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THE ROLE OF MULTISLICE COMPUTED TOMOGRAPHY IN THE DIAGNOSIS AND SURGICAL ASSESSMENT OF TRIGONOCEPHALY

Amangeldiyeva Zhazira Nurlanovna
Student of the Faculty of Pediatrics at EMU University
Tashkent, Uzbekistan

Soibov Suratjon Bakhromovich
Lecturer, EMU University, Tashkent, Uzbekistan

Background:
Trigonocephaly is a form of nonsyndromic craniosynostosis caused by premature fusion of the metopic suture. It is characterized by triangular narrowing of the frontal region, a prominent metopic ridge, and varying degrees of hypotelorism. The deformity may involve both the anterior cranial vault and the orbital region, making accurate preoperative assessment essential for appropriate surgical planning.

Keywords: craniosynostosis, trigonocephaly, metopic suture, multislice computed tomography, 3D reconstruction, orbital morphology, hypotelorism, fronto-orbital advancement, pediatric neurosurgery.

Objective:
To evaluate the diagnostic significance of multislice computed tomography (MSCT) with three-dimensional reconstruction in patients with trigonocephaly and to assess morphological changes of the frontal and orbital regions before and after reconstructive surgery.



Materials and Methods:

Patients with nonsyndromic trigonocephaly who underwent surgical treatment at the Republican Scientific Center of Neurosurgery were evaluated. The diagnostic protocol included clinical examination, photographic documentation, preoperative and postoperative MSCT, three-dimensional reconstruction of the skull, and morphometric assessment of the frontal and orbital regions. The presence of metopic suture fusion, anterior cranial narrowing, interorbital distance, orbital position, and configuration of the fronto-orbital complex were assessed. Surgical treatment included bilateral frontal craniotomy, fronto-orbital advancement, and frontal bone remodeling.

Results:

Preoperative MSCT demonstrated premature fusion of the metopic suture, narrowing of the anterior cranial region, a prominent midline ridge, and medial displacement of the orbital rims. Three-dimensional reconstruction provided detailed visualization of the craniofacial deformity and facilitated individualized surgical planning. Following reconstructive surgery, improvement of the frontal contour and fronto-orbital symmetry was observed. The interorbital distance increased, while the degree of hypotelorism decreased. Postoperative MSCT demonstrated stable reconstruction of the anterior cranial vault and improved anatomical proportions of the orbital region. In the presented clinical case, these morphological changes were accompanied by a significant aesthetic improvement.



Conclusion:

MSCT with three-dimensional reconstruction is an important diagnostic and preoperative planning tool in trigonocephaly. Assessment of standardized cranial and orbital morphometric parameters allows objective evaluation of the severity of deformity and the effectiveness of reconstructive surgery. The combination of MSCT-based morphometry with clinical and photographic assessment provides a comprehensive approach to evaluating surgical outcomes in children with trigonocephaly.