CONTEMPORARY ANGIOGRAPHIC ASSESSMENT AND CLINICAL IMPLICATIONS OF THE VEIN OF LABBÉ IN NEUROLOGIC SURGERY

Nael M. Shoman, MD1; Biraj Patel, MD2; Ravi N. Samy, MD1; Rebecca S. Cornelius, MD2; Myles L. Pensak, MD1

1Department of Otolaryngology-Head and Neck Surgery, University of Cincinnati / Cincinnati Children’s Hospital, Cincinnati, OH
2Department of Radiology, Neuroradiology Section, University of Cincinnati Academic Health Center, Cincinnati, OH

OBJECTIVE
1) To determine the drainage patterns of the superficial anastomotic venous system using formal angiographic studies. 2) To determine the dominance of the vein of Labbé as a superficial anastomotic vein and shed light on the clinical implications this may have on the approaches routinely utilized by neurosurgeons.

INTRODUCTION
One of the most feared complications of neurologic and skull base procedures is compromise of blood supply to areas of the brain and subsequent cerebral ischemic events. The cerebral venous system can be divided into a superficial and a deep system. A series of anastomotic veins lie along the lateral surface of the brain and connect the superficial venous system to the major venous sinuses. The three largest of these veins are the vein of Trolard (VT), the vein of Labbé (VL) and the superficial sylvian vein (SSV). The VL drains blood from the lateral surface of the temporal lobe and from the region adjacent to the sylvian fissure, almost always emptying into the transverse sinus. This vein may be at risk during transpetrosal and middle fossa approaches. The abundance of anastomotic veins within the cortex implies that intraoperative sacrifice of the VL does not inevitably lead to a postoperative neural deficit. However, in cases where the VL represents the single dominant vessel draining a majority of the temporal lobe or lateral cerebral hemisphere, its injury may result in catastrophic neurologic consequences.

MATERIALS AND METHODS
The radiology database at the University of Cincinnati was accessed for retrieval of all cerebral angiographic studies performed during the 6 month period extending from June 1 to December 31, 2009. Inclusion criteria comprised patients ≥18 years of age with no evidence of intratemporal pathology. Studies were excluded if there was significant motion artifact, in the case of an intracranial disease process that hindered complete visualization of the superficial venous system and major anastomotic veins, or if only one side could be radiographically assessed for example from previous surgery. During the selected time period, 250 angiographic studies were sequentially identified that met the study criteria. The angiograms were reviewed by a senior radiology resident and staff neuroradiologist. The three major superficial anastomatic veins were assessed for presence and dominance, the latter determined by the relative size of the vein compared to the other two cortical veins.

RESULTS
One hundred and forty nine patients were included in the study, of which 101 (68%) underwent bilateral and 48 (32%) underwent unilateral angiograms, for a total of 250. One hundred and twenty three (49.2%) angiographic studies were left sided, and 127 (50.8%) were right sided.

When analyzing data on the overall presence of the superficial cerebral veins, the VL was present in 216 (86.4%) of the studies, while the VT and the SSV were each present in 237 (94.8%) studies (Chart 1). Various patterns were observed; this data is summarized in table 2. Of 250 studies, one (0.4%) showed absence of the transverse sinus. Dominance data is summarized in Chart 2. The VL was the dominant superficial cerebral vein in 51 (20.4%) studies. The VT was the dominant vein in 26 (10.6%) and the SSV in 27 (10.8%). The rest of the studies (57.2%) showed no dominance of any one superficial cerebral vein.

There was no significant correlation between presence of the VL and patient age (rho= 0.059, p= 0.355), gender (rho= -0.002, p= 0.974), or study side (rho= -0.064, p= 0.516). There was no significant correlation between vessel dominance and patient age (rho= -0.026, p= 0.792), gender (rho= 0.008, p= 0.936), or study side (rho= 0.069, p= 0.483).

CONCLUSIONS
Considerable variability is demonstrated in the drainage patterns of the superficial anastomotic veins. The vein of Labbé is present in 86% of patients, and care should be taken in neurologic surgery to avoid injuring this vessel as it may represent the single dominant drainage pathway of the lateral surface of the temporal lobe in 20% of patients.

REFERENCES