

## **PERCUTANEOUS RADIO FREQUENCY NEUROTOMY**

The small paravertebral joints of the vertebrae in the neck (cervical area), lower back (lumbar area) or the vertebrae in relation to the ribs (thoracic area), can be the source of pain. When such discomfort is caused by degenerative changes in these joints, various options of treatment exist, amongst others fusion by surgery, physiotherapeutic and other methods of treatment based on exercise and mobility strategies and pharmacological methods using medication and injections.

Another method of treatment is called percutaneous radio frequency neurotomy. The scientific base of this treatment, is to prevent painful sensation from the abnormal joints reaching the spinal cord and then the brain. This can be done by destroying the small nerve (medial branch) from the posterior (back) ramus (branch), which has no other function but the conduction of pain.

This can be done by placing an electrode (needle) under continuous x-ray guidance in specific target points and passing a high frequency electrical current through the electrode. This generates heat in the electrode tip that can be controlled and will destroy the nerve, but no other structures or nerves that could lead to any form of neurological deficit.

This form of treatment does not cause any structural changes to the abnormal joint and is a symptomatic treatment directed at reducing pain. If properly performed, on the average 75% of patients showed 60% to 75% of pain reduction from the paravertebral joints. This procedure is usually performed in an operating room environment. It should be done under sterile conditions, with excellent continuous radiographic control facilities available, as well as resuscitation facilities, should this be needed.

The procedure can be performed under local or general anaesthetic. Apart from the small period of time when the radio frequency current is flowing, it is not a

painful procedure. It is important that during the procedure the patient has a patent airway and should be able to move as little as possible during the procedure. This is necessary for accurate placement of the needle electrode.

Usually the patients are admitted on the morning of the day when the procedure will be performed and can be discharged on the same day, returning to their normal activities on the next day.

Post procedure discomfort is usually limited to slight discomfort in the muscle area where the electrode had passed on its way to the target point on the small paravertebral joint. The decision whether a specific patient is suitable to receive this particular treatment, is made after a recommendation by the surgeon who was consulted and then the patient must agree to the procedure. It will usually be patients who either do not yet need surgery, who do not respond favourably to other methods of conservative treatment, patients who do not wish to have surgery and those who are advised because of other health problems, not to have any form of major surgery if possible.

When counselling a patient about the procedure, the surgeon should inform the patient about why he recommends the procedure, explain the availability of the necessary facilities in an institution where he proposes to admit the patient, explain his own experience and training in performing the procedure and give a basic, but informed explanation of the possible side effects.

Serious complications are extremely rare in this procedure. Side-effects such as minor discomfort originating from the skin, deep muscle and other soft tissue areas, are more common. They are usually of low intensity, but could last between two and fourteen days.

Slight unsteadiness and spatial disorientation could occur for some hours as a temporary side effect related to the local anaesthetic in the higher areas of the

neck. Most of the local anaesthetics usually lose their effect within a couple of hours.

Patients should give information regarding all possible medication and pharmacological agents to which they are allergic. These would include local anaesthetic and anti-inflammatory drugs that are very important in this respect.

Slight loss of sensation may be experienced more peripherally, especially low down at the area of junction between the skull and the neck as well as over the shoulder girdle. This rarely occurs and if it does, it only lasts a day or two, but cases have been reported to last for a number of weeks. In the lumbar or thoracic areas these sensations do not occur as a rule.

Patients with cardiac pacemakers or spinal cord stimulators, could have the function of these devices disturbed by the electrical current from the radio frequency machine. Either the devices will have to be switched off, or left in the mono-polar stimulation mode. If such adaptations are not possible in any specific device, the procedure should not be performed.

As continuous radiological screening is an important part in monitoring the placement of electrodes, patients in their early pregnancy should preferably not be offered this treatment at that stage. Theoretically there exists a risk of blood vessel, nerve or spinal cord injury, but this should not occur when the procedure is performed under optimal conditions by a well-trained surgeon.

It is of great importance that the patient should understand that the basis of the treatment is a symptomatic one aimed at reducing pain from the small joints. The structure of the joints will not be changed. The surgeon should be very clear as to the expectations the patients have from the procedure, as well as allowing ample time between the procedure and the decision to offer other alternative treatments of a more radical nature. The duration of the improvement can vary

and is not predictable. It is possible to repeat the procedure if the previous result was positive.