

ABSTRACTS

OF LECTURES AND POSTERS

EUROPEAN ORTHODONTIC SOCIETY
88th Congress Santiago de Compostela, Spain, 2012
18-23 June

421 QUANTIFICATION OF THE ACID ETCHED ENAMEL PATTERN OF BRACKETS BONDED *IN VIVO*

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AIM: To quantify the proportion of type 1 and 2 acid etch enamel patterns of brackets bonded *in vivo*.

SUBJECTS AND METHOD: Patients planned for extraction orthodontic therapy had their full dentition acid etched and bonded with brackets by light cured liquid resin and Transbond XT composite paste according to the manufacturer's instructions. Thirty-eight premolars were removed for therapeutic reason directly after bonding of the full braces. They were decalcified in 20 per cent formic acid, leaving behind only the cured liquid and composite resins on the brackets. The liquid resin surfaces of the 38 bondings were examined under a scanning electron microscope (SEM), with grids of 10 × 10 boxes best fitting each specimen on the SEM screen. At each grid intersection, the specimen was examined at ×500 magnification to determine the type of bonding pattern. The percentages of type 1 and 2 patterns found at the grid intersections of these 38 brackets were recorded and the descriptive statistics were calculated in Sigmaplot 11.0. Standard deviation (SD) to number of specimens were plotted to confirm the reproducibility of the data obtained.

RESULTS: The average coverage of each bracket by type 1 or 2 pattern was 8 per cent (SD 11.8%, median 3.8%). There were 13 brackets (34% of all brackets) with complete absence of types 1 and 2 patterns. Sixteen brackets (42% of all brackets) had less than 10 per cent of type 1 and 2 patterns. No brackets had more than 40 per cent coverage of type 1 and 2 bonding patterns.

CONCLUSION: In an *in vivo* environment, the proportion of the acid etched enamel patterns on orthodontic bracket bases, related to their mechanical interlocking to human enamel, is small and highly variable and may even be non-existent.

422 A MOLECULAR STUDY OF THE MASSETER MUSCLE IN SUBJECTS WITH A UNILATERAL POSTERIOR CROSSBITE

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AIM: It has been shown that subjects with a unilateral posterior crossbite (UPC) exhibit different mandibular kinematics during mastication when chewing on the affected side, resulting in an increased frequency of reverse chewing cycles. Integrins are a family of cell surface membrane proteins that mediate the interaction of cells with each other; these proteins also link the extracellular matrix (ECM) to the cytoskeletal actin and provide a bidirectional signalling between the ECM and the cytoplasm. The aim to this work was to analyze, by immunohistochemical techniques, biopsies of human masseter muscles of surgical patients with severe Class III malocclusions with a UPC.

MATERIALS AND METHOD: Biopsies were obtained, under general anaesthesia, from the superficial and anterior portion of both masseters of patients undergoing orthognathic surgery. In the immunohistochemical analysis, the expression of the major integrin specific in the muscular tissue: $\alpha 7B$, $\beta 1D$, $\alpha 7A$ and $\beta 1A$ were studied. With specific software, the pixel intensity of 100 fibres was analysed for each reaction and a mean and standard deviation for single fibres were obtained.

RESULTS: The amount of integrins appeared significantly lower, in the right masseter, than that detected in left counterpart; furthermore, $\alpha 7A$ and $\beta 1A$ isoforms, compared with $\alpha 7B$ and $\beta 1D$ isoforms, respectively, were significantly predominant in both masseters.

CONCLUSION: Based on the results, it is possible to hypothesize that the decreased masseter activity on the crossbite side can be strongly related to integrin behaviour. The data provides the first suggestion that integrins in masseter muscle play a key role in regulating muscular activity, allowing the optimization of the contractile forces of this muscle.

423 NATURAL HEAD POSITION AND INTRACRANIAL PLANES

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AIM: To evaluate the reproducibility of natural head position (NHP) using four different photographic methods to reorientate lateral radiographs to NHP, and to determine the grade of coincidence in diagnosis of the three planes studied (Frankfort plane, sella-nasion line and horizontal plane).

SUBJECTS AND METHOD: Standing NHP was studied in a group of 51 patients with unselected occlusions, 36 females and 15 males. NHP was registered four times (first time, 10 minutes later and after 1 week and 1 month). It was firstly performed with the help of a mirror as an external visual reference, secondly with correction by the operator when a significant deviation of posture was observed, thirdly with an air level on glabella and lastly with the level over a SAM facebow (right lateral arm). The reproducibility and method agreement was measured using different statistical analyses. Bland-Altman graphical representation was used to evaluate method agreement.

RESULTS: The reproducibility of NHP was good and similar to others investigations (Dahlberg's coefficient less than 1.8). The method corrected by the operator showed the best reproducibility (Dahlberg's coefficient less than 1.6) and method agreement (Bland-Altman graphical). There was poor coincidence between the three planes studied (Wilcoxon test); Frankfort plane presented less coincidence. The horizontal and sella-nasion lines presented high degrees of coincidence in diagnosis of maxillary position, indicating a retrognathic tendency of the sample.

CONCLUSION: NHP is a good and reliable method in orthodontic diagnosis but the information from classical planes should not be discarded. Frankfort plane showed the best results in variability but the poorest results in diagnosis coincidence with other lines of reference.

424 CEPHALOMETRIC EVALUATION OF MELAS PATIENTS WITH THE m.3243A>G MUTATION IN MITOCHONDRIAL DNA

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AIM: Mitochondrial encephalopathy, lactic acidosis and stroke-like episodes (MELAS) is a maternally inherited mitochondrial diseases caused by mutations in the mitochondrial DNA (mtDNA). It is most commonly caused by the m.3243A>G mutation. The mutation is biochemically characterized by a decreased capacity to produce adenosine triphosphate in the cell. Clinically MELAS is characterized by considerable phenotypic variability and multiorgan involvement. It often manifests in organs with high aerobic energy metabolism such as the nervous system, muscle and heart. Many patients also have short stature. The aim of this study was to find out whether the craniofacial morphology of m.3243A>G MELAS patients differs from that in an unaffected normal population.

SUBJECTS AND METHOD: Twenty-three patients (6 males, 17 females) harbouring m.3243A>G were radiologically examined. The median age was 47 years