Percutaneous Stereotaxic Cordotomy

II. A Guidance Technique for the Anterior Approach

By

J. L. Fox, M.D., and R. C. Green

With 10 Figures

Recently Lin, Gildenberg, and Polakoff described their technique of percutaneous cordotomy by the anterior approach through the lower cervical disc. Because of certain problems we encountered by the lateral approach at the C-1, 2 level, we set about to perfect the lower cervical anterior approach. In our initial experience with 50 percutaneous cordotomies in 34 patients, 15 cordotomies in 10 patients were carried out satisfactorily by the anterior approach through the intervertebral disc using a modification of the technique of these authors. The following method was used to gain more efficient target-electrode approximation through the immobile cervical disc. The specific modification is the use of a surveying telescope developed by us for more accurate guidance of the needle to the target.

Method

Following premedication with a narcotic the patient is placed in the supine position on the x-ray table with the head immobilized over a small sponge pillow. If the patient is particularly anxious, intravenous diazepam may be used. This drug is very effective in allaying anxiety yet allowing accurate pinprick perception when testing the patient. Lateral and antero-posterior (AP) x-ray tubes are set in position for
radiographic views of the cervical spine. A standard 18 gauge spinal
needle is buried deep into the upper posterior cervical musculature. The
entire tract of the needle should be anesthetized locally. This needle
serves as the indifferent electrode both for stimulation and for radio-
frequency coagulation of the spinal cord.

An 18 gauge thinwall 3 1/2 inch. spinal needle then is inserted between
the carotid sheath and the midline structures of the neck after a local

anesthetic is infiltrated. Generally the needle is inserted into the neck
on the side of the pain so as to pass obliquely through the disc and into
the anterolateral quadrant of the spinal cord on the side opposite the pain.
A lower cervical intervertebral disc is palpated with the needle. The
C-5, 6 disc is preferred since it lies above the shoulders on the lateral
x-ray and below the phrenic respiratory center. This guide-needle then
is placed only into the anterior edge of the disc so that it still can be
tilted through the soft tissue and not immobilized by the disc. The tip
of the needle thus acts as a fulcrum about which the needle, within limits,
can be tilted and from which measurements are made on the lateral and
AP x-ray films as described by Gildenberg et al.1.

With the needle thus positioned radiographic films of the cervical
spine are made (Fig. 1 and 2). Then a right triangle may be drawn on
paper representing the polar plane (Fig. 3) of the patient (perpendicular

---

Fig. 1. Translateral x-ray film of cervical spine. Cephalad is indifferent electrode in soft tissue.
Caudad is guide-needle with tip in anterior edge of C-5, 6 disc. Long arrow represents vertical distance
(Fy in Fig. 3) from needle tip (Fulcrum) to radiographic target (x in Fig. 3). Short arrow touches
posterior border of spinal canal.

Fig. 2. Frontal (antero-posterior) x-ray film of cervical spine of same patient. The two crossed arrows
point to the lateral border and the midline of the spinal canal. The lower arrow represents the horizontal,
lateral distance (yx in Fig. 3) from the guide-needle tip (Fulcrum) to the radiographic target (x in Fig. 3).