introduction and objective

Patients with isolated cleft lip and/or palate (CLP) have an anatomical defect that may occur during the 4th and 12th week of pregnancy. Some studies demonstrate that CLP is not a localized phenomenon and that a deviant morphology could be observed in various basic structures of the craniofacial complex. The spheno-occipital synchondrosis (SOS) is a cartilaginous union between the body of the sphenoid and the basilar part of the occipital bone. The SOS is an endochondral growth center in the craniofacial skeleton that has a late ossification, therefore growth on this synchondrosis will influence the anteroposterior dimension of the cranial vault and the height and depth of the upper face. Maturational age of a subject can be estimated by analyzing the fusion stage of the SOS. The literature suggests complete fusion for girls between 11 to 14 years and 13 to 16 years for boys. Despite the great usefulness of the information that can be gathered through the study of the SOS, there is a lack of studies in children with cleft lip and palate.

The aim of this study was to evaluate the time of complete ossification of the spheno-occipital synchondrosis, in patients with cleft lip and palate and a control group, using cone-beam computed tomography (CBCT) scans, in a Portuguese caucasian population.

Experimental and methods

In order to evaluate the median time to reach the complete closure of SOS, corresponding to stage 4 of the fusion system proposed by Bassed et al., the following study compared patients with and without CLP and found that the median time for complete ossification of the SOS occurs earlier in girls than in boys, which is in line with the age range described in the literature. No statistically significant differences were found regarding sex in the control group, which may be explained by the fact that the group had fewer individuals. Because of the small sample size and lack of references in the literature, further studies should be conducted to determine the age of complete SOS ossification in patients with and without CLP in the Portuguese population.

Discussion

Previous studies reported that the fusion of this synchondrosis occurred 2 or 3 years earlier in females than in males. However, the timing of complete ossification of the synchondrosis is still controversial in the literature. This inconsistency is probably due to a difference in criteria, population, and assessment methods. The only study that evaluated the SOS in patients with CLP were Molsted et al. in 2012, which only used CBCT. Shkoukani et al. in 2013, compared the fusion stage of the SOS in patients with and without CLP in the Portuguese population.

In this study compared patients with and without CLP and found that the median time for complete ossification of the SOS occurs earlier in girls than in boys, which is in line with the age range described in the literature. No statistically significant differences were found regarding sex in the control group, which may be explained by the fact that the group had fewer individuals. Because of the small sample size and lack of references in the literature, further studies should be conducted to determine the age of complete SOS ossification in patients with and without CLP in the Portuguese population.

There are no differences regarding the ossification of the spheno-occipital synchondrosis between individuals with and without cleft lip and palate. The complete ossification of this synchondrosis in individuals with cleft lip and palate occurs earlier in females than in males.

Clinical implications

Dento-facial orthodontic treatment may be started earlier in female children, than in males, in the search for the best therapeutic results.