

EOS and Chiari Malformations: Does Neurosurgical Decompression Alter the Natural History of EOS?

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Disclosures

None related to this talk



Intraspinal Pathology and Scoliosis

Intraspinal pathology in presumed idiopathic scoliosis

-11.1 and 26.0%

MRI in 1740 patients with scoliosis (avg age 7.7)

-114(6.6%) Chiari malformation (CM-I)

-137 (7.9%) syringomyelia (SM)

-72 (4.1%) both



The association between Chiari malformation Type I, spinal syrinx, and scoliosis

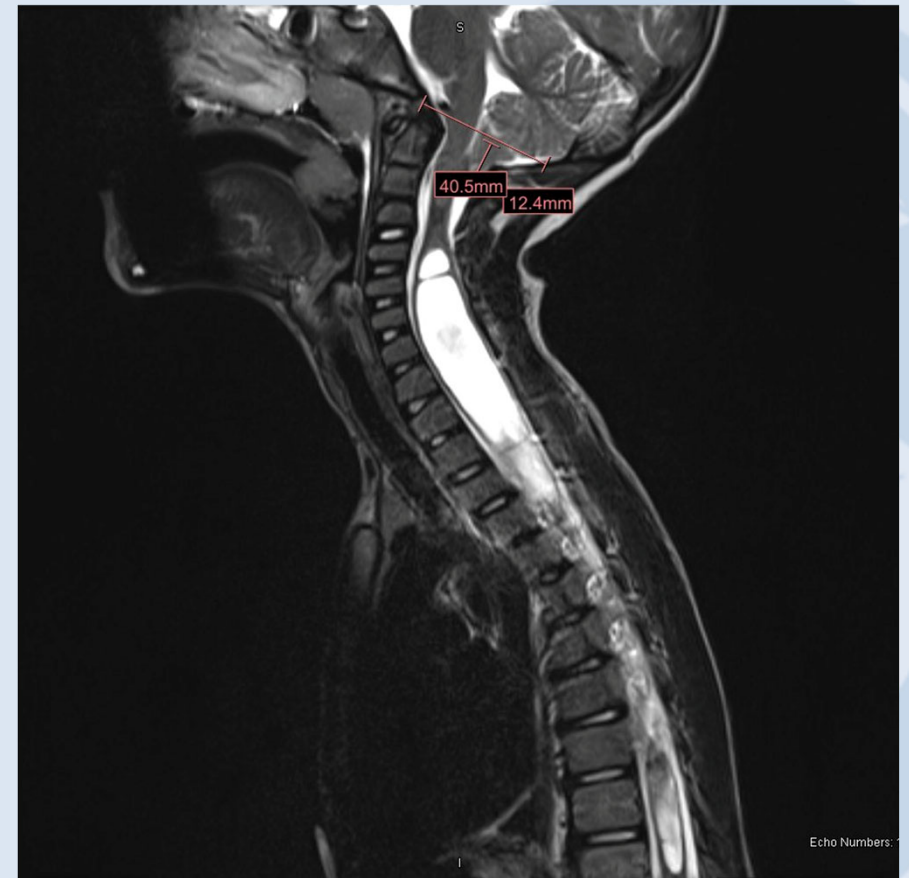
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Intraspinal Anomalies and EOS

18.7% neural abnormalities

64.8% (61/94)

-CM-I w/ and w/o SM



The prevalence of intraspinal anomalies in infantile and juvenile patients with “presumed idiopathic” scoliosis: a MRI-based analysis of 504 patients

Wen Zhang[†], Shifu Sha[†], Leilei Xu, Zhen Liu, Yong Qiu and Zezhang Zhu^{*}

CM and Scoliosis

Association or causative?

Mechanism:

- CSF obstruction, expanding syrinx, asymmetric weakness
- Cerebellar tonsil compression

CLINICAL ARTICLES

Pathophysiology of syringomyelia associated with Chiari I
malformation of the cerebellar tonsils
Implications for diagnosis and treatment

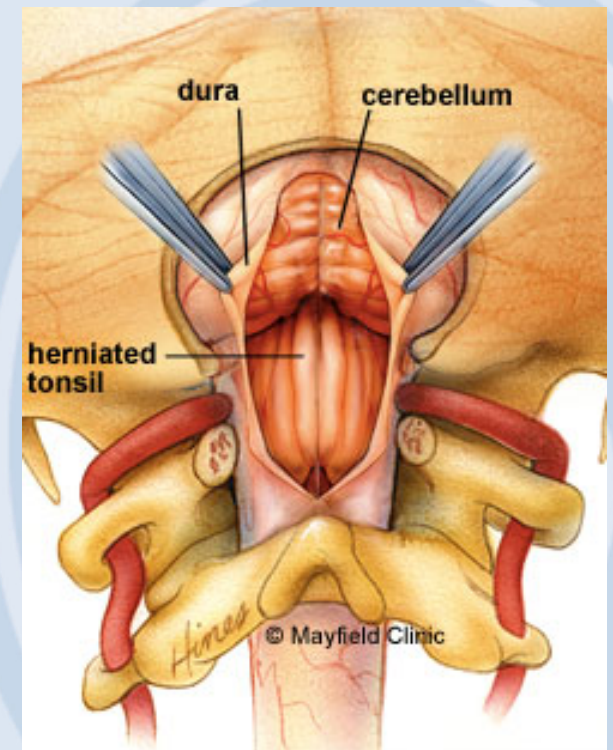
Edward H. Oldfield, M.D., Karin Muraszko, M.D., Thomas H. Shawker, M.D., and Nicholas J. Patronas, M.D.



Does Decompression Help?

Brockmeyer et al:

- 21 patients w/ CM and SM
- 13 curve improvement w/ decompression



Scoliosis Associated With Chiari I Malformations: The Effect of Suboccipital Decompression on Scoliosis Curve Progression

A Preliminary Study

Douglas Brockmeyer, MD,* Sohrab Gollogly, MD,† and John T. Smith, MD†

OL

Purpose

Describe natural history of EOS a/w CM

Determine if decompression alters curve progression



Methods

64 patients <10 yrs

- Cobb $>10^{\circ}$

- CM-I ($>4\text{mm}$)

Neuromuscular or congenital curves excluded

Indications for decompression

- Syrinx, scoliosis, headache and back pain

Median follow-up of 4.8 years (2-16)

Results

34% Male

Mean age 6.6 yrs (0.8-9.8)

43/64 had syrinx (67%)

45/64 decompression (70%)

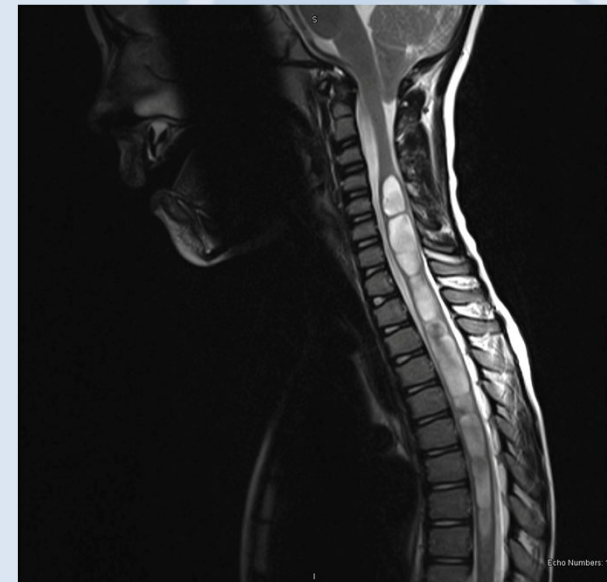
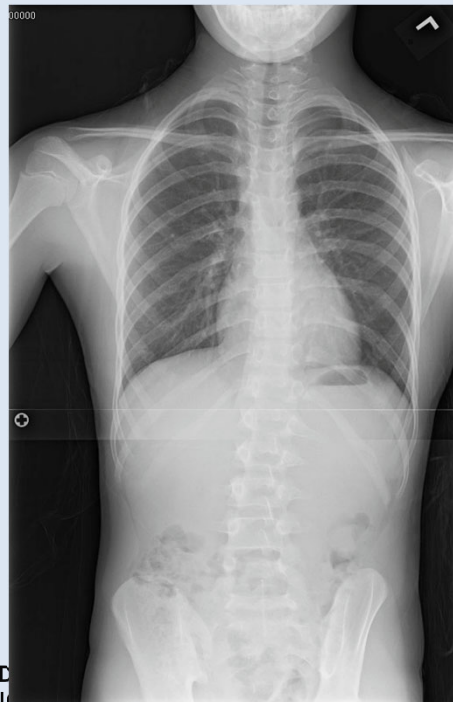


Results

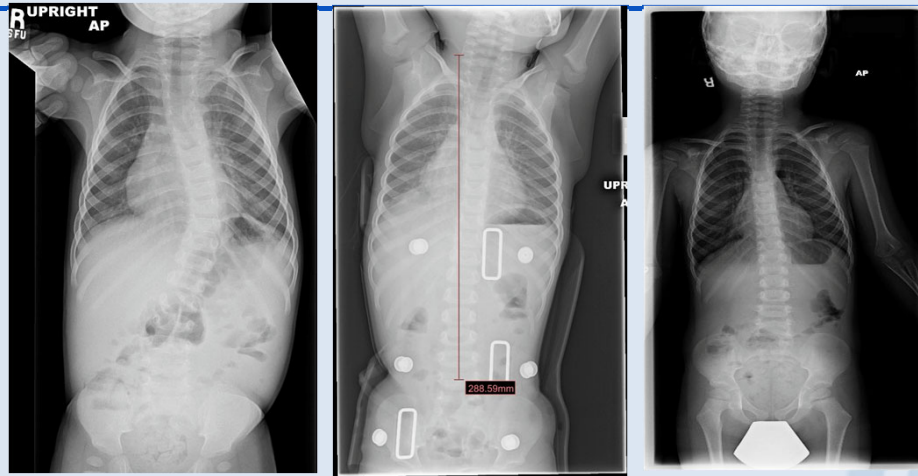
	CM +syrinx Decompression	CM +syrinx No Decompression	CM Decompression	CM No Decompression
Initial Cobb	25.1	23	24.7	34.7
Latest Cobb	25.1	41.8	28.3	32.1
Change in Cobb	-0.1 (-9.8-9.7)	14.8 (-18.1-47.6)	3.7 (-29.3-36.7)	-2.6 (-8.7-3.5)
Fusion Rate	12.5%	20%	33.3%	17.5%

CM I With Syrinx

50% had curve improvement after decompression



Without SM



Decompression not associated with curve improvement

50% experienced curve improvement with bracing alone

No Association With Progression

Syrinx size
Curve severity
Kyphosis
Tonsillar ectopia
Use of brace



Results

Patients w/ SM:

- Younger patients less likely to progress to fusion ($p=.05$)
- Thoracolumbar curves 87% less likely to progress to fusion ($OR=.13$ $p<.05$)

Discussion

In patients with EOS:

Patients with CM + SM: no change in curve at last follow-up after decompression suggesting overall curve stabilization

-50% may improve

Unclear benefit in patients without SM

Conclusion

Decompression of CM-I malformations should be considered in EOS patients w/ SM

Limitations

Presence of SM drives decision making

A limited number of CM-I +SM patients not decompressed

Asymmetric group sizes

Underpowered for risk factors

Incomplete data on bracing



Thank you!

