Non-Operative Clinical Outcomes in Chiari I Malformation Patients

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Introduction

While post-operative outcomes of Chiari I malformation patients have been well-reported, there is a paucity of literature concerning non-operative management in these patients. We conducted an analysis of clinical outcomes in Chiari I patients treated conservatively to better understand the management and outcomes of non-operative patients as well as elucidate potential predictors that could indicate if patients are likely to benefit from non-operative management.

Background

Chiari I Malformations are defined as the herniation of the cerebellar tonsils >5mm through the foramen magnum. Chiari Type I is associated with scoliosis, cough headaches, paresthesias, dizziness and syringomyelia. Surgical outcomes have been well defined and Chiari decompression has had success in improving many symptoms. However, there is some ambiguity of surgical criteria and concern that not all patients may benefit from surgical intervention.

There are multiple surgical techniques and variable indications for determining when to operate. Current criteria for operative management include progressive syrinx/syringobulbia or symptomatic syrinx, objective signs on exam, severe cough headaches with radiographic evidence of tonsillar herniation.
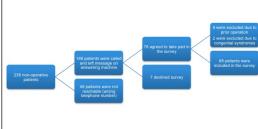
Methods

We retrospectively identified patients with a diagnosis of Chiari I malformation that were not recommended for surgery based on lack of clinical objective findings or inconsistent cough headaches and obtained follow-up with a telephone survey (Tufts Medical Center Institutional Review Board approved) consisting of five questions. Patients were asked to rate headaches and cough headaches at the time of their last visit and currently as well as other symptoms and alternative therapies. Patients were referred to a headache specialist for medical management. We analyzed clinical data using chi square analysis and logistic regression models.
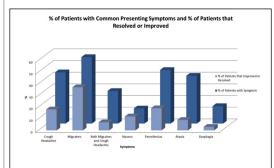
Demographics

Of the 68 patients, 71% were female, 29% male and 31% were pediatric patients (age at diagnosis < 18 years) Mean age at diagnosis was 30.1 years +/- 17.4 with a range of 3-68 years. Average years of follow up was 4.9 +/-2.9 with a range of 1-12 years.

Response Rate

Results

16% of patients presented with cough headaches, 29% with migraines or non-specific headaches, 28% reported both while 26% reported no headaches at all. Patients often presented with other subjective symptoms including dysphagia, paresthesias, nausea and ataxia. 40% of patients that had cough headache and 61.5% of patients with non-specific headaches reported improvement. The presence of subjective sensory symptoms was significantly associated with less likelihood of cough headache improvement (p = 0.0049).

% of Patients with Common Presenting Symptoms and % of Patients that Resolved or Improved

However, the remaining factors (dysphagia, nausea, ataxia) were not significant predictors of clinical changes of cough headaches. The presence of a cough headache was also associated with a lower likelihood of improvement in all non-cough symptoms (p= 0.0049).

Limitations

Limitations included a possible selection bias as choosing patients that were not recommended for surgery may self select for patients with better non-operative outcomes. Symptoms are also highly subjective and we relied on patients to qualify their symptoms in a retrospective fashion.

Conclusions

Through application of our surgical decision algorithm, we found that many symptoms of Chiari I malformation patients from our conservative cohort either improved or remained unchanged over time. However, the presence of cough headaches was a significant negative predictor of concomitant symptom improvement. This further validates that patients with cough headaches are more likely to benefit from and should be considered for surgical intervention. Patients with cough headaches may benefit from conservative Chiari I malformation treatment using a decision algorithm similar to our practice.