Chiari I Malformation: Should We Operate Pictures or Children?Proposal of a Diagnostic and Therapeutic Flow Chart Based on the Review of 450 Monoinstitutional Cases

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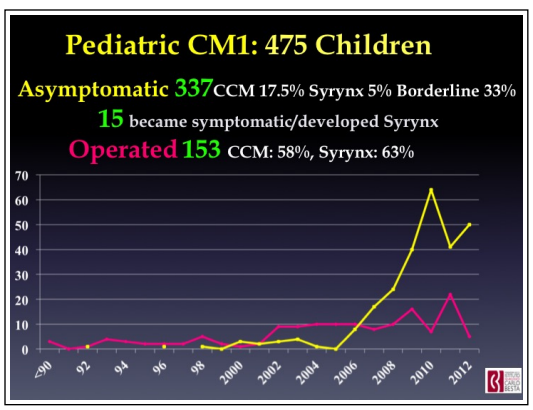
Introduction

There are still many discussions about treatment for Chiari I Malformation (CM1) and Syringomyelia , both on indications and on surgical technique; Complex Chiari (CCM) are reported to need Craniovertebral Stabilization nin as much as 50%.

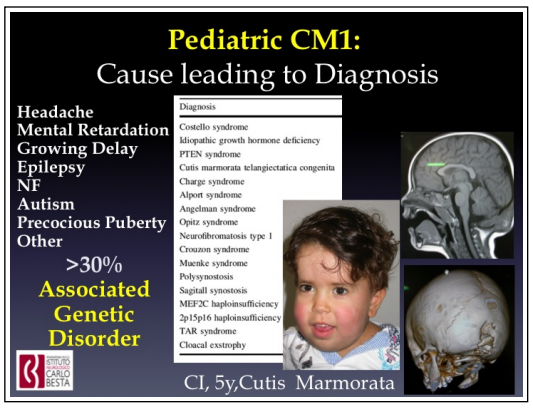
Methods

The aims are to evaluate the results of CVD with/without duroplasty and/or Tonsillar resection in a large series of operated Children (150), focusing on the controversial points (association with tethered cord and craniovertebral instability) and to define the correct surgical timing by the follow-up in the series (300 asymptomatic children) about the natural history. 150 children were operated for CM at Institution. the asymptomatic children were followed by annual MRI for a mean time of 4,5 years.



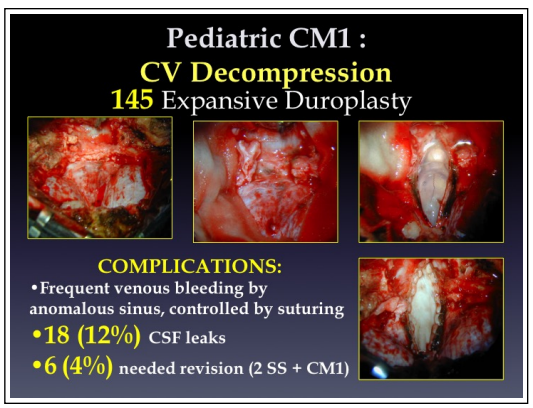
Results-Asymptomatic

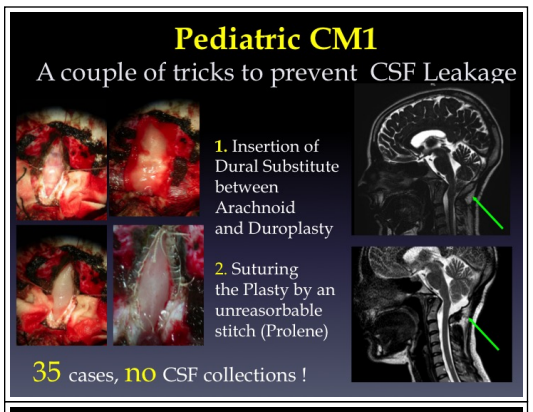
377 pauci or a-symptomatic children were followed for a mean time of 4,5 years: 311 (92.2%) remained stable, 11 (3,3%) displayed cranial tonsils migration and 15 (4.5%) worsened and deserved surgery for symptoms or syrynx occurrence.

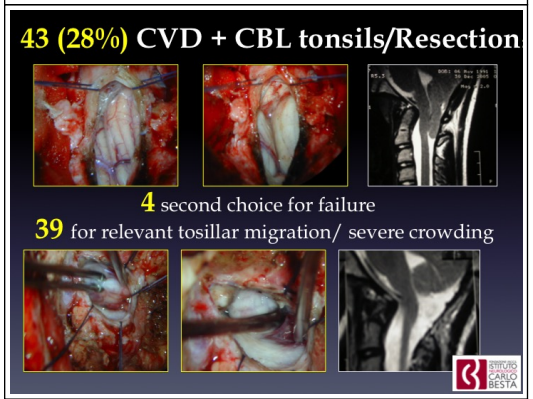


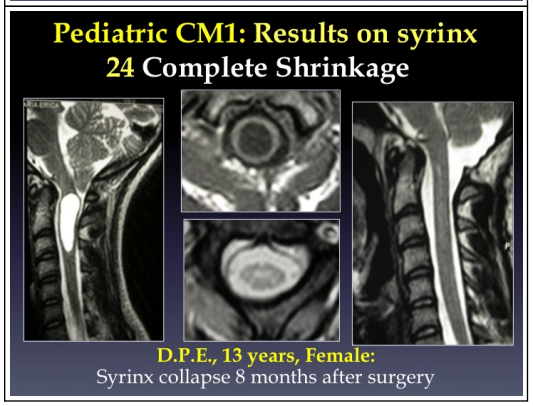
Results - Operated Children

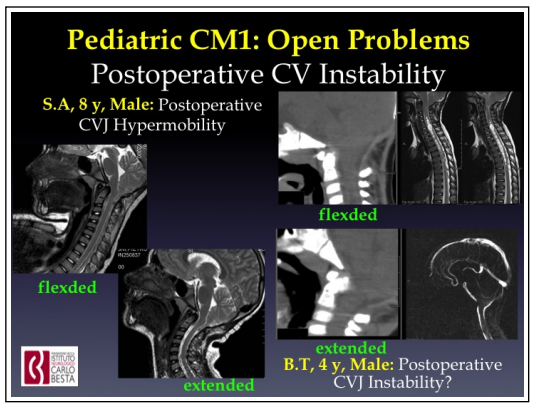
In the surgical series there was no major surgical morbidity nor mortality. Preoperative symptoms improved when related to CM1. Associated Syringomyelia reduced in >80% and disappeared in a significant number, but 30 pts needed CBL tonsils resection for failure of simple CV with duroplasty. An high percentage of associated Craniovertebral Junction Malformations (CVJM) was documented and defined as Complex CM (CCM). All were submitted to dynamic MRI or CT and none deserved fixation except one adolescent, that had true instability needing fixation (0,6%)











Conclusions

The surgical technique applied led to good results on CM1 related symptoms. This aggressive approach in symptomatic children was aimed to syrinx shrinkage: CVD + duroplasty as first choice, followd by tonsils coagulation/resection in case of failure of the first year. Despite the high incidence of CVJM observed, true clinical and MRI instability was quite rare (<1%). Surgery was spared in a huge population of pauci or asymptomatic CM1 children. They mainly remained stable; a few changed and had the same chance (<5%) to heal and to progress.

Symptoms, first of all headache, may be wrongly attributed to CM1, leading to a surgery burdened by a clinical failure despite the anatomic success. To avoid this, we propose the following Flow Chart for diagnosis and treatment of Pediatric CM1.