Computer-aided manufacturing

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The aim of a study is to assess the usefulness of CAD/CAM technology in the surgical trigonocephaly treatment compared to conventional surgical treatment. Children operated from trigonocephaly between 2017 and 2019 at the French Referral Center for craniosynostosis of Hôpital Femme Mère Enfant of Lyon, France, were included and separated into two groups. Group 1 included children who operated on trigonocephaly using CAD-CAM technology; Group 2 included children who operated on trigonocephaly without CAD-CAM technology. Age, gender, duration of surgery, complications, blood transfusion, and esthetic results were analyzed. The experience of the craniofacial surgeon was also evaluated and quantified in order to weigh the results. Twenty children were included in the study: 10 in Group 1 and 10 in Group 2. No statistical difference was observed between these 2 groups concerning the duration of the surgery (137 min \pm 39,17 versus 137,2 min \pm 64,50; p = 0,85), complications (20% in group 1 versus 10% in group 2; p = 1), the realization of blood transfusion (80% in group 1 versus 70% in group 2) and the esthetic results (5/5 in group 1 versus 4,6/5 in group 2; p = 0,21). However, the use of CAD-CAM technology significantly accelerates the duration of surgery by 25.8 min on average for the surgeon starting in craniofacial surgery (from $197,8 \pm 10,21$ min without CAD-CAM to $172 \pm 18,76$ min with CAD-CAM; p = 0.05) but significantly slows the experienced surgeon by 25.4 min on average (from 76,6 \pm 8,65 min without CAD-CAM to 102 \pm 6,2 min with CAD-CAM; p = 0.01). In the management of trigonocephaly, CAD/CAM technology seems to present a modest interest for the experienced surgeon but presents a real interest for the young surgeon. Within the limitations of the study, it seems that CAD/CAM technology is a relevant addition to the armamentarium of doctors who are in training because surgical time is reduced ¹⁾.

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Julie CP, Pierre-Aurélien B, Mathieu D, Alexandru S, Carmine M, Christian P, Federico DR, Arnaud G. Is computer-assisted design and manufacturing technology useful in the surgical management of trigonocephaly? J Craniomaxillofac Surg. 2021 Jun 15:S1010-5182(21)00155-4. doi: 10.1016/j.jcms.2021.06.003. Epub ahead of print. PMID: 34187730.

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