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CONE BEAM COMPUTED TOMOGRAPHY AND PROSTHODONTIC REHABILITATION OF CLEIDOCRANIAL DYSOSTOSIS

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ABSTRACT

The aim of this study is to present a clinical case of a male patient with cleidocranial dysostosis, in which the cone beam tomography was crucial in the decision making regarding the type of prosthetic rehabilitation to be established.
Keywords: cleidocranial dysostosis, cone beam computed tomography, prosthodontics.

INTRODUCTION

Cleidocranial dysostosis (CCD) is a rare disease characterized by the presence of typical manifestations that include total or partial absence of clavicles, cranial changes, brachydactyly and specific dental abnormalities (Nayar, 2006; Bhat, 2012; C N, 2012; Fang, 2011; Mehta, 2011). Supernumerary teeth (mainly in mandibular premolar region), delayed eruption and retention of deciduous teeth are typical alterations observed in these patients (Bhat, 2012; C N, 2012; Fang, 2011; Mehta, 2011; D'Alessandro, 2010). The presence of supernumerary teeth implies a resolution need of treatment on the maintenance or in their surgical removal (Brauer, 2010). In an initial diagnostic phase the traditional radiographs can be used to localize supernumerary and also tooth inclusion, although the subsequent execution of cone beam computed tomography (CBT) reveals extra advantages (Brauer, 2010; Katheria, 2010; Liu, 2008).

A 21 year old male patient with CCD was examined at an appointment on Orofacial Genetics of FMDUP, motivated by the urgent need for dental treatment due to the complexity of dental changes that he presented. Family history revealed the presence of similar symptoms on his mother, who has only this son, but two miscarriage episodes. General examination showed clinical features of CCD, respectively short stature, severe hyperadduction of shoulders (nearly approximated in midline) and hypertelorism. The clinical dental examination revealed supernumerary teeth and retention of deciduous teeth. To help in taking a decision regarding the ideal plan of treatment it was decided to make a CBT (DentaScan, GE Healthcare, United States). The pictures obtained confirmed the presence of supplement teeth, retention of certain deciduous teeth and inclusion of some of the permanents. The delayed intervention, after completion of craniofacial growth, resulted in more complex treatments than those that could have been made initially. To prevent severe osseous loss with a more invasive intervention, a prosthodontic rehabilitation, removable or fixed, with surgical removal of only problematic teeth and the control of the others, represents a better therapeutic option in this particular case. Additionally, a research was made on Pubmed database, without time limitation, with the key words “Cone-Beam Computed Tomography", “Cleidocranial dysostosis” and "prosthodontics”.

CRITERIA FOR CLINICAL EVALUATION

Clinical evaluation was made according to the protocol attached to Orofacial Genetics consultation of FMDUP, which includes the medical history, clinical examination, photographic records (Fig.1), radiographic records (Panoramic Radiograph, Cone-beam computed tomography) (Fig. 2, 3 and 4), and confection of study models. This evaluation allowed to detect typical signals and symptoms of CCD and established a clinical oral diagnosis of generalized active chronic periodontitis.

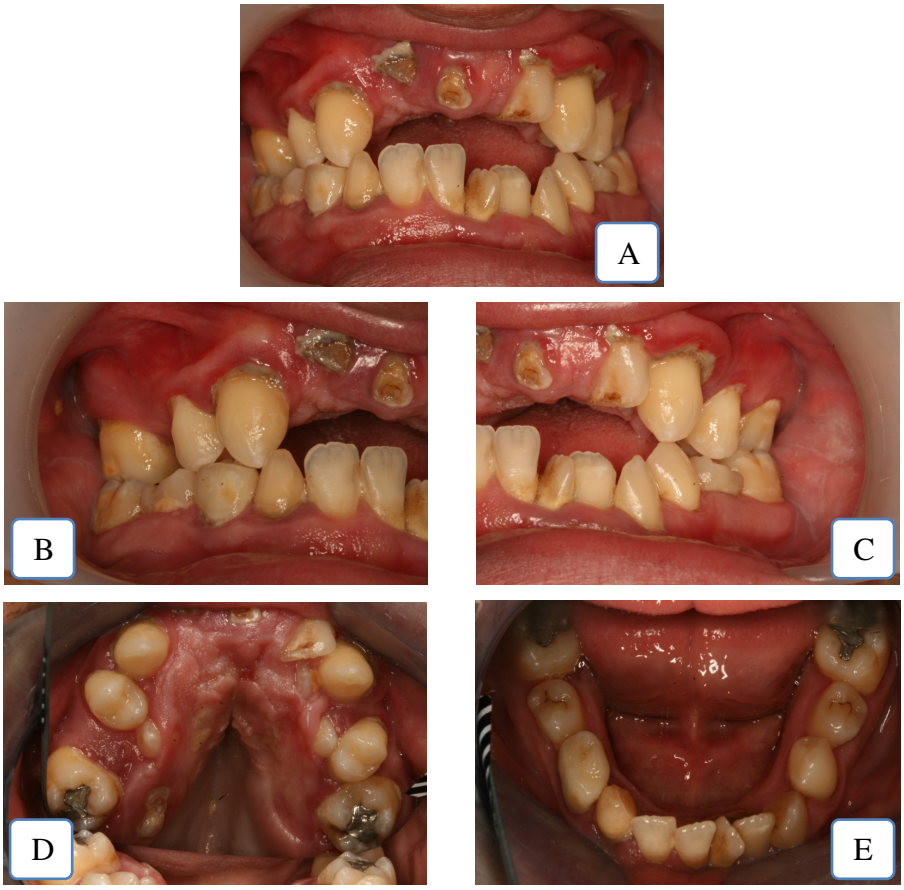

Fig.1 Intraoral photographs. A - Frontal view, B- Right Lateral view, C- Left Lateral view, D – Maxilla view, E – Mandible view.

Fig.2 Panoramic radiography

RESULTS

The radiological study with CBT (DentaScan, GE Healthcare, United States) was done in spiral module with acquisition of axial images with 0.5 mm thick contiguous and reconstructions were performed to obtain panoramic coronal images and sagittal images with 1 mm thick contiguous.

CBT images of Maxilla (Fig.3) reveal persistence of various deciduous teeth with the inclusion of several permanent teeth. Retained deciduous teeth are located medially to the dental arch composed of the permanent teeth. Permanent incisors are included, in a vertical arrangement, in the anterior maxillary, the lateral incisors insinuate on nasal apophysis of zygomatic bone.

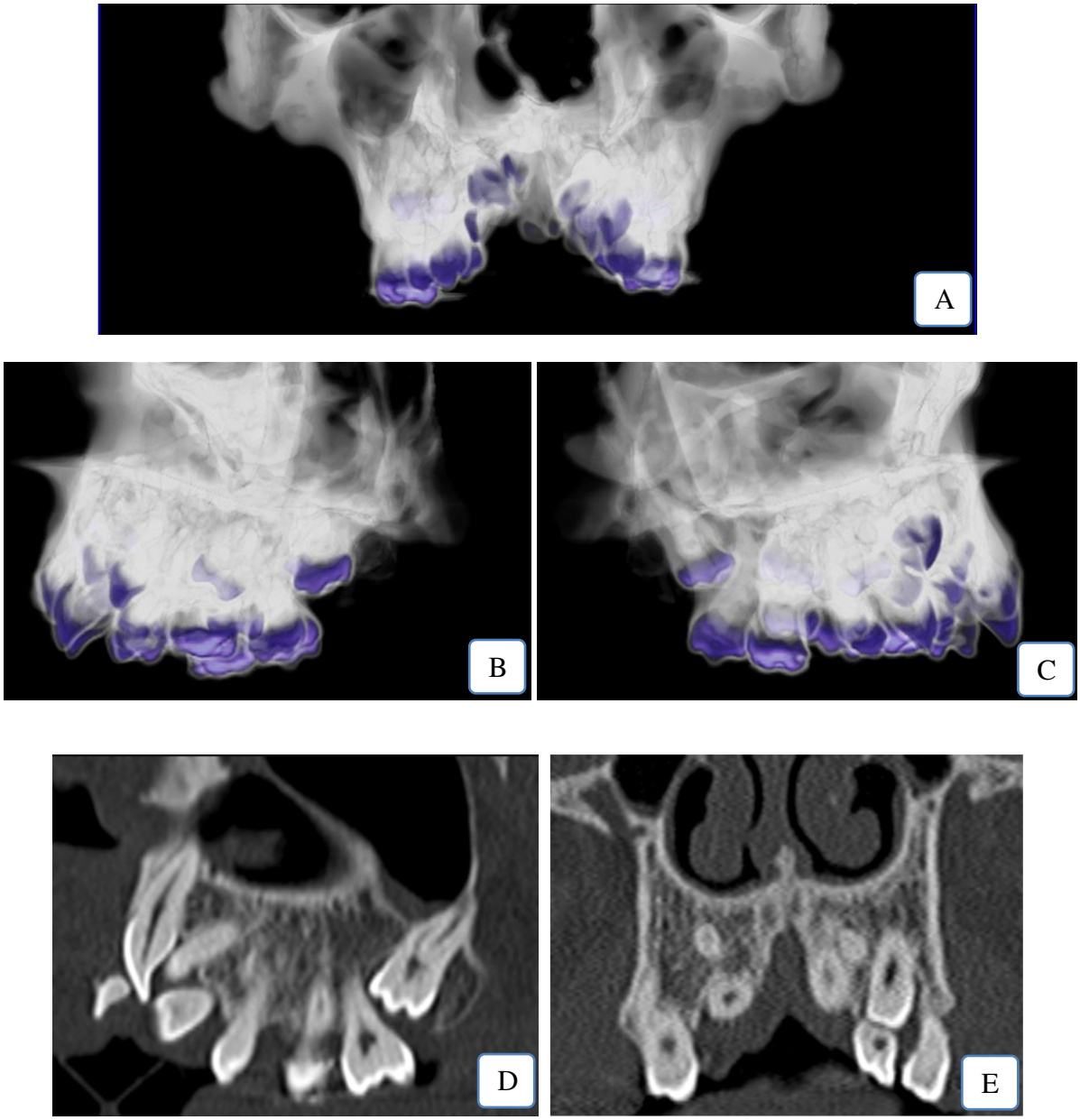

Fig. 3 CBT images of Maxilla. A- Three-dimensional (3D) Frontal view, B- 3D Left Lateral view, C- 3D Right Lateral view, D- Lateral view, E- Frontal view (DentaScan, GE Healthcare, United States).

CBT images of Mandible (Fig.4) reveal also the retention of deciduous teeth, inclusion of permanent teeth and the presence of supplement teeth. The topographic analysis exposed the bulging of vestibular cortical bone. The third molars included have a horizontal arrangement.

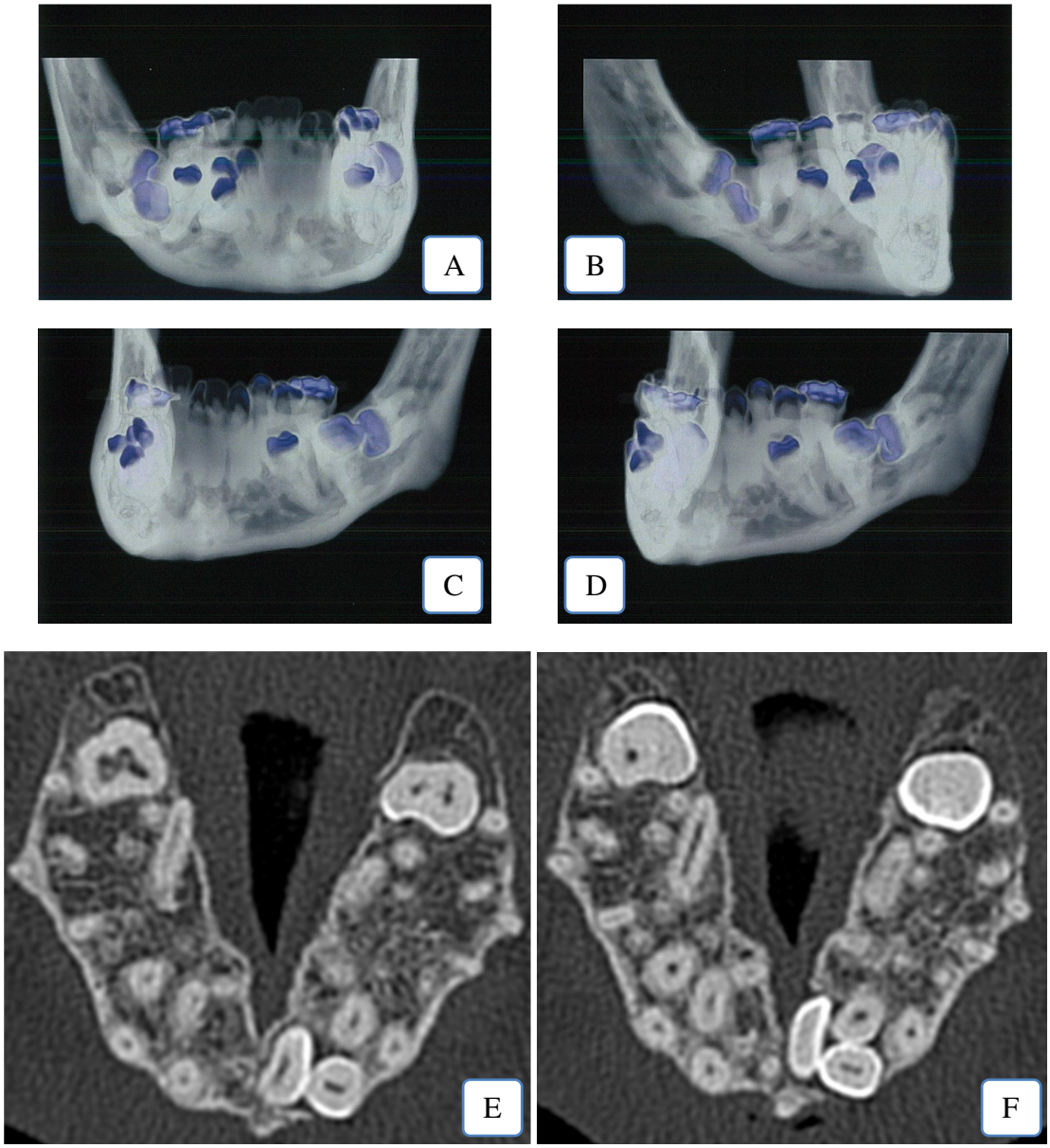

Fig. 4 CBT images of Mandible. A, B, C, D - Frontal view, Right Lateral view and different Antero-posterior views; E, F – Different coronal views (DentaScan, GE Healthcare, United States).

CONCLUSION

CBT allows the execution of three-dimensional images that yield accurate pictures of supernumerary teeth and other dental and bony structures and supported a pre-treatment evaluation. Furthermore, it is essential in the decision of the type of prosthodontics oral rehabilitation, chiefly in this type of cases in which it is fundamental to decide between a more or a less invasive intervention.

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