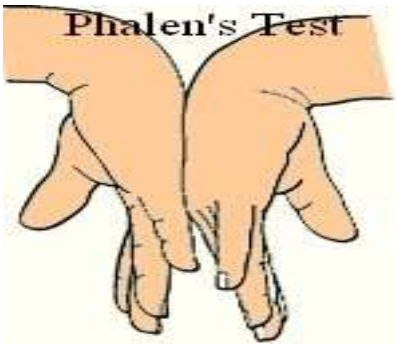
Causes Most cases of CTS are of unknown causes, or idiopathic.[11] Carpal Tunnel Syndrome can be associated with any condition that causes pressure on the median nerve at the wrist. Some common conditions that can lead to CTS include obesity, oral contraceptives, hypothyroidism, arthritis, diabetes, prediabetes (impaired glucose tolerance), and trauma.[12] Carpal tunnel is also a feature of a form of Charcot-Marie-Tooth syndrome type 1 called hereditary neuropathy with liability to pressure palsies. Other causes of this condition include intrinsic factors that exert pressure within the tunnel, and extrinsic factors (pressure exerted from outside the tunnel), which include benign tumors such as lipomas, ganglion, and vascular malformation.[13] Carpal tunnel syndrome is provoked by repetitive movement and manipulating activities and that the exposure can be cumulative. It has also been stated that symptoms are commonly exacerbated by forceful and repetitive use of the hand and wrists in industrial occupations,[14] but it is unclear as to whether this refers to pain (which may not be due to carpal tunnel syndrome) or the more typical numbness symptoms.[15]

Associated conditions

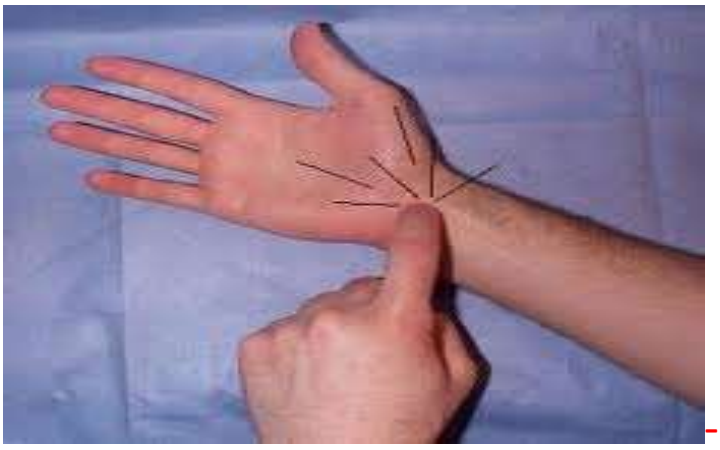
Rheumatoid arthritis and other• diseases that cause inflammation of the flexor tendons. With hypothyroidism, generalized• myxedema causes deposition of mucopolysaccharides within both the perineurium of the median nerve, as well as the tendons passing through the carpal tunnel. During pregnancy women• experience CTS due to hormonal changes (high progesterone levels) and water retention (which swells the synovium), which are common during pregnancy. Previous injuries including• fractures of the wrist. Medical disorders that lead to fluid retention or are associated with inflammation such as: inflammatory arthritis, Colles' fracture, amyloidosis, hypothyroidism, diabetes mellitus, acromegaly, and use of corticosteroids and estrogens. Carpal tunnel syndrome is also• associated with repetitive activities of the hand and wrist, in particular with a combination of forceful and repetitive activities[14] Acromegaly causes excessive• growth hormones. This causes the soft tissues and bones around the carpel tunnel to grow and compress the median nerve.[16] Tumors (usually benign), such as• a ganglion or a lipoma, can protrude into the carpal tunnel, reducing the amount of space. This is exceedingly rare (less than 1%). Obesity also increases the risk of• CTS: individuals classified as obese (BMI > 29) are 2.5 times more likely than slender individuals (BMI < 20) to be diagnosed with CTS.[17]

Physical examination:

1-phalens test: is performed by flexing the wrist gently as far as possible, then holding this position and awaiting symptoms[5]. A positive test is one that results in numbness in the median nerve distribution when holding the wrist in acute flexion position within 60 seconds. The quicker the numbness starts, the more advanced the condition.



2-Tinels sign: - test is a way to detect irritated nerves. Tinel's test is performed by lightly tapping the skin over the flexor retinaculum to elicit a sensation of tingling or "pins and needles" in the nerve distribution. is less sensitive, but slightly more specific than Phalen's sign[6]



3-pressure provocation test: applying firm pressure to the palm over the nerve for up to 30 seconds to elicit symptoms [7]

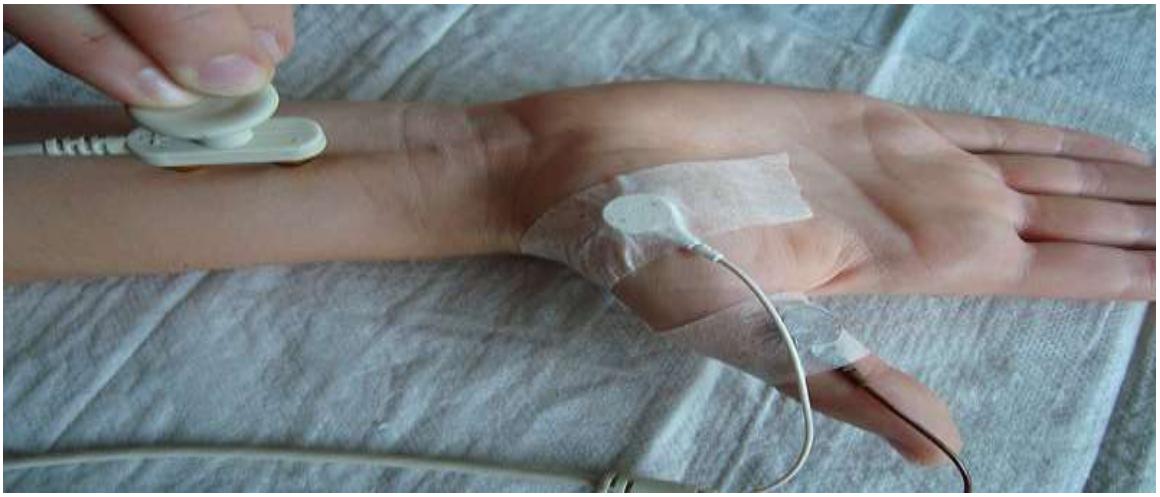
4-hand elevation test:the patient elevated their hand overhead for 2 minutes to produce symptoms of CTS .the test was recently proven to be accurate and may be provide useful information when combined with the tinel and phalen tests[8]

5-median compression test: the elbow ext;forearm supination ;wrist flex then make pressure over the carpal tunnel .test positive if parasthesia or numbness within 30 sec.

6-shelf sign: atrophy and wasting of thenar muscle.

Nerve conduction studies:

To performe nerve conduction studies two electrodes are taped to the skin[9].along the nerves that are being studied then asmall stimulus is applied(electric current) that activated nerve . if the nerve damaged the current will be slower and weaker. The procedure takes 30 to 90 miuntes. There is no complication from the procedure just feeling of discomfort from electric current but not painful.



Treatment:

Conservative

1-wrist splinting: A splint that holds your wrist still while you sleep can help relieve night time symptoms of tingling and numbness. Nocturnal splinting may be a good option if you're pregnant and have carpal tunnel syndrome[10].

2-**Nonsteroidal anti-inflammatory drugs (NSAIDs):**

such as ibuprofen may help relieve pain from carpal tunnel syndrome in the short term.

3-**Corticosteroids**: steroid injection such as cortisone to relieve pain. Corticosteroids decrease inflammation and swelling, which relieves pressure on the median nerve. Oral corticosteroids aren't considered as effective as

corticosteroid injections for treating carpal tunnel syndrome.

Surgery

If symptoms are severe or persist after trying nonsurgical therapy, surgery may be the most appropriate option.

The goal of carpal tunnel surgery is to relieve pressure on your median nerve by cutting the ligament pressing on the nerve.

Endoscopic surgery. In endoscopic surgery, use a telescope-like device with a tiny camera attached to it (endoscope) to see inside carpal tunnel and cut the ligament through one or two small incisions in your hand or wrist.

Endoscopic surgery may result in less pain than does open surgery in the first few days or weeks after surgery.

Open surgery. In open surgery, makes a larger incision in the palm of hand over the carpal tunnel and cuts through the ligament to free the nerve. This procedure may also be conducted using a smaller incision, which may reduce the risk of complications.

In general, can use hand after surgery, gradually working back to normal use of hand while avoiding forceful hand motions or extreme wrist positions[11]

Patient and method

This study was prospective study of 30 patients diagnosed with Carpal tunnel syndrome and were scheduled for surgery .peroid from december2018to march 2019.at al_imamian Alkadhimian teaching hospital;from orthopaedic consultant; Baghdad Iraq.data including age;sex;diagnosis criteria which include ((symptom ; recurrence, complication, weak grip)).

*Age……

Sex……

Cases: are distributed between mild,• moderate, severe.

Average age was 36 years,. Twenty seven out of the thirty cases were female,three male cases. Two out of the 27 female cases were recurrent after surgery. All female cases were house wives, six of them pregnant. Clinical examination The most presenting symptoms was the numbness, then pain and heaviness especially at night. - Numbness = (6) cases - Pain = (5) cases - Numbness and Pain = (19) cases One case presented after history of cut wound at the wrist, and Neuroma of the median nerve. One case presented with myexodema.

All the cases sent for EMG and N.C.S : - eight cases = severe – twelve cases = moderate - ten cases = mild.

One case presented with a trophy of the thinear muscle.

Side: (twenty cases) occurred in right hand and (ten cases) (all the mild cases and half of the moderate given the chance of conservative treatment) . which include :- 1- Treating the cause . 2- Changing the work habit . 3- Splint . 4- Anti-inflammatory and analgesics . 5- Local steroids . All cases under go surgical intervention under L.A .

Post operatively all the cases had complete cure (except two had recurrence) - No infection

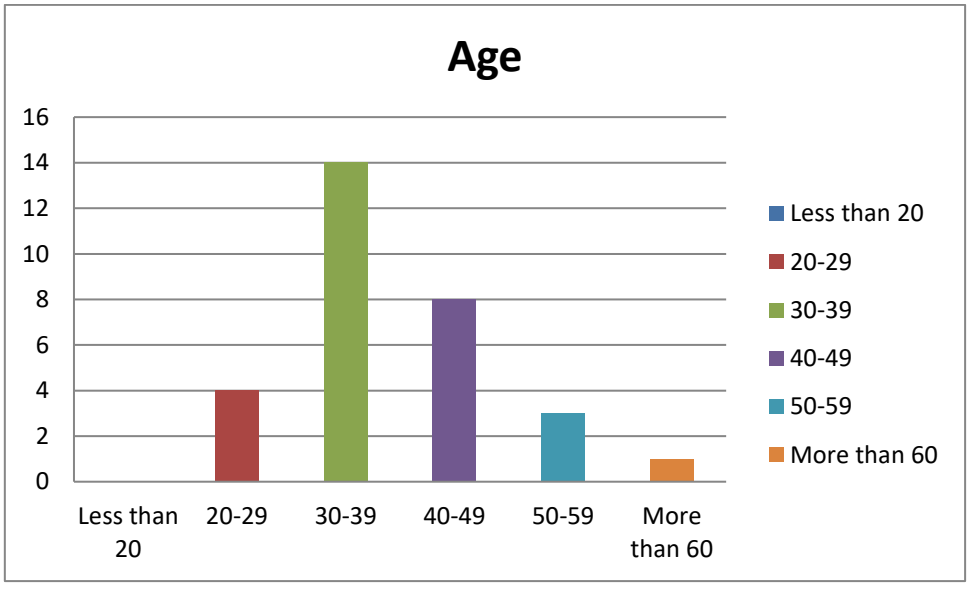
Result

1-Age frequency distribution:

Table(1) distribution of patient according to age

Age	Number	Percentage
<20	Zero	Zero
20-29	4	13.3%
30-39	14	46.6%
40-49	8	26.6%
50-59	3	10%
>60	1	3.3%
Total	30	100 %

Figure(1)frequency disturbution of age.

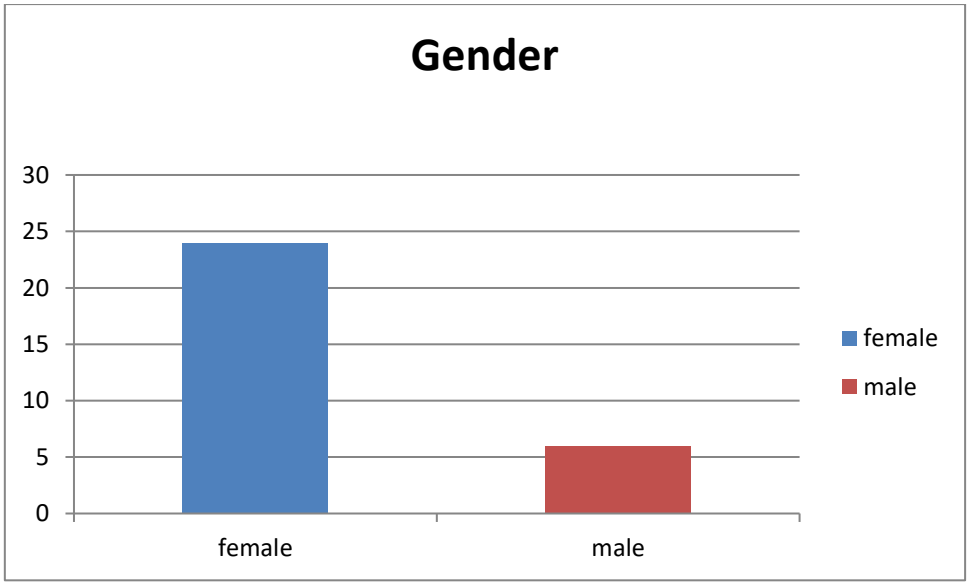


2-frequency distribution of gender

Table(2)frequency distribution of gender

sex	Number	Percentage
female	24	80%
male	6	20%
total	30	

Figure(2)frequency disturbution of gender



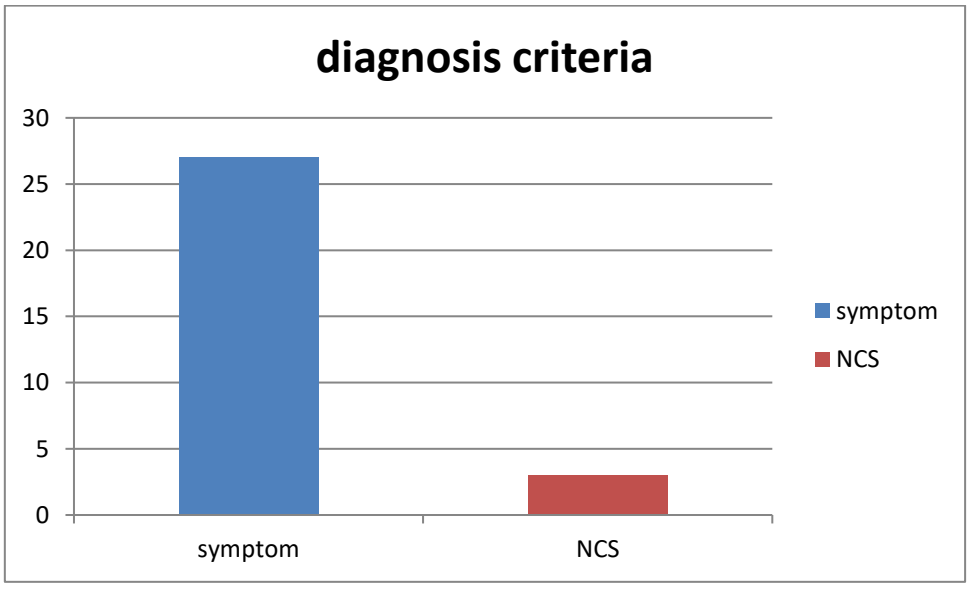
3-diangosis criteria

Number of patient 30 case the majority of them diagnosis by symptom which was 90% and diagnosis by NCS was 10%, all of them improve after the surgery. Table(3)

Table(3)diagnosis criteria

DC	number	Percentage
symptom	27	90%
NCS	3	10%
Total	30	

Figure(3) diagnosis criteria



Discussion

CTS is a common problem affecting mostly female, especially house wives. It affects mostly the right side. Majority of cases were moderate presented mostly by numbness, pain, heaviness, respectively. EMG and NCS mostly show affection of both sensory and motor component of the median nerve ,. A lot of mild and moderate cases can be treated conservativley by: 1-treating the precipitating factor that lead to the disease. 2-changing work habits. 3-wrist splintage. 4-anti inflammatory and analgesics with or with diuretics. 5-local steroids. Surgical intervention still remain the corner stone in treating CTS,if proper technique was applied,especially by cutting the transverse ligament completely proximally and distally and not leaving any constricting points on the median nerve, and we believe that this why signs and symptoms remain postoperatively if the strict above technique not followed. We don't advice to operate on CTS under local anesthesia and with out tourniquet for the above mentioned cause.

Conclusion

C.T.S is a common orthopedic problem. 1- Female affected more than the male.
2- House wives are the usual victim.
3- Majorty of the cases are moderate , by E.MG , NCV study
4- Complete release of the flexor retinaculum proximally and distally is the key for the success of the surgery.
5- Chance should be given for the mild cases to be cured by conservative treatment and restriction of the work.
6- Diuretics may be of benefit in some cases.
7- Recurrence may occur if the surgery done under local anesthesia with small incision.
8- In long standing median nerve compression surgery may not improve the weak grip of the hand.
9- Local steroid injection has a good place in minimizing the symptoms but recurrence is usual.

Refernces:

1-Carpal tunnel syndrome fact sheet. National Institute of Neurological Disorders and Stroke. http://www.ninds.nih.gov/disorders/carpal_tunnel/detail_carpal_tunnel.htm. Accessed Oct. 1, 2013

2-Williams HB,)abaley ME. The importance of internal anatomy of t he peripheral nerves to nerve repair in the forearm and hand. Hand Clinc.

3-*Thieme Atlas of Anatomy: General Anatomy and Musculoskeletal System. Thieme. 2006. pp. 248–249*

4-*"Carpal tunnel syndrome - Symptoms". NHS Choices. Retrieved 2016-05-21.* Page last reviewed: 18/09/2014

5-*Cush JJ, Lipsky PE (2004). "Approach to articular and musculoskeletal disorders". Harrison's Principles of Internal Medicine (16th ed.). McGraw-Hill Professional. p. 2035*

6-*Scott, Kevin R.; Kothari, Milind J. (October 5, 2009). "Treatment of carpal tunnel syndrome"*

7-*Durkan, JA (1991). "A new diagnostic test for carpal tunnel syndrome". The Journal of bone and joint surgery. American volume.*

8-*Ma H, Kim I (November 2012). "The diagnostic assessment of hand elevation test in carpal tunnel syndrome". Journal of Korean Neurosurgical Society.*

9- *Graham, B. (1 December 2008). "The Value Added by Electrodiagnostic Testing in the Diagnosis of Carpal Tunnel Syndrome". The Journal of Bone and Joint Surgery*

10-Kothari MJ. Treatment of carpal tunnel syndrome. http://www.uptodate.com/home. Accessed Oct. 1, 2013.

11-Hunter AA, et al. Surgery for carpal tunnel syndrome. http://www.uptodate.com/home. Accessed Oct. 1, 2013.

12-Gozalez Roig .Relationship between clinical probability of CTS and Neurophysiological studies 2008;52:353-8 cuba.

13-Chang MH Liu.Comparison of sensitivity transcarpal median motor conduction velocity in electro diagnosis of CTS 2006;117:984-991 .

14-Burke F D .Primary care management of CTS .J postgrad Med 2003;79:433-7 .

15-Atroshi, Jonhsson.Evaluation of reportable nerve conducting testing in carpal tunnel syndrome .journal of hand surgery,1996,vol.21A:651-654 .

16-Susan Ferry,Philip Hannaford and Maria warasky.CTs risk factors in women.AJE {UK} 2000;151(6):566-573 .

17-Frank L.Urbano. Tinel and Phalen physical tests of carpal tunnel syndrome 2000:39-44 .

18-Prakaush P Kotwal and M.varshney.CTS controversies and consensus. Pb journal of orthopaedics India 200911(1) :32-35 .

19-Gozalez Roig .Relationship between clinical probability of CTS and Neurophysiological studies 2008;52:353-8 cuba.

20-Bruske .M.Bednarski, H.Grazelec, A.Zyluk.Usefulness of the Phalen and Tinel –Hoffman sign in the diagnosis of carpal Tunnel Syndrome. Acta Orthopædica Belgica, 2002; 68 (2) :141-145.

21-Alexis Descatha , Ann-Marie Dale and Alfred Franzblau . Diagnostic Strategies using Physical Examination are Minimally Useful in Defining carpal Tunnel Syndrome in Population Based Research Studies. Occup Environ Med 2010;67(2):133-5.

22-Solways S ,Beaton DE and Bombardier. The DASH out come measure ,2nd edition.Toronto:Institute for Work and Health ;2002:52-59.