Biomedical imaging began 100 years ago: in 1885 Roentgen discovered X-rays and in the early 1970s computed tomography (CT), in the early 1980s magnetic resonance imaging (MRI), and in the last few years positron emission tomography (PET) and single photon emission computed tomography (SPECT) have come to be.

The past two decades have seen a revolution in imaging that has had a profound effect on medicine and research; and research is still under way.

In pain therapy, imaging is a fundamental tool in algorithmic clinical diagnostics and therapeutic intervention by invasive techniques [1].

The injection of anaesthetic, neurolytic agents is a medical procedure and thus constitutes a true contract between the anaesthesiologist and patient.

In this context of legal responsibility, the anaesthesiologist undertakes the following:
- to give the most up-to-date care;
- to inform the patient of normally expected consequences of the procedure;
- to record the patient’s medical history and to evaluate the indications for the procedure to undertake;
- to provide adequate human and technical resources for the procedure and follow-up.

The practice is inseparable from risk. Risk management requires the recognition that risk exists and that imaging it is a suitable means of diminishing this risk.

Many investigators believe that, for many pain syndromes in which the functional relationship of the sympathetic nervous system causes of chronic pain have been recognized, early treatment by antalgic blocks will decrease the likelihood that chronic intractable pain will ensue.

Moreover, a vast amount of experimental and clinical evidence has accumulated to indicate that interruption of a certain portion of the sympathetic nervous system has beneficial effects on many of these disorders.

Many studies have, however, demonstrated a direct modulation of the sympathetic on afferent fibres, on proprioceptors and on other peripheral receptors, the so-called pain receptors. So the sympathetic system can control pain, allodynia and hyperalgesia.

As far as the action of pain on the sympathetic nervous system is concerned, it has been demonstrated that the action of noxious stimuli at the level of the deep
somatic structures may determine the excitation on the sensitive receptors, activating the afferent discharge and inducing a reflex excitation of somatic and vegetative efferent paths. Activation of the somatic efferent fibres determines the phenomenon of muscular contraction and, consequently, further excitation of the sensitive receptors [2].

This is a sudden interruption in the flow of pain information from the periphery to the dorsal horns. In the case of prolonged pain stimulation, it slows the process of genic expression that accompanies the first electrophysiological response. This process, which is one of transcription and can quite justifiably be likened to the long-term potentiation of memory, is responsible for the sensitization of the response, for the broadening of the receptive field, and for the prolongation of the discharge. It starts within a few minutes of repetition of the stimulus (immediate-early genes) and extends to the entire neuronal chain, including the central section, right up to the somatosensory cerebral cortex [3].

Sympathetic blockade alleviates sympathetically maintained pain, whether the causative lesion is central or peripheral. It probably has an indirect beneficial effect by causing local vasodilatation that improves blood/tissue exchange, with the peroxidation of the products of cellular decomposition and the removal of toxic products (which stimulate pain) [4].

The pathogenesis of this pain is explained by the hypothesis of the “vicious circle” of impulses “periphery – afferent fibres – spinal cord – sympathetic efferent fibres – periphery”.

**Block of the stellate ganglion and thoracic sympathectomy**

Sympathetic blockade at the cervicothoracic level is used for the diagnosis and treatment of painful and other conditions of the head and extremities. One must be as certain as possible that the needle is properly placed; except for C6 anterior tubercle injection, this means the use of radiologic imaging [5].

The stellate (or cervicothoracic) ganglion is the fused inferior cervical and first thoracic sympathetic ganglion. The anterior paratracheal approach to the C6 anterior tubercle is the most popular since it lessens the risk of vascular injection and pleural or vascular injury. This level is chosen for safety reasons and the easy identification of the landmark, not because this is the location of the ganglion.

In vivo imaging with MR shows the ganglion sitting on the anterior surface of the head of the first rib [6]; in transverse planes the distance between the stellate ganglion and the midline varied from 19 and 28 mm (left side) to 21 and 30 mm (right side). In sagittal MRI planes the distance between the stellate ganglion and the dome of the pleura varied from 10 to 40 mm [7].

A relatively large volume of local anaesthetic is required for stellate ganglion blockade in order to fill the fascial compartment around the anterior lateral vertebral column when needle placement is at Chaussaignac’s tubercle .

Placement of the needle at the anterior lateral border of C7 provides a higher