



SMART DENTAL UPDATES

Volume 4 | Issue 37 | 2023

Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you **"SMART DENTAL UPDATES"** which contain latest and interesting news in the field of Dentistry.

This issue contains:

- **Clinical and Radiographic Analysis of Platform Matching and Platform Switching Dental Implants in the Esthetic Zone**
- **Evaluating the Dental Arch Relation and Craniofacial Growth in Individuals Born with Unilateral Cleft Lip and Palate (UCLP) undergone two-stage palatal surgery**
- **A Cross-Sectional Study to Evaluate the Impact of BMD On the Quality and Quantity of the Edentulous Mandible**
- **A Rare Case of Generalized Short Root Anomaly and Management of Tooth Mobility**

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Clinical and Radiographic Analysis of Platform Matching and Platform Switching Dental Implants in the Esthetic Zone

Introduction:

Implant treatment is an acceptable choice to replace missing elements and has shown high long-term survival rates¹. After advances in implantology, patients are benefited from fixed implant rehabilitation with good available bone and even the patients with a single missing tooth can receive a restoration analogous to the missing natural tooth². Platform-switching (PS) ensuring the success of dental implants in the long term, the benefits and feasibility of PS have been discussed in several studies, with a report stating that PS implants decreased crestal bone loss compared with platform-matched (PM) implants. The evaluation of treatment outcomes that is measuring the long-term stability of the peri-implant tissue was made by using radiographic and clinical parameters³. Success of dental implant rely on the presence of good amount and quality of bone around the implants, especially the crestal bone⁴. The aim of this study is to compare the long-term clinical, radiographic and Esthetic results of PS and PM dental implants

Methods:

A retrospective cohort study was conducted in patients who had been treated with dental implants in the anterior maxilla presence. Patients with at least one dental implant functioning for >10 years with a baseline periapical X-ray taken at the day of prostheses delivery were included for the follow up. A digital picture analysis software was used to assess mean marginal bone loss (MBL) levels on digital periapical X-rays acquired through an imaging plate scanner. To calibrate the evaluation two examiners assessed the X-rays independently of each other, by using the real length and diameter of the implants

Results:

A total of 58 patients were included in this study: 31 females (53.44%) and 27 males (46.56%), with a mean age of 65.91 ± 9.66 years. Patients were divided in two groups based on the type of dental implant installed as 29 patients received PM implants, while other 29 were treated with PS implants.

Among the variables included, only follow-up time that is 13.37 ± 2.39 years and 11.55 ± 0.73 years in the PM and PS groups, respectively and implant diameter 22 and 14 regular diameter implants in the PM and PS groups, respectively which showed statistically significant differences ($p < 0.05$) between the two groups.

Mean MBL levels at the follow-up visit were 1.02 ± 0.81 mm vs. 1.67 ± 0.99 mm in the PS and PM groups, with a statistically significant difference among the two groups in favour of PS implants as shown in figure 1. Mean PPD values were 3.69 ± 1.1 vs. 5.16 ± 1.09 mm in the PS and PM groups, with a statistically significant difference ($p < 0.001$) in favour of PS implants.

Mean PES values were statistically significantly higher in the PS group compared to the PM group, even if a greater prevalence of peri-implant diseases was found out in the PM group, no statistically significant differences were detected.

Results showed that PS implants can obtain an excellent long-term crestal bone stability with a limited bone resorption after 10 years, therefore representing an excellent choice in the Esthetic area, resulting in statistically significant higher PES values when compared with PM implants.

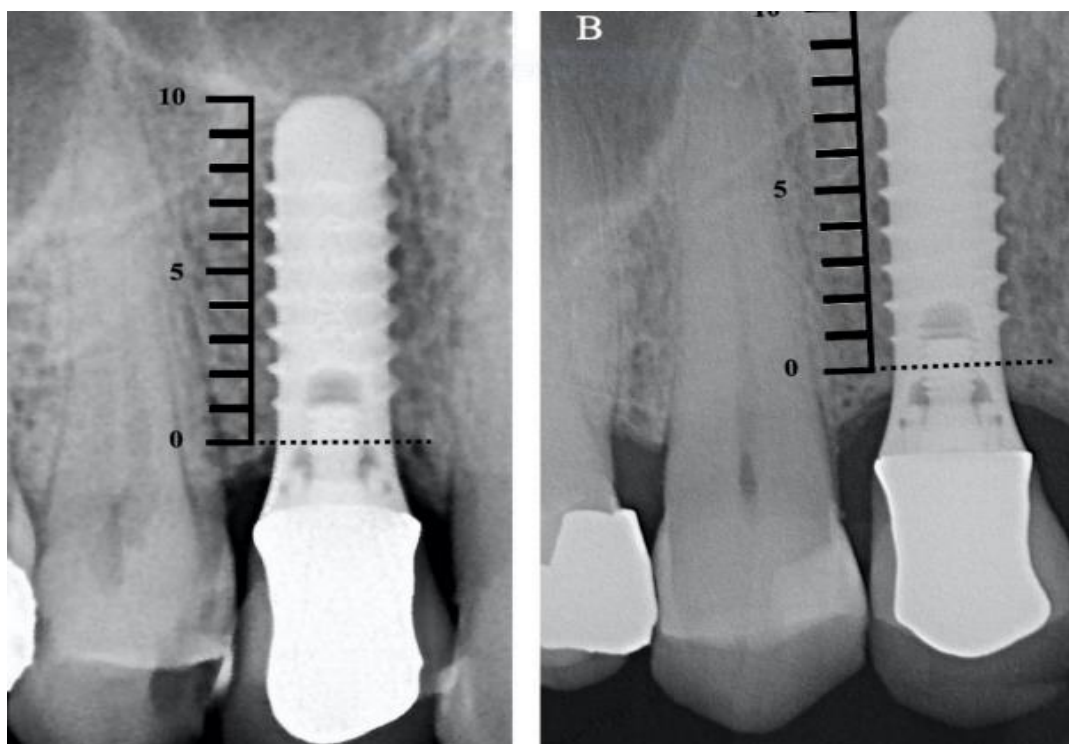


Figure 1 Representative X-rays of an implant of the platform matching group

Conclusion:

Study concludes that bone-level implants with a PS implant showed statistically significant lower MBL and PPD values and higher PES values even after more than 10 years of functional loading compared to PM implants

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Evaluating the Dental Arch Relation and Craniofacial Growth in Individuals Born with Unilateral Cleft Lip and Palate (UCLP) undergone two-stage palatal surgery

Introduction:

The one of the main reasons for acceptance of palatal surgery for Unilateral cleft lip and palate (UCLP) is restricted mid facial growth in individuals born with CLP¹. Palatoplasty may influence the development of the anterior part of the maxilla, depending on the extension and type of the cleft. Closing the gap in the palate causes impact in maxillary growth, as it may create scar zones which act as barriers for transversal growth. Palatoplasty is not the surgical procedure that contributes the most to reducing the arch width, lip repair surgery and osteotomy also responsible for the restricted growth of the upper arch. Underlying cause for maxillary hypoplasia is still incomplete, even if factors such as surgical method and timing as well as initial cleft width or infant orthopaedics are considered. An association between dental agenesis and maxillary length as well as protrusion has been suggested for non-cleft individuals and is also reported for individuals born with UCLP³. The aim of this study was to compare dental arch relation and craniofacial growth for two consecutive series of individuals born with UCLP.

Methods:

Individuals born with complete UCLP who had all surgery performed by the Gothenburg CLP team, and had finalized the follow-up according to the regional care program for CLP, individuals who were consecutively operated according to two surgical protocols were included in this study. By using the GOSLON, dental arch relationship was assessed independently by 3 raters. Standardized lateral cephalograms were taken with natural head position and the teeth in centric occlusion. Generalized linear models (GLMs) fitted in the generalized estimating equation (GEE) framework were used to evaluate whether the surgical protocol had an impact on craniofacial growth, allowing for repeated measures on participants.

Results:

The study results show that there were no statistical significant differences were observed between the two surgical protocols for any of the ages of 5, 10, 16, and 19 years. At the age of 5 years, 66% of the patients in HPC3 demonstrated favourable growth and 83% in HPC8. At the age of 10 years, an increased number of the patients in HPC3 78% demonstrated favourable growth and 86% in HPC8.

In addition, at the age of 16 years, the portion of cast models revealed GOSLON scores of 1 and 2 decreased to 70% and 72% in HPC3 and HPC8, respectively, and finally 54% and 74% at the age of 19 years. The mean GOSLON score for the entire sample was found to be 2.3 for HPC3 and 2.1 for HPC8. A statistical significant difference for SNA was observed at the age of 5 years but not at the ages of 10, 16 and 19 years.

Discussion:

No difference for final outcome at the age of 19 years with respect to dental arch relationship and craniofacial growth was found between the two surgical methods. Except from maxillary prominence at the age of 5 years, dental arch relationship and craniofacial growth were corresponding during growth between the studied surgical protocols.

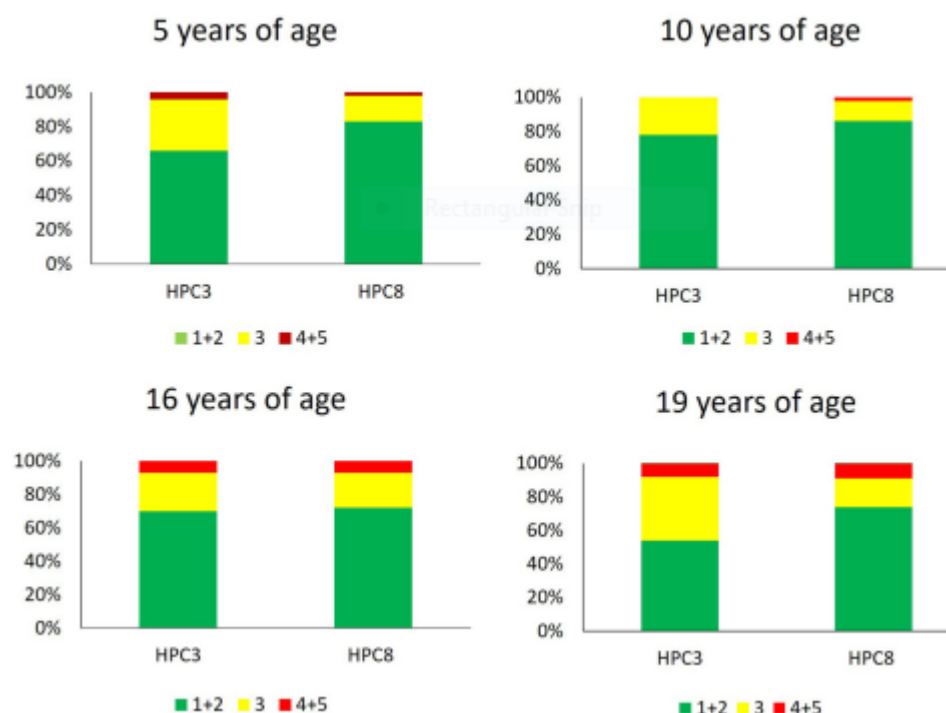


Figure 2 GOSLON scores for the two surgical protocols, with hard palate closure

A worsening of the dental arch relationship with time from the age of 5 to 19 years was noticed. This finding is though conflicting with studies where either stable or improved results were observed from childhood until ceased growth⁴.

Conclusion:

The protocol with two-stage HPC, were considered having corresponding favourable long-term outcome for dental arch relationship and craniofacial growth and also considered justified for long-term craniofacial growth, dental arch relationship, and oral articulation outcome.

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A Cross-Sectional Study to Evaluate the Impact of BMD On the Quality and Quantity of the Edentulous Mandible

Introduction:

Dental implants significantly improve the stability and retention of complete dentures, thus also improving the quality of life of patients but most common problems with the insertion of dental implants is the insufficient quantity and quality of alveolar bone¹. Complex Osseo integration process is affected by other factors like primary implant stability, described as the absence of implant movement relative to the surrounding bone immediately after insertion and it is affected by bone density, implant geometry, surgical technique and bone quantity². The alteration in shape of the edentulous mandible gives rise to problems with retention and function of a lower denture. Dental implant surgery is particularly indicated in edentulous patients, and is a challenging procedure in progressively resorbed mandibles. For primary stability of the dental implant Mineral density, bone volume and trabecular microarchitecture of the encasing bone is crucial and a predictor of Osseo integration and implant success³. The aim of this study is to determine the impact of general bone mineral density (BMD) on the quality and quantity of the edentulous mandible in postmenopausal women

Methods:

A cross-sectional study was conducted in 127 edentulous postmenopausal women aged 52 to 91 who underwent a CBCT investigation for planning their dental implant treatment. female patients who had lost their teeth at least five years prior, had been using conventional full dentures for at least 3 years, made at the same technical laboratory by using the same standards, and which had been provided with the same usage guidelines and who had at least two years since the beginning of menopause were included in this study. Patients were divided into three groups according to the dual-energy X-ray absorptiometry (DXA) result normal BMD (T-score ≥ -1.0), osteopenia (T-score -1.0 to -2.5), and osteoporosis (T-score ≤ -2.5). The data were analysed using the statistical program R.

Results:

According to the DXA results, 39 women had normal BMD, 57 women had osteopenia, and 31 had osteoporosis. There were statistically significant differences among the groups according to weight and BMI, but no statistically significant difference was seen among the different BMD groups according to the women's age or height The cortical bone volume decreased as BMD decreased as shown in figure 3. A statistically significant difference among the different BMD groups according to the amount of cortical bone was noted in the lateral incisor and first premolar regions, both in the complete mandibular area and in the basal part of the mandibular body. The total mandibular bone volume decreased with a decrease in BMD in all regions of the mandible.

In the basal part of the mandibular body statistically significant differences among the different BMD groups were noted in all mandibular regions. A statistically significant difference was noted in the basal part of the mandibular body between the osteoporosis and normal BMD groups The intra-examiner observations demonstrated high repeatability for all measurements, with an intra-class correlation coefficient of >0.90 .



Figure 3 cortical, trabecular, and total bone volume measurements in the different BMD groups

Conclusion:

The study concludes that when compared to the women with a normal BMD, postmenopausal women with osteoporosis have lower total and cortical bone volume in the basal part of the edentulous mandible. Quantity and quality of bone in the basal part of the edentulous mandible is effected by Osteoporosis

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A Rare Case of Generalized Short Root Anomaly and Management of Tooth Mobility

Introduction:

Short root anomaly (SRA) is a developmental disorder characterized by permanent teeth with short and blunt roots with closed apices¹ and it is accompanied with dental anomalies like hypodontia, supernumerary teeth, microdontia, dens invaginatus, taurodontism, and obliterated pulp chambers. The prevalence of SRA ranges from 2.4% to 2.7% in Caucasians up to 10% in Mongolians and this disorder is on the rise, especially in Hispanic populations². Diagnosis of teeth with short roots can be challenging, especially in a young patient. Definitive etiologic factors, such as systemic factors, syndromes and genetic disorders must be investigated. the most common misdiagnosis for both localized and generalized SRA is idiopathic root resorption (IRR), because both are asymptomatic with a predilection for females. The distinction between the two is important from a clinical standpoint because IRR, unlike SRA, may have varying periods of progressive resorption³. The aim of this study is to report a case of generalized SRA and the management of tooth mobility.

Case Report:

An 11-year-and-9-month-old female was referred to orthodontist with chief complaints of generalized appearance of short roots in the orthopantomography (OPG). Patient's medical history shows she was born full-term by natural delivery, after an uneventful pregnancy and recurrent ear infections was noted. Two years earlier, patient mentioned a mild dental trauma at the central maxillary incisors, which was not evaluated by a dentist at the time. On clinical examination shows the poor oral hygiene of the patient and presented mild gingivitis.

From an orthodontic point of view, she presented an Angle class I molar relationship; the overjet was 2 mm and overbite 3 mm. Using Miller's classification mobility of the teeth was evaluated. Mandibular central incisors presented grade I mobility due to their very short roots, and due to almost complete root resorption, maxillary lateral incisors presented grade II mobility. All upper incisors were sensitive to cold and electrical pulp vitality testing. All lower incisors responded positively to both tests.

Initial radiographic evaluation included the OPG and periapical X-rays of the incisors as shown in figure 1. Only first molars presented abnormally short roots with round apices. The mandibular first premolars had also short roots, despite of their short roots, all other teeth presented normal pulp chambers and root canals. Except for the two maxillary lateral incisors, all teeth presented a physiological lamina dura and no alveolar bone abnormalities were noticed. The patient was also advised to avoid biting with her anterior teeth.

To stabilize the maxillary lateral incisors and prolong their presence in the oral cavity, using a 0.015"stainless steel coaxial wire splinting was done them with their adjacent teeth. using composite resin, wire was bonded at the palatal surface of the anterior maxillary teeth. The placement of a single wire from tooth 13 to tooth 23 would irritate the incisal papilla and interfere in the occlusion, so two separate pieces of wire were used to splint the teeth #11–#12–#13 and #21–#22–#23 together.



The custom-made mouth guard was tried in the mouth instructions were given and advised to wear at all times when playing sports. Close observation, every 3 months, was planned. At 6-months follow-up, the splint was intact, and all maxillary incisors presented no mobility and were no longer sensitive to percussion. Oral hygiene instructions were given again, emphasizing on the palatal surface of the maxillary anterior teeth, at which splint was located. During the 24-month follow-up, it was noticed that oral hygiene was good, and all maxillary incisors presented no mobility and no sensitivity to percussion and complete healing of the periapical area of the upper lateral incisors and no further root resorption was noted.



Figure 4 Initial radiographic examination of SRA and radiographic examination during 24 month follow up

Conclusion:

The study concludes that special attention was given in positioning the splint as it favours plaque control and keeps from irritating the adjacent soft tissues. Esthetics were of most importance so splint was placed on the palatal surface of the anterior teeth. At 24-month follow-up, mobility was reduced, and the periapical region of the maxillary lateral incisors showed alveolar bone healing with no further root resorption, indicating that splinting was a successful choice of treatment.

This case report described that splinting was a successful choice of treatment as mobility was reduced, periapical region of the maxillary lateral incisors showed alveolar bone healing with no further root resorption.

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