The AAO is the only organization solely dedicated to orthodontic specialists. Membership leaders work to develop tools and support needed to succeed in practice.

You are the AAO.

Visit aaedinfo.org to learn more.

• Received DDS at Univ. of Michigan Dental School
• Received orthodontic training at Northwestern Univ. Orthodontic program
• Received Master of Science in Radiology at NUDS
• Lectured hundreds of dentists and orthodontists on diagnostic & treatment planning for orthodontic and TMD patients
• Associate prof. at Univ. of Detroit Mercy orthodontic program
• Work with residents on research projects pertaining to condylar position
• Founder of the Five Condylar Positions © Orthodontic and TMD practice in Northbrook, IL

DISCLOSURE STATEMENT

• I have no financial interest in any of the company’s products I may mention.
• I have not altered any images of my clinical orthodontics.
• I do get paid on occasion for lecturing by AGD/CBCT scan companies, and some of the study clubs I facilitate that earn AGD/PACE credits from my personal education programs. You are welcome to contact me if you are looking for programs that provide CE credits.
• If I have not discussed something you wanted to hear, please ask. You are welcome to contact me anytime after we depart today if you have any unanswered questions.
• Unfortunately your time is limited so if you have questions, I will be happy to answer them after the presentation.
• It is an honor to be in your presence and I appreciate the invitation to share our experiences.

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CBCT Helps Detect Jaw Alignment Problems & the Hidden Vertical Dimension

AAO 2017

Kati June 2003

Kati July 2006
Kati
Sept 2015
Didn’t know why it was a failure until the CBCT

Faith
12y 2m

Faith
12y 2m
Evaluation of the condylar position with a CBCT scan shows the clinician a significant dual bite.

Faith 13y4m

Five Condylar Positions

Taken in Maximum Intercuspation with Cone Beam Volumetric Tomography can help diagnose and treatment plan any orthodontic, temporomandibular dysfunction, or restorative patient.

By Dr. Bob Kaspers

Take your CBCT scans in Maximum Intercuspation and you will have a "functioning radiograph". You will be able to analyze the effect of the occlusion on the condylar position.

Treatment planning can be properly done with an CBCT scan if the practitioner understands the structural ramifications of the condylar position in maximum intercuspation and knows the proper treatment modalities to achieve a centric relation position.

Ikeda and Kawamura findings matched Christiansen in determining the consistency of limited cone beam computed tomography in optimal joints. Their studies concluded that in healthy joints the joint spaces (anterior space, superior space, and posterior space) showed consistent mean values of 1.3mm (AS), 2.5mm (SS), and 2.1mm (PS) thereby verifying a concentric position of the condyle.

The "seated condylar position" presents the appearance of a condyle being concentric in the glenoid fossa. This condylar position represents a balanced position.

I. Seated Condylar Position

Fig 6. Mean distances and ratios for optimal condylar positions.
II. Protruded Position of the Condyle

A "protruded position of the condyle" is where the condyle appears forward on the eminence. The patient possesses a skeletal Class II discrepancy with the upper jaw forward of the lower jaw and the patient has to position their lower jaw forward to achieve maximum intercuspation (MI).

III. Retruded Position of the Condyle

A "retruded position of the condyle" is where the patient’s maximum intercuspidation forces the mandible backward. This condylar position may be due to how the buccal segments interdigitate or possibly a lack of torque on the maxillary incisors.

IV. Retruded Condyle which is Down in the Fossa

A "retruded condyle which is down in the fossa" is a condylar position created when the patient pivots around a posterior premature contact (usually a molar) to achieve maximum intercuspation (MI). This condylar position is achieved when the patient activates their lateral pterygoid muscle (moving the mandible forward) and then activates the masseter and medial pterygoid muscles to close down into MI.
Patients will position their lower jaw so they can achieve a stable bite (postural positioning). Samantha finished braces three years ago but was now having jaw pain and clicking. The orthodontist treated her with 2-dimensional radiographs.

Analyze the condylar position first along with the lateral cephalogram to establish the A-P and vertical dimension.

Samantha's condylar position prior to the bite plate therapy. Both condyles assumed a "retruded & down" position when in MI.

Samantha wore a bite plate (full-time) for three weeks and when she returned...

Samantha's condylar position after 3 weeks of full time bite plate therapy and major changes to her occlusion.

Has this ever happened to you?
Both of Leon’s condyles were in a retruded and down position.

Splint therapy verified the hidden vertical dimension which was seen in the CBCT scan.

**WHAT IS A DUAL BITE?**

- Most patients possess “two bites”. The more popular of the two bites is where the teeth fit together best (maximum intercuspation); however, the patient usually has to force their lower jaw to this position.
- The second bite is where your lower jaw assumes a more “relaxed” position (pseudo centric relation) but unfortunately does not have as many teeth touching.
- Bouncing between a forced bite and a relaxed bite can lead to problems (TMD symptoms, occlusal wear of the teeth, fractured teeth, etc).

**V. Centered Condyle which is Down in the Fossa**

A “centered condyle which is down in the fossa” is a condylar position created when the patient pivots around a first premature contact and holds their lower jaw in a forward position to achieve maximum intercuspation (MI). A centered condyle which is down in the fossa may also be due to edema within the joint. It could also be a recapturing of a meniscus (disc).
The Key Point within the “Five Condylar Positions© Analysis” is the Vertical Component.

Three of the five condylar positions possess a vertical component. If splint therapy is utilized with a “protruded condyle, a “retruded condyle which is down in the fossa”, or a “centered condyle which is down in the fossa” – the bite would “open” as the orofacial musculature relaxed and the condyle seated in a concentric position (*). The vertical component is a critical finding when a practitioner is diagnosing and treatment planning a case.

Superior joint space for the right TM joint measured 4.8 mm.

An increase in the superior joint space lets the practitioner know that the patient has a “dual bite”.

- Approximately 80% of the patients possessed a “hidden vertical dimension
- Approximately 80% of the patients are more Class II than their MI bite indicates.
Clinical Research on 220 Consecutive Patients

Seated Condylar Position
- 7/220 had “both” condyles fully seated (only 3.2%)
- 60/220 had at least one fully seated condyle (27.3%)

Protruded Condylar Position
- 76/220 had “both” condyles protruded in the fossa (35.4%)
- 148/220 had at least one protruded condyle (67.3%)

Retruded Condylar Position
- 6/220 had “both” condyles retracted in the fossa (2.7%)
- 21/220 had at least one retracted condyle (9.5%)

Retruded and Down Condylar Position
- 25/220 had “both” condyles retracted & down (11.4%)
- 65/220 had at least one retracted & down condyle (29.5%)

Centered and Down Condylar Position
- 6/220 had “both” condyles centered & down (2.7%)
- 34/220 had at least one centered & down condyle (15.4%)

After years of research, I found that traditional methods and 2D technologies were not giving me the correct diagnoses and long-term outcomes I wanted for my patients.

2D versus 3D

Without my i-CAT, I would never have found the five condylar positions.

Helping orthodontists in my area – they all said they wouldn’t know how to implement the 3D technology into their practice.

I decided to write a 3D manual to share this exciting technology with orthodontists. I wanted to show you how using CBCT scans instead of 2D radiographs will ensure the right diagnosis, the right treatment and the right treatment mechanics.
Thank You