Skull Base Angle Predicts Surgical Outcome

A group of Chinese researchers has found that a single skull base angle may be useful in identifying who will respond well to decompression surgery. Specifically, they measured the clivus-supraocciput (C-SO) angle in 73 adult surgical patients with Chiari and syringomyelia. The C-SO angle essentially measures how steep of a funnel the bottom part of the posterior fossa is:

Previous research has shown that the average C-SO angle for Chiari patients is around 96 degrees, so the researchers divided the patients based on C-SO angle above and below 96 degrees and analyzed their surgical outcomes using the Chicago Chiari Outcome Scale (CCOS), a rating of Excellent/Good/Poor, and amount of syrinx reduction. They found that the patient group with the larger C-SO angle (>96 degrees) did significantly better across all measures. For example, in the large angle group 81% hadExcellent outcomes (CCOS=13+) whereas in the smaller angle group 60% had an Excellent outcome. Similarly, a significantly higher percentage of the large C-SO angle group showed a substantial reduction in syrinx size as compared to the small angle group.

The authors admit it is not clear why the C-SO angle seems to play a role in surgical outcome, especially since a smaller angle would generally indicate a tighter posterior fossa which would be expected to respond better to surgery. It should be noted that patients without a syrinx or with other bony abnormalities, like basilar invagination, were excluded. Before reaching any conclusions, this study needs to be repeated at another institution with a larger, and less restrictive, sample of patients.


Conquer Chiari’s research updates highlight and summarize interesting publications from the medical literature while providing background and context. The summaries do contain some medical terminology and assume a general understanding of Chiari. Introductory information and many more research articles can be found in the Conquer Chiari Library.