

ETV IN COMMUNICATING HYDROCEPHALUS

ETV is a surgical procedure that allows the CSF to flow directly from the third ventricle to the basal subarachnoid spaces, thus by-passing the aqueduct and the CSF pathways of the posterior fossa; obviously, patent subarachnoid spaces and adequate CSF resorption are necessary to ensure the success of the procedure. This widely accepted theory, that considers the ETV an internal shunt, explains the high success rate of this procedure in obstructive hydrocephalus due to malformative aqueductal stenosis or tumor compression. On the other hand, it is more difficult to explain why a stomy between the third ventricle and the interpeduncular cistern results in clinical improvement also in patients with INPH (where the CSF pressure is normal or slightly increased) and with hydrocephalus secondary to infection and/or hemorrhage and impaired CSF resorption.

The success of ETV in various forms of hydrocephalus and the different mechanisms involved in determining the occurrence of hydrocephalus suggest that the obstruction of the CSF pathways and the pressure gradient, although very important, are not the unique factors in determining the success of ETV itself. We think that the restoration of the cerebral pulsatility within the ventricular system is the key-point for obtaining the improvement of the CSF dynamics. The fenestration of the third ventricle floor results in flow of CSF within the subarachnoid space and consequent restoration of the pulsatility of the wall of the third ventricle, as confirmed by the intraoperative finding of reappearance of normal cerebral pulsations and out movements of the third ventricle floor suddenly after the stomy is performed. This is, in our opinion, the most important effect of ETV in the restoration of the normal CSF dynamics in most patients with hydrocephalus. This may also explain why ETV is successful in most patients with hydrocephalus without obstruction between the ventricular system and the subarachnoid spaces, as in INPH or hydrocephalus secondary to infection or hemorrhage.

According to this theory, ETV is not only an internal shunt, but influences primarily the capacity of the brain pulsatility to ensure the CSF flow.