

Patient Information Sheet

Nerve Injuries

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Nerves in the forearm and hand

The three nerves of importance in the wrist are the median, ulnar and radial. These give rise to numerous branches in the hand and the ulnar and median nerves supply sensation to the skin on the palmar side of the hand as well as the small muscles, which permit fine movements. Each digit is supplied by two branches, the thumb, index, middle and part of the ring finger are usually innervated by branches of the median nerve, and the remaining fingers by branches of the ulnar nerve. Some of the back of the hand is supplied by the radial nerve and the remainder by a branch of the ulnar nerve.

What is a nerve injury ?

When a nerve is injured, the part of the hand supplied by it feels numb distal to the injury. The nerve can be badly bruised, in which case it will recover with time, but if there is a deep cut to the skin, it has to be assumed that the nerve has also been at least partially cut. The nerves are under tension and the cut ends tend to spring apart.

Diagnosis

Numbness in the territory supplied by a nerve can be detected by clinical examination and injury to a motor branch may manifest as weakness of the muscles. Sometimes the results of the examination are not absolutely clear-cut and it may be necessary to explore the nerve. Special tests are not usually required, although X-rays may be obtained to exclude the presence of foreign bodies, such as glass, or if fractures of the bones are suspected.

Treatment

Cut nerves have to be repaired surgically as they do not heal satisfactorily on their own. This is done under general anaesthesia. The surgery does not have to be performed immediately, but can be delayed for up to a couple of days until appropriate microsurgical facilities are available. The stitches used are finer than a human hair. At the time of surgery, the original cut in the skin usually has to be enlarged to allow the retracted ends of the nerve to be identified and the adjacent structures identified for injury. The wound extensions are usually in the form of a zigzag to avoid scar contracture. After surgery, a plaster of Paris splint is applied to prevent straightening of the fingers and wrist. This is to protect the nerve repair whilst healing is taking place.

After surgery

A long-acting local anaesthetic is also used at the time of surgery to provide postoperative pain relief. The numbness lasts for several hours and simple pain killers are all that are necessary afterwards. You must avoid aspirin as this may cause bleeding. The stitches are left in for 2-3 weeks. The hand must be kept dry during the first week. You can bathe by placing a plastic bag over the hand. It is very important you keep your hand elevated as much as possible, at least during the first week. During the

daytime you can wear a sling and at night the hand can be rested on a couple of pillows. This helps reduce the swelling and postoperative discomfort. The dressings are changed after a few days and at this stage the hand therapists will teach you how to begin moving the digits and you may require a further splint, especially if there are associated tendon injuries. With isolated nerve injuries in the fingers, most people are able to return to work within 2-3 weeks.

The outcome is determined by the level of injury, the age of the patient and the extent of the damage to the nerve. In general, the further toward the finger tips the injury and the younger the individual, the better the outcome.

The nerve grows at a rate of approximately 1 mm per day and the nerve sprouts can get jumbled up by the time they reach the skin of the finger tip. This means that the various sensations we take for granted in adult life have to be re-learned. Initially, re-innervation is perceived as tingling, followed by the return of protective sensation, which allows the perception of pain and hot and cold temperatures. Until the latter stage is reached, it is imperative that the affected digits are protected from inadvertent injury. Eventually more sophisticated sensation returns and this entire process can take up to 18 - 24 months.

The site of nerve repair remains very sensitive for some time and the hand therapist will help with desensitisation procedures and also with sensory re-education.

Despite advances in recent years, it is just not possible for adults to make a complete recovery from nerve injuries.

When the nerves supplying the small muscles of the hand have been injured, there is a tendency for the digits to assume abnormal postures, which have to be prevented by exercises and splints whilst awaiting nerve regeneration. If the recovery is incomplete and hand function is severely compromised, it may be necessary to transfer tendons to perform the tasks of the paralysed muscles.

Possible complications

- Infection is rare and usually respond to antibiotics.
- Sympathetic dystrophy, which presents as pain, swelling, stiffness and discolouration, is uncommon and is treated by intensive hand therapy.