Exposure of the Posterior or Cerebellar Fossa

PAUL C. BUCY, M.D.
Northwestern University Medical School and the Section of Neurological Surgery, Chicago Wesley
Memorial Hospital, Chicago, Illinois

There are few places in neurological surgery where the technical aspects have changed so decidedly as they have in the exposure of the posterior fossa. The old cross-bow incision which Harvey Cushing developed for the exploration of the cerebellar fossa served a most useful purpose. It provided a wide exposure and a firm closure. In a period when accurate localization of a lesion in the posterior fossa was often impossible, when in fact the surgeon was often hard put to determine whether the tumor was in the posterior fossa at all, a wide exposure, such as the cross-bow incision provided, was a necessity.

The general education of the medical profession leading to earlier diagnosis in most brain tumors, the marked improvement in diagnostic procedures including pantopaque ventriculography, fractional pneumoencephalography, radioactive scanning, the great technical advances in anesthesia, and many other features, have all benefited the neurological surgeon and the wide cross-bow incision no longer seems such a necessity.

The position of the patient on the operating table is particularly important for operations in the posterior fossa. The surgeon must obtain adequate flexion of the neck to provide good visualization of the contents of the posterior fossa; yet this must be done without constricting the veins of the neck or obstructing the trachea. This ideal position is attained most easily with the patient in the sitting position. For many years I operated in the posterior fossa with the patient lying prone and with the upper part of the body raised so that the long axis formed an angle of approximately 40° with the floor. I am now convinced that the sitting position is superior to this and less hazardous. Most of the risks of this position, principally those of air-embolus and of arterial hypotension, can be avoided with care and are more than adequately compensated for by the advantages. Each surgeon, however, must determine which position is best for him and his staff. If the sitting position is used, it is important that the lower extremities be elevated until they are horizontal to counteract the tendency to arterial hypotension.

Preoperative drainage of the ventricular system was often a necessity in years gone by, but most patients with cerebellar tumor do not now arrive in such poor condition and this precaution is not usually necessary.

Surgical Technique

Ventricular drainage. When the intracranial pressure is increased, provision should be made to puncture the lateral ventricle and reduce the pressure before the cerebellum is exposed. This is done by making a burr-hole over the right occipital lobe. The burr-hole should be made above and behind the ear, thus avoiding any proximity to the visual cortex. This location facilitates entrance through the trigone of the lateral ventricle at its widest portion rather than at its narrower tip.

Ordinarily the lateral ventricle is punctured just before opening the dura mater of the posterior fossa, unless the patient is having respiratory difficulty, arterial hypotension, or any other trouble resulting from increased intracranial pressure. In that case the ventricle may be punctured earlier and the ordinary brain cannula replaced with a flanged cannula which can be left in place to provide drainage throughout the operation. Cotton should be packed around the burr-hole to prevent air from entering the subdural space after the ventricular fluid has been evacuated.

Midline Incision

It was Howard Naffziger who first taught me the value of the midline vertical sub-occipital incision for exposure of tumors of the cerebellum and the 4th ventricle. This incision is adequate to expose all tumors of the 4th ventricle and most tumors of the
Exposure of Posterior Fossa

Fig. 1. Exposure of posterior fossa. Midline incision. A. At the time the midline incision is scratched out on the skin, a curved incision is outlined on both sides which may be used later to enlarge the exposure. B. The deep midline incision is then made in the plane of the median raphe. Bilateral transverse incisions are made in the muscles just below their attachment to the superior curved line of the occipital bone.