3D LOCALIZATION OF THE DENTAL OCCLUSAL PLANE USING WiFi TECHNOLOGY

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3D LOCALIZATION OF THE DENTAL OCCLUSAL PLANE IN NATURAL HEAD POSITION USING WiFi TECHNOLOGY
* INTRODUCTION OF LATERAL HEAD RADIOGRAPH IN 1931

ADVENT OF CEPHALOMETRICS
APPLICATION OF CEPHALOMETRICS

DIAGNOSIS AND TREATMENT PLANNING

GROWTH ASSESSMENT/PREDICTION

EVALUATE TREATMENT CHANGES
* CHALLENGES OF CEPHALOMETRICS

* STABILITY OF THE CEPHALOMETRIC POINTS

* REPRODUCEABILITY OVER TIME TO ALLOW COMPARISON
CEPHALOSTAT TO ORIENT THE HEAD TO THE LATERAL RADIOGRAPH
2D CEPHALOMETRIC ANALYSIS WITH TRACING PAPER ON RADIOGRAPHIC FILM
*STANDARDIZATION TECHNIQUES*
**STANDARDIZATION TECHNIQUES**

**SELLA-NASION PLANE**

- Very stable position of cranial base
- Growth completion at age 7 years
- SN 9 degrees to the horizontal
STANDARDIZATION TECHNIQUES

NATURAL HEAD POSITION

* TRUE VERTICAL
* RESTED POSITION
* PARALLEL TO FLOOR
* EYE LEVEL TO FLOOR
* SELF BALANCED BODY POSITION
* GUIDED BY MIRROR
* GUIDED BY PROFESSIONAL
* REPRODUCIBLE
2D CEPHALOMETRIC ANALYSIS WITH DIGITAL SOFTWARE
CONCEPT OF NATURAL HEAD POSITION
* NATURAL HEAD POSITION: SPATIAL RELATIONSHIP OF THE HEAD TO TRUE VERTICAL

* NO WELL DEFINED STANDARDIZATION EXIST

* ELUSIVE POSITION, VARIES FROM POSTURE TO POSTURE

* DIFFICULTY IN REPRODUCING THE POSITION
BODY POSTURE AND ALIGNMENT

MYOCENTRIC STATE
DELICATE BALANCE OF ALL THE SKELETON AND THE NEUROMUSCULAR SYSTEMS
**POSTURAL DISORDERS**

* GROWTH DISORDERS
* CRANIOFACIAL DYSMORPHOGENESIS
* CRANIOFACIAL PAIN
* SPINAL CORD DISORDERS
* OBSTRUCTIVE SLEEP APNEA
* TEMPROMANDIBULAR JOINT DYSFUNCTION
* OCCLUSAL DISHARMONY
* PERIODONTIUM BREAKDOWN
Figure 1
WHAT IS THE OCCLUSAL PLANE?

* POSITION OF MAXIMUM INTERCUSPATION (MIP) OR CONTACT OF POSTERIOR TEETH

1. THE STATIC POSITION IS USED AS A REFERENCE GUIDE OF THE OCCLUSION

2. THE DYNAMIC POSITION HAS 3 DIMENSIONS THAT CAN RANGE UPTO 7mm;
OCCLUSAL PLANE IN 2D CEPHALOMETRIC ANALYSIS
* STANDARDIZATION TECHNIQUES

* FRANKFURT PLANE
*OCCLUSAL PLANE*
OCCLUSAL PLANE HAS A LINE, RANGE

Brackets are placed on the inside, or lingual side, of the teeth.
* 3D OCCLUSAL CLOUD: RANGE OF OCCLUSAL CONTACT FROM MIP TO DISOCCLUSION
3D OCCLUSAL PLANE: STATIC POINT OF MAXIMUM INTERCUSPATION
FAILURE TO ACCURATELY ESTABLISH THE POSITION OF THE OCCLUSAL PLANE IN DIAGNOSIS AND TREATMENT PLANNING CAN HAVE A DAMAGING EFFECT ON THE DENTITION.

FACIAL BALANCE (ESTHETICS)
ESTABLISHED AROUND THE ORIENTATION OF THE OCCLUSION

FUNCTIONAL OCCLUSION DISORDERS
ESTABLISHED AROUND THE POSTURE
MOVEMENTS OF THE LOWER JAW (MANDIBLE)
WHAT FACTORS EFFECT OCCLUSAL PLANE?

* GENETIC DISORDERS

* CRANIOFACIAL MORPHOGENESIS

* ENVIRONMENTAL FACTORS

* IATROGENIC: DENTAL INTERVENTION
ADVANCES IN 3D DIAGNOSTICS AND TREATMENT PLANNING
*Translucent soft-and hard-tissue images of pre- & post-surgery case*
PROGRESS SUPERIMPOSITION IN 3D
* DISCONNECT WITH 3D PHOTOS, 3D CBCT...
.....and NATURAL HEAD POSITION
NEW METHOD OF RECORDING NHP

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A New Method to Orient 3-Dimensional Computed Tomography Models to the Natural Head Position: A Clinical Feasibility Study

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Brian C. Dawson, BS∥ Kathleen A. Kennedy, MD, MPH,¶
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Purpose: The purpose of this study was to evaluate the clinical feasibility of a new method to orient 3-dimensional (3D) computed tomography models to the natural head position (NHP). This method uses a small and inexpensive digital orientation device to record NHP in 3 dimensions. This device consists of a digital orientation sensor attached to the patient via a facemask and an individualized bite jig. The study was designed to answer 2 questions: 1) whether the weight of the new device can negatively influence the NHP and 2) whether the new method is as accurate as the gold standard.
**FIGURE 1.** Laser scanning method. A, The patient sits on a calibrated chair that is positioned at the center of the laser scanner. B, A 3D facial image in the NHP is captured by the laser scanner. C, A 3D CT facial and bone (underneath the soft tissue) model of the patient’s head. D, The recorded NHP is transferred to the 3D CT facial model by registering it to the 3D facial image in the NHP. E, Resultant 3D CT facial model in the NHP. F, Resultant 3D CT bone model in the NHP.

NEW DIRECTIONS?

* 3D/3T VIRTUAL ARTICULATOR
* MISSING PIECE IN THE PUZZLE IS THE ORIENTATION OF THE OCCLUSAL PLANE IN NHP, AND THE ABILITY TO REPRODUCE THE POSITION AT WILL OVER TIME
* LOCALIZATION OF THE OCCLUSAL PLANE IN REAL TIME WITH ABSOLUTE OCCLUSAL FORCES
* COMPUTER GENERATED OCCLUSAL PLANE
* CAD/CAM TECHNOLOGY
ST. APOLLONIA DIED C. 249 IN ALEXANDRIA, EGYPT
* SAINT APPOLODIA: VICTIM OF TORTURE
THANK YOU FOR YOUR ATTENTION