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ABSTRACTS OF FREE PAPERS AND KEYNOTE PRESENTATIONS

Abstracts are listed according to the Congress program

February 6, 2026

KEYNOTE SPEAKERS

1. INNOVATING TEEN SMILES – EXPANSION, ANCHORAGE AND THE POWER OF DIGITAL VISUALIZATION

M. PEDERNEIRA

Private practice, Barcelona, Spain

The session focuses on the clinical protocols for maxillary expansion in growing patients including diagnostic criteria, timing considerations, and selection between dental, dentoalveolar, and skeletal expansion strategies. To be emphasized on recognizing the skeletal deficiencies early and utilizing growth potential to improve arch form, crowding resolution, and airway dimensions. It also outlines evidence-aligned protocols for utilizing IPE to achieve predictable skeletal and dentoalveolar expansion. Clinical considerations including patient selection, growth stages, activation patterns, and digital monitoring will also be discussed and explained through case-based examples. The lecture also explains the anchorage and sagittal correction by incorporating MAOB thereby highlighting the integration of occlusal blocks into aligners to advance the mandible, promote favorable growth adaptation, and support stable correction of Class II malocclusions. The approach will be focused on practical guidelines for controlling vertical dimension, optimizing bite advancement, and coordinating MAOB with full comprehensive aligners and treatment strategies. In addition, the presentation will include the advantages of digital visualization through a series of smile-simulation videos and 3D forecast tools and showcase dynamic visual planning to enhance diagnostic accuracy, facilitating communication with patients and parents, and motivates teen engagement by anticipated the expected functional and esthetic outcomes.

2. GINGIVAL RECESSION 2026: EVIDENCE AND PRACTICAL GUIDELINES FOR ORTHODONTISTS

E. ZASČIURINSKIENĖ, L. RASTOKAITĖ

Lithuanian University of Health Sciences, Clinic of Orthodontics, Kaunas, Lithuania

Gingival recession is one of several unwanted consequences of orthodontic tooth movement affecting up to 38% of patients in 5 years posttreatment. Periodontal evaluation — especially assessment of periodontal phenotype is essential when planning orthodontic treatment. Also, understanding the biological limits of tooth movements is a key, which allows to prevent the development and/or progression of gingival recession during treatment.

During the lecture two types of gingival recession (pre-existing and developed during/post-treatment) associated with orthodontic treatment will be discussed. The lecture will cover the latest evidence and clinical guidelines regarding the diagnosis, management & prevention of gingival recessions.

3. TOOTH MICROCRACKS IN 3D: HOW NOVEL IMAGING ADVANCES OUR UNDERSTANDING

I. DUMBRYTĖ

Institute of Dentistry, Faculty of Medicine, Vilnius University, Vilnius, Lithuania

Enamel microcracks represent a clinically relevant yet still under-researched dental health issue. Their clinical impact extends beyond aesthetics, affecting tooth structural integrity, increasing sensitivity, and raising the risk of carious lesions. In orthodontic practice, microcracks often appear or progress during bracket debonding procedures. For decades, our knowledge in this field was limited by 2D imaging techniques, which led to the assumption that microcracks are superficial defects confined to the enamel layer. However, recent advances in 3D imaging using X-ray micro-computed tomography (μ CT), combined with deep learning, have revolutionized this perspective.

Research using machine-learning-enhanced segmentation reveals that microcracks form a complex, star-shaped network extending throughout the tooth structure and, contrary to traditional beliefs, may propagate across the dentin-enamel junction into deeper tissues. Multi-modal approaches integrating μ CT with micro-spectroscopy techniques demonstrate systematic optical and chemical alterations within crack-damaged enamel regions, including a twofold increase in carbon content along the crack lines, suggesting localized organic accumulation.

These findings indicate that microcracks may play a more complex role than previously assumed, potentially contributing to the redistribution of forces rather than acting solely as structural defects. Advanced 3D multi-modal characterization of enamel microcracks provides a scientific foundation for the development of digital diagnostic and monitoring algorithms, supporting improved clinical decision-making in orthodontics and restorative dentistry.

4. HERITABILITY OF PALATAL MORPHOLOGY: EVIDENCE-BASED INSIGHTS FOR MAXILLARY EXPANSION PROTOCOLS AND CLINICAL DECISION-MAKING

M. ŠIDLAUSKIENĖ

Lithuanian University of Health Sciences, Clinic of Orthodontics, Kaunas, Lithuania

Aim. To evaluate the heritability of palatal dimensions in twins with completed maxillary growth and to assess correlations between palatal morphology and selected craniofacial structures—specifically PNS–ANS (maxillary length) and SNA (maxillary sagittal position).

Materials and Methods. The study included 53 twin pairs (mean age 17.82 ± 3.05). Palatal widths, heights, surface area, and volume were measured from digital dental casts. Heritability estimates were obtained using structural equation modeling (SEM). Pearson correlation coefficients were calculated to examine associations between palatal dimensions, PNS–ANS, and SNA.

Results. High heritability was observed for most palatal traits, including intermolar width ($a^2=0.86$), palatal height ($a^2=0.70$ – 0.80), palatal surface area ($a^2=0.61$), and palatal volume ($a^2=0.69$). Significant associations were identified between palatal morphology and craniofacial structures. Palatal area and palatal volume demonstrated positive correlations with PNS–ANS ($r=0.28$, $p=0.003$), indicating that individuals with larger palatal dimensions also exhibit increased maxillary vertical length. Additionally, several anterior palatal parameters correlated positively with SNA: intercanine width at the gingival level ($r=0.27$, $p=0.006$), intercanine height ($r=0.23$, $p=0.018$), and inter-first premolar palate height ($r=0.23$, $p=0.019$).

Conclusions. Palatal morphology is highly heritable and demonstrates meaningful structural relationships with maxillary length (PNS–ANS) and sagittal maxillary position (SNA). These findings highlight the importance of integrating genetically determined palatal characteristics with craniofacial assessment in clinical evaluation and treatment planning.

5. THE INTERSECTION OF ORAL HEALTH AND SLEEP MEDICINE: CAN WE PREVENT OSA?

T. JAGOMÄGI

University of Tartu, Tartu, Estonia

Background. Obstructive sleep apnea (OSA) is common in ageing, overweight populations and is tightly linked to oral health, craniofacial form and orofacial myofunctional disorders. Dental teams often first see mouth breathing, malocclusion, bruxism, periodontal disease or xerostomia, yet care pathways remain treatment-focused, relying mainly on positive airway pressure (PAP), mandibular advancement devices (MADs) and, in selected cases, orthognathic surgery once OSA is established. *Aim.* To explore whether, and to what extent, modifying oral health and orofacial function across the life course can prevent OSA or reduce its severity, and to assess how strong the current scientific evidence is.

Emerging studies suggest that targeting oral posture, tongue tone, and nasal breathing can reduce apnea–hypopnea indices in some children and adults, and that preventive attention to swallowing patterns, nasal breathing and craniofacial growth in early childhood may modify later OSA risk. However, most studies are small, heterogeneous and short-term, and robust trials on primary prevention and long-term outcomes are still lacking.

Conclusion. We cannot yet promise to “prevent OSA” for every patient, but we can move from a purely reactive model to a prevention-oriented, craniofacial sleep medicine approach. This requires routine screening for oral function and sleep-disordered breathing in dental and primary care, earlier interdisciplinary collaboration between dentists, orthodontists, ENT and sleep physicians, and a research agenda that tests multi-component, life-course interventions.

6. CHANGES IN FACIAL ASYMMETRY AFTER ORTHOGNATHIC SURGERY

A. ABELTINS, E. NIKE, P. LOCMELE

Institute of Stomatology, Riga Stradins University, Riga, Latvia

This study evaluated facial soft-tissue asymmetry changes after orthognathic surgery and the accuracy of digital surgical planning using three-dimensional stereophotogrammetry. A total of 185 patients were included: 101 with skeletal Class III malocclusion, 54 with Class II malocclusion, and 30 undergoing digitally planned bimaxillary surgery. Three-dimensional facial images were obtained preoperatively and at 6 and 12 months postoperatively. Twenty-one anthropometric landmarks were analyzed to quantify whole-face and regional asymmetry, while planned and postoperative models were compared to assess surgical accuracy in transversal, sagittal, and vertical planes.

Both Class II and Class III groups showed small but measurable reductions in asymmetry within 6 months, with stability at 12 months. Chin region changes were most pronounced, particularly in Class III patients. Sex- and procedure-related differences were minor and not clinically significant. Digital plan implementation demonstrated high precision, with mean deviations below 2 mm in all planes and greater accuracy in the maxilla than the mandible.

Three-dimensional stereophotogrammetry enables reliable longitudinal assessment of outcomes, and digital surgical planning provides clinically accurate and predictable results in orthognathic treatment.

7. GROWTH OF THE SOFT TISSUES OF THE FACE

G. JĀKOBSONE, S. SILINEVICA, K. KIENKAS

Institute of Stomatology, Riga Stradins University, Riga, Latvia

This presentation aimed to introduce the longitudinal cohort of facial scans obtained in Latvia using stereophotogrammetry (3dMD face scanner, Atlanta, GA, USA). The cohort comprises adolescents aged 11 to 18 years. The growth study aimed to determine the rate and pattern of change in facial landmarks, assess relative growth in facial length and width, and analyze sex-related differences in growth dynamics. The second part of the presentation evaluated clinically relevant facial changes following rapid maxillary expansion.

Growth curves were constructed for upper and lower facial height, inner and outer canthal width, nasal width, lip dimensions, and vertical and sagittal parameters for males and females. The findings demonstrate that vertical and transverse facial dimensions exhibit different growth rates, with distinct peak periods between sexes. The lower face shows more prolonged and intensive growth compared with the midface, while the upper lip demonstrates minimal vertical growth after early adolescence. Sexual dimorphism is evident across multiple facial characteristics and varies by age and anatomical region.

Both, tooth-born (RPE) and bone born (MARPE) rapid maxillary expansion produced similar increases in nasal height and transverse dimensions of the nose, mouth, and nostrils. The magnitude of these changes is influenced by patient sex and age.

These findings contribute to improved understanding of adolescent facial growth patterns and provide clinically relevant insight for orthodontic diagnosis, treatment timing, and outcome prediction.

8. SHORT FACE SYNDROME: SURGERY VS. CONSERVATIVE ORTHODONTIC TREATMENT

D. LATKAUSKIENĖ

Private practice, Kaunas, Lithuania

Short face syndrome in adults is characterized by reduced vertical facial height and altered lower facial proportions, often resulting in functional and aesthetic concerns. Conservative treatment options, such as orthodontic appliances and functional therapy, have minimal impact in adults due to limited skeletal adaptability after growth completion. These modalities may offer minor improvements in soft tissue profile but are generally insufficient for correcting significant vertical deficiency. Surgical approaches are the mainstay for adult patients, providing substantial and predictable changes in facial height and contour. Surgical planning is increasingly individualized, utilizing quantitative assessment of maxillary and mandibular sub-units to guide operative strategy. Outcomes demonstrate significant increases in facial height, improved mandibular angles, and high patient satisfaction, with long-term stability and low complication rates.

In summary, surgical management is the preferred option for adult short face syndrome, offering reliable correction of skeletal and aesthetic deficits. Conservative therapy may be considered in select cases with mild deformity, but its efficacy is limited in the adult population.

February 7, 2026

KEYNOTE SPEAKERS**9. INTEGRATED ROLE OF THE ORAL AND MAXILLOFACIAL SURGEON: OCCLUSION, TEMPOROMANDIBULAR JOINT FUNCTION, AESTHETICS, AND UPPER AIRWAY PATENCY**

D. RAZUKEVIČIUS

Department of Maxillofacial Surgery Hospital of Lithuanian University of Health Sciences (LSMU)
Kauno klinikos, Kaunas, Lithuania

Orthognathic surgery requires the coordinated integration of occlusion, temporomandibular joint (TMJ) function, facial aesthetics, and upper airway patency. TMJ disorders—more than 250 identified conditions—present with diverse symptoms and often require multidisciplinary diagnostics, with MRI remaining the gold standard for evaluating joint morphology. A clear understanding of joint rotation and translation is essential for planning stable surgical jaw movements.

Surgical correction is indicated when skeletal discrepancies cannot be resolved orthodontically and aims to restore functional occlusion, improve facial balance, and enhance airway patency, including in selected cases of obstructive sleep apnea. Because jaw deformities often arise from multifactorial developmental or functional disturbances, treatment relies on a tightly coordinated team approach. Within this team, the oral and maxillofacial surgeon is a central member who collaborates continuously with the orthodontist throughout all stages of care—from initial diagnosis and treatment planning to virtual surgical simulation, intraoperative execution, and early postoperative management. Effective communication between surgeon and orthodontist ensures proper alignment of skeletal and dental objectives and contributes to long-term stability. Through this integrated and communicative approach, orthognathic surgery achieves predictable functional and aesthetic results.

10. CHOOSING THE RIGHT PATH: TREATMENT ALTERNATIVES FOR CLASS II MALOCCLUSION

B. S. YILMAZ

Department of Orthodontics, Bezmialem Vakif University, Istanbul, Turkey

Various treatment alternatives can be applied in the orthodontic management of Class II malocclusion cases, depending on their dental and skeletal components. Extractions, distalization, growth modification, and orthognathic surgery are among these options. In this presentation, an overview of the different treatment modalities will be provided, with a particular focus on distalization and functional treatments.

11. DECISION-MAKING IN CLASS III MALOCCLUSION: FROM EARLY INTERVENTION TO ADULT TREATMENT

B. S. YILMAZ

Department of Orthodontics, Bezmialem Vakif University, Istanbul, Turkey

Effective management of Class III malocclusion requires a tailored approach integrating early treatment in young patients and camouflage or surgical solutions in adults. This lecture outlines the indications, limitations, and expected outcomes of each treatment option, supported by clinical cases and evidence-based protocols.

12. TREATMENT OF COMPLEX CASES USING SKELETAL ANCHORAGE

V. CACCIAFESTA

Private practice, Milan, Italy

The present orthodontic lecture will show the tools, techniques and confidence to immediately treat moderate to difficult cases with the appropriate biomechanics combining TADs and Braces. You will learn about the fundamental bases of orthodontics and understand the importance of biomechanics in the various treatment phases with TADs.

You will learn the importance of interdisciplinary treatments, a careful diagnosis and how to screen your patients to select those cases suitable for a multidisciplinary approach with or without mini-implants, and with or without extractions.

You will understand the actual archwire sequences in the different malocclusions, providing therapeutic concepts and clinical tips for each clinical situation, especially in the management of anchorage control. You will see how orthodontics has changed its mechanics since the introduction of cortical anchorage and TADs.

13. A MULTIDISCIPLINARY APPROACH COMBINING ORTHODONTICS AND OTHER DISCIPLINES FOR THE TREATMENT OF COMPLEX CASE

V. CACCIAFESTA

Private practice, Milan, Italy

Treatment of complex cases, where multiple clinical problems need to be faced, can be demanding if a comprehensive treatment plan is not performed. The presentation will focus on a combined workflow, where Orthodontic procedures are associated with Digital Design of the Smile and pre-visualization techniques, Implant Dentistry with soft and hard tissues augmentation, Perioplastic Surgery and Prosthetic procedures including ceramic minimally invasive bonded restorations. Multidisciplinary treatment strategies will be presented in this lecture to highlight the importance of combining different clinical procedures to achieve an improved result. The lecture will include step by step clinical presentation of different cases.

FREE PAPERS

14. THE TREATMENT WITH INVISALIGN FIRST EFFECTS ON THE ERUPTION PATHWAY OF THE MAXILLARY PERMANENT CANINESD. CEBANOVA¹, G. JĀKOBSONE²¹Private practice, Riga, Latvia²Institute of Stomatology, Riga Stradins University, Riga, Latvia

Clinical studies demonstrate that Invisalign First can achieve predictable increases in maxillary intermolar width (mean 2.5–3.0 mm), intercanine width, and incisor torque control. However, there is no evidence that it affects, reliably improves or normalizes the eruption pathway of the maxillary permanent canines.

Aim. To compare the eruption trajectory of maxillary canines in mixed dentition in patients treated with Invisalign First compared with untreated control group.

Methods. This retrospective study, used measurement technique based on the angle formed between the long axis of the unerupted canine and the midline on a panoramic radiograph. The treatment group consisted of 113 patients (mean age 8.9±0.9 years, 52 boys and 61 girls) treated with Invisalign First I phase. The control group consisted of 39 patients (mean age 7.9±1.1 years, 22 boys and 19 girls). For each included participant, at least two panoramic radiographs were available: one obtained prior to or at the beginning of treatment (T0), and second radiograph (T1) was acquired after approximately one year.

Results. In the control group, the left canine angle to the midline at T0 was 13.3 (IQR 20.3) and 15.1 (IQR 20.3) at T1. The right canine angle to the midline at T0 was 16.3 (IQR 13.7) and 16.1 (IQR 10.7) at T1. In the treatment group, the left canine angle to the midline at the beginning of treatment was 15.7 (IQR 13.8) and 11.3 (IQR 18.8) after one year. The right canine angle to the midline at the beginning of treatment was 16.0 (IQR 13.5) and 9.7 (IQR 19.9) after treatment. The changes were statistically significant ($p=0.002$ and $p=0.008$ for the left and right sides respectively). The change in canine angulation was affected by age in the treatment group (-3.2 CI -5.4 to -1.0 , $p=0.006$) and by age (-5.5 CI -9.6 to -1.4 , $p=0.011$) and presence of crossbite ($p=0.045$) in the control group.

Conclusion. Treatment with Invisalign First I phase improves the angulation of maxillary canine relative to the midline. However, spontaneous improvement in angulation may also occur with increasing age.

15. ASSESSMENT OF THE POSITIONAL CORRELATION BETWEEN MAXILLARY IMPACTED CANINE LOCATION, LATERAL INCISOR AND FIRST PREMOLAR ANGULATION, AND DENTAL ARCH SPACING: A RETROSPECTIVE RADIOGRAPHIC STUDY

G. MOCKUTĖ, R. JAKAVIČĖ, R. ALMONAITIENĖ

Vilnius University, Vilnius, Lithuania

Aim. To evaluate the association between maxillary impacted canine location, lateral incisor and first premolar angulation, and maxillary arch spacing.

Materials and methods. This cohort study (all cases treated in 2013 – 2025 period) was conducted at Vilnius University Hospital Santaros Clinics, Žalgiris Clinic. Patients with unilateral and bilateral maxillary canine impaction were included, and after applying the study criteria, 148 patients contributed 163 impacted canines, each analysed as an independent sample. Lateral incisor and first premolar angulation were measured on OPGs using the external angle between the nasal horizontal axis and the tooth long axis. Canine impaction was assessed on CBCT images, and maxillary spacing was classified from digital models. Statistical analyses included nonparametric tests, correlation analyses, and regression modelling, with significance set at $p<0.05$.

Results. Lateral incisor angulation differed across impaction types, although this variation did not reach statistical significance ($p=0.054$). However, the direction of lateral incisor root angulation showed a significant association with impaction type, with mesial angulation occurring most frequently in palatal impactions ($p=0.001$). First premolar angulation differed significantly among impaction types ($p=0.001$), with labial impactions demonstrating lower angulation than palatal ($p=0.003$) and alveolar impactions ($p=0.007$). The absence of maxillary arch spacing was associated with higher first premolar angulation ($p=0.023$), whereas spacing had no effect on lateral incisor angulation. Regression analysis showed that lateral incisor angulation was a weak but significant predictor of impaction type ($p=0.020$) ($R^2=0.033$).

Conclusions. Labially impacted canines are associated with distal root angulation of the maxillary lateral incisor and lower first premolar angulation, whereas palatally impacted canines are associated with mesial lateral incisor root angulation and higher first premolar angulation.

16. WHAT FACTORS AFFECT THE DURATION OF FORCED ERUPTION OF IMPACTED MAXILLARY CANINES?

M. MONTRIMAITĖ, R. ALMONAITIENĖ
Vilnius University, Vilnius, Lithuania

Aim. To assess duration of forced eruption (FE) of impacted maxillary canines (IMC) and identify associated factors.

Materials and method. In retrospective study, treatment history and panoramic X-rays of subjects who underwent immediate or delayed FE of IMC with closed eruption technique and TMA extrusion spring, NiTi wire, elastic chain or mixed traction were analysed. Regarding bilateral IMC, canine with greater alpha angle was included. Duration was calculated from first activation until canine's eruption. Collected information: age, sex, FE duration, type of FE and anchorage, perpendicular distance from tip of canine's crown to occlusal plane, vertical (by Stivaros and Mandall) and horizontal (by Ericson and Kurol) position, canine's angulation to upper midline (alpha angle), lateral incisor (beta angle), first premolar (eta angle). Data was analysed using descriptive statistics, Spearman correlation, Kruskal-Wallis and Mann-Whitney U test.

Results. Overall, 108 IMC (55 (50.9%) right and 53 (49.1%) left side) were analysed. Mean (SD) age was 15.4 (4.7) years. Mean (SD) and median (IQR) FE duration was 295.9 (291.5) and 209 (253) days, respectively. There was positive correlation between FE duration and angles (alpha ($r(106)=0.34$, $p<0.001$), beta ($r(106)=0.30$, $p=0.001$), eta ($r(106)=0.40$, $p<0.001$), distance from crown's tip to occlusal plane ($r(106)=0.61$, $p<0.001$) and no correlation with age. FE duration was longer when IMC were higher than half the length of lateral incisor's root compared to when IMC were lower ($U=695$, $p<0.001$), also longer when IMC were mesial to lateral incisors than in more distal position ($U=945$, $p=0.008$). There was no significant difference in FE duration between sides, groups of sex, types of FE and anchorage.

Conclusions. Mean FE duration of IMC was approximately 10 months. Duration was affected by higher vertical and more mesial position, greater angulation to midline and adjacent teeth, while age, sex, type of FE and anchorage had no significant effect.

17. EFFECT OF DIFFERENT ORTHODONTIC ADHESIVE REMOVAL TECHNIQUES ON ENAMEL SURFACE ROUGHNESS: AN IN VITRO STUDY

T. MUSULAS, G. KLIMAITĖ, A. VASILIAUSKAS

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Aim. This study aims to assess changes in enamel surface roughness following different residual orthodontic adhesive removal techniques after molar tubes debonding in an in vitro setting.

Material and methods. Forty extracted human molars were allocated into four groups (n=10) based on residual orthodontic adhesive removal technique: G1 – carbide bur (CB); G2 – CB and Enhance polishing points; G3 – CB and OneGloss polishing points; G4 – CB and SuperSnap polishing disks. The average enamel surface roughness of all samples was evaluated using a laser scanning microscope. Scanning electron microscopy (SEM) analysis was performed on one sample per group to determine enamel surface integrity changes. The evaluations were performed before bonding (T1) and after adhesive removal (T2). The time required for adhesive removal was recorded in all groups. Statistical analysis was conducted by applying Shapiro-Wilk, Wilcoxon, Spearman's correlation, Kruskal-Wallis H, and Dunn's tests.

Results. The average enamel surface roughness at T1 was 15.94 (SD 2.68) μm . A significant increase in average surface roughness was observed at T2, reaching 23.18 (SD 7.59) μm ($p=0.000$). The greatest change in surface roughness was observed in G1 (9.43 μm), followed by G2 (8.55 μm), G4 (7.43 μm), and G3 (3.55 μm). Significant differences in adhesive removal time were observed between the G1 and G2 ($p=0.034$), G1 and G4 ($p<0.001$), G1 and G3 ($p<0.001$), G2 and G3 ($p=0.007$). Spearman's correlation analysis revealed a significant correlation between adhesive removal duration and surface roughness at T2 ($p<0.05$). Alterations in enamel surface integrity were observed in all groups following SEM analysis.

Conclusions. Using a carbide bur to remove thick excess of orthodontic adhesive, followed by a OneGloss polishing point to eliminate residual orthodontic adhesive, resulted in the lowest enamel surface roughness and minimal alterations in enamel integrity; nevertheless, this approach was the most time-consuming among those tested.

18. LONG-TERM RELIABILITY OF CEPHALOMETRIC MEASUREMENTS PERFORMED BY ARTIFICIAL INTELLIGENCE SOFTWARE

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Aim. To compare agreement, reliability, and longitudinal performance of two artificial intelligence-based cephalometric analysis software systems with human-performed semi-automatic cephalometry.

Materials and methods. This retrospective longitudinal observational study included 60 lateral cephalograms obtained at the Department of Orthodontics, Lithuanian University of Health Sciences. Cephalometric analyses were performed at two time points (T1: 2023; T2: 2025). Human-performed semi-automatic analysis was conducted using Dolphin Imaging software, while fully automated artificial intelligence analysis was performed using AudaxCeph and WebCeph. Twelve cephalometric parameters recommended by the European Board of Orthodontics were evaluated, and the time required for each analysis was recorded. Agreement and reliability were assessed using intraclass correlation coefficients (ICC) and Bland-Altman analysis. Paired t-tests or Wilcoxon signed-rank tests were applied to detect systematic differences between methods. A clinically significant difference was defined as a difference greater than 2° and 2 mm for angular and linear measurements.

Results. Human-performed measurements demonstrated high intra-examiner reliability at both time points (ICC>0.82). AudaxCeph showed good to excellent agreement with human analysis (ICC 0.751-0.948 at T1 and 0.779-0.951 at T2), with clinically significant differences limited to LI-Go-Gn and UI-LI at T1 and only LI-Go-Gn at T2, indicating improved agreement over time. In contrast, WebCeph exhibited greater variability (ICC 0.524-0.864 at T1 and 0.468-0.908 at T2) and a higher number of clinically significant differences, involving SN/ANS-PNS, SN/GoGn, ANS-PNS/GoGn, LI-Go-Gn, and UI-LI at T1, with additional discrepancies for ANPg at T2. Artificial intelligence-based analyses were 32-47 times faster than human analysis. Patient age and sex had no statistically significant influence on measurements.

Conclusions. Artificial intelligence-based cephalometric analysis offers substantial time efficiency; however, agreement and accuracy are software-dependent. AudaxCeph demonstrated stable and reliable longitudinal performance, whereas WebCeph showed greater variability across time points. Human supervision remains essential.

19. IS THERE A RELATIONSHIP BETWEEN DIFFERENT ORTHODONTIC MALOCCLUSIONS AND OSSIFICATION CHANGES IN THE CRANIAL BASE AND UPPER CERVICAL SPINE?

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Aim. To evaluate the relationship between the morphological features of sella turcica bridging (STB), ponticulus posticus (PP), and atlas posterior arch deficiency (APAD) with cervical vertebral maturation stages and skeletal malocclusion types.

Subjects And Methods. The study sample consisted of 300 randomly selected pre-orthodontic treatment patients (153 females, 147 males; aged 7–40 years). According to the study protocol, cephalometric analysis was performed twice by two researchers, under the supervision of a radiologist. The Cohen's Kappa coefficient was used to evaluate inter-examiner reliability. The patients were divided into groups according to cervical stage (CS1–CS6) and skeletal malocclusion type. Statistical analysis was performed using SPSS version 29.0.

Results. PP prevalence was 51.33% (11.33% complete, 40.0% partial), STB 52.67% (15.67% complete, 37.0% partial), and APAD 20.67%. PP was significantly more common in men (56.7%), while STB was more common in women (60.1%). All three anomalies were more common in Class II skeletal patterns, followed by Class I and Class III, with only PP showing a statistically significant association ($p=0.042$). Both PP and STB were more prevalent in postpubertal stages (CS5–CS6), although statistical significance was observed only for STB (58.2%; $p<0.05$). Furthermore, PP and STB occurred more frequently in patients with low mandibular plane angle (43.3% and 51.1%, respectively), while APAD was more frequent in those with high mandibular plane angle (24.2%). However, only APAD showed significant difference ($p<0.05$).

Conclusions. Sella turcica bridging, atlas posterior arch deficiency, and ponticulus posticus were related to sex, skeletal pattern, and cervical vertebral maturation stages. Ponticulus posticus was more prevalent in males and in patients with Class II malocclusion. Sella turcica bridging occurred more frequently in females and during the postpubertal period. Atlas posterior arch deficiency was more common in individuals with high mandibular plane angle.

20. BOND STRENGTH OF ORTHODONTIC MOLAR TUBES: THE ROLE OF BASE AREA AND ENAMEL SANDBLASTING – AN IN VITRO STUDY

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Background. Adequate bond strength of orthodontic molar tubes to enamel is essential to ensure appliance stability under high masticatory forces. Insufficient adhesion may lead to frequent debonding and prolonged orthodontic treatment.

Objective. To evaluate the effect of orthodontic tube base area and enamel sandblasting on debonding force (N) and shear bond strength (MPa) in vitro.

Materials and Methods. Eighty extracted permanent molar teeth were used for this study, divided into four groups of 20 samples each: M—small base tubes (non-sandblasted enamel), SM—small base tubes (sandblasted enamel), T—large base tubes (non-sandblasted enamel), and ST—large base tubes (sandblasted enamel). Shear bond strength was measured using the Mecmesim Multitest 2.5-I device. Statistical analysis was conducted using IBM SPSS 27.0 software, applying ANOVA and Tukey's post hoc test.

Results. The highest mean debonding force was recorded in the ST group (85.51 ± 25.04 N), and the lowest in the M group (50.23 ± 19.76 N). Tube base area had a statistically significant effect on debonding force ($p < 0.001$), whereas enamel sandblasting did not ($p > 0.05$). When expressed as shear bond strength, the highest value was observed in the SM group (11.31 ± 3.57 MPa), while the lowest was found in the T group (4.89 ± 1.33 MPa). Small-base tubes demonstrated significantly higher shear bond strength per unit area compared to large-base tubes ($p < 0.001$).

Conclusions. Orthodontic tube base area significantly influences bonding performance. Large-base tubes require higher removal forces, while small-base tubes exhibit higher shear bond strength per unit area. Additional enamel sandblasting before phosphoric-acid etching does not significantly improve bond strength on intact enamel.

21. TREATMENT OUTCOME OF IMPACTED MANDIBULAR CANINES

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Objective. This study aimed to evaluate the duration of orthodontic traction required for impacted mandibular canines to erupt and to assess their periodontal status following treatment. A secondary aim was to determine how the position of the canine influences the traction duration.

Materials and methods. This study was carried out using clinical data collected from patients who received treatment at the Riga Stradiņš University Institute of Stomatology between May 2010 and December 2024. A total of 712 patients' records with 870 impacted teeth were retrieved from the database; 36 patients were selected based on the inclusion and exclusion criteria. Finally, 16 patients and 17 impacted mandibular canines were included in the study. Post-treatment, patients were recalled for clinical evaluation. The periodontal condition of the impacted canines was assessed and compared with their normally erupted contralateral counterparts, which served as controls.

Results. Panoramic radiographs, clinical findings, and medical records were analyzed. The 17 impacted mandibular canines required an average of $17.96 (\pm 16.06)$ months to be brought into the arch, with treatment times ranging from 2.5 to 49.30 months. Linear regression identified the angular measurements as the strongest predictors of traction duration, with the angle between the canine and the occlusal plane ($\angle OP$) showing the strongest association ($R^2 = 0.581$). Comparison of the normally erupted contralateral and the impacted tooth showed a statistically significant difference in crown length ($p = 0.023$).

Conclusion. Canine angular position was a stronger predictor of treatment duration than linear distances, with each 1° increase in $\angle OP$ reducing traction time by 0.628 months and each 1° increase in $\angle ML$ increasing it by 0.698 months. Systematic clinical and radiographic assessments confirm that orthodontic traction within biological limits can successfully erupt impacted mandibular canines while preserving periodontal stability; however, crown length may be influenced by traction mechanics, emphasizing the need for precise biomechanical planning.

Key Words. Orthodontic treatment; Periodontal health; Panoramic radiographs; Long term; Mandibular canines; Impacted canines; Tooth traction.

22. EFFECT OF IMPACTED CANINES ON MAXILLARY SINUS VOLUME AND DIMENSIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background. Maxillary impacted canines are a concern in orthodontics, with a wide scope of causes and consequences. A neighboring anatomical structure — the maxillary sinus (MS) — tends to be affected by the impaction.

Objective. To assess patients with and without impacted canines maxillary sinus volume (MSV) and dimensions (length, width, height)

Materials and Methods. The search for relevant studies has been carried out through five databases (PubMed, ScienceDirect, Wiley, Springer Link, Google Scholar) up to August 2025. The primary focus was for studies examining the maxillary sinus volume and/or dimensions in patients with and without impacted canines by cone-beam computed tomography. As for the risk of bias, Newcastle-Ottawa Scale for cohort and case-control studies has been utilized. For the meta-analysis MedCalc software was used.

Results. A total of 1 579 articles were identified; five met the inclusion criteria. Regarding methodological quality, three articles were graded as “Good” and two as “Moderate”. In the meta-analysis, patients with unilateral palatally impacted canines (PICs) demonstrated a significant difference in MSV, whereas those with buccally impacted canines (BICs) did not. Regarding maxillary sinus dimensions (MSD), no significant differences were observed in either group; however, a controversial variation was observed in bilateral PICs. From pre- to post-treatment, PICs showed a difference in MSV. In both types of impaction, MS extended more often into the incisor and canine regions. For each 1000 mm³ decrease in sinus volume, the odds of PICs increased by 1.7 times, and vice versa in BICs. Each 1 mm increase in sinus height increased the odds of PIC by 22%.

Conclusion. The MSV is prone a significant reduction in PICs, but not in BICs. In case of bilateral PICs, the MSDs tends to be reduced, whereas unilateral PICs and BICs do not. From pre- to post-treatment of PICs, MSV increases. PICs are more frequent in smaller or higher sinuses, and BICs are more common in larger sinuses.

E-POSTERS

23. COLOR CHANGES OF ORTHODONTIC ALIGNERS DUE TO DIETARY BEVERAGES: IN VITRO STUDYG. TRAKINYTĖ¹, D. TRAKINIS², A. VASILIAUSKAS³, G. TRAKINIENĖ³¹Faculty of Odontology, Lithuanian University of Health Sciences, Kaunas, Lithuania²ETH Zurich University, Zurich, Switzerland³Department of Orthodontics, Lithuanian University of Health Sciences, Kaunas, Lithuania

Aim. To determine whether transparent orthodontic aligners change color from coloring components in the most consumed beverages.

Materials and methods. The study group consisted of 77 aligners samples divided into 11 groups of 7 specimens. The control group samples were immersed in the distilled water, while the other groups were the following: Coca-Cola, apple juice, black tea, red wine, green tea, dark beer, Fanta, orange juice, cappuccino, black coffee. The color changes of the samples were measured with a standard colorimeter (datacolor, ColorReaderPro) 3 times: before immersion, after 12 hours and after 7 days. IBM SPSS 28.0.1.1 was used for statistical analysis. The statistical significance of the effects of different solutions on clear orthodontic aligners was tested using one-way and two-way dispersive analysis (ANOVA). The difference in results between variables was considered statistically significant when $p < 0.05$.

Results. The results showed that all solutions after 12 hours caused color changes compared to the control group. The smallest color changes, compared to the control distilled water group, were seen in the dark beer, apple juice, orange juice, cappuccino, Fanta, Coca-Cola groups (ΔE varied from 1.25 to 1.33). The green tea and red wine samples changed slightly more (ΔE varied from 1.72 to 1.82). The largest change after twelve hours was observed in the black coffee ($\Delta E = 3.78$) and black tea ($\Delta E = 2.68$) group. After 7 days, only the apple, orange juice, and Coca-Cola groups showed a slight change in the color of the orthodontic aligners (ΔE varied from 1.51 to 1.53), while the color changes intensified in all other groups. The most significant changes were seen in the black coffee ($\Delta E = 5.2$) and the black tea ($\Delta E = 3.93$) groups.

Conclusions. All evaluated beverages caused color changes of the clear orthodontic aligners even after 12 hours and 7 days, the most pronounced of which were in the black coffee and black tea groups.

24. THE INFLUENCE OF BEVERAGES ON THE COLOR OF AESTHETIC ORTHODONTIC LIGATURES: IN VITRO STUDYG. TRAKINYTĖ¹, D. TRAKINIS², A. VASILIAUSKAS³, G. TRAKINIENĖ³¹Faculty of Odontology, Lithuanian University of Health Sciences, Kaunas, Lithuania²ETH Zurich University, Zurich, Switzerland³Department of Orthodontics, Lithuanian University of Health Sciences, Kaunas, Lithuania

Aim. The aim of this in vitro study was to investigate the influence of certain liquids on the color changes of aesthetic orthodontic elastic ligatures.

Materials and methods. The study samples of aesthetic orthodontic ligatures were divided into 11 groups of 7 specimens and placed in the containers with the corresponding liquids. The ligatures of the control group were not immersed in the liquids. The following beverages were tested: Coca-Cola, Fanta, green tea, black tea, orange juice, carrot juice, beetroot juice, apple juice, black coffee, turmeric solution. Measurements of the color changes of the ligature sticks were performed after 10 days of soaking, using a spectrophotometer (Ocean Optics USB4000 UV-VIS). Statistical analyses were performed

using IBM SPSS 28.0.1.1. The statistical significance of the effects of different solutions on elastic ligatures was tested using one-way repeated measures analysis of variance (ANOVA, Fisher PLSD test). The difference in results between variables was considered statistically significant when $p < 0.05$.

Results. When evaluating the effect of solutions on the color changes of orthodontic transparent ligatures, it was found that black coffee ($\Delta E = 19.93$) and turmeric solutions ($\Delta E = 17.65$) changed the color of the ligatures the most, followed by black tea ($\Delta E = 17.51$), carrot juice ($\Delta E = 14.99$) and Fanta ($\Delta E = 14.08$). Meanwhile, green tea ($\Delta E = 13.86$), beetroot ($\Delta E = 12.54$), apple ($\Delta E = 11.39$), orange juice ($\Delta E = 9.08$) and Coca-Cola ($\Delta E = 11.29$) stained the ligature sticks less. All the liquids produced high clinically visible changes of color (NBA units varied from 8.35 to 18.34).

Conclusions. The data from this experiment suggested that the most pronounced statistically significant color change over 10 days was observed in the coffee, turmeric, and black tea groups.

25. THE MOST POPULAR DIETARY BEVERAGES AMONG ORTHODONTIC PATIENTS: A PILOT STUDY

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Aim. To identify the most commonly consumed beverages among orthodontic patients.

Materials and methods. In order to find out what beverages were most commonly consumed, a pilot questionnaire study was conducted. The questionnaires were anonymous and consisted of 17 closed-ended questions with possible answers. The questionnaire listed the most popular beverages consumed in previous studies and provided possible answers about the frequency of consumption of these beverages, e.g., once a day, once a week, etc. The questionnaire was posted in the Facebook group "BRACKETS! And everything related to teeth!". The survey was attended by 415 respondents. Descriptive statistics were performed for the study variables. A chi-square test was used to determine the difference in the prevalence of used beverages between the genders. A value of $P < 0.05$ was considered significant.

Results. The results of the study showed that cappuccino (23.40%) and black coffee (10.80%) and black (8.00%) and green (9.40%) tea were most commonly consumed at least once a day. Meanwhile, Coca-Cola (36.40%), orange (15.40%), Fanta (9.10%), apple juice (8.50%), dark beer (4.10%) and red wine (2.20%) were most commonly consumed at least once a week. Carrot, beetroot, tomato juice and Matcha were least commonly consumed during the week (about 2%). Women drank cappuccino and green tea, all juices and red wine statistically significantly more often than men ($P < 0.05$), while men drank black coffee, black tea and dark beer more often ($P < 0.05$).

Conclusions. The following beverages were most commonly consumed among orthodontic patients: cappuccino, black coffee, black tea, green tea, Coca-Cola, Fanta, orange and apple juice, dark beer and red wine.

26. RESIN INFILTRATION AND FLUORIDE VARNISH FOR ICDAS ≤ 2 WHITE SPOT LESIONS DURING ORTHODONTIC TREATMENT: A NARRATIVE REVIEW AND META-ANALYSIS

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Background. White spot lesions (WSLs) are a common adverse effect of multibracket orthodontic treatment due to biofilm accumulation around brackets. Resin infiltration masks enamel lesions

by penetrating the porous enamel surface, while fluoride varnish enhances remineralization. The comparative effectiveness of these approaches for managing ICDAS ≤ 2 WSLs remains unclear.

Purpose. To evaluate the clinical effectiveness of resin infiltration compared with fluoride varnish in managing ICDAS ≤ 2 WSLs in orthodontic patients.

Material and methods. A narrative review with meta-analysis was performed according to PRISMA (PROSPERO: CRD420251239505). Five databases were searched between November 2020 and December 2025. Randomized controlled trials comparing resin infiltration with fluoride varnish or placebo in orthodontic patients with ICDAS ≤ 2 lesions were included. Risk of bias was assessed using the Joanna Briggs Institute checklist. Four trials were eligible.

Results. All trials showed low risk of bias and consistently favored resin infiltration. Meta-analyses of ΔE outcomes demonstrated a significantly greater reduction in color difference after resin infiltration (mean difference -3.27 ; 95% CI -4.26 to -2.28 ; $I^2=0\%$), indicating superior esthetic masking. Narrative findings also showed greater lesion regression and caries arrest than fluoride varnish.

Conclusion. Resin infiltration is more effective than fluoride varnish in improving esthetic outcomes and promoting regression of ICDAS ≤ 2 WSLs in orthodontic patients. Further randomized trials with longer follow-up are recommended.

27. WELL-BEING OF ORTHODONTIC PATIENTS WEARING ORTHODONTIC APPLIANCES

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Aim. The purpose of this investigation was to analyze and evaluate the psychological health of patients wearing various orthodontic appliances during orthodontic treatment, emphasizing mental issues rather than psychical ones.

Materials and methods. The study group consisted of 339 patients. The criteria for inclusion into investigation were as follows: patients that were being treated orthodontically in the Orthodontic Clinic without mental disorders and congenital syndromes. Investigation was performed using anonymous questionnaires made up of 31 questions that were composed to evaluate the psychological well-being of patients wearing orthodontic appliances. Printed questionnaires in the Lithuanian language were given to the patients during their visit to their orthodontist. All of the questions were given with an option to choose from given answers or, if needed, to write their own. Investigation was performed in an Orthodontic Clinic. All of the collected data were processed using the SPSS 22.0 program which was used in collecting and analyzing data. Descriptive statistics were reported as the mean and standard deviation (SD). Hypotheses of interrelations between characteristics were verified using the Pearson chi-squared test (χ^2), p-values less than 0.05 were considered significant. The power of the analysis was 0.8.

Results. It was discovered that during the treatment, 41.6% of the patients were satisfied with their smile while 48% were unsatisfied. Considering the psychological well-being of the patients, almost 50% of the subjects (48.7%) noted that they were feeling good and about 38% noted that they were feeling normal. Nevertheless, only 4% of all subjects included in this investigation noted that they were feeling bad while wearing orthodontic appliances. Also, a statistically significant difference was found between genders as women were more likely to feel very comfortable (great) while men usually felt good or normal while wearing orthodontic appliances. Only 9% of the subjects stated that they felt unhappy while wearing orthodontic appliances; however, 45% of subjects stated that they felt unhappy at least sometimes. It was found that 43% of subjects felt stress while wearing orthodontic appliances. There was a statistically significant difference between patients younger than 14 years old wearing removable appliances and patients older than 14 years old wearing

braces, as these two groups felt stress more often than other patient groups. Speech difficulties were experienced by more than 30% of the subjects and about 26% indicated that they felt they experienced speech difficulties at least partially. The most common speech difficulties were slurred speech (84%) and difficulties pronouncing certain words (16%).

Conclusions. In conclusion, even though patients indicated several negative aspects of orthodontic appliances on their well-being during orthodontic treatment, for the majority of the subjects, the end results of the treatment significantly increased their psychological well-being, self-esteem and social life.

28. THE MOST IMPORTANT RISK FACTORS AFFECTING THE PHYSICAL HEALTH OF ORTHODONTISTS: A PILOT STUDY

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The aim. First, to evaluate the most frequent problems in the physical health of orthodontists; second, to find out which factors in the working environment of dental specialists have the most important influence on the physical health of orthodontic practitioners.

Materials and methods. The study sample consisted of 266 respondents with a mean age of 34.5 ± 10.1 years. The research method was an anonymous questionnaire survey which was posted on the website <https://apklausa.lt>. The questionnaire consisted of a total of 42 questions. Six open-ended and closed-ended questions were designed to gather general information about respondents: their gender, age, place of work, qualifications, and work experience. The 3 open-ended questions were designed to find out the workload of the dental specialist in terms of working hours. The eleven closed-ended questions were designed to assess dental specialists' attitudes towards their work and their personal self-assessment of their health status. A scale type 1 question was asked to help specialists indicate how often they experience certain ailments during and after work. The five questions were about doctors' leisure, sports, and harmful habits. Finally, 14 questions were about the ergonomic working conditions of dental specialists and the application of ergonomic standards in their everyday practice, which were translated from other studies. The data was processed by IBM SPSS Statistics (Statistical Package for Social Sciences, version 17) and Microsoft Office Excel 2013. Chi-square (χ^2) and ANOVA tests were used to determine statistically significant differences in results. A p-value of 0.05 was considered significant

Results. Dentists mostly had diseases of the musculoskeletal system (24.4%) and respiratory system (20.4%). The most common problems faced by dentists every day or at least once per week were general physical (61.3%), eye fatigue (48.9%), back (51.7%), shoulder girdle (45.4%), and neck (44.8%) pain. In contrast, orthodontists had general physical (43.3%, $p=0.027$), back (35.5%, $p=0.033$), shoulder girdle (32.5%, $p=0.023$), and neck pain (31.5%, $p=0.017$) less frequently. Dentists and orthodontists who used an individually adjustable chair with a backrest experienced back pain during work significantly less than specialists who used other types of chairs ($p=0.006$). They also experienced fewer shoulder girdles ($p=0.008$) and neck pain ($p=0.003$). It was found that both dentists and orthodontists who kept the tools close to themselves were less likely to experience back ($p=0.016$) and shoulder girdle pain. Specialists who took breaks between patients had statistically significantly less pain during and after work. Dental practitioners (18.1%) and 5.6% of orthodontists who kept their knee joints bent at an angle of less than 90 degrees during work suffered from back ($p=0.001$), shoulder girdle pain ($p<0.001$), and lower back pain ($p=0.049$) more frequently than colleagues who bent their knees at 90 or 100 degrees. Respondents believed that pain and ailments could be caused by static and prolonged backward positions, long working hours due to a desire to ensure the most comfortable treatment position for the patient, work without an assistant, and low physical activity after work.

Conclusions. The health status of orthodontists was better than that of dentists. Usually, orthodontists experience shoulder and neck pain. The factors that helped to avoid health disorders in orthodontic specialists were the use of individually adjustable backrests and saddle-type chairs, maintaining a neutral sitting position, keeping work equipment as close as possible, and breaks between patients during work. The main limitation of this study was a small sample size. Thus, future research with larger data should be conducted for the evaluation of the effect of new technologies, such as self-ligating or indirect bonding effects on the health of orthodontists.

29. CLINICAL EFFICACY OF ALIGNERS WITH MANDIBULAR ADVANCEMENT IN TREATMENT OF CLASS II MALOCCLUSIONS COMPARED TO CONVENTIONAL FUNCTIONAL APPLIANCES: A SYSTEMATIC REVIEW

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Background and Objectives. Clear aligners were initially limited to the treatment of mild malocclusions. Recent advancements have expanded their use to skeletal Class II correction through mandibular advancement features designed to mimic conventional functional appliances. However, evidence regarding their clinical effectiveness, particularly compared with traditional functional appliances, remains limited. The aim of this systematic review is to evaluate the clinical effectiveness of clear aligners with mandibular advancement in the management of Class II malocclusion, in comparison with conventional functional orthopedic appliances.

Material and methods. The protocol of the systematic review is in line with the PRISMA requirements, papers published in English language between 2020 and 2025 were searched in PubMed, ScienceDirect, The Cochrane Library and Google Scholar databases using the PICO framework. The ROBINS-I tool was used to assess the risk of bias.

Results. A total of 726 articles were identified. After eliminating duplicates and applying eligibility criteria, nine studies involving 412 patients were included, primarily using cephalometric analyses to evaluate skeletal and dental changes before and after treatment. Despite variability in the parameters assessed and methodologies used, both aligners with mandibular advancement and conventional functional appliances showed similar skeletal and dental correction. Consistent reductions in overbite and overjet, increases in SNB as well as decreases in ANB and Wits appraisal.

Conclusion. Aligners with mandibular advancement appear to be an effective option for treating Class II malocclusions in growing patients, demonstrating similar dentoalveolar and skeletal effects to conventional functional appliances. However, methodological limitations and heterogeneity among studies restrict the strength of the evidence.

Keywords. Mandibular advancement, Functional appliances, Invisalign mandibular advancement, Class II malocclusion, Mandibular skeletal retrusion

30. THE EFFECT OF ORTHODONTIC LOWER PREMOLARS EXTRACTION TREATMENT ON MANDIBULAR THIRD MOLARS ANGULATION: A SYSTEMATIC LITERATURE REVIEW

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Objectives. Third molars are the most commonly impacted teeth. The angulation of lower third molars may be improved after orthodontic treatment involving the extraction of premolars. The aim

of this study is to evaluate whether orthodontic treatment with lower premolar extractions affects changes in the angulation of mandibular third molars.

Methods. The search was conducted up to December 29th, 2025, in databases PubMed, PMC, ScienceDirect, Cochrane Library following PRISMA guidelines. PICO question: in patients undergoing orthodontic treatment, does the extraction of lower premolars affect the angulation of mandibular third molars compared to those who do not have premolars extracted? Used keywords: “third molar”, “extraction”, “angulation”, “orthodontic treatment”. To be included, the study had to be full-text article written in English and published less than 5 years ago.

Results. Six articles were included in this review. A total of 647 subjects were evaluated before and after orthodontic treatment with a fixed bracket system using orthopantomograms (OPGs). Four studies examined mandibular third molars [1, 3, 4, 6] and two studies assessed both maxillary and mandibular third molars [2, 5]. Only lower molars were analyzed in this review. Patients were treated either with premolar extractions or without extractions. Several studies reported that changes in mandibular third molar angulation before and after treatment were not statistically significant between extraction and non-extraction groups [2, 3, 4]. In contrast, two researches found statistically significant differences between these groups ($p < 0.05$) [1, 5]. Additionally, one study reported that angulation changes were significant only when the second premolar was extracted ($p = 0.002$) [6].

Conclusions. This review found inconsistent evidence regarding significant changes of mandibular third molar angulation, after orthodontic treatment with premolars extraction or without.

31. THE RELATIONSHIP BETWEEN THE AIRWAY WIDTH, DENTAL ARCH WIDTH, AND PALATAL HEIGHT IN SAGITTAL ORTHODONTIC ANOMALIES

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Aim. The aim of this study was to evaluate the relationship between sagittal skeletal orthodontic anomalies and airway width, dental arch width, and palatal height.

Materials and methods. This retrospective study was approved by the Kaunas Regional Biomedical Research Ethics Committee, number BE-2-100. According to study protocol, 100 patients (mean age 18.83 ± 5.36) were randomly selected from the database of the Department of Orthodontics at the Lithuanian University of Health Sciences. Inclusion criteria: pre-orthodontic patients, patients without congenital syndromes, high-quality lateral cephalograms. Patients were divided in two groups based on the type of skeletal malocclusion: Angle I (ANB $0-4^\circ$) ($n=50$), Angle II (ANB $>4^\circ$) ($n=50$). The ANB, upper and lower airway widths were measured in lateral cephalograms using WebCeph software v.2.0.0. Maxillary and mandibular arch widths and palatal height were evaluated using digital dental models analyzed with Medit Link software v3.3.0. Palatal height index was calculated according to the Korkhaus formula. Statistical analysis was performed using IBM SPSS 29.0, with $p < 0.05$ considered significant.

Results. Out of 100 patients, 61 % were females and 39 % were males. The results revealed that patients with skeletal Class II malocclusion showed significantly narrower upper airway width (13.04 ± 3.21 mm) compared to Class I patients (14.72 ± 2.88 mm) ($p = 0.007$). No significant differences were found in lower airway width. Maxillary arch width in premolar and molar regions was significantly reduced in Class II patients ($p < 0.05$). Mandibular arch width, palatal height, and palatal height index did not differ significantly between the groups.

Conclusion. Patients with skeletal Class II malocclusion exhibited significantly narrower upper airway width and maxillary arch width. Differences in lower airway width and mandibular arch width were not statistically significant between the groups. No statistically significant differences in palatal height parameters were found.

32. EVALUATING THE IMPACT OF DIFFERENT CLEANSING AGENTS ON THE COLOR STABILITY OF CLEAR ALIGNERS: IN-VITRO STUDY

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Aim. This in-vitro study aims to evaluate the staining effects of various commonly consumed beverages on clear orthodontic aligners and to compare the cleaning efficacy of different cleansing solutions after staining, with color changes assessed via spectrophotometric analysis. It is hypothesized that commonly consumed beverages will cause measurable and statistically significant discoloration of clear orthodontic aligners, and that aligner cleansers will be effective in reducing discoloration.

Materials and methods. The study was conducted at the Lithuanian University of Health Sciences, Kaunas, Lithuania. Clear aligners from the Ordoline brand were used. A total of 100 clear orthodontic aligners were immersed for 7 days in four commonly consumed beverages, specifically black coffee, black coffee with milk, kombucha and a green smoothie, as well as in distilled water, which served as the control solution. Following this immersion period, 20 aligners from each beverage group were cleaned using four different cleansing agents: Bluem Aligner Foam, Curaprox BDC 100 Denture Gel Daily, IsoDent Ortho Cleaner and 3% hydrogen peroxide. The VITA Easy-Shade compact spectrophotometer used the Commission International lightening L*a*b* color scheme to evaluate the color change of the aligners at four intervals. T0 (before immersion), T1 (after 24 hours), T2 (after 48 hours), T3 (after 7 days), and T4 (after cleaning with cleansing agents). The color values were converted into National Bureau of Standards (NBS) units to quantify the degree of color change. Statistical analysis was performed using SPSS software, employing non-parametric methods to assess differences between groups and across time intervals.

Results. Significant color changes in aligners were detected after immersion in the tested solutions ($p < 0.001$). Among the staining agents, black coffee induced the highest and most consistent colour change at T0 - T3 $\Delta E = 8.867$ (8.553-9.22), followed by coffee with milk $\Delta E = 3.325$ (3.259-3.544), kombucha $\Delta E = 2.45$ (2.272-3.094) and green smoothie $\Delta E = 1.581$ (1.463-1.723) ($p < 0.001$). Intergroup and intragroup comparisons of the cleansing agents showed no significant differences.

Conclusions. The study demonstrated significant differences in the staining potential of the evaluated beverages, with black coffee producing the most pronounced discoloration of clear aligners. All specimens exhibited a progressive increase in color alteration over the observation period. Furthermore, the cleansing agents investigated showed limited effectiveness, with no statistically significant capability to reverse the discoloration.

33. ASSESSING MAXILLARY CANINE RETRACTION AFTER FLAPLESS LASER CORTICOTOMY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aim. The aim of this systematic review and meta-analysis is to evaluate the effectiveness of flapless laser corticotomy in accelerating canine distalization during extraction - based orthodontic treatment.

Material and methods. This systematic review was performed in accordance with the PRISMA guidelines. A comprehensive electronic search was conducted across PubMed, The Cochrane Library, ScienceDirect, and Web of Science databases, employing electronic databases and hand searches. The search included all available human studies published in English up to August 31,

2025, with no time restriction applied. The quality of the studies was assessed using the Cochrane Risk of Bias tool (RoB 2.0) and the statistical examination was done using the Review Manager 2020 (RevMan-5, Version 5.4. Copenhagen: The Cochrane Collaboration, 2020).

Results. The study included 7 split-mouth studies with 103 patients, of which 4 studies with 55 patients were suitable for quantitative analysis. Flapless laser corticotomy significantly accelerated canine distalization in the first month (MD=0.83, 95% CI: 0.30, 1.35; $p=0.002$) and second month (MD=0.44, 95% CI: 0.09, 0.79; $p=0.01$), despite high heterogeneity. No significant differences were found in the third (MD=0.03, 95% CI: -0.18, 0.24; $p=0.79$) or fourth month (MD=-0.04, 95% CI: -0.13, 0.05; $p=0.37$).

Conclusions. The findings of this systematic review and meta-analysis indicate that flapless laser corticotomy can effectively enhance the rate of canine distalization during the initial two months of orthodontic treatment. However more high-quality trials with bigger sample sizes should be performed to validate its clinical effectiveness.

34. FACTORS DETERMINING PATIENT SATISFACTION WITH ORTHODONTIC TREATMENT IN ALYTUS COUNTY

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Background. Patient satisfaction with orthodontic treatment is an important indicator of healthcare quality, particularly in regions with limited access to orthodontic services, such as Alytus County.

Aim. To assess factors associated with the level of patient satisfaction with orthodontic treatment in Alytus County.

Methods. A cross-sectional quantitative study was conducted using an anonymous questionnaire survey. The study included 210 residents of Alytus County who had experience with orthodontic treatment, either personally or for their children. Statistical analysis was performed using chi-square (χ^2), Mann-Whitney U, Kruskal-Wallis and Spearman's rank correlation tests. Statistical significance was set at $p<0.05$, and effect sizes were calculated to evaluate practical significance.

Results. Patient satisfaction did not differ significantly according to gender, place of residence, or whether orthodontic treatment was provided to the respondent or their child ($p>0.05$). In contrast, significantly higher satisfaction levels were reported by patients treated in private clinics compared to public institutions, as well as by those who received treatment outside Alytus County, either in other cities or abroad ($p<0.001$). Moderate positive correlations were observed between patient satisfaction and travel duration as well as waiting time until the first visit ($p<0.001$; $\rho\approx 0.30-0.34$). Organizational factors, including transportation and financial constraints, and appointment scheduling complexity, were moderately to strongly negatively associated with satisfaction ($p<0.001$; $\rho\approx -0.38$ to -0.41). Higher satisfaction was additionally associated with treatment using clear aligners and continuity of care with the same orthodontist ($p<0.05$).

Conclusions. Patient satisfaction with orthodontic treatment in Alytus County is influenced more by treatment organization and service accessibility than by demographic factors. These findings suggest that targeted improvements in service organization and accessibility could substantially enhance patient satisfaction in regional orthodontic care.

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