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Digit Sucking and Hyoid Bone Position

Evaluation of treatment changes in Class II Div I using Advansync 2 Appliance

Orthodontic Treatment and Temporo-Mandibular Disorders

Orthodontic Treatment of Moderate Lower Anterior Crowding

Orthodontic Treatment of AOB in an Adult Patient

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Orthodontic Treatment of moderate Anterior Crowding of Lower Arch with Bilateral Maxillary Lateral Incisors Microdonts - A Clinical Case Report

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Abstract

A case of a 17 year-old female who presented to the orthodontic clinic of the department of Child Dental Health Lagos University Teaching Hospital, Lagos with a complaint that "my teeth are scattered and I want to check if it can be corrected". We were to unravel the lower arch crowding, to derotate the rotated teeth and to build up the pegged shaped laterals with composite. A comprehensive Fixed orthodontic therapy of upper and lower arches using pre-adjusted Roth's 022 slot Edgewise brackets was done in conjunction with the paediatric dentistry department for a composite build up of the pegged shape lateral incisors.

After 48 months of active orthodontic treatment, a normal over-jet was achieved with the anterior crowding of the lower arch resolved and the pegged shape lateral incisors built up.

Keywords: Peg-shaped Laterals, composite, Fixed Orthodontic appliance

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ORIGINAL ARTICLE

Introduction

The Peg-shaped lateral is a tooth with a conical crown size reduction, reducing from the cervical region to the incisal edge.[1] Aberrations in the tooth morphology resulting from late disturbances during the differentiation process most commonly result in the size variation among teeth.[2,3] Maxillary lateral incisors vary in form, second to the third molar.[3]

The overall prevalence of peg-shaped maxillary permanent upper lateral incisors is 1.8%.[4]

The prevalence of peg-shaped laterals was found to be 1% and 2.3% in field and clinic samples respectively in South Western Nigeria.[5]

The management is interdisciplinary when presenting with malocclusion. The purpose of this article is to present a clinical case report.

Case Report

The patient presented at the Orthodontic unit of Child Dental Health, Lagos University Teaching Hospital, Idi-Araba Lagos.

Biodata

Name: LO
Age: 17 years
Sex: Female

Presenting complaint: "I want my upper teeth to be normal and my lower teeth look scattered".

History of Presenting complaint: Patient complained of not being pleased with her look because she feels her teeth are not well shaped and she wants them arranged to look normal. She became aware it can be corrected from the internet, so she made the decision to visit the Orthodontic clinic with her mother.

She has visited the dental clinic routinely but not

eventful and no medical history of any significance.

Examination:

Extra-Oral examination

- Frontal: There was no facial asymmetry. She had competent lips. Jackson's 3/1
- Profile: She had a straight profile on Skeletal pattern 1.

Figure 1: Full frontal and profile views:

Intra-Oral Examination: Teeth present: 1-7 in all quadrants except upper Right 1-6.DMFT – 0

Mild spacing of 3 mm in the upper anterior segment. She had moderate crowding in the lower anterior segment of about 5mm and Peg-shaped lateral incisors. The upper incisors were retroclined but the lower incisors were of normal inclination. The upper and lower arch widths were normal but there was deviation to the right on the path of closure of the mandible.

In Occlusion: She was on Angles class I malocclusion molar relationship on both sides. Overjet of 2mm for 11 and 21 respectively. Upper midline was coincident with the midline of the face. Shift to the right of about 2mm of the midline of the lower arch, at Rotations of 31,33,35,41,43 and 45. Deep and complete overbite.

Figure 2: shows the Intraoral views of the patient:

Orthodontic Summary

- Angles class I malocclusion on skeletal pattern 1 complicated by:
- Mild spacing of 3 mm in the upper anterior segment
- Moderate crowding in the lower anterior segment 5mm
- Peg-shaped upper lateral incisors
- Deep and complete overbite
- Lower midline shift to the right by 2mm
- Rotations of 31,33,35,41,43 and 45.
- Competent lips. Jackson's lip pattern of 3/1

Investigation

Figure 3: Shows the patient's Pretreatment Radiographs and tracing.

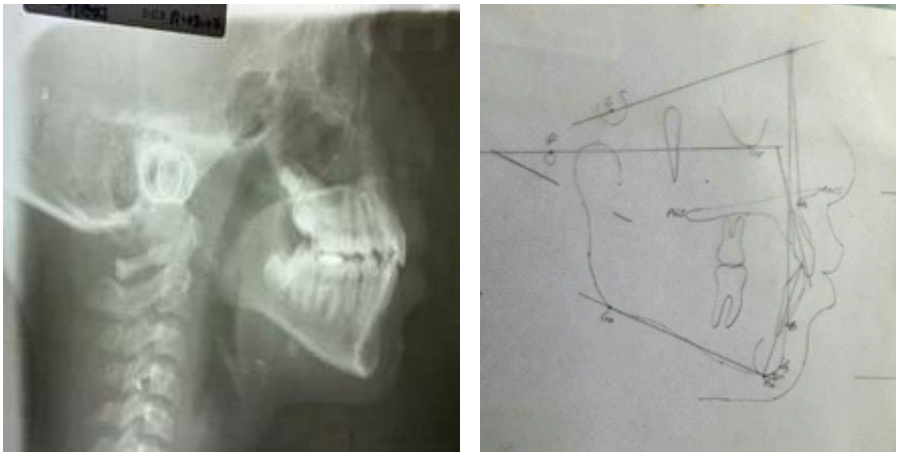


Table 1:Shows the Pretreatment Cephalometric Values.

Measurement	Pretreatment	Range for Nigerian norm
SNA	83	85.5 ° ±3.5
SNB	78	82.7 ° ±3.0
ANB	5	2-4 °
U1 TO FP	108	119-127 °
L1 TO MP	88	96-104 °
IIA	140	108-116 °
FMA	26	24-26 °
MMA	34	24 °
LFH	60.5%	55%

LEGEND: SNA-Sella/Nasion A-point Angle, SNB-Sella/Nasion B-point Angle, A-point-Nasion-B-point Angle, U1 TO FP- Maxillary Incisor to Frankfort Plane Angle, L1 to MP- Mandibular Incisor to Mandibular Plane Angle, IIA- Interincisal Angle, FMA- Frankfort Maxillary Plane Angle. MMA- Maxillary Mandibular Plane Angle. LFH- Lower Facial Height Percentage

Figure 4: Shows the Panoramic radiograph of the Patient

Figure 5: Shows the Pretreatment Models of the Patient.

Treatment Objectives

- To resolve the Moderate crowding in the lower anterior segment
- To build up the peg-shaped lateral incisors
- To correct the deep bite
- To correct the inclination of the incisors
- To correct the lower midline shift
- To derotate the rotated teeth
- To maintain Angles class I molar relationship and canine class I relationship

Treatment Plan

Non extraction treatment

- Fixed orthodontic appliance in both upper and lower arches. Pre-adjusted Edgewise technique Roth's prescription.
- Composite build up of the Peg-shaped laterals
- Retention with vacuum-form retainers in both arches.

Alternative treatment option: Passive self-ligating of both arches

- Build up of the peg shaped lateral incisors
- Non extraction
- Retention with vacuum-form retainers in both arches.

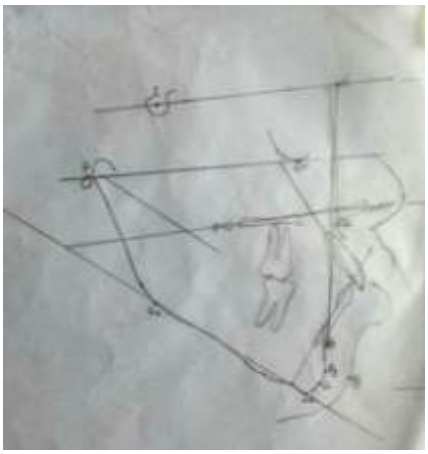
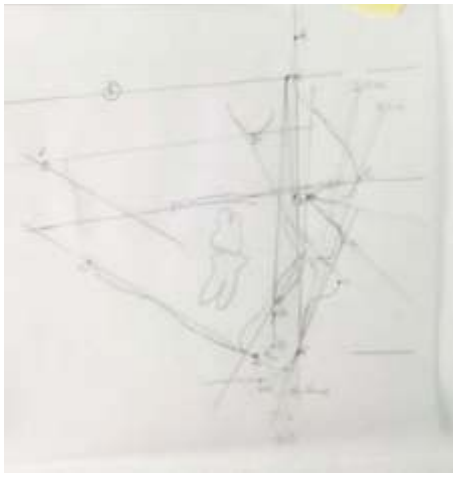
Treatment Progress

Full arch- upper and lower arches were set up using preadjusted Edgewise Roth's brackets 022 slot prescription.

Treatment sequence was as follows:
014" Nickel titanium (Niti)wires ligated in upper and lower (U/L) arches
016" Niti ligated U/L arches
016" SS ligated U/L arches
018" SS ligated U arch and L arch 016 Niti
Interproximal reduction done from 6 to 6 in the lower arch
016" Niti ligated U/L arches
018" Niti Ligated U/L arches
020" SS ligated U/L arches
019"x025" SS ligated U/L arches
019x025 SS maintained U/L arches
Crimpable hooks placed U/L archwires for cross elastics
Open coil springs placed 11-13,21-23
019x025 SS maintained U/L arches
Patient referred for restoration of peg shaped laterals

Figure 6A: Shows the Intra operative Photographs

Figure 7: Shows the Post Treatment Models

Soft Tissue Tracing

Figure 8: Shows the patient's Posttreatment Radiographs and tracing.

Table 2:Shows the Post-treatment Cephalometric Values.

Measurement	Post treatment values	Range for Nigerian norm
SNA	84°	85.5 ° ±3.5
SNB	82°	82.7 ° ±3.0
ANB	2°	2-4 °
U1 TO FP	120°	119-127 °
L1 TO MP	92°	96-104 °
IIA	118°	108-116 °
FMA	35°	24-26 °
MMA	35°	24 °
LFH	60%	55%S

Figure 9: shows her full frontal and profile views post treatment.

Figure 10: shows Post treatment Intra oral photographs.

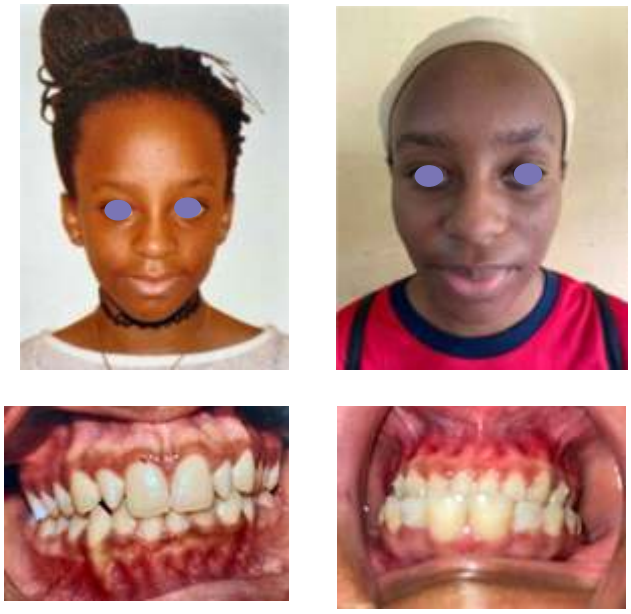


Figure 11: shows Pretreatment and Post treatment photographs.

Table 3: Shows the Pre-treatment and Post-treatment Cephalometric Values.

Measurement	Pre treatment	Post treatment	Differences
SNA	83	84°	1^0
SNB	78	82°	4^0
ANB	5	2°	3^0
U1 TO FP	108	120°	12^0
L1 TO MP	88	92°	4^0
IIA	140	118°	22^0
FMA	26	35°	9^0
MMA	34	35°	1^0
LFH	60.5%	60%	0.5%

Table 4: Shows the Pretreatment and Posttreatment soft tissues cephalometric analysis

SOFT TISSUE MEASUREMENTS	NIGERIAN NORMS	PRE-TREATMENT	POST-TREATMENT	DIFFERENCES
UL TO E-LINE	3.21 ±2.69mm	2mm	4mm	2mm
LL TO E-LINE	6.76 ±2.83mm	7mm	7mm	0mm
UL TO S-LINE	5.89±2.23mm	5mm	9mm	4mm
LL TO S-LINE	8.19±2.6mm	10mm	11mm	1mm
UL TO B-LINE	9.84±2.02mm	6mm	16mm	10mm
LL TO B-LINE	10.53±2.40mm	12mm	16mm	4mm
H-ANGLE	20.77^0±3.57	16^0	22^0	6^0
NASOLABIAL ANGLE	84.35^0 ±13.71	92^0	82^0	10^0

Treatment Outcome

- After about 48 months of fixed appliance therapy, the following were achieved:
- The moderate crowding in the lower anterior segment was resolved
- The Peg-shaped lateral incisors were built up with composite
- The deep overbite was corrected
- The inclination of the incisors became normal
- The lower midline shift slightly improved, though the patient defaulted in wearing her cross elastics.
- The rotated teeth were derotated
- The buccal segment was maintained - Angles class I molar relationship and canine class I relationship
- The Patient was satisfied

Discussion

Microdontia is a condition in which teeth are smaller than the normal size. A common form of microdontia that affects the maxillary lateral incisor is known as Peg lateral.[7]

Peg-shaped lateral is a tooth with a conical crown size reduction, reducing from the cervical region to the incisal edge.[1] Aberrations in the tooth morphology resulting from late disturbances during the differentiation process, most commonly result in the size variation among teeth.[2,3] Peg- shaped laterals are dental anomalies that are likely to be connected to various defects in certain genes.[6] There is probably a strong component of heredity, and peg-shaped lateral incisors have been linked genetically with tooth agencies.[6] In our case report, there was a little resemblance because the mother of the patient affirmed to it "running in the family with a little apathy for correction in the course of treatment.

A study[5] carried out in South Western Nigeria indicated that prevalence of peg-shaped laterals was found to be 1% and 2.3% in the field and clinic samples respectively. A total of one thousand and seventy individuals were assessed by intra-oral examination and case files respectively for the presence of peg-shaped laterals and other dental anomalies. This case report is also from the South Western region, the Lagos University Teaching Hospital.

The goal of Orthodontic treatment is the aesthetic value it renders to the patient, so the management was interdisciplinary when presenting with malocclusion. The prevalence has been reported to be higher than the prevalence of other developmental malformations. The treatment options of peg laterals include extraction of the peg- shaped tooth and orthodontic movement of canine into the space of lateral incisor, which can then be re-contoured to resemble lateral incisors. Replacement with a single-tooth implant/FPD supported restoration; Direct resin-composite bonding or indirect restoration of the peg laterals with Porcelain laminate veneers, metal-ceramic restorations or all-ceramic crowns, to develop normal tooth morphology.[7,8]

A conservative veneer technique involves the application of resin composite without a reduction of the tooth structure. Resin composite can be altered and re-polished in situ, and a direct resin composites are not as expensive as porcelain laminate veneers.[9] Saatwika et al[7] described a simple direct technique for restoring the aesthetic appearance of the peg – shaped lateral. This case report, in conjunction with the Paediatric dental unit, a direct composite resin build up was done on the bilateral peg-shaped laterals of the patient. In this case, Preadjusted Edgewise appliance was used in both aches. In the course of treatment with a sequence of archwires, the crowing in the mandibular arch was resolved. At the rectangular arch wires 0.019x 0.025 stainless steel arch wires, auxiliary open coiled springs were used to create enough space for the composite build-up of the pegged-shaped laterals.

Conclusion

After 48 months of not too regular appointments but active orthodontic treatment, a normal over-jet was achieved with the anterior crowding of the lower arch resolved

Contributors

All the authors contributed to the design, data collection, analysis and write-up of the manuscript.

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Conflict of Interest

Nil

and build –up done with composite of the pegged shaped lateral incisors.

References

1. Becker A, Smith PR. Incidence of anomalous maxillary lateral incisors in relation to palatally displaced cuspids. Angle Orthod. 1981;51: 24-29.
2. Kook YA, Park S, Sameshima GT. Peg shaped and small lateral incisors not at higher risk for root resorption. Am J Orthod Dentofac Orthop 2003;123:253-258.
3. Jameel K, Saqib A, Fazal S, Imran F, Shifat A, Mohammed A, Mohammad K. The Prevalence of Peg Shaped and Missing Permanent Maxillary Lateral Incisors in Non-Syndromic Orthodontic Patients. Journal of International Dental and Medical Research · 2019; 12:1416-1420.
4. Fang Hua 1, Hong He, Peter Ngan, Wassim Bouzid. Prevalence of peg-shaped maxillary permanent lateral incisors: A meta-analysis**.** Am J Orthod Dentofacial Orthop . 2013 Jul;144(1):97-109
5. I Ucheonye, A Tokunbo. Prevalence of Peg-Shaped Laterals in South Western Nigeria: A Comparison of Field and Clinic Findings. The Internet Journal of Dental Science. 2009 Volume 8 Number 2.
6. Peck S, Peck L, Kataja M. Prevalence of tooth agenesis and peg-shaped maxillary lateral incisor associated with palatally displaced canine (PDC) anomaly. Am J Orthod Dentofac Orthop 1996;110:441-3.
7. Saatwika L, Anuradha B, Selvakumar GM, Arunajetasan S. Esthetic correction of peg laterals – a case report . Eur J Mol Clin Med 2020;7:663-666.
8. Kulshrestha R. Interdisciplinary approach in the treatment of peg lateral incisors. J Orthod Endod. 2016;2(1) 11.
9. Sultana A, Karim FA, Quader SA, Tasnim T, Hossain M, Nasrin KF. Composite facing of peg shaped lateral incisor-a case report. Update Dental College Journal. 2016;6(2):31-33.