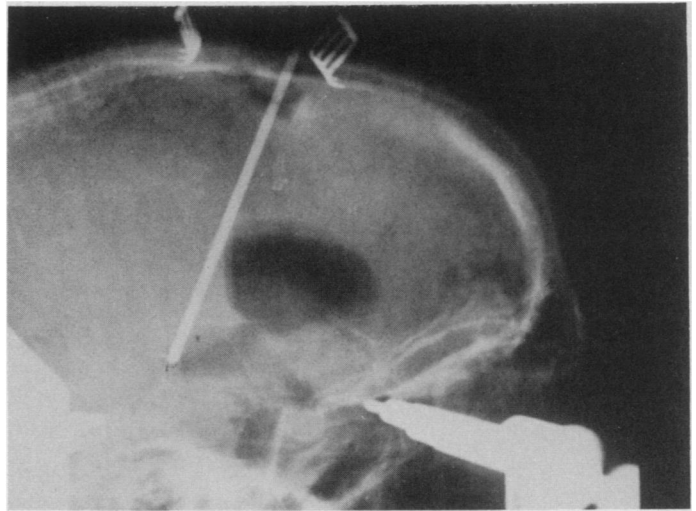


Cryosurgery relieves spastic paralysis



Illustrations: ESN

Side view of cannula freezing the brain's pulvinar region.

Twenty years ago, Irving Cooper of St. Barnabas Hospital for Chronic Diseases, Bronx, N.Y., developed a brain surgery technique that partially relieves patients with the tremors of Parkinson's disease. Ten years ago he perfected the operation by using cryosurgery, that is, by freezing the tremor-causing portions of the brain. More recently, he has used cryosurgery to prevent the formation of new tumors in cancer patients (SN: 8/19/72, p. 120). At the annual meeting of the American Academy of Cerebral Palsy this week, Cooper announced perhaps his greatest surgical contribution yet. He has applied cryosurgery to the brains of 70 cerebral palsy, stroke and related brain-damaged patients. Cryosurgery relieved spastic paralysis caused by cerebral palsy, stroke or related brain damage in more than half of these patients.

One or several cryosurgery operations may be necessary to relieve the spastic paralysis, Cooper explained. The major technique he uses is cryopulvinectomy. Part of the brain's pulvinar region is destroyed by freezing. The pulvinar region is marble-sized and located behind the thalamus. "Not too long ago," Cooper said, "nobody had any

idea that the pulvinar had any motor function. Now we know that it is very complex with motor functions, and it has a high-level sensory data integrator. Its role varies depending upon the functional condition of the individual brain."

Recently Cooper and his associate operated on Ferraro, a young man who had come from Italy with the hope that Cooper could relieve him of spastic paralysis caused by a brain tumor that had been removed two years before. His left side was still, his foot pointed rigidly, his hand was gnarled claw-like. While Ferraro remained alert under local anesthesia, Cooper drilled a small hole through his skull.

"Ferraro, touch your nose," Cooper commanded. Ferraro tried, but had little control over his hand. Cooper inserted a cannula (a long, slender tube) into Ferraro's brain. During probing liquid nitrogen passes through the cannula at cool test temperatures. When the cannula was on target, Cooper called for a lowering of temperature for two minutes. Immediately Ferraro's hand relaxed. Some paralysis remained in his upper arm and leg, however. Cooper destroyed more of the pulvinar; the left side improved more.

Later Cooper said they would keep the boy in the hospital for 10 days. If he showed enough improvement, he would go home. Otherwise he might need more surgery.

The procedure apparently has no major side effects. Cooper puts surgical risks at two percent. He says that currently the only way to tell whether the half million Americans who are crippled annually by stroke and the 15,000 born annually with cerebral palsy can be helped by the new operation is to try it. Spasticity can only be taken away if the stroke or other condition is one in which the underlying mechanisms for movement remain.

In addition to presenting data on his cryosurgery techniques for spastic paralysis, Cooper also gave a preliminary report on another brain operation that he has developed during the past year. The operation consists of stimulating

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the anterior cerebellum, which plays a crucial role in body movement and muscular coordination, in stroke and epileptic patients. Stimulation of this brain region can relieve spasticity.

In one stroke patient, Cooper implanted an electrode in the anterior cerebellum. A lead wire was brought under the skin and down the neck, and an antenna was placed under the skin of the chest. Over this spot was taped a transmitter from a small electrical stimulation box. At regular intervals the stroke patient turned a dial and stimulated a portion of his brain to relieve the spasticity. Before the procedure the man had spastic paralysis on one side for 40 years. "Now," Cooper says, "his leg is so loose he can walk without a cane."

Another patient, a severe epileptic, had a similar device implanted. He kept the stimulator at his side and activated it whenever he felt a seizure coming on. Several of Cooper's colleagues who examined the patient were surprised at the success of the technique, since epilepsy had previously been thought to be a dysfunction of an entirely different part of the brain. Cooper stresses, however, that this technique needs to be tried on a lot more patients before its value in relieving spasticity can be confirmed. □

