Dural Sinus Thrombosis following Translabyrinthine Approach Microsurgery of the Cerebellopontine Angle

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INTRODUCTION

The translabyrinthine approach is a commonly utilized approach to gain access to tumors and lesions of the cerebellopontine angle particularly in cases of tumor extension into the internal auditory canal and in patients with non-serviceable hearing (i.e. pure tone average greater than 50 dB and speech discrimination scores less than 50%). Various complications have been well documented in association with the translabyrinthine approach including cerebrospinal fluid leak, meningitis, facial nerve paresis or paralysis, vascular injury, intracranial hemorrhage, seizures or death. Per the currently available literature, dural sinus thrombosis is a less commonly encountered complication of microsurgery of the cerebellopontine angle. Dural sinus thrombosis rates of 0.1% to 4.6% have been reported for all approaches to the cerebellopontine angle. 1-4 The objective of this study was to describe the rate of sigmoid sinus thrombosis following translabyrinthine approach to the cerebellopontine angle as well as its associated risk factors and treatment. Study Design: Retrospective review. Methods: A retrospective chart review was performed of all patients at a tertiary care facility who underwent translabyrinthine approach to the cerebellopontine angle between January 2000 and July 2011. Results: One hundred ninety-six patients underwent translabyrinthine approach to the cerebellopontine angle. Of these patients, only one patient experienced symptomatic dural sinus thrombosis presenting with progressive, severe, unremitting headache starting approximately 2 weeks post-operatively. This patient was successfully treated with anticoagulation therapy with complete resolution of thrombus confirmed radiographically. The rate of asymptomatic dural sinus thrombosis as well as risk factors for thrombosis will be reported. There were no mortalities associated with dural sinus thrombosis. Conclusions: Dural sinus thrombosis is a potential complication of translabyrinthine approach to the cerebellopontine angle. However, in the asymptomatic patient observation alone may be employed without complication. If symptomatic, dural sinus thrombosis may successfully be treated with long-term outpatient anticoagulation therapy.

METHODS

A retrospective chart review was performed of patients who underwent translabyrinthine approach for microsurgical resection of tumors of the cerebellopontine angle at the study institution between January of 2000 and July 2011. Patient who underwent microsurgical resection as primary therapy were included within this review. Additionally, patients who presented with recurrent tumors and underwent microsurgical resection for the primary tumor prior to the study period were included. Patient who had undergone previous radiation therapy were excluded from this study. Data were extracted regarding the age at primary surgery, presenting symptoms, primary tumor pathology, tumor size, tumor location, procedure duration, post-operative clinical course (e.g. dural sinus thrombosis, symptoms, treatment and latency until resolution of thrombosis), and post-operative imaging.

DISCUSSION

Most reports in the literature highlight the rates of dural sinus thrombosis in association with the retrosigmoid approach to the cerebellopontine angle. 2-4 This study focused on the rate of dural sinus thrombosis in association with the translabyrinthine approach to the cerebellopontine angle. A total of 74 patients underwent imaging in the immediate post-operative period accounting for 38% of all patients who underwent translabyrinthine approach to the cerebellopontine angle during the study period. The indications for imaging within the immediate post-operative period included partial resection to assess residual tumor mass, complete resection of tumors with significant brainstem compression pre-operatively to assess brainstem post-operative changes, post-operative evaluation of patients with hydrocephalus, evaluation of post-operative cerebrospinal fluid leak, and evaluation of headache. Five patients (7%) were found to have dural sinus thrombosis. The rate of dural sinus thrombosis within this study was somewhat higher than previously reported rates of dural sinus thrombosis within the literature of 0.1% to 4.6% for all approaches to the cerebellopontine angle. 1,4 Although the majority of patients within this study underwent CT as post-operative imaging, dural sinus thrombosis was diagnosed on MRI in 4 or 5 patients. Because the sensitivity of head CT in diagnosing dural sinus thrombosis is inferior to MRI, the rate of asymptomatic dural sinus thrombosis may in fact be higher than gleaned by this study. To truly ascertain the rate of dural sinus thrombosis following translabyrinthine approach, a prospective study of post-operative MRI would be necessary. The sigmoid sinus was involved in all cases. The mean operative time amongst the patients with dural sinus thrombosis was slightly longer at 6.3 hours compared to 5.2 hours among the non-thrombosis group (p=0.05). This was the only variable identified to be a potential risk factor for dural sinus thrombosis. Similar to previous reports in the literature, 2-4 the majority of patients (80%) presented asymptptomatically with dural sinus thrombosis. In 4 of 5 patients, the diagnosis of dural sinus thrombosis was made incidentally. Two patients presented with complete thrombosis of the sigmoid sinus. One of these two patients experienced associated symptom of severe headache and vision changes. Figures 1-3 present the 3 dimensional MRV imaging obtained from this patient. This patient was treated with a 3 month course of anticoagulation therapy with complete resolution of symptoms. All asymptomatic patients within this study (4 of 5) were treated conservatively with observation alone. All patients experienced complete resolution of dural sinus thrombosis by follow-up imaging at a mean duration of 5 months post-operatively. No patients experienced focal neurological symptoms, required ventriculostomy for treatment, or experienced mortality as a function of dural sinus thrombosis.