ACOUSTIC NEUROMA
REPAIR OF FACIAL NERVE WITH AUTOGENOUS GRAFT
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For many years it has been possible to restore useful facial expression and emotional movement in patients whose facial nerve had been injured in the temporal bone by fracture, infection or inadvertent surgical division during mastoidectomy. Bunnell\textsuperscript{3,4} and Ballance and Duel\textsuperscript{1} were the pioneers in the use of a graft to replace the injured segment. Bunnell also transposed the nerve so that enough length could be obtained for direct anastomosis in the petrous bone. It has become apparent that these intrapetrous procedures restored useful emotional movement in a high proportion of cases.

Total removal of an acoustic neuroma usually has been followed by a facial paralysis, which is, perhaps, the most difficult of the aftermath for the patient to accept. In order to restore some degree of facial function neurosurgeons have relied upon the anastomosis of the 11th or 12th cranial nerve to the facial nerve in the neck. Facial tone and symmetry of the face at rest usually resulted and some patients, especially women, after a good deal of practice in front of a mirror, developed a voluntary grin as a stereotyped response. However, the expression of genuine and uninhibited emotion, as in laughing or crying, resulted in the grimace that is so difficult to hide and accept.

My first interest in the restoration of facial function with a graft arose in the following manner. In March 1956 the facial nerve was preserved intact during total removal of an acoustic neuroma. However, the distal end of the nerve was seen to be running through a residual nubbin of tumour buried in the depths of the enlarged porus. Removal of this remaining small portion of tumour which seemed necessary resulted in the loss of continuity of the nerve. A segment of facial nerve, fully 2 cm. long and a little shredded at the end, was left dangling from the pons. The wound was closed but it seemed worth while to plan for a graft.

Although no literature on this subject had been published, it was learned a few days later, in discussion with Dr. J. H. Maxwell of Ann Arbor, Michigan, that Professor Norman Dott had by-passed successfully the temporal bone with a graft as early as 1936. With this knowledge, the craniotomy was reopened 2 weeks later and a 2-inch length of lateral femoral cutaneous nerve was joined to the stump of the facial nerve by two stitches of 6–0 silk. This graft was then carried through the floor of the posterior fossa behind,
to be joined to the peripheral end of the facial nerve which had been divided just below the stylomastoid foramen.

This operation has been performed in 2 further cases (in September 1956 and October 1957) in which a significant length of facial nerve was preserved. At the initial craniotomy the graft was sutured to the stump of the facial nerve and then left coiled in the wound behind the tip of the mastoid process outside the closed dura mater (Fig. 1). Two or three weeks later the anastomosis was completed by reopening and extending the lateral limb of the incision a short distance down the anterior border of the sternomastoid muscle. We have found it convenient to shorten the graft by making a gutter in the lateral floor of the posterior fossa at the first operation and removing the tip of the mastoid process when completing the anastomosis (Fig. 2). The latter also allows a greater length of the distal segment of the facial nerve to be obtained. Preliminary degeneration in the graft no longer appears to be a prerequisite for successful reinnervation.2,5,9,13

These 3 patients have shown gratifying recovery of facial function and especially a useful degree of emotional movement. The last patient, who had had severe hypertension, succumbed following a stroke 10 months after the operation. Unfortunately no photographs had yet been taken. Her face had become symmetrical and showed moderate voluntary and emotional movement but she could not close her eye. Motion pictures of the first and