PHRENICOFACIAL NERVE ANASTOMOSIS
FOR FACIAL PARALYSIS

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Attempts to correct facial paralysis by anastomosing the distal portion of the facial nerve with a donor nerve began with the turn of the century. The first anastomosis of the spinal accessory to the facial nerve was performed by Faure in 1898, and in 1903 Ballance and his associates reported good results in similar anastomoses. Use of the hypoglossal nerve as the donor implant was reported almost simultaneously by Körte, Kennedy and Cushing were among the first to report successful results of spinofacial anastomosis. The operative technic progressed from an end-to-side anastomosis to the correct end-to-end procedure. The glossopharyngeal nerve has also been used successfully by Watson-Williams.

Recent reports of anastomosis of the facial nerve with the spinal accessory and hypoglossal nerves have emphasized the inherent disadvantages of both procedures, including the undesirable mass movements, the failure of return of emotional and reflex responses, and the sometimes serious deficits secondary to surgical interruption of the donor nerve. Plastic procedures designed to restore facial symmetry have been helpful in cases in which repair of the nerve was not feasible.

The facial nerve is so bound within the capsule of an acoustic neurinoma that removal of the intracranial portion of the nerve usually occurs with the total removal of the tumor. The use of either the spinal accessory or the hypoglossal nerve may not be warranted for anastomosis as a result of its involvement by the tumor or damage incidental to removal of the tumor. Our first case is that of a patient with facial paralysis following the total removal of an acoustic neurinoma treated by an anastomosis of the phrenic nerve with the facial nerve.

CASE REPORT

SU1 #54-12720. The patient was a 44-year-old widow who complained of hearing roaring noises, deafness, diminished vision, difficulty in walking, nausea and vomiting. She had been aware of diminished hearing on the right side for many years, and she recalled that several years ago she had heard an almost continuous roaring noise for several months. For about 9 months she had noticed increasing difficulty in walking. For 3 months she had been bothered with episodes of nausea and vomiting of increasing frequency and severity. For 2 months she had had spells consisting

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of blindness and a strange sensation of numbness of the entire body lasting several minutes. For several weeks there had been increasing impairment of distant and near vision.

Examination. The patient walked with a wide-based unsteady gait. On Romberg testing she would fall to the right. There was drifting of the outstretched left upper extremity. The right eye could not be sustained in right lateral gaze. Papilledema was marked bilaterally. Moderate weakness of the right side of the face was evident. There was pronounced hypalgesia of the right side of the face, and scarcely any corneal sensation was present on this side. Bone conduction of the right ear was markedly diminished. The right heel-to-left knee performance was poorly executed.

Roentgenograms of the skull revealed pronounced enlargement of the right internal auditory meatus. Loss of function of both components of the right acoustic nerve was shown by audiometric and caloric tests.

Operation. On Oct. 29, 1954, a right suboccipital craniectomy was carried out and an encapsulated spherical tumor, approximately 3 cm. in diameter, was completely removed from the cerebellopontine angle. The inferolateral one-third of the cerebellar hemisphere was sacrificed to provide greater exposure. The clinical impression of acoustic neurinoma was confirmed microscopically.

Postoperative course was complicated by a B. coli meningitis, but after several days of intramuscular streptomycin and intravenous Terramycin therapy, the cerebrospinal fluid cultures were negative and the protein and sugar values approached normal limits. Gastric-tube feedings were necessary following operation, but after 4 weeks she was able to swallow adequately. The hoarse quality of speech also slowly improved. Her vision continued to deteriorate for 2 months, at the end of which time it was 2/60. There was no further loss of vision. She had a disfiguring facial palsy, and in addition there was wasting of the right side of the tongue, weakness in elevation of the right shoulder, and wasting of the corresponding trapezius and sternomastoid muscles.

A facial nerve anastomosis was desired, and in view of the significant damage to the spinal accessory and hypoglossal nerves, it was decided to use the phrenic nerve.

2nd Operation. A right phrenicofacial anastomosis was carried out on Dec. 30, 1954. The phrenic nerve was exposed through a transverse incision just above the clavicle. The nerve was followed as far inferiorly as possible before it was cut. It was transposed deep to the sternomastoid muscle to a wound near the angle of the jaw, where the trunk of the facial nerve was exposed. A small incision between the two wounds was made to facilitate the transposition. In order to gain necessary length, the contribution from the 5th cervical nerve was sacrificed. The phrenicofacial anastomosis was accomplished with epineural sutures of #00000 silk. Rotation of the head to the left of midposition was avoided by the use of a chin-shoulder adhesive strap for 4 weeks.

Course. On Mar. 13, 1955, 5 months after the craniectomy and 3 months after the phrenicofacial anastomosis, the patient’s gait was improved, she swallowed more easily and her voice was normal. An iridocyclitis had developed, which responded favorably to treatment. There was marked flaccidity of the facial musculature of the right side.

Three months later, June 22, 1955, a return of muscle tone of the right side of the face was evident. In repose, a barely perceptible movement of the right side of the mouth was observed to coincide with each inspiration. With a deep inspiration the face was pulled to the right side and the right lid would close (Fig. 1B).