Chapter 6. Percutaneous Spinal Root Lesion

Synonym: Percutaneous radiofrequency rhizotomy

As an alternative to open rhizotomy, Uematsu et al. [1974b], inspired by the experience obtained with the thermocoagulation of the retrogasserian root, have proposed a technique aimed at destroying the spinal nerve trunk, and the posterior root ganglion or rootlets by a percutaneous method. As in the trigeminal procedure the technique combines the use of a thermistor-monitored electrode, a fluoroscopic image intensifier, a nerve stimulator and an RF lesion generator. The radiological landmarks to introduce the probe into the intervertebral foramen to perform cervical, thoracic, lumbar and sacral rhizotomies, as well as all technical details of the percutaneous RF method, have been well described [Uematsu et al., 1974b; Sluijter and Mehta, 1981; Uematsu, 1982]. Much emphasis is placed on prognostic blocking before performing the procedure, and physiological confirmation by electrostimulation of the proper site of the electrode.

As already discussed in the chapter on trigeminal thermocoagulation, the preferential destruction of small-diameter fibers can be achieved by using graded increments of heating. Uematsu et al. [1974b] recommend that these be between 50 and 70 °C for a period of 120 s. For a cervical rhizotomy, the needle should be placed in the posterior part of the intervertebral foramen in order to avoid damage to the vertebral artery. Before heating a thoracic electrode one should verify that the needle is not situated in lung parenchyma.

The published results are summarized in table 6/1. Follow-up has usually been short. Lumping together good and fair results makes a clear-cut appraisal impossible.

Severe complications, such as paraplegia and one transitory paralysis of an arm, have been reported [Verdie and Lazorthes, 1982]. Destruction of essential nutrient arteries to the cord must be a problem.

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Table 6/1. Results of percutaneous RF rhizotomy

Conclusions

Although the method is relatively simple for the surgeon and comfortable for the patient, the meager volume of published reports indicates that it has not gained general acceptance. This is probably related to the facts that: (1) trigeminal rhizotomy often need not denervate as completely as spinal posterior
rhizotomy; (2) the trigeminal root is more consistently placed vis-à-vis bony landmarks than the various spinal roots, and (3) the trigeminal motor root is less important functionally than many of the spinal motor roots.