



An Evaluation of Tooth Anomalies, Malocclusion, and Dental Age in Children with Autism Spectrum Disorder

Gabriella Ciancimino DMD; Stephanie Tan, DMD; Kaci, Pickett-Nairne, MS; Roopa Gandhi, BDS, MSD; Chaitanya P. Puranik, BDS, MS, MDentSci, PhD



Children's Hospital Colorado

BACKGROUND

- Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by persistent deficits in social communication and interaction, accompanied by restricted, repetitive patterns of behavior, interests, or activities
- 1/36 children in the U.S are diagnosed with ASD
- Higher prevalence among males
- Emerging research linking ASD to dental anomalies:
 - Early disruptions in neural crest cell migration (Reilly et al. (2017))
 - Chromosomal microdeletions and gene variants affecting ectodermal and craniofacial development (Dentici et al. (2016), Albores-Gallo et al. (2017), Soysal et al. (2011))

METHODS

- Retrospective, comparative cross-sectional chart review
- Used clinical documentation and diagnostic panoramic radiographs
- Radiographic assessments were conducted by examiners trained and calibrated in pediatric dentistry and oral and maxillofacial radiology.
- Population: pediatric patients between 6 and 21 years
- ASD group: patients with a documented diagnosis of ASD recorded in the EMR
- Control group: neurotypical patients without documented neurodevelopmental, genetic, or systemic disorders.
- Age and Sex Matched

Dental Anomalies

WHAT WE ARE MEASURING

TOOTH STRUCTURE



TOOTH TIMING



TOOTH POSITION



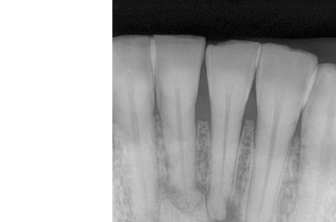
TOOTH NUMBER



TOOTH SHAPE



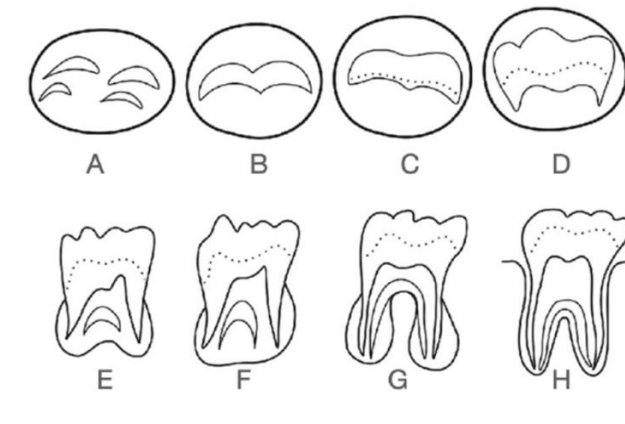
OTHER PATHOLOGIES



Dental Age Assessment

WHAT WE ARE MEASURING

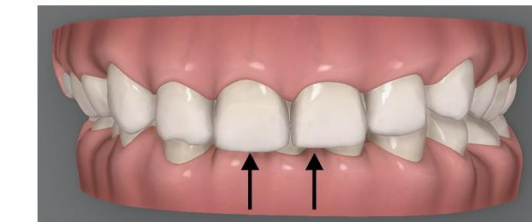
DEMIRJIAN METHOD: ESTIMATES CHRONONOLOGICAL AGE BASED ON MOLAR DEVELOPMENT



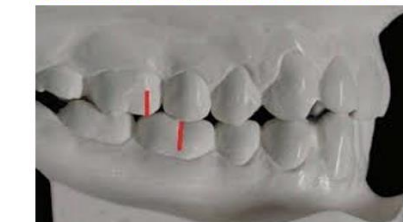
Orthodontic Variables

WHAT WE ARE MEASURING

OVERBITE



MOLAR CLASSIFICATION



OVERJET



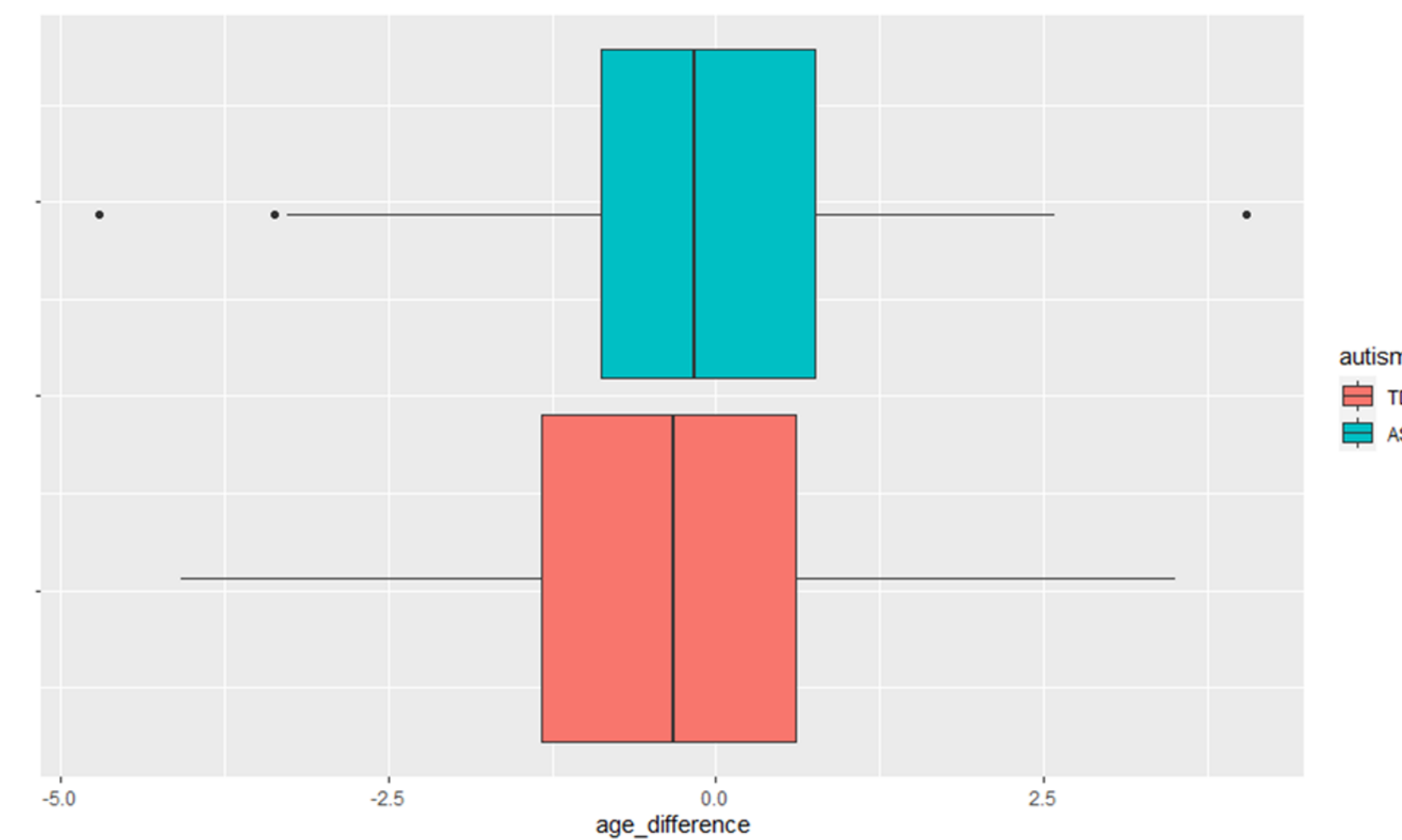
CROSSBITE



SPACING



MIDLINE DEVIATION



Overview of Retrospective Case-Control Study

Study Approval IRB Exempt

Inclusion
Children (6-21 years) with Autism (case) or Healthy, non-syndromic, and neurotypical (control) with diagnostic panoramic radiographs (PRs)

Exclusion
non-diagnostic PRs, syndromic conditions or chromosomal abnormalities, history of trauma or surgery, previous orthodontic care

Calibration and Masked Examiner

Image acquisition and analysis under standardized conditions

Assessment of developmental dental anomalies and pathologies (DDAPs)

Statistical Analysis

Results

- Advanced dental age in boys with ASD
 - No discrepancy between chronological and dental age in girls with ASD
- Higher frequencies of ectopic eruption and pyramidal molars in the ASD group
 - No significant difference in total anomaly burden between ASD and controls
- Increased prevalence of certain malocclusion traits
 - Class II molar relationships, excessive overjet, and open bite

IMPLICATIONS

- Children with ASD may present with developmental patterns that extend beyond behavioral challenges and warrant focused clinical evaluation.
- Assessment of the studied features can enhance anticipatory guidance and inform the timing of orthodontic care.
- Early radiographic evaluation and individualized treatment planning are important to address anomalies efficiently.

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