

原文題目(出處)：	Advantages of cone beam computed tomography (CBCT) in the orthodontic treatment planning of cleidocranial dysplasia patients: a case report. Head & Face Medicine 2011, 7:6.
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報告日期：	2011/08/08

Background

### **Cleidocranial dysplasia (CCD)**

1. Affects most prominently those bones derived from endochondral and intramembranous ossification and it's characterized by defective development of the cranial bones and by the complete or partial absence of the clavicles
2. Clinical and radiographic findings, that include imaging of the cranium, thorax, pelvis and hands.

### **Intelligence is normal in individuals with classic CCD**

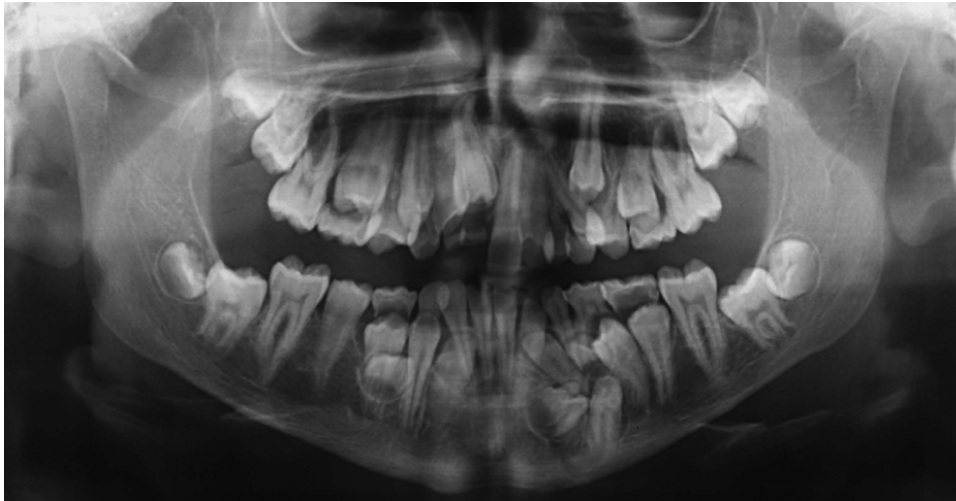
1. The most important dental problem associated with this syndrome is the malocclusion and the crowding of the dental arches caused by the retention of multiple deciduous teeth and the presence of several supernumerary teeth.
2. The previous approach to the dental problems of these patients consisted in no treatment or in the extraction of the impacted or malformed teeth and their prosthetic replacement the permanent teeth.
3. If there isn't any, or just a mild, skeletal discrepancy between maxilla, mandible and cranium, the treatment is finished with the alignment of all permanent teeth, obtaining a correct occlusion and an agreeable smile aesthetics.
4. In presence of an important skeletal discrepancy, most commonly a mandibular prognathism, that preclude the possibility to achieve an acceptable orthodontic camouflage, it's necessary to wait until the completion of skeletal growth and then restoring a correct bone position through orthognatic surgery, followed by the orthodontic finishing.
5. In these cases it's appropriate to use a multi-slice computed tomography (MSCT) scanner with an accurate tridimensional information regarding the anatomy of every single tooth, the spatial relation between adjacent teeth and face to the surrounding anatomical structures.
6. Unfortunately, a conventional MSCT exam exposes the patient to an high dose of x-ray, thereby limiting the application of this techniques only to the most complex cases.
7. Recently a relatively new technique, the CBCT, reducing the dose of radiation adsorbed by the patient, had been improved by different manufacturer, obtaining good quality images.

### **Case Report**

A 15-year-old man, with a diagnosis of Cleidocranial dysplasia, was referred to our department for orthodontic treatment. The patient was previously treated only with deciduous and supernumerary teeth extraction and four panoramic x-rays were taken in the last two years in order to check teeth development and eruptive direction.

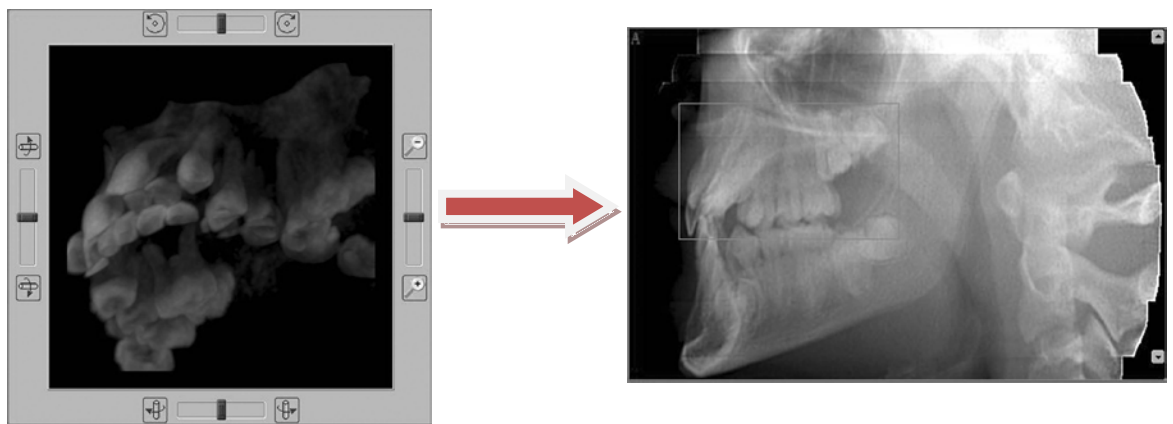
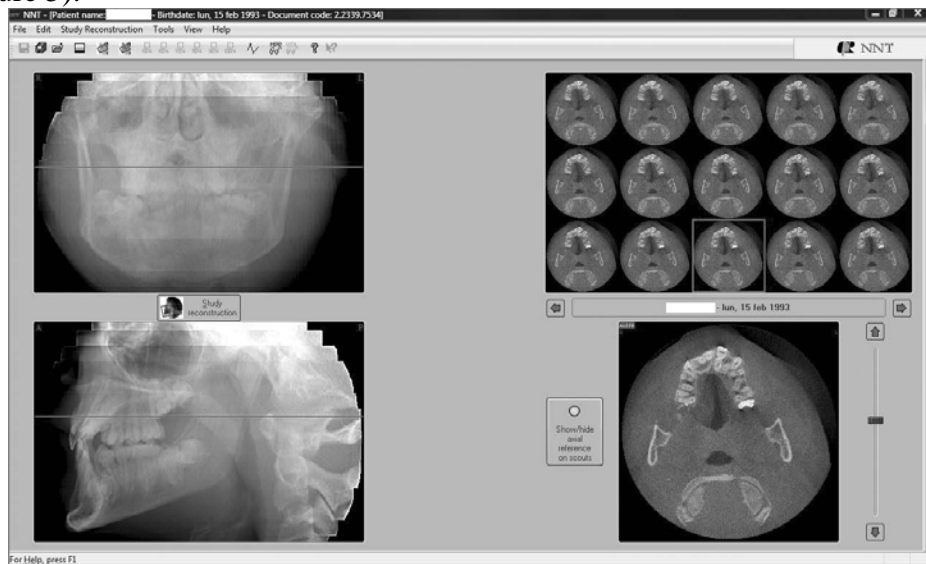
**Oral examination revealed a bilateral cross bite with marked teeth misalignment**

1.

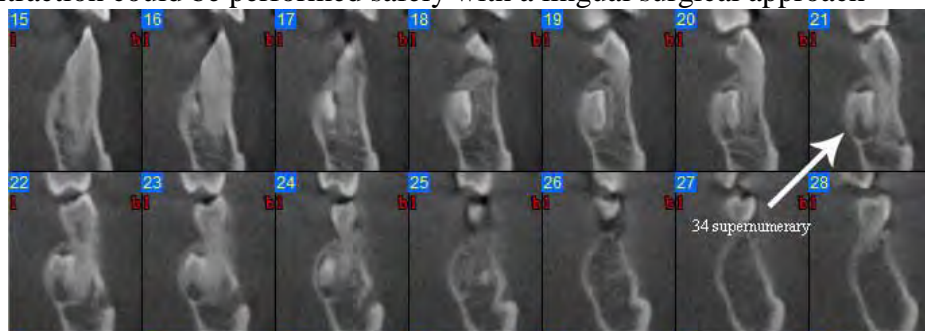


On the basis of these findings a three-dimensional CBCT scan was obtained, in order to exactly recognize teeth anatomical anomalies, to decide which of them are to be extracted and to plan the surgical access.

2. We used the 2.11 version of the QR NNT program to visualize the most interesting axial sections showing the impacted and the supernumerary teeth (Figure 5).



- Sections from 21 to 24 in figure nr. 8 show the relationship between supernumerary 3.4, tooth 3.4 and mental foramen. The supernumerary is situated lingually to tooth 3.4 and there is no contiguity with mental foramen, so its extraction could be performed safely with a lingual surgical approach



**Discussion**

- The use of 3D computer assisted tomography is the best, and probably the only one method permitting to elaborate a real individual orthodontic treatment plan for each CCD patient. It allows to precisely locate the impacted or ectopic teeth and therefore to perform a minimally invasive surgery and to plan the most effective orthodontic strategies [17,18].
- Therefore CT images permit to safely place titanium screw, that have been suggested by Kuroda [19] to be very useful as an absolute anchorage during the forced orthodontic traction of impacted teeth in order to reduce the patient’s treatment time and psychological stress, in both maxilla and mandible, avoiding the risk of damaging during the screw insertion some important surrounding anatomical structures like dental roots,nerves and blood vessels.
- The shortcoming of the routinely use of this technique was related to the high radiation exposure of the patient,limiting the application only at complex cases.

**Conclusion**

- In CCD patients the use of reconstructed 3D images obtained by a CBCT exam for diagnosis and treatment planning has only scarcely been documented until now, so no evidence-based conclusion can be made based on the current literature.
- We present this case report to support the use of a less invasive CT exam, the low dose CBCT technology,in CCD patients in late mixed dentition undergoing orthodontic treatment and to promote the collection of sufficient data to come to a common agreement on the use of 3D radiological exam in these patients.

題號	題目
1	Which is not the character about CCD? (A) Hypertelorism (B) Premature closing of the coronal suture (C) Spinal scoliosis (D) Hypertension
答案(D)	
題號	題目
2	Which of the following is not the advantage of cbct? (A) Low radiation dosage (B) Accurate visualization of head and neck structures (C) More cheaper than conventional x-ray machine

答案(C)	
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