Mild hypodontia is associated with reduced tooth dimensions and cusp numbers compared to controls in a Romanian sample

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Objectives

- The associations seen clinically between variations in tooth number, size and shape reflect the repetitive genetic interactions occurring between the epithelium and mesenchyme during the initiation and morphogenetic stages of dental development. The **aim** of this study was to investigate this relationship further by *comparing multiple crown parameters*, including cusp numbers, between patients with mild hypodontia and controls.

Methods

- Digital images of dental casts of the permanent dentition from **28** Romanian **subjects with mild hypodontia** and **28 controls** were used. Measurements of the vestibular and occlusal surfaces were performed using a **2D image analysis method** *(Fig.1).*
- Cusps were counted and seven dimensions were measured *(Fig.2, 3):* mesio-distal (MD), occluso-gingival (OG), bucco-lingual (BL), vestibular perimeter, vestibular area, occlusal perimeter and occlusal area
- Multivariate analysis of variance was performed using SPSS V17 software

Fig.1 – The image capturing equipment

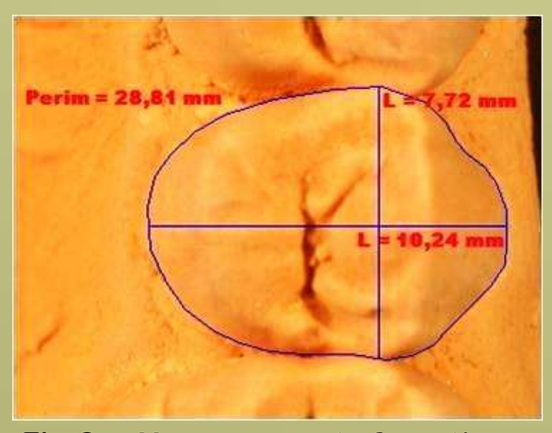
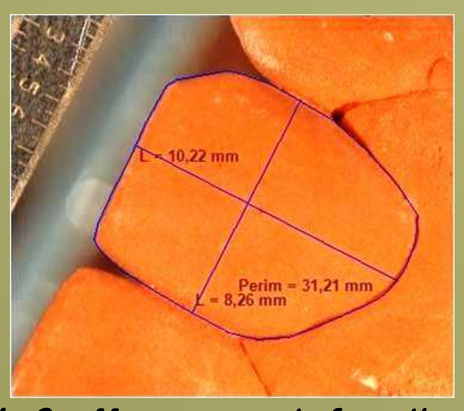


Fig.2 – Measurements from the occlusal view



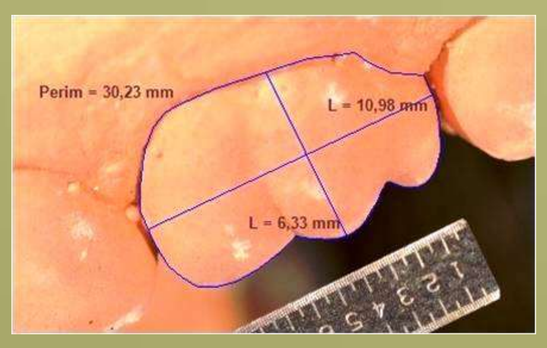
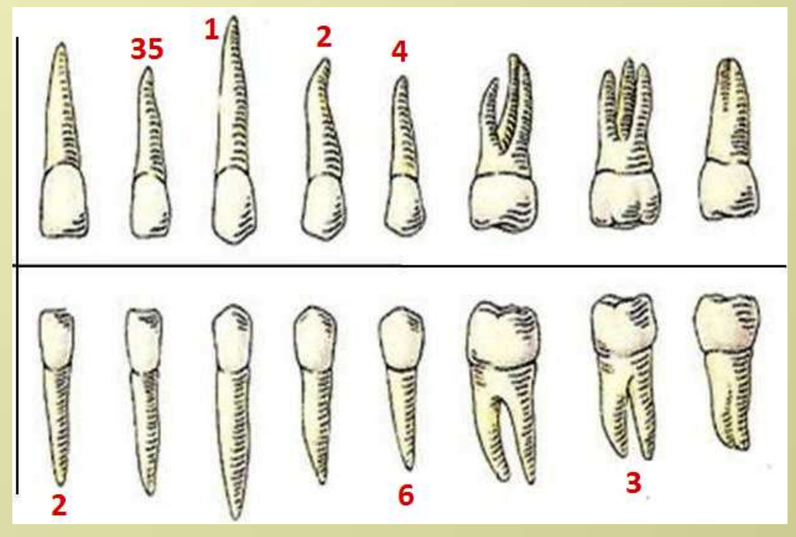


Fig.3 – Measurements from the vestibular view

Results

- Age and gender distribution in both groups:
  - between 13 and 29 years; 16 female and 12 male
- Teeth in the hypodontia group were smaller than those of controls, with many measurements being significantly different (*Table I*).

Number of missing teeth in the hypodontia group



- The **most reduced dimensions** were found in: lower first incisors, upper first premolars
- The **most affected dimensions** were: MD, BL , occlusal area and perimeter
- Upper first molars presented the **Carabelli trait** (*Fig.4, 5*) in significantly less subjects in the hypodontia group than in controls. This variation was accompanied by a difference in tooth height.
- **Lower premolars showed reduced cusp numbers** in hypodontia subjects, accompanied by variation in tooth width or depth.

Fig.4 – Carabelli trait present in a case from the control group

Fig.5 – Missing Carabelli trait in a case from the hypondontia group

Teeth	p values						
	MD	OG	BL	Occl. area	Occl. perim.	Vestib. area	Vestib. perim.
11_21	0.117	0.03	0.0001	0.006	0.005	0.073	0.073
12_22	0.008	0.709	0.631	0.845	0.82	0.924	0.896
13_23	0.001	0.437	0.024	0.001	0.001	0.092	0.137
14_24	0.002	0.302	0.031	0.024	0.023	0.016	0.184
15_25	0.432	0.309	0.298	0.948	0.166	0.328	0.381
16_26	0.108	0.041	0.158	0.567	0.417	0.174	0.139
31_41	0.009	0.239	0.021	0.013	0.007	0.004	0.029
32_42	0.039	0.565	0.226	0.048	0.066	0.717	0.670
33_43	0.024	1.00	0.418	0.175	0.365	0.470	0.518
34_44	0.027	0.191	0.326	0.366	0.481	0.031	0.096
35_45	0.078	0.503	0.009	0.015	0.015	0.284	0.278
36_46	0.374	0.813	0.183	0.457	0.396	0.555	0.587

Table I - Showing the significance of differences between hypodontia and control group in case of each measurement and each pair of teeth

Conclusions

- This study demonstrated differences in multiple parameters of crown size and shape in patients with mild hypodontia compared to controls. The degree of these differences varied between different tooth types and dimensions.

Acknowledgments

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