

## PP22: "PSEUDO-PALATAL" IMPACTED CANINES AND THEIR DIAGNOSTIC FEATURES

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**AIM:** "Pseudo-Palatal" Impacted (PPI) canine occurs when the canine lies between central and lateral incisors, with the tip palatal to the central incisor and part of the crown buccal to the lateral incisor (Fig. 1). The Orthodontic treatment is challenging due to difficult position and often can fail. The key to success is the early and accurate positional diagnosis.

The aim of this research was to provide the clinician clues to suspect pseudo-palatal canine impaction by offering clinical and radiographical signs based on the typical position of the adjacent teeth, validated by CBCT analysis. These clues will be "red flags" for early diagnosis, timing initiation of orthodontic treatment and planning the most efficient mechanotherapy, with minimal side effects.

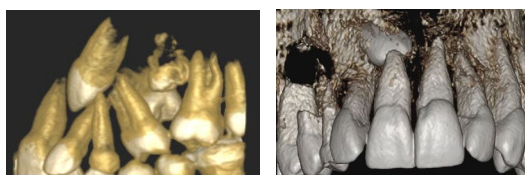


Fig. 1. Characteristic case of pseudo-palatal impacted canines.



Fig. 2. Clinical views: rotation, angulation, torque of central, lateral incisors and first premolars.

**MATERIALS AND METHOD:** Sample group - PPI canines - consisted of 14 intraoral photographs, 19 panoramic x-rays, 12 CBCTs. Control group of normally erupted canines was taken from a previous study<sup>1</sup>.

Inclusion criteria: upper permanent central, lateral incisors, first premolars erupted in the arch and high quality orthodontic records: clinical views (Fig. 2), panoramic x-rays (Fig. 3), CBCTs (Fig. 4).

Exclusion criteria: missing lateral incisors, permanent first premolars not erupted, previous orthodontic treatment, syndromes, cleft lip and/or palate and trauma to anterior teeth.

Statistical analysis: paired t-test, non-parametric Wilcoxon signed rank test, McNemar test.

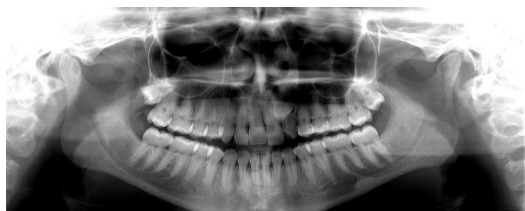


Fig. 3. Panoramix x-rays: rotation, angulation, torque of central, lateral incisors and first premolars.

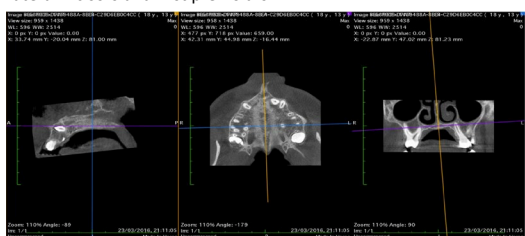


Fig. 4. CBCT reconstruction: (software Horos Project) central, lateral incisors and first premolars positions in three planes of space (rotation, mesiodistal and buccolingual angulation).

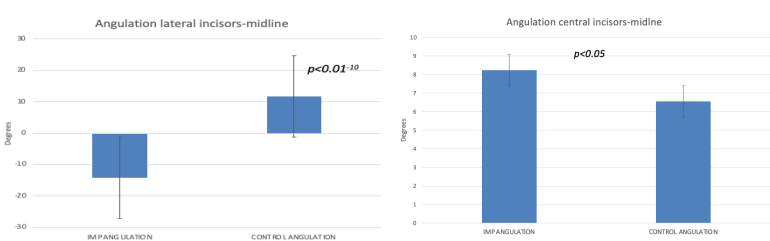


Fig. 5. Radiographic evaluation: Panoramic x-rays

**RESULTS:** Photographic evaluation: lateral incisors showed significant distal tipping and palatal root displacement and mesiolabial crown rotation; central incisors revealed labial root displacement.

Radiographic evaluation - panoramic x-rays (Fig. 5): lateral incisors exhibited statistically significant distal root angulation; central incisors displayed statistically significant mesial root angulation.

Radiographic evaluation - CBCT analysis (Fig. 6): lateral incisors presented statistically significant mesiolabial crown rotation, distal root angulation and palatal root torque; first premolars showed statistically significant mesiopalatal rotation and palatal root torque; no significant statistical differences were found for central incisors.

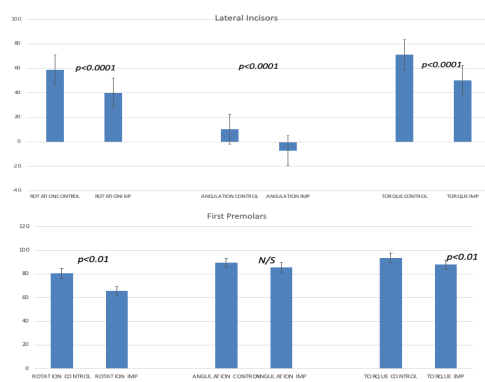


Fig. 6. Radiographic evaluation: CBCT analysis

**CONCLUSIONS:** In PPI cases, the differential position of the adjacent teeth is pathognomonic. The present study provides the orthodontist evidence-based clinical and radiographical clues for early diagnosis and optimal planning of treatment strategy, minimizing its risks.

**REFERENCES:** 1.E. Dekel et al, "Impaction of maxillary canines and its effect on the position of adjacent teeth and canine development: A cone beam computed tomography study. Am J Orthod Dentofacial Orthop, 2021; 2.T. Baccetti, "A controlled study of associated dental anomalies", Angle Orthod, 1998; 3.E. Mercuri et al, "Dental anomalies and clinical features in patients with maxillary canine impaction", Angle Orthod, 2013; 4.T. Baccetti, "A controlled study of associated dental anomalies", Angle Orthod, 1998; 5.S. Peck et al, "Palatal displacement of canine is genetic and related to congenital absence of teeth", J Dent Res, 1997; 6.S. Peck et al, "The palatally displaced canine as a dental anomaly of genetic origin", Angle Orthod, 1994; 7.S. Pirinen et al, "Palatal displacement of canine is genetic and related to congenital absence of teeth", J Dent Res, 1996; 8.A. Alqerban et al, "Early prediction of maxillary canine impaction", Dentomaxillofac Radiol, 2016; 9.A. Becker et al, "Etiology of maxillary canine impaction: a review", Am J Orthod Dentofac. Orthop, 2015; 10.S. Ericson et al, "Early treatment of palatally erupting maxillary canines by extraction of the primary canines", Eur J Orthod, 1988; 11.S.M. Power et al, "An investigation into the response of palatally displaced canines to the removal of deciduous canines and an assessment of factors contributing to favourable eruption", Br J Orthod, 1993; 12.T. Baccetti, "Risk indicators and interceptive treatment alternatives for palatally displaced canines", Semin Orthod, 2010.