

Introduction

Chiari malformations (CM) are characterized by congenital hypoplasia of the posterior fossa and caudal displacement of cerebellar tissue below the foramen magnum. The two most prevalent types, CM Type 1 and Type II, are most commonly treated surgically with posterior fossa decompression. In this series, we present 70 patients over a 15-year period who underwent repeat Chiari decompression. To our knowledge, this is the first series to report outcomes following repeat posterior fossa decompression.

Methods

Eighty-three patients underwent repeat Chiari decompression by a single surgeon (HG) between 2001 and 2017. Thirteen patients were excluded due to lack of follow-up, leaving a study group of 70. Sixty-five patients had CM type I, and 5 had CM type II. Surgery was performed for recurrent or residual debilitating symptoms along with restriction of CSF flow, tethering, and/or crowding of the neural structures at the level of the foramen magnum on MRI. The length of follow-up was 3-179 months. Outcomes were assessed using the Chicago Chiari Outcome Scale (CCOS).

Results

The patients' ages ranged from 2-67 years. Sixty-one patients had had 1 previous decompression, 6 had had 2, 2 had had 3, and 1 had had 4 (mean 1.2). Their CCOS scores ranged from 6-16. The mean CCOS score was 14.36/16, which correlates with a good outcome. Complications included pseudomeningocele (15, 21%), wound hematoma (2, 2.9%), and deep infection (1, 1.4%). Among the patients with pseudomeningocele, 7/15, or 10% of the group, were diagnosed with hydrocephalus and underwent shunt placement.

Conclusions

Patients with recurrent Chiari symptoms and stenosis may benefit from repeat decompression. Re-exploration was not associated with recurrent adhesions or obstruction. The risk of CSF leak appears higher in these patients, compared to 2-10% nationally for initial decompressions.

Learning Objectives

- 1) Understand the benefits, risks and objectives of Chiari re-exploration/decompression surgery.
- 2) Become familiar with management of Chiari co-morbidities such as hydrocephalus and connective tissue disorder.

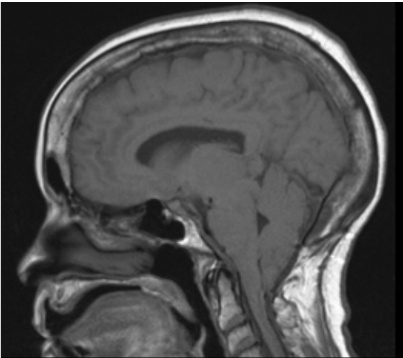
References

Gilmer HS, et al. Surgical Decompression for Chiari Malformation Type I: An Age-Based Outcome Study Based on the Chicago Chiari Outcome Scale. World Neurosurgery107:285-290, 2017.

Aliaga L, et al. A novel scoring system for assessing Chiari malformation type I treatment outcomes. Neurosurgery 70(3):656-664, 2012.

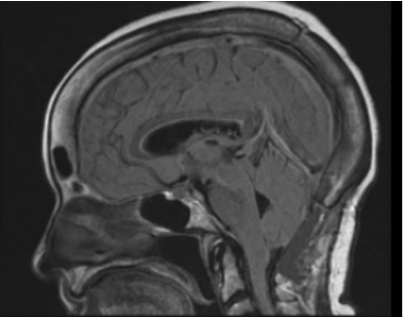
Arnautovic A, et al. Pediatric and adult Chiari malformation Type I surgical series 1965-2013: A review of demographics, operative treatment, and outcomes. Journal of Neurosurgery: Pediatrics 15(2):161-177, 2015.

Adult repeat surgery preoperative scan



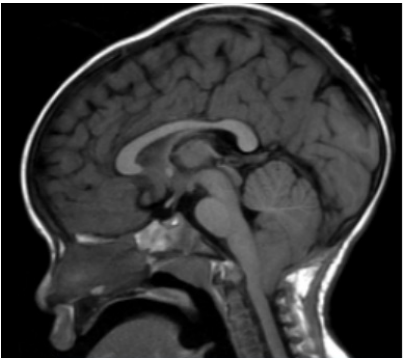
MRI of a 67 year-old female who had undergone previous Chiari decompression

Adult repeat surgery postoperative scan



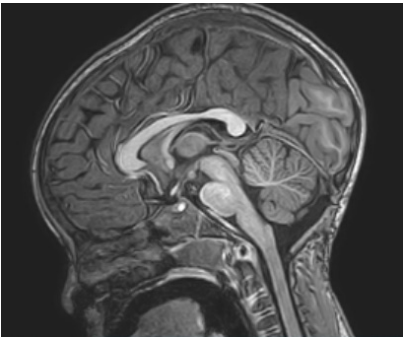
The 67 year-old female's brain MRI following re-exploration, showing expansion of the medulla and spinal cord, and unrestricted CSF space at the level of the foramen magnum.

Pediatric repeat surgery preoperative scan



MRI of a 2-year-old female who had undergone previous Chiari decompression

Pediatric repeat surgery postoperative scan



Postoperative brain MRI of the same 2 year-old girl, showing decompression of the IVth ventricle and ascension of the cerebellum.