

# Metopic Ridging

One of the forms of craniosynostosis is premature fusion of the [metopic suture](#), referred to as [trigonocephaly](#), but the diagnosis of metopic suture synostosis remains controversial. The purpose of this study was to clarify, using geometric morphometric analysis, if a metopic ridge alone observed in cases of mild trigonocephaly represents a pathological phenomenon.

Three different cranial morphologies were compared among patients up to 2 years old who were categorized into the true group, the mild group, and the normal group, based on the presence or absence of specific symptoms, history of cranioplasty for trigonocephaly, or lack of any abnormality on computed tomography. Using the obtained computed tomography images, 235 anatomical landmarks and semi-landmarks were plotted on the entire cranial surface for analysis of neurocranial morphology, and the cranial shapes represented by landmarks were analyzed using geometric morphometrics. Principal components of shape variations among specimens were then computed, based on the variance-covariance matrix of the Procrustes residuals of all specimens, and statistically analyzed.

The principal component analyses of the variations in endocranial shape, frontal [bone shape](#), and occipital bone shape did not show any significant differences in cranial morphology between mild trigonocephaly and normal skulls; however, true trigonocephaly was found to differ significantly from mild trigonocephaly and normal skulls.

Conclusions: These findings suggest that in assessments of cranial morphology, the presence of a ridge alone cannot be diagnosed as fundamentally pathological, and may represent normal morphology <sup>1)</sup>

1)

Sakamoto Y, Amano H, Ogihara N, Miwa T, Tamada I, Hikosaka M, Imai K. Geometric Morphometric Study on Distinguishing Metopic Craniosynostosis from Metopic Ridging. *Plast Reconstr Surg Glob Open*. 2024 Aug 7;12(8):e6034. doi: 10.1097/GOX.0000000000006034. PMID: 39114798; PMCID: PMC11305778.

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Last update: **2024/08/08 12:00**

