CARPAL TUNNEL SYNDROME
AN INFORMATION SHEET

INTRODUCTION

The carpal tunnel is rather like an underpass from the wrist into the hand. Its floor and side walls are made of bone and its roof is a tough fibrous ligament. All the tendons which go from the forearm to the hand run along the floor and the main nerve runs just underneath the roof, like a big telephone cable.

In carpal tunnel syndrome the nerve becomes squashed because there isn't quite enough room for it and the tendons as well. The tendons still work well even though they are squashed but the nerve doesn't. Normally the nerve transmits messages to and from the hand. If it is squashed fewer messages get through to the muscles and so these are weakened. Altered and fewer messages from the skin sensors get back to the brain and so the fingers feel numb or tingle.

If the nerve is squashed for a very long time, ie for many months or years, the nerve is damaged permanently and is unlikely to recover. It is, therefore, important not to ignore carpal tunnel syndrome. If you try to put up with its symptoms for too long the nerve may never recover in spite of an operation to relieve the pressure. The operation may still be worthwhile to stop your symptoms getting any worse.

WHAT ARE THE CAUSES OF CARPAL TUNNEL SYNDROME?

Probably the commonest cause of carpal tunnel syndrome is a change in the fluid content of the nerve and the coverings of the tendons passing through the tunnel. The tunnel itself doesn't shrink but the nerve and tendons swell. Over activity can sometimes cause irritation of the membranes around the tendons and more activity on top of this can make the swelling worse. We usually never find out why there is swelling but it may be due to changes elsewhere in the body, sometimes influenced by age, hormonal status, weight, activity, etc. There are noticeable changes in fluid distribution in the body between night and day and many carpal tunnel syndrome sufferers develop the worst symptoms during the night. They are woken from sleep by pain and discomfort in the hand and forearm. There are a very large number of other rare causes of carpal tunnel syndrome which sometimes can be guessed at before surgery, but some are only found by the surgeon when he operates.

Occasionally the membranes around the tendons are very swollen due to rheumatoid arthritis or acute tenosynovitis. In general the causes are not due to any disease in the nerve itself but due to the structures surrounding the nerve.

TREATMENT OF CARPAL TUNNEL SYNDROME

There are two possible approaches to the problem. One can either try to shrink the tendons and their membranes around them to give more room for the nerve and to leave the tunnel walls alone, or one can enlarge the dimensions of the tunnel. The first approach is called the medical or conservative method and the second is the surgical method.

THE MEDICAL/CONSERVATIVE METHOD

If one rests the wrist by stopping work, splinting the wrist with a splint or putting the arm up in a sling, the swelling of the structures in the tunnel usually lessens and relieves the pressure on the nerve. This can be achieved artificially by an injection of steroid around the tendons or the nerve. The steroid will calm down any irritation or inflammation in the tunnel for a time. Sometimes the steroid calms everything down sufficiently to last a very long time and can break the vicious cycle of swelling which causes irritation which causes more swelling. However, sometimes the steroid only calms things for a few days or a week or so and then the problem starts up all over again. If steroids seem to help for a short time this is a very useful confirmation of the diagnosis and is convincing proof that an operation is likely to be helpful. So one way of relieving carpal tunnel syndrome is to rest the hand completely for a while, but of course few people can afford to do this for long. An injection of steroid may give a quick fix solution but may last only a few weeks.

THE SURGICAL TREATMENT OF CARPAL TUNNEL SYNDROME

The surgical method is to enlarge the tunnel and to give the nerve more room permanently. If one cuts the ligament the roof of the tunnel springs apart and suddenly there is plenty of space for the tendons and the nerve. The ligament then heals across again but in a more relaxed position. This surgical approach is successful in nearly all cases. It usually only fails if either it isn't done properly or if the nerve hasn't in fact been compressed in the first place. Hence, it is very important to carry out surgery only when one is sure of the diagnosis.

In most people who develop the syndrome, the symptoms and changes in the hands are so typical that these clinch the diagnosis and the doctor is in no doubt that the treatment is needed. He can then make the recommendation about what is appropriate.

However, in a small number of people the diagnosis is in doubt because some of the symptoms (what the person complains of or notices) don't seem to fit or are in some way not typical of what one should expect to find in carpal tunnel syndrome. The person's complaints may in fact suggest another problem altogether.

In such cases the doctor, who should have examined the hand and wrist very carefully already and recorded the findings, may carry out special tests on the nerve to stress it, perhaps by tapping it or pressing it or stretching it to see whether this brings on the pain or the numbness or tingling. He may ask for a special electrical test in which one measures the speed with which electrical impulses are carried along the nerve. If the nerve is being badly compressed the nerve impulses are not transmitted as rapidly as normal.

If the doctor suspects arthritis he may ask for blood tests to be done. If he suspects a bony problem he may obtain x-rays or scans of the wrist.

Confusion can arise when a patient has other previous problems in the hand, such as arthritis or poor circulation or a history of previous injuries, or has pressure on the nerves in the neck from arthritic changes in the neck.

Thus, when you go to see an expert about a possible diagnosis of carpal tunnel syndrome, you may have to have special tests done before you are offered any particular treatment. In a very small number of people, even after all the tests have been carried out, there is still doubt. One is then left with the dilemma of what to do. One can either leave it alone and wait and see if the situation changes or one can try and enforce rest for a period of time or one can try the injection of steroid or one can go ahead and carry out the operation.

COMMON SYMPTOMS IN CARPAL TUNNEL SYNDROME

It is very important to realise that carpal tunnel syndrome causes different problems in different people.

In most people there is a combination of pins and needles, pain, numbness and weakness, but some people have no pain at all but only weakness or numbness. Some people have severe aching pain while others have shooting pains. In some people the pain is confined to the hand alone but in others it is mostly in the wrist, and in others it goes all the way to the elbow or shoulder.

SIGNS IN CARPAL TUNNEL SYNDROME

In the early stages of carpal tunnel syndrome there are usually no visible signs of change in the wrist or the hand. However, stressing the nerve by pressing on it or tapping it or stretching it may cause characteristic symptoms which the doctor needs to interpret during the examination. Longstanding compression of the nerve causes the muscles around the bottom of the thumb to thin and weaken and there is a typical flatness to the contour of the normally rounded full-curve of the bottom of the thumb where it joins the wrist.

TREATMENT

Splintage:

There is no doubt that many people obtain a worthwhile relief of pain by splinting the wrist in a neutral or unbent position.

A Futura splint with Velcro straps is one such splint which is cheap and popular and quite effective. It interferes with some people's work because it makes them clumsy and has to be removed for washing. If worn at night it may prevent the pain which wakes some people up in the early hours of the morning.

Injection of Steroid:

An injection of steroid into the carpal tunnel is a skilled procedure. One has to get the steroid around the nerve and not into it. If the tunnel is tight it can be quite painful for a few minutes but most people tolerate it easily. It is common to numb the skin first with local anaesthetic before giving the injection of the steroid. The steroid injection does not have an immediate effect and in fact the wrist may be more painful for a couple of days after the injection. If the injection is going to help it will normally become noticeable within 3-4 days, however. It will then improve symptoms progressively for the next 1-2 weeks. Some people enjoy permanent relief of symptoms and are never troubled again. Others find the symptoms are relieved for only a few weeks and then they return just as severely. Other people may notice the symptoms relieved for only as long as they stop the job of activity which seems to stress the hand or wrist. An injection is extremely unlikely to make symptoms worse permanently or to do any permanent damage unless the nerve is damaged by the injection itself. Fortunately, the latter is very rare.

Repetitive Strain:

Unusually vigorous use of the hand in a repetitive manner can provoke carpal tunnel syndrome. Certain jobs/occupations can do this and a person affected this way may have to find alternative employment, but can rarely claim compensation because these symptoms will not cause long term harm if lasting for only a short time. There is no doubt that some people are 'prone' to carpal tunnel syndrome whereas other people even under the same provocation don't suffer in the same way.

THE OPERATION

A cut is made on the palm side of the wrist in approximately the mid-line. Different surgeons use different positions of the cut, different length of incisions and do different things in the operation. However, common to all operations is division of the tight ligament lying underneath the skin.

There are a lot of variations in how the operation is arranged and it is best to be guided by the surgeon about what he thinks is most appropriate for you. Remember that some surgeons may feel more confident in doing the operation in their particular favourite way and of course they may do it better and more safely this way. The main differences of approach for which there are plenty of pros and cons are:

1. Local versus general anaesthetic, ie an injection as opposed to going to sleep for the operation.
2. Day case versus overnight stay.
3. Open versus endoscopic surgery.
4. Repair versus non-repair of the ligament.
5. Dissolvable or non-dissolvable stitches
6. Correction of one wrist or both wrists at the same operation.
   (If you live on your own it may be very difficult to look after yourself if you have both hands bandaged at the same time.)

In summary, there isn't a best way which is universal. Some approaches are more comfortable than others, some encourage earlier return to work, some are cheaper and some have fewer complications. These are all matters for discussion or debate with the surgeon or the hospital. Don't forget that ultimately what matters is whether the operation is a success in the long term rather than how convenient or comfortable it may have been at the time.

WHAT TO EXPECT AFTER THE OPERATION

It is normal to expect pain in the wrist and hand for several days after the operation but some people get more than others. It is common for the person to be relieved of the troublesome symptoms of pins and needles and numbness almost immediately. If this doesn't happen it does not necessarily signify failure of the operation because it may take several days or weeks in a few people, especially those people who have had symptoms for many years. It is normal for wrist actions to be weakened and uncomfortable for up to three months so that twisting or untwisting things, such as taps, handles, caps will be difficult. This may mean, for example, that a mechanic won't be able to work as efficiently as normal for a couple of months after the operation but should eventually return to almost normal power and strength. It is common to find that the scar in the palm is tender for several weeks in most people but in a few it will be tender for longer. Itchiness in the scar is another irritating problem for some people and in a few people needs extra treatment. It is very unwise to try and lift/pull heavy things or flex the wrist forcibly for about a month after the operation. The usual maxim is – if it is painful don't do it!

COMPLICATIONS

About 9 out of 10 people regard the operation as a great success. They are relieved of their symptoms and they recover with no long term side effects or problems and they soon forget they ever had a problem.

Common to all forms of surgery, there is a 1-2% risk of infection developing in the wound after the operation. This may be very serious if it is due to a virulent bacteria because it can result in injury to the nerve. A person who develops increased pain in the wound 2-5 days after the operation must report it, preferably to the surgeon or to the nurses where he/she was treated. Failing this, to his/her G.P. If you have diabetes, this puts you at increased risk of infection and it is a wise precaution to take antibiotics before and possibly after the operation.

However in about 1 out of 10, something doesn't work out quite right. In most cases this is nobody's fault but is simply unfortunate. One of the commonest problems is that the person expects to be back to normal immediately and feels in some way misled when it takes longer than expected to recover. In about 3-5% of people the important symptoms of pain and weakness don't improve. This then needs either further investigation or possibly a further operation. This will have to be discussed in great detail with the surgeon.

In about 2-3% of people a small nerve to the skin of the palm is damaged in the operation and makes part of the palm either numb or very sensitive to touch. This can be a considerable nuisance to a few people because it remains very sensitive for a long time after the operation. Fortunately, this problem usually clears up by itself or at least lessens with time.

In about 2-3% of people the operation scar becomes swollen and rubbery, hard and infuriatingly itchy. This type of scarring is called hypertrophic scarring. It can be controlled by pressure or the use of a silicone pad on the scar or the application of steroid creams or sometimes an injection of steroid into the scar itself. Fortunately, hypertrophic scars nearly always soften and become less itchy over 12-18 months.

In a very small number of people something unusual is found at the time of the operation, such as an anatomical variation from the normal, such as the presence of an abnormal muscle or a peculiar distribution of the nerve. This might result in a poor outcome or the need of another operation or some other form of treatment.

In very rare cases the main median nerve is damaged accidentally in the operation. This can cause permanent weakness in the muscles to the thumb or may result in altered feeling to one of the fingers or thumb. If the nerve is damaged at the time of the operation the surgeon will usually know about it or try to repair it then and there and will tell the patient as soon as possible after the operation what has happened.

BLEEDING AND INFECTION

The risk of developing an infection in the wound after having an operation of carpal tunnel release is, fortunately, very small indeed. It is in the region of 1% of patients. If you know that you are at increased risk of developing an infection because you have diabetes or because you have often had infections in other wounds on your body, then you must discuss this with the surgeon.

The surgeon may feel it is appropriate for you to have antibiotics at the time of the operation to try and reduce your risk. The use of antibiotics doesn't always stop you from getting an infection but it certainly will reduce the chances of developing a severe infection.

Infection very rarely shows itself or causes pain or discomfort until 2 or 3 days have passed after the operation. Most patients having carpal tunnel surgery have pain for the first 24 hours or so but it then usually subsides within 48 hours. The development of pain after this must be assumed to be due to an infection until proved otherwise. Therefore, a person who develops pain three days after the operation, which is getting increasingly worse and which might be associated with a feeling of warmth in the arm and general feeling of being unwell, must be regarded as having an infection until proved otherwise and antibiotics have to be given urgently.

The other uncommon risk which affects less than 1% of patients having carpal tunnel surgery is the development of a blood clot in the wound. If you are known to have a bleeding problem or if you are taking medication such as Aspirin or Warfarin which increase your chances of bleeding, there will be an increased risk of you developing a swelling in the wound due to accumulation of blood. This nearly always causes pain as well as swelling and bruising and has to be treated seriously. There is an increased risk of infection associated with a haematoma and it is very important for a patient who has extreme pain after the operation to have their wrist checked to see whether or not they might be suffering from a haematoma.

Provided the haematoma is released as soon as it has been recognised and has not been present for more than 24 hours, it is very unlikely that any serious long term consequences will arise from this complication.

Thus, a person who has just had a carpal tunnel operation who has severe pain after the anaesthetic has worn off, should have their wrist and hand checked by the surgeon or one of the medical staff. If the severe pain occurs in the first 24-48 hours after the operation it is more likely to be due to a haematoma, but if it occurs after this it is more likely to be due to an infection.

PAIN SYNDROME

There is a very rare syndrome called "sympathetic dystrophy" or "regional pain syndrome" which can affect one in every two or three hundred patients having carpal tunnel surgery. It causes long lasting and disabling pain and tenderness in the hand/wrist. It is not well understood. Most people recover from it in part if not completely. There is no known cause, nor way of preventing it. However, if a person developed it after one hand has been treated they may be at higher risk of suffering it again if the other hand is treated also.

SUMMARY

Carpal tunnel syndrome is very common. It is hardly ever caused by a person's job but overworking the wrist may make it worse. It is usually relieved by complete rest but most sufferers benefit from either an injection or an operation. Injection gives permanent relief in about 25% of cases and the rest need surgery. 9 out of 10 people having surgery have an excellent result but 1 out of 10, although having a technical success may have some minor problem which may take several months to resolve.

This information sheet has attempted to answer some of the common questions posed by patients who have been diagnosed as having carpal tunnel syndrome. It cannot be fully comprehensive and if in doubt you should ask your doctor or specialist for further advice.

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