

Acupuncture For Analgesia and...

It's an impressive performance — brain surgery performed with nothing but acupuncture needles to provide pain relief — but U.S. researchers don't think we'll be seeing much of it here

BY ROBERT J. TROTTER

A man stepped onto the middle of the busy street, stopped traffic and waved our cars onto the hospital grounds. We were hastily greeted and taken upstairs for a cup of tea and a brief introduction to the hospital and its functions. Before our tea had a chance to cool, we were told that it was time to get on with the tour. This haste was surprising since our visits usually began with elaborate, formal and lengthy "brief introductions." In this case the need for urgency soon became obvious.

We were ushered into an observation room that looked down on an operating table. On it was a 46-year-old man prepped for brain surgery. The surgeons were ready to go to work, but the patient was fully conscious, smiling and talking. He had not been given general anesthesia, but had one acupuncture needle (electrified, 10 volts) in his cheek and this, we were told, would provide the pain relief necessary for the entire operation.

Within moments we were led across the hall to look down on another operation. A fully conscious woman with acupuncture needles in both hands and wrists stared up at us. Almost as soon as we entered an incision was made in her throat, and an operation to remove a thyroid tumor was underway. The patient showed no sign of discomfort, and the operation proceeded smoothly and efficiently.

During the next 40 minutes we moved back and forth between observation rooms and watched the two teams of surgeons at work. The thyroid patient's eyes were open, she was awake, and it seemed obvious that she was suffering no pain throughout the procedure. The brain surgery patient's face was covered, but the

anesthesiologist (the woman in charge of the electroacupuncture apparatus and the needle in the man's cheek) tapped the patient on the leg from time to time. He responded by lifting his leg to signal that he was doing well.

While the surgery proceeded we returned to the meeting room for a detailed description of acupuncture analgesia and a discussion of the research being done at the hospital. Then we went back to watch the conclusions of both operations. The thyroid patient, neatly sutured, smiled at

us, indicated that she was feeling fine and was rolled away. The brain patient was still being closed, but within minutes the operation was over. When the man's face was uncovered, he looked up at us with a big smile and began waving, talking, posing for our cameras and signaling that he had come through the surgery successfully. We had been told that the tumor had seriously impaired the man's vision, but after the operation he could obviously see us looking down at him.

These operations took place at the



Smiling patient (above) waves before undergoing brain surgery. Acupuncturist (lower left) communicates with patient during surgery. The single needle can be seen in cheek of wide-awake patient immediately after surgery.



Huashan Hospital, the teaching hospital of the Shanghai First Medical College, where research is being carried out on the effects and mechanisms of acupuncture analgesia. Chairman Mao described traditional Chinese medicine and pharmacology as a "great treasure house," and said that "efforts should be made to explore them and raise them to a higher level." For the past ten years the Chinese have been attempting to do this through the integration of traditional Chinese and modern Western medicines. They now describe acupuncture analgesia as "one of the outstanding achievements" of the combined traditional and Western medicines.

Chen Gongbai, vice chairman of the department of neurology and neurosurgery at Huashan Hospital and our host at the surgery demonstration, was the first person to use acupuncture analgesia during a neurosurgical procedure. He did so in 1965, and since then an estimated 7,469 craniocerebral operations have been successfully performed under acupuncture analgesia in 21 units of neurosurgery in China.

In March of 1975 a research program was designed to evaluate the effectiveness of acupuncture analgesia, and in the 4,466 craniocerebral operations performed between then and the end of 1978, acupuncture analgesia was found to be effective in 92.2 percent of the cases, with good or excellent results in 76.6 percent of those cases. All patients in the study, however, had been put through a screening process before being selected for acupuncture analgesia. Test needlings were done to determine each patient's adaptability to acupuncture. All were older than 18 years of age, had an alert and clear consciousness and had agreed to the procedure. The Chinese say that acupuncture analgesia requires a clear mind and is contraindicated when the patient is either in a coma, deaf, mute, mentally disturbed or intellectually deficient. Chemical anesthesia is used on such patients and also when the disorder is too deep or too extensive. Approximately 30 percent of the operations at Huashan Hospital are done with acupuncture analgesia. But even though acupuncture cannot be used in all cases, Chen says the data illustrate that it is "safe, effective, simple and economical."

The method of producing pain relief via acupuncture is simple. A few fine needles are inserted at certain points of the body and are either twisted continuously by hand or connected to an electric stimulator. (Electroacupuncture during surgery has been in use since 1965. The effects are the same, and it avoids the need to have a team of nurses work relay-fashion twisting the needles during long operations.) Patients usually describe a feeling of slight pressure at the acupuncture point. Once analgesia is achieved, after 20 to 30 minutes, a conscious patient can be operated on without, or with a minimum of, narcotic medicine, says the Chinese.

The procedure is not, however, completely drug free. Sedative drugs are given routinely. Sodium phenobarbital and atropine or scopolamine are usually administered one hour before surgery. For patients with a history of epilepsy or who are especially nervous or excitable, dilantin is prescribed. Haloperidol, a sedative and antiemetic, is also used to enhance the analgesic effect of acupuncture. Dosage of the sedatives is increased if patients give

the local anesthetic procaine (Novacain) under the scalp. Only one patient had sufficient pain relief with the local anesthetic while success was achieved in 46 of the acupuncture patients. "This," says Chen, "indubitably proved that acupuncture had definite analgesic effects."

In addition to the anti-pain effect, the Chinese cite two additional positive effects of acupuncture analgesia. One is an anti-shock effect. Acupuncture not only



The details of brain surgery could be seen clearly from the observation room above the operating theatre. Chen (below) with some of the pain-relieving needles.



any indication of feeling pain during the surgery. If severe pain is indicated, a chemical anesthesia is applied immediately.

The Chinese surgeons and their patients appear to have little doubt about the effectiveness of acupuncture analgesia, but a primary goal of their research has been to show (especially to skeptical Westerners) that acupuncture can prevent pain. In one study 100 craniotomy patients were divided at random into two groups of 50. One group received acupuncture analgesia, the other group received injections of

leaves the physiological factors of the body almost undisturbed, explains Chen, but renders blood pressure, pulse rate and respiration stable during an operation.

The Chinese also claim that acupuncture has an anti-infection effect. Their experiments suggest that needling of certain points increases production of leukocytes, or white blood cells, and increases the phagocytic power of leukocytes. Postoperative pulmonary infections were studied in 644 patients, 333 of whom had been operated on under general anesthesia. The pulmonary complication rate was 10.5 percent among the general anesthesia patients, compared with 2.8 percent among the acupuncture group.

Because acupuncture analgesia has anti-pain, anti-shock and anti-infection effects, explains Chen, "it is not only effective, simple and economical, but also safer and less liable to incur complications, capable of hastening recovery and more appropriate in patients of hepatic, renal, pulmonary or cardiac insufficiency or in patients of old age, poor health, or in states of shock. Since the patient is able to remain fully conscious during an operation performed under acupuncture anesthesia, the operative effects may be checked in time, and unnecessary injuries caused by operative manipulations to normal nerves may be minimized."

In addition to studying the effects of acupuncture analgesia, researchers at the Huashan Hospital are attempting to find out how acupuncture analgesia works. Studies of patients with various spinal diseases offer some clues. In cases of complete transverse section of the spinal cord, for instance, needling below the section yields no analgesia sensations. This indicates that such sensations depend on im-

pulses ascending from the spinal tracts to the brain. Other studies suggest that the ventrolateral bundle is the specific spinal pathway that carries the sensations of acupuncture analgesia.

Research with animals is also yielding some clues. Experiments performed with rabbits, for instance, have shown that electrical stimulation of the caudate nucleus (part of the corpus striatum deep in the cerebral hemisphere near the thalamus) can increase the pain threshold and enhance the analgesic effect of electroacupuncture. Because caudate lesions have the opposite effect, the Chinese feel that the caudate nucleus is definitely involved in producing the effects of acupuncture analgesia.

Since 1973 the Chinese have been using the technique of caudate stimulation through implanted electrodes to treat patients in the advanced stages of cancer who suffer chronic, intractable pain. (Research in the late 1960s in Spain and the United States found that electrical stimulation of various areas of the brain stem can inhibit pain, and the technique is being used here clinically [SN: 4/13/74, p. 245; 11/22/75, p. 327].) Three to five minutes of stimulation, say the Chinese, yields 5 to 10 hours of pain relief, and they find this the most effective form of treatment for relieving chronic pain. It also gives them the chance to study the role of the caudate nucleus in acupuncture analgesia. So far they have found that acupuncture can modify the activity of caudate neurons sensitive to the neurotransmitters acetylcholine, serotonin and dopamine. They have also found that naloxone, a narcotic antagonist, reverses the effect of acupuncture on the pain threshold, suggesting that the caudate nucleus is one of the important central nervous system links in acupuncture analgesia and that caudate stimulation-produced analgesia may be related to the endorphin system. Canadian researchers also have reported evidence suggesting that acupuncture causes the pituitary gland and other brain structures to release endorphins (SN: 11/20/76, p. 324).

"We assume," says Chen, "that acupuncture stimulates the caudate nucleus to release endorphins." Preliminary investigations of a possible link between acupuncture analgesia and endorphins indicate that that assumption may be correct. In eight patients undergoing spinal surgery, cerebrospinal fluid was collected before and after the needling of acupuncture points. Assay showed that the level of morphinelike substances in the cerebrospinal fluid increased by an average of 36.6 percent after acupuncture needling. The chemical characteristics of the substances are different from those of other known endorphins, and studies of their structures are being carried out.

How do U.S. physicians evaluate acupuncture analgesia? "I couldn't quite believe it," says Nathan Kaplan of the Univer-

| Nature of the Disease | No. of Cases |
|--|--------------|
| Glioma | 1,058 |
| Meningioma | 393 |
| Pituitary tumor | 521 |
| Cranio-pharyngioma | 101 |
| Cerebral abscess | 101 |
| Intracranial hematoma | 232 |
| Vascular malformation and aneurysm | 57 |
| Neurofibroma | 364 |
| Trigeminal neuralgia | 292 |
| Vasoanastomosis (cerebral thrombosis) | 12 |
| Torkildsen's operation (hydrocephalus) | 58 |
| Scalp and skull disorders | 792 |
| Other disorders | 585 |
| Total | 4,466 |

Most of the neurosurgery performed was for removal of tumors in the cerebral hemispheres, but many other brain operations are being done with acupuncture.

sity of California at San Diego Medical School who was with us at the surgery demonstration in Shanghai. But after seeing more such surgery, talking with several surgeons and visiting some of the institutions where research is being carried out, he concludes that "it probably is real." Kaplan was most impressed by the animal research and by the data on endorphins, which, he says, provide a rationale "and makes what we saw seem more believable." Acupuncture analgesia, he feels, could be very useful in certain cases, such as with patients who have weak hearts. He says "we would do well to study the technique." Foreign physicians (primarily from Japan and West Germany) have been studying acupuncture analgesia with the Chinese, and the West Germans are reportedly using the technique during some heart surgery.

The American Society of Anesthesiologists is not involved in any research on acupuncture but Harold Carron, professor of anesthesiology and director of the pain clinic at the University of Virginia Medical Center in Charlottesville, Va., and chairman of the American Society of Anesthesiologists committee on pain therapy, is familiar with some of what the Chinese are doing. He is not very impressed.

As far as pain therapy is concerned, says Carron, there are other, noninvasive tech-

niques that offer the same relief. He cites the transcutaneous nerve stimulation units that have been in use in this country for more than ten years. They stimulate the nerves (as acupuncture does) but do not break the skin. The mechanism, suggests Carron, is probably the same as that of acupuncture — it results in increased production of endorphins.

As far as acupuncture analgesia for surgery is concerned, Carron says it is "highly overrated and is not being used in this country." He says it is "highly unreliable and probably requires a strong cultural background to be effective." Research on it, he says, has pretty much been abandoned.

David J. Mayer, professor of physiology at the Medical College of Virginia in Richmond, is somewhat less pessimistic. He has been investigating several aspects of acupuncture analgesia for the past five or six years and has presented data suggesting that acupuncture and hypnotism relieve pain by different methods (SN: 11/20/76, p. 324). Mayer visited China this summer and saw acupuncture used to produce pain relief during surgery. "I believe that under some circumstances it works," he says, but he came to this belief only after some vacillation. It is very difficult, he explains, to tease out the various factors that might be involved — drugs, hypnotism, political indoctrination.

Mayer says he doesn't think there was much monkey business going on, such as giving large doses of narcotic drugs to patients who were supposedly getting pain relief solely from acupuncture, but he says suspicions arise because it is obvious that the Chinese are under a lot of pressure from their government to show that acupuncture works. Most patients, for instance, receive several days of indoctrination before undergoing surgery. This gives the doctors time to select patients most likely to react well to acupuncture as well as to prepare patients mentally in a way that might enhance the analgesic effects of acupuncture.

Does acupuncture analgesia have a place in the Western medical system? "It has an economic value in a country that has to provide medical care to a billion people, but it probably won't be used much in the West," says Mayer. Even though "it looks like it has some value," he explains, "there is no need for it in the West except in special cases in which a general anesthetic can't be used... It probably has some merit when used with patients with heart conditions but not for typical, everyday surgery."

Mayer was, however, impressed by the major effort being put into research and by some of the results. He feels that endorphins probably represent one of several analgesia systems that can be activated in different ways. The analgesia story is getting to be very interesting and acupuncture, he concludes, probably has a place in it. □

