Superior Semicircular Canal Dehiscence in Patients with Spontaneous Cerebrospinal Fluid Otorrhea

Kyle P Allen MD, MPH1, Carlos L. Perez MD2, Brandon Isaacson MD1, Peter S. Roland, MD1, Thao T. Duong3, J. Walter Kutz, Jr., MD1
1Department Of Otolaryngology, UT Southwestern Medical Center (UTSW), 2Department of Radiology, UTSW, 3UTSW Medical School

ABSTRACT

Objective: To determine the prevalence of superior semicircular canal dehiscence (SCD) in patients with spontaneous cerebrospinal fluid (CSF) otorrhea. Study design: Case series with chart review Setting: Tertiary care referral center Subjects and Methods: Patients included have undergone a middle fossa craniotomy for repair of spontaneous CSF otorrhea between January 2007 and December 2011. The main outcome measure is the presence or absence of SCD observed during spontaneous CSF leak repair. Computed tomography (CT) imaging was also reviewed to determine the diagnostic accuracy of this modality. Results: 33 ears in 31 patients underwent surgical repair for spontaneous CSF otorrhea via a middle fossa craniotomy. The average age at the time of repair was 60.5 years and 80.6% of patients were female. A dehiscence of the superior canal was observed in 15.2% of ears (16.1% of individuals). No significant difference in age, BMI, or gender was noted between those patients with or without a superior canal dehiscence. For the diagnosis of SCD, coronal CT was 100% sensitive and 91.7% specific. The positive predictive value and negative predictive value of CT were 66.7% and 100% respectively. Conclusion: The prevalence of superior semicircular canal dehiscence in ears with spontaneous otorrhea is 15.2%. This prevalence is greater than the 0.5% reported in a temporal bone study with a prevalence of 0.5%. This is possibly due to a common etiology in the formation of each disorder. Increased operative morbidity was seen with SCD repair. Additional study is warranted to determine the optimal management of SCD in patients with spontaneous CSF otorrhea.

RESULTS

METHODS

Radiographic Evaluation
Coronal CT images were available for 28 affected ears in 26 individuals. The majority of these scans were performed at outside facilities, and the protocol, including slice thickness and quality of the studies varied. A radiographic diagnosis of SCD was made in 6 (21.4%) of ears, which included 4 true positives and 2 false positives. No false negatives were identified. CT was 100% sensitive for SCD as all cases were identified by a neuroradiologist. The 2 false positives correspond with a specificity of 91.7%. The positive predictive value of coronal CT imaging was 66.7%, and the negative predictive value was 100%. A coronal CT demonstrating SCD with an encephalocele is shown in figure 2.

FIGURE 2: A direct coronal CT of a right temporal bone demonstrates an encephalocele (asterisk) and a dehiscent superior semicircular canal (arrow).