Three-Dimensional Cephalometric Evaluation of Maxillary Growth following in utero Repair of Cleft Lip and Alveolar-Like Defects in the Mid-Gestational Sheep Model

Abstract:
Objective: To evaluate maxillary growth following in utero repair of surgically created cleft lip and alveolar (CLA)-like defects by means of three-dimensional (3D) computer tomographic (CT) cephalometric analysis in the mid-gestational sheep model. Methods: In 12 sheep fetuses a unilateral CLA-like defect was created in utero (untreated control group: 4 fetuses). Four different bone grafts were used for the alveolar defect closure. After euthanasia, CT scans of the skulls of the fetuses, 3D reconstructions, and a 3D-CT cephalometric analysis were performed. Results: The comparisons between the operated and nonoperated skull sides as well as of the maxillary asymmetry among the experimental groups revealed no statistically significant differences of the 12 variables used. Conclusions: None of the surgical approaches used for the in utero correction of CLA-like defects seem to affect significantly postsurgical maxillary growth; however, when bone graft healing takes place, a tendency for almost normal maxillary growth can be observed.

Stichworte:
Cleft lip and palate; Intrauterine surgery; Mid-gestational sheep model; Fetal bone graft; Maxillary growth; Three-dimensional computed tomography; Three-dimensional