

Evolution of the incisal relationship in a Central European population (1870/1970)

Language: English

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The relationship between the upper and lower incisors is one of the keys to occlusal organisation and can be evaluated by:

- occlusal and markers: overbite and overjet
- skeletal markers: cephalometric values

Phylogenetic analysis of the incisal relationship and of the occlusion suggests, however, that anterior guidance recent variations in relation with environmental factors

Material and Method

The material consisted of a series of dental cast (Fig. 1) and lateral cephalometric X ray (Fig. 2), of young men average age 25 years, caucasian type from central europe, displayed in two groups:

- i) the 1870 group (Gr. 1870) data were 30 randomised subjects from 133 male skulls of soldiers who had served in the Austro-Hungarian army. They were all born circa 1870 and died of disease at around 25 years of age (the skulls form part of the Weisbach collection, Vienna, Austria).
- ii) the 1970 group (Gr. 1970) data were 30 randomised subjects from 170 male conscripts to the Austrian Federal Army born in circa 1970, in the same region as the previous group, and of an average age of 20 years at the time of study.

Maxillary and mandibular cast in centric occlusion were used to measure Over-bite and Over-jet with a calliper rule. (Fig. 3) Cephalometric measurement were made and the 52 points needed for computer analysis were marked (Fig. 4). These data were entered into the computer using a scanner and the computer analysis was performed. The different values (angles and distances) for the incisal relationship were retained (Table 1)



Fig. 1: Plaster models in centric occlusion



Fig. 2: Lateral cephalometric X ray

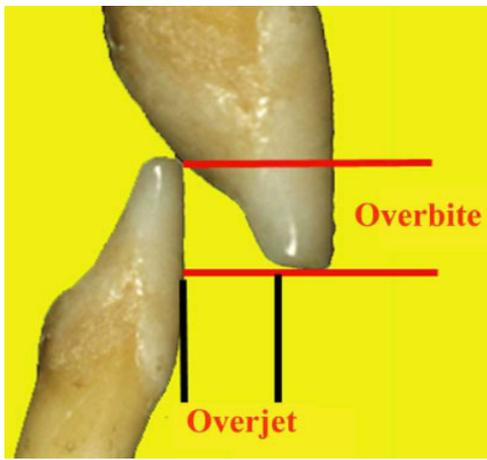


Fig. 3: Anthropometric measurements: overbite and overjet

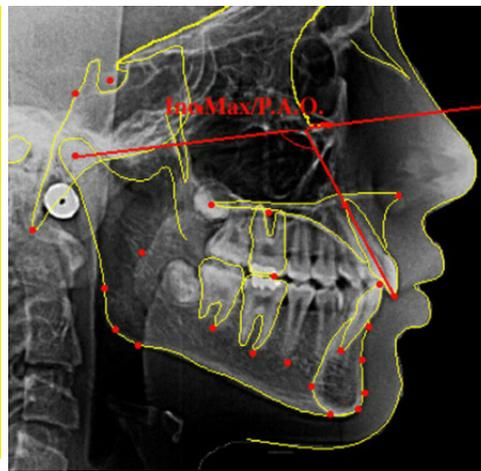


Fig. 4: 52 cephalometric points were used to analyse the determinant of incisal relationships

Inter-incisal angle

Angle between upper incisor and A-pogonion

Angle between upper incisor and PAO (axial-orbital plane)

Position of upper incisor in relation to the tangent

Supra-occlusion (upper incisor / occlusal plane)

Lower incisor to PAO

Angle of lower incisor in relation to A pogonion

Angle of lower incisor in relation to mandibular plane

Horizontal values of lower incisor to PAO

Vertical values of lower incisor to PAO

Position of lower incisor in relation to the tangent

Position of lower incisor in relation to A Pogonion

Inclination of upper incisor

Position of lower incisor

Egression of lower incisor

Skeletal Class

SNB, ANB, SNA, FMIA angles

SNA angle

ANB angle

FMIA angle

Radius of the curve of Spee

Table 1: Cephalometric values studied.

Statistical analysis

The cephalometric and anthropometric measurements were compared between populations using parametric tests for large sample size and the distribution of skeletal class was determined using the Chi squared test.

Results

A statistically significant difference was found for the following variables ($p < 0.001$):

- Overbite (Fig. 5)
- The FMIA (Fig. 6)
- Position of the free edge of the mandibular incisor Sagittal and Vertical Value (Fig. 7)
- Distribution in Skeletal class (Fig. 8)

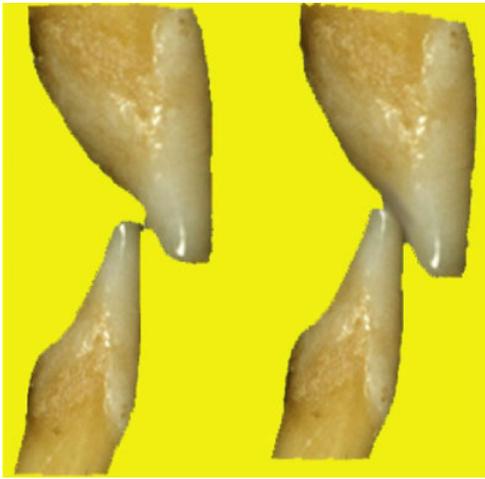


Fig. 5: Overbite evolution

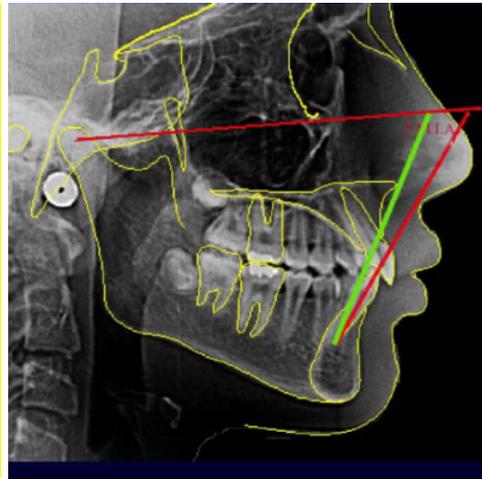


Fig. 6: FMIA evolution

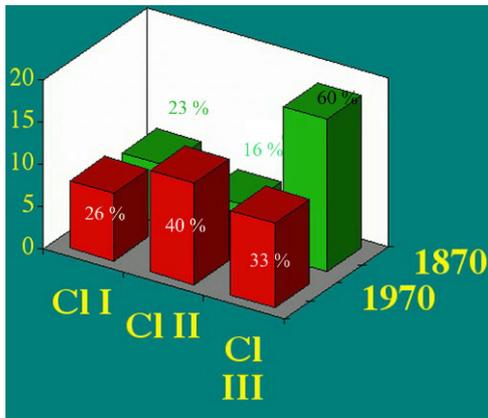


Fig. 7: Evolution of Position of the free edge of mandibular incisor X (sagittal) value

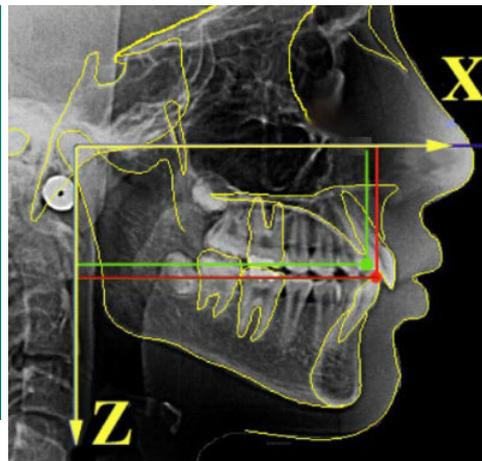


Fig. 8: Skeletal class: evolution of distribution

	Gr. 1870 Average (S.T.)	Gr. 1970 Average (S.T.)	
Overbite	1.17 mm (1.97)	3.81 mm (1.45)	Fig. 5
The FMIA angle	65.97° (8.83)	58.4° (7.85)	Fig. 6
Position of the free edge of the mandibular incisor Sagittal Value	78.75 mm (6.54)	82.88 mm (6.76)	Fig. 8
Vertical value	54.74 mm (5.82)	58.87 mm (8.21)	Fig. 8
Skeletal class	See distribution		Fig. 7

Table 2: Results

Conclusion

In the limits of this study, the overall tendency amongst this population of young Western European males was to mandibular retrusion, vestibuloversion of the mandibular incisors and caudalisation of the free edge of mandibular incisors and overbiting.

This poster was submitted by Dr. Olivier Laplanche.

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The relationship between the upper and lower incisors is one of the keys to occlusal organisation and can be evaluated by:

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STUDY AIMS

Study of recent evolution of incisal relationship in an european population

MATERIAL and METHOD.

Young men average age 25 ans, caucasian type from central europe

MATERIAL

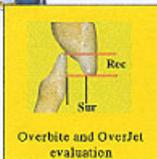
Group 1870:
30 subjects born circa 1870
from Weisbach collection

Group 1970 :
30 subjects born circa 1970
(conscripts from Austrian Army)

METHOD

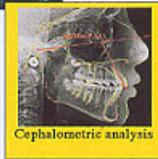
For each subject

Maxillary and mandibulary cast



Overbite and OverJet evaluation

Téléradiographie de profil



Cephalometric analysis

Anterior guide markers

Overbite
Overjet
Inter Inc Angle
Max.Inc./Apeg
Max.Inc./PAO
Max.Inc./pos/Apog
Max.Inc. Inclination
Max.Inc. Position (PIO)
Mand.Inc./Pao
Mand.Inc./Apog
IMPA
Mand.Inc.X/Pao
Mand.Inc.Z/Pao
Mand.Inc./Inag
Mand.Inc./pos/Apeg
Mand.Inc. Inclination
Mand.Inc. Position
Mand.Inc.Egression
Skeletal class
SNE
ANB
SNA
FMIA
Curve of speec

STATISTICAL ANALYSIS

Comparison of populations 1870 and 1970 for each value (parametric test).

RESULTS

Significant differences for the 1970 population compared to the 1870 group for

Overbite



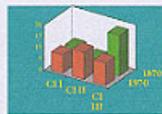
1870 1,17 mm
1970 3,81 mm

F.M.I.A. Angle



65,9°
56,4°

Squeletal class



26% 40% 33%

mand. incisor position



x: 79 mm z: 55mm
x: 83 mm z: 59mm

CONCLUSIONS

Overbite increasing

Vestibularisation of the lower incisor

higher prevalence of skeletal Class II: mandibular retrusion

Augmentation du rayon incision / P.I.O