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Functional need for orthognathic treatment



Role of gender on parent's decision on orthodontic treatment



Two Phase Orthodontic Treatment of Class II Division 1 - A Case Report



Abstract Presentation at NAO 2024 Annual Scientific Conference



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Editorial

Editor's Choice

This edition of the journal offers readers a thoughtful selection of interesting articles reflecting the scientific breadth and clinical complexity of modern orthodontic practice. One of the most recurring challenges in orthodontics is the management of skeletal discrepancies in all three planes of space. While orthognathic surgery remains the definitive treatment for severe cases, its application in resources limited settings continue to face substantial barriers.

Kolawole and Abdullai's application of the Index of Orthognathic Functional Treatment Need (IOFN) to a Nigerian population yields epidemiological insights with fewer than 11% demonstrated high treatment need, and the IOFN exhibited low concordance with other orthodontic indices.

In a socio-epidemiological study, Okeke et al. investigate parental attitudes towards orthodontic treatment based on patient's gender. Whilst majority endorsed treatment for both sexes, a discernable preference emerged for prioritizing female children when resources are scarce. This important gender-based triaging invites further interrogation into the intersection of culture, economics and clinical decision making.

Abhulimen and colleagues present a well-documented orthodontic intervention combining the Frankel II appliance with fixed mechanotherapy. The favourable outcome exemplifies the enduring relevance of classical techniques when applied judiciously.

Finally, this issue includes abstracts and proceedings from the 18th Annual Scientific Conference of the Nigerian Association of Orthodontists. We commend this effort effort and encourage similar academic engagement across the sub-region.

Olayinka Donald Otuyemi,
Editor-in-Chief

The Functional Need for Orthognathic Treatment in a Nigerian Orthodontic Population

Kolawole KA, Abdullai CO

Abstract

Background: The functional need for orthognathic treatment among the orthodontic population in Nigeria is unknown. This study therefore evaluated malocclusion types, orthodontic treatment need and the functional need for orthognathic treatment in a Nigerian orthodontic population.

Methods: Clinical Records of 94 patients who presented for orthodontic treatment at the Obafemi Awolowo University Teaching Hospital, Ile-Ife were evaluated. Orthodontic treatment need was determined with the Dental Aesthetic Index (DAI) and Index of Orthodontic Treatment Need (IOTN), functional need for orthognathic treatment was determined with the Index of Orthognathic Functional Treatment Need (IOFTN). SPSS version 26.0 was used for analysis.

Results: Angles class I malocclusion was predominant in the population (77.6%). Based on the Aesthetic Component (AC) of IOTN, 31.9% had great need for treatment, while 57.4% had great need for treatment with the Dental Health Component (DHC). The Dental Aesthetic Index (DAI) gave 55.3% as having very severe malocclusions with treatment considered mandatory. The IOFTN determined 31(33.0%) as having no need, 9 (9.6%) mild need, 10 (10.6%) moderate need, 34 (36.2%) great need and 10 (10.6%) very great need for orthognathic treatment. Moderate significant correlation was observed between DHC of IOTN and IOFTN (r = 0.411), DAI and IOFTN (r = 0.376) and AC of IOTN and IOFTN (r = 0.303) showed low significant correlations.

Conclusion: A significant proportion of the population studied had functional need for orthognathic treatment, with increased overjet, increased overbite with trauma and speech difficulties as the main indicators. Comprehensive assessment and multidisciplinary care are essential to address functional orthognathic needs.

Keywords: Functional treatment need, Index of Orthognathic Functional Treatment Need (IOFTN), Orthognathic treatment, Orthognathic surgery.

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ORIGINAL ARTICLE

Introduction

Orthodontic treatment is often indicated when the presence of malocclusion causes significant deviations in intramaxillary or intermaxillary relations of teeth. However, when severe skeletal deformities exist, the orthodontic treatment goals of attaining acceptable occlusion, aesthetics, and function are impossible to attain with orthodontic treatment alone, such cases are amenable orthognathic surgery.[1] Osteotomies of the midface and mandible may be required to address these dysmorphologies of the maxillomandibular complex.[2]

Deformities that require orthognathic surgery include significant skeletal discrepancies in the sagittal, vertical, or transverse planes of the maxilla, mandible, or both, leading to functional impairments such as compromised mastication, speech difficulties, temporomandibular joint dysfunction, and psychosocial issues related to impaired facial aesthetics. [3,4] Orthognathic surgery provides positive improvements in function, occlusion, aesthetics, psychological well-being and quality of life. [2,5]

Identification of deviations from predetermined norms, are routinely measured in orthodontics with a variety of standardized indices such as the Index of Orthodontic treatment Need (IOTN) and the Dental Aesthetic Index (DAI).[6] Indices are tools that are used

as a reference against which to measure.[7] They comprise of numerical values describing the relative status of a population on a graduated scale with definite upper and lower limits, which are designed to permit comparison with other populations classified by the same criteria and methods.[8]

Determining the need for orthognathic surgery is a complex process that must consider both functional and aesthetic factors, as well as the impact of the deformity on a patient's quality of life.[9] While some studies report that patients' concerns about physical appearance and psychosocial consequences are the greatest motivation for demanding orthognathic surgery,[10] others have found that the primary motivation for requesting treatment are functional needs rather than aesthetics.[11] Selection of patients from orthognathic surgery must therefore be carefully made with objective universally acceptable, and applicable means of measurement.[8,12]

To aid clinicians in assessing the necessity for orthognathic intervention, the Index of Orthognathic Functional Treatment Need (IOFTN) was developed by Ireland et al.[13] in 2014. The IOFTN provides a standardised, objective method for categorising the functional severity of dentofacial deformities. It was modelled after the widely used Index of Orthodontic Treatment Need (IOTN), with the hope of creating an index that feels familiar to many who use the IOTN. Wherever possible the same traits as used in the Dental Health Component (DHC) of IOTN, but with modifications and additions to reflect the functional indications of treatment need for orthognathic patients. The IOFTN offers a structured framework for treatment prioritization and resource allocation within healthcare systems.[13] The IOFTN has been validated and utilized in various populations, and has been found to be simple, reliable, and appropriate for the prioritization of surgical patients.[14] It was able to determine that about 93.5% patients who had been treated with orthognathic surgery[15], and 90% of patients being prepared for orthognathic surgery had great need for orthognathic treatment.[16] According to a recent systematic review and meta-analysis, the IOFTN successfully identified 93% of patients who underwent orthognathic surgery with a great need for treatment.[17]

Orthognathic surgery is becoming an essential component of modern orthodontic practice which is now routinely incorporated into the multidisciplinary care of patients with severe dentofacial deformities.[2,18] However, despite its clear advantages, and the widespread use abroad, orthognathic treatment is still rarely provided in developing countries, to correct severe skeletal malocclusions.[19,20] A framework for improving surgical-orthodontic collaborative care of patients has been developed and adopted in our study environment[21], yet there is a dearth of information on the need for orthognathic surgery among the orthodontic population. Borzabadi-Farahani[17] reported only studies from UK, New Zealand, Iran, Pakistan, Turkey, Malaysia, Japan in a meta-analysis. This gap in knowledge makes it necessary to investigate such need in a clinical setting like ours where patients often present with varying degrees of skeletal discrepancies. The aim of this study was therefore to evaluate the functional need for orthognathic surgery in a Nigerian orthodontic population with the IOFTN, by applying this index, we sought to assess the proportion of patients requiring surgical intervention and to determine the nature of the functional problems exhibited, we also determined the relationship between the IOFTN and the familiar indices of the orthodontic treatment need, the Index of Orthodontic Treatment Need (IOTN) and the Dental Aesthetic Index (DAI).

Materials and Methods

Ethical approval

Ethical approval for the study was obtained from the Health Research Ethics Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife, with protocol number IPH/OAU/12/1979.

Study design, location, and population

Study was a cross sectional study conducted at the Orthodontic Unit of the Department of Child Dental Health, Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, Osun State.

The study population consisted of patients 18 years and older, who had presented at the Orthodontic unit of the hospital, who had appropriate study models and complete clinical records.

Sample size determination

The sample size was calculated using the formula for cross sectional studies in Epi Info Version 2000 (Atlanta, Georgia, USA) based on a previous study's prevalence of 5%.[22] The minimum sample size required for this study was determined as 73 participants, this was rounded up to 80 participants.

Study procedure

The complete sets of study models and clinical records of patients who were 18 years and above at the time of presentation were retrieved and included in the study. Study models were considered appropriate for use if they were properly trimmed and unbroken. Relevant patient biodata and other clinical details were extracted from the patients' case notes.

Classification of malocclusion:

Malocclusion was classified according to Angle's Classification, which is based on the anteroposterior relationship of the first permanent molars. Study models were examined in centric occlusion, and the classification was recorded as follows:

Class I: The mesiobuccal cusp of the upper 1st permanent molar occludes which the anterior buccal groove of the lower 1st permanent molar, but the line of occlusion is incorrect because of malposed teeth, rotations or other causes.

Class II: The mesiobuccal cusp of the upper 1st permanent molar occludes at least one-half cusp width anterior to the anterior buccal groove, line of occlusion not specified.

Division 1: The upper central incisors are proclined so that there is an increase in overjet.

Division 2: The upper central incisors are retroclined, lateral incisors may be proclined and the overbite is deep.

Class III: The mesiobuccal cusp of the upper first permanent molar occludes at least one-half cusp width distal to the anterior buccal groove, line of occlusion not specified.

Index of Orthodontic Treatment Need:

Orthodontic treatment need was evaluated from dental casts. Aesthetic impairment was assessed and determined with the Aesthetic Component (AC) of IOTN. A rating was allocated for overall dental attractiveness rather than specific morphological similarity to the photographs. Photographs 1-4 represent "No need for treatment"; 5-7, Borderline need for treatment" and 8-10 represent "great Need for treatment". For the Dental Health Component (DHC), each occlusal trait thought to contribute to the longevity and satisfactory functioning of the dentition was examined, dental health impairments were identified, and the most severe trait was the basis for grading an individual's orthodontic treatment need. Grades 1 and 2 represent "No need for treatment"; grade 3 "Borderline need for treatment" and grades 4 and 5 represent "Great need for treatment".

Dental Aesthetic Index:

Scores for each of the ten morphologic characteristics assessed by the DAI namely: number of missing visible teeth, crowding and spacing in the incisal segments, midline diastema, anterior irregularity in the maxillary and mandibular arches, anterior maxillary overjet and mandibular overjet, vertical anterior open bite and the antero-posterior molar relationships were determined by measurements from the dental casts. The multiplication of these scores by the weighting factor (regression coefficient), a summation of the products, and a constant produced the total DAI score. The DAI scores were graded into four groups based on the pre-defined DAI categories. Scores of 13–25 represent Grade 1 (normal or minor malocclusions with slight or no treatment need); scores of 26–30 represent Grade 2 (definite malocclusions with treatment considered elective); scores of 31–35 represent Grade 3 (severe malocclusions with treatment highly desirable); and scores of 36 and higher represent Grade 4 (very severe or disabling malocclusions with treatment considered mandatory).

The Index of Orthognathic Functional Treatment Need (IOFTN):

The IOFTN is a five-point scale similar to the DHC of

IOTN with the greatest need for treatment classified as group 5 and the little or no need for treatment classified as group 1. Within each group are descriptors of malocclusion that reflect the functional need for orthognathic treatment including overjet, openbite overbite, scissors bite, speech difficulties, facial asymmetry, sleep apnoea etc. As with the IOTN, the single most severe occlusal trait was used to score each dental cast. Details on presence of hypodontia, displacements, impaction or functional/speech difficulties, trauma to the soft tissues, overbite, lip competence or incompetence were extracted from the patients' clinical records.

Standardization of Examiner

The investigator (C.O.A) was calibrated by an expert (K.A.K) who is conversant with the development and application of occlusal indices. The investigator scored a set of dental casts not included in this study using the DAI, IOTN and IOFTN; scores were assessed with corrections made appropriately. Thereafter the investigator scored all selected study models, thirty of which were reassessed after two weeks to determine intra and inter-examiner agreement. Intra examiner agreement Cronbach's alpha ranged from 0.91-0.96 and the inter examiner agreement Cronbach's alpha ranged from 0.89-0.94.

Data analysis

The statistical analysis was carried out using SPSS Version 26.0. Descriptive statistics was done for sociodemographic variables such as age and gender. The frequency of the different components of the IOTN, DAI and IOFTN were determined and compared between gender using the Chi-Square test. Mean and standard deviation was determined for the DAI. Spearman correlation tests was conducted to determine relationship between the various indices. Statistical significance was inferred at $p \leq 0.05$.

Results

The data of 94 patients with age ranging from18 years to 48 years were analyzed. The mean age was 24.86 (SD = 6.02) years. There were 73 (77.6%) study models with Angles class I malocclusion, 12 (12.8%) with class II and 9 (9.6%) with class III. (Table 1)

The AC of IOTN scores for the study population ranged from 3 (4.3%) to 10 (2.1%). The greatest number of casts were scored as 7 (20.2%) and 8 (19.1%). The majority of the population were determined to have moderate need for treatment 44 (46.8), 30 (31.9%) fell in the great need for treatment category while (20) 21.3% had no need for treatment on aesthetic grounds. (Table 2) With the Dental Health Component (DHC) of IOTN, the most prevalent trait noticed within grades were contact point displacements. Table 3 shows the distribution of the study population according to treatment need, (20) 21.3% of the population had no treatment need, (20) 21.3% borderline need for treatment while 54 (57.4%) had great need for treatment.

The Dental Aesthetic Index (DAI) assessed the aesthetic aspects of occlusion from study models to produce a single score. The Mean DAI score was 38.35 (SD = 11.95), the mean score was 39.78 (SD =12.38) for females and 35.30 (SD = 10.53) for males. There was no significant gender difference in mean scores ($p = 0.090$). The need for orthodontic treatment according to the DAI id as presented in Table 4. Ten (10.6%) study models were graded as having normal or minor malocclusions with no/slight need for treatment, while the majority 52 (55.3%) had very severe/handicapping malocclusions, with treatment being mandatory. A significant gender difference in treatment need was observed ($p = 0.040$). A larger percentage of the female population compared with the male (62.5% vs 40%) had very severe handicapping malocclusions (Grade 4) whereas a larger percentage of the male population than the female (33.3% vs 9.4%) had definite malocclusion (Grade 2).

The functional need for orthognathic treatment of the study population was determined with the IOFTN. Distribution of models in the subcategories of the Index of Orthognathic Functional Treatment Need are as presented in Table 5. Subcategories 4.2 which represents increased overjet 6mm and 9mm, 4.8 increased overbite with evidence of dental or soft tissue trauma and 1.12 which represents speech difficulties were recorded for 14(14.9%), 11(11.7%) and 10(10.6%) dental casts respectively. Subcategory 1.14 which represented occlusal features not classified in the index was recorded for 21 (22.3%) dental casts.

The distribution of functional need for orthognathic treatment showed that, 31(33.0%) had no need, 9 (9.6%) mild need for treatment, 10 (10.6%) moderate

need for treatment, 34 (36.2%) great need for treatment and 10 (10.6%) had very great need for orthognathic treatment. Table 6 presents the gender distribution of orthognathic functional treatment need scores for this population, 40 (42.6%) dental casts [24 (37.5) female vs 16 (53.3) male] were determined to require no orthognathic treatment, 10 (10.6%) [5 (7.8) female vs 5 (16.7) male] had moderate need for treatment while 44 (46.8%) [35 (54.7) female vs 9 (30) male] had great need for orthognathic treatment. There was no significant gender difference in the need for orthognathic treatment (p = 0.068). A significant difference in functional need for orthognathic treatment based on Angle's malocclusion type was identified (p = 0.048), while the majority population with Angle's class I malocclusion had IOFTN grades 1 &2, most of those with Angles Class II and III had IOFTN grades 4 &5 (Table 7).

To determine the relationship between the occlusal indices used, the Spearman's rank correlation coefficient test was performed. Positive and significant moderate correlation was observed between the DHC of IOTN and IOFTN, 0.411 (p = 0.000). The DAI and AC of IOTN had low but significant positive correlations of 0.376 (p =0.000) and 0.303 (p = 0.003) respectively with the IOFTN.

Table 1. Malocclusion Distribution in the Study Population

Angle's Malocclusion	Female n (%)	Male n (%)	Total n (%)	p value
Class I	52 (81.2)	21 (70.0)	73 (77.6)	
Class II	9 (14.1)	3 (10.0)	12 (12.8)	0.075
Class III	3 (4.7)	6 (20.0)	9 (9.6)	
TOTAL	64 (100)	30 (100)	94 (100)	

Table 2. Distribution of Orthodontic Treatment Need of the Study Population according to the AC of the IOTN

AC of IOTN Category	Female n (%)	Male n (%)	Total n (%)	p value
1-4 (No need for treatment)	16 (25.0)	4 (13.3)	20 (21.3)	0.308
5-7 (Moderate need for treatment)	27 (42.2)	17 (56.7)	44 (46.8)	
8-10 (Great need for treatment)	21 (32.8)	9 (30.0)	30 (31.9)	
Total	64(100)	30(100)	94(100)	

Table 3. Distribution of Orthodontic Treatment Need of the Study Population according to the DHC of the IOTN

AC of IOTN Category	Female n (%)	Male n (%)	Total n (%)	p value
Grades 1&2 (No need for treatment	13 (20.3)	7 (23.3)	20 (21.3)	0.749
Grade 3 (Moderate need for treatment)	15 (23.4)	5 (16.7)	20 (21.3)	
Grades 4&5 (Great need for treatment)	36 (56.3)	18 (60.0)	54 (57.4)	
Total	64(100)	30(100)	94(100)	

Table 4: Distribution of Orthodontic Treatment Need of the Study Population according to the Dental Aesthetic Index (DAI)

DAI Category	Female n (%)	Male n (%)	Total n (%)	p value
Grade 1 Mild malocclusion (No need for orthodontic treatment)	7 (10.9)	3 (10.0)	10 (10.6)	0.040
Grade 2 Definite malocclusion (Treatment elective)	6 (9.4)	10 (33.3)	16 (17.0)	
Grade 3 Severe malocclusion (Treatment highly desirable)	11(17.2)	5 (16.7)	16 (17.0)	
Grade 4 Very severe malocclusion (Treatment mandatory)	40 (62.5)	12 (40.0)	52 (55.3)	
Total	64 (100)	30 (100)	94 (100)	

Table 5: Distribution of Study models of the Study Population in the Subcategories of the Index of Functional Orthodontic Treatment Need (IOFTN)

IOFTN Subcategory	n	(%)
5.4	2	2.1
5.3	1	1.1
5.2	7	7.4
4.8	11	11.7
4.4	5	5.3
4.3	4	4.3
4.2	14	14.9
3.4	1	1.1
3.3	9	9.6
2.8	9	9.62
1.14	21	2.3
1.12	10	10.6
Total	94	100

Table 6: Gender Distribution of Orthognathic Functional Treatment Need (IOFTN) Grades of the Study Population

IOFTN Grades	Female n (%)	Male n (%)	Total n (%)	p value
No need for treatment (Grades 1&2)	24 (37.5)	16 (53.3)	40 (42.6)	0.068
Moderate need for treatment (Grade 3)	5 (7.8)	5 (16.7)	10 (10.6)	
Great need for treatment (Grades 4 &5)	35 (54.7)	9 (30)	44 (46.8)	
Total	64 (100)	30 (100)	94 (100)	

Table 7: Distribution of Orthognathic Functional Treatment Need (IOFTN) Grades of the Study Population based on Malocclusion Type

IOFTN Grades	Angles Class I n (%)	Angles Class I n (%)	Angles Class I n (%)	Total n (%)	p value
No need for treatment (Grades 1&2)	35 (47.9)	2 (16.7)	3 (33.3)	40 (42.6)	0.048*
Moderate need for treatment (Grade 3)	9 (12.3)	0 (0.0)	1 (11.1)	10 (10.6)	
Great need for treatment (Grades 4 &5)	29 (39.7)	10 (83.3)	5 (55.6)	44 (46.8)	
Total	73 (100)	12 (100)	9 (100)	94 (100)	

*Likelihood Ratio

Discussion

This study evaluated malocclusion types and orthodontic treatment need within an orthodontic population using three indices: the Dental Aesthetic Index (DAI), the Index of Orthodontic Treatment Need (IOTN), and the Index of Orthognathic Functional Treatment Need (IOFTN). Angles Class I malocclusion was the most prevalent (77.6%) in the study population. The AC of the IOTN had 31.9% of the study population in the great need for treatment category, while the DHC of IOTN had 57.4% in the same category. Using the DAI, 55.3% had very severe malocclusions, with treatment considered mandatory. The IOFTN determined 46.8% as having great need for treatment (Grades 4 &5). Moderate correlation was between the DHC of IOTN and the IOFTN.

Our finding of the prevalence of Angles class I malocclusion in the population is consistent with previous Nigerian reports.[23-26] This observation within an orthodontic population however reflects the shortcoming of the Angles classification which is based on 1st molar relationship without an assessment of the features of malocclusion. Many reports among orthognathic surgery patients report the prevalence of Classes II and III malocclusion.[5,27-28]

The Aesthetic component (AC) of the IOTN, showed that about a third of this population had great need for treatment category. This was surprising in an orthodontic population typically motivated for treatment because of dissatisfaction with dental aesthetics.[29-31] This could be due to the limitation of the AC when applied to dental casts as previously reported.[32] The frequent occurrence of the AC of IOTN score 8 in the study population, may be related to the unesthetic appearance of the canine in this photograph. Ectopic canines have been reported as a common driving factor among orthodontic

populations.[33] With the Dental Health Component (DHC) of the IOTN, most of the population fell within great need for treatment, this aligns with the expectation in an orthodontic population. Interestingly, about a fifth had no need for treatment, probably due to the use of a single occlusal trait thought to contribute to the longevity and satisfactory functioning of the dentition to determine the DHC score.

The DAI identified significant gender difference with the distribution orthodontic treatment need. A larger percentage of the female population compared with the male population had very severe handicapping malocclusions. The reason for this observation is not clear as most previous investigations fail to identify gender-based differences in orthodontic treatment need.[34-36] However similar to our findings Närhi et al. [37] observed significant gender differences with the need for orthodontic treatment. It was interesting that the DAI determined only about 10% as having no need for treatment compared to about 20% by the AC and DHC of IOTN. This is similar to a report among individuals with special health care needs in the same environment.[35] This reflects the DAIs more comprehensive evaluation of the occlusal traits. The World Health Organisation (WHO) endorses the DAI for evaluation of malocclusion in epidemiological studies.

Nearly half (46.8%) of our study population were identified as needing functional orthognathic treatment according to the IOFTN. This is similar to the report of Zheng et al.[38], where 48% of the patients in the orthodontic treatment group were classified as category 4 or 5, and contrasts the high rates 90% - 93.5% reported in in England and Pakistan among patient treated and awaiting orthognathic surgery.[15,16] This is an eye opener as our finding suggests that the proportion of patients who would benefit from a combination of orthodontic and surgical intervention rather than only orthodontic treatment is large. This information is important for Nigerian orthodontists as it raises the awareness that cases with indications for orthognathic treatment are probably being underdiagnosed and undertreated. The implication of this is that the quality of life of orthodontic patients may remain suboptimal even after provision of orthodontic treatment.

Previous studies have proffered reasons for the grossly suboptimal orthognathic practices in Nigeria, some of the barriers identified are the lack of coordinated collaboration between the orthodontists and maxillofacial surgeons and absence of a multidisciplinary treatment protocol.[20] In the report of a framework for improving surgical-orthodontic collaborative care of patients, the importance of the surgical-orthodontic clinic for evaluation and treatment planning was highlighted[21], however the report failed to identify and emphasize the need for use of objective indices like the IOFTN during such evaluations. Routine use of objective universally acceptable, and applicable means of measurement for selection of patients for orthognathic surgery has been recommended[8,12] which our findings support.

The IOFTN Subcategories most commonly responsible for orthognathic treatment need in our population were 4.2 which represents increased overjet 6mm and 9mm; 4.8 which represents increased overbite with evidence of dental or soft tissue trauma and 1.12 which represents speech difficulties. Several other studies have found 4.2 as one of the prevalent subcategories.[5,22,27] Clinicians should therefore be mindful that these very familiar occlusal traits and speech difficulties could constitute indications for orthognathic treatment. Many in our population also fell in the subcategory 1.14 with occlusal features not classified in the IOFTN. The reliance on dental casts rather than chairside assessments could have contributed to this. This represents a limitation with the use of the IOFTN.

We observed no significant gender difference in treatment need with the use of the IOFTN. This is similar to the observation of Eslamian et al.[5] among Iranian orthognathic patients, however Olkun et al.[39] reported gender differences in a population of patients who also received orthognathic treatment. A moderate correlation was observed between the DHC of IOTN and IOFTN, with lower correlations seen with the AC of IOTN and DAI. This is expected since the development of the IOFTN was modelled after the (DHC) of IOTN and where possible the same traits had been used.

To the best of our knowledge, this is the first report of the functional need for orthognathic treatment with the IOFTN in a Nigerian population. There are several implications of our study findings. The high prevalence of severe malocclusion with functional orthognathic treatment need highlights the necessity for comprehensive orthodontic and orthognathic assessment in Nigerian orthodontic practice. This work contributes to the growing body of evidence advocating the routine use of the standardised occlusal indices including the IOFTN in clinical practice.

Despite the potential of the IOFTN to improve diagnosis of functional orthognathic problems access to such specialized services is still limited in Nigeria due to low public awareness, the high cost and lack of specialized centres.[20] Surgical treatment of dentofacial deformities requires coordinated team care to meet the needs of patients. Perhaps a more important implication of our findings is the need to advocate for multidisciplinary care of the orthodontic patient population. The multidisciplinary team approach has been found to provide superior treatment outcomes compared with individualized care with cleft lip and palate management[40], this approach is inevitable for the successful management of patients with dentofacial deformity.[41] Such coordinated care is likely to stimulate patient motivation and increase the utilisation of surgical care.

Orthodontic treatment in Nigeria is currently provided on the basis of fee for service rendered which makes it inaccessible to many. This is unlike the practice in countries like the United Kingdom where indices are used to prioritize treatment which are public funded.[13] Our study findings serve as a justification for the advocacy for public health campaigns to educate the population about the importance of early detection and treatment of malocclusions. In addition, healthcare and education sector policies that recommend Government funding of orthodontic care through provision of subsidies and insurance coverage and support of specialised training for relevant professionals are long overdue.

This study provides baseline data that can guide future research in Nigeria. It also highlights and advocates the adoption of standardized indices like the DAI, IOTN, and IOFTN for clinical and epidemiological settings to ensure consistency and comparability of data. A limitation of this study is our reliance on information retrieved from the dental records of an orthodontic population. Chairside evaluation including the use of psychological indicators which this study could not apply are recommended for IOFTN use.[42] Also, our findings reflect a single-centre population in southwest Nigeria, it however serves as a valuable baseline data that highlights the overlap between aesthetic, dental health, and functional assessments of treatment need. Larger multicenter studies among orthodontic patients and the general population will be necessary.

Conclusion

There was a high prevalence of severe malocclusions with functional treatment need in the studied population. According to the IOFTN, 42.6% had no or mild need 10.6% had moderate need and 46.8% had great or very great need for orthognathic treatment. Increased overjet, increased overbite with trauma and speech difficulties were the main indicators for orthognathic treatment. These findings underscore the importance of comprehensive assessment and multidisciplinary care to address unmet functional needs in the Nigerian orthodontic population.

Kolawole KA was responsible for the concept and design, data analysis, drafting, critical revision and final approval of the manuscript.

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APPENDIX

Index of Orthognathic Functional Treatment Need

This index applies to those malocclusions that are **not amenable** to **orthodontic treatment alone, due** to **skeletal deformnity,** and will ordinarily apply to those patients who will have completed facial growth prior to surgery (commonly 18 years of age and older). It relates only to the functional need for treatment and should be used in combination with appropriate psychological and other clinical indicators.

5. Very Great Need for Treatment

5.1 Defects of cleft lip and palate and other craniofacial anomalies
5.2 Increased overjet greater than 9 mm
5.3 Reverse overjet ≥3 mm
5.4 Open bite≥4 mm
5.5 Complete scissors bite affecting whole buccal segment(s) with signs of functional disturbance and or occlusal trauma
5.6 Sleep apnoea not amenable to other treatments such as MAD or CPAP (as determined by sleep studies)
5.7 Skeletal anomalies with occlusal disturbance as a result of trauma or pathology

4. Great Need for Treatment

4.2 Increased overjet ≥ 6 mm and ≤9 mm
4.3 Reverse overjet ≥0 mm and <3 mm with functional difficulties
4.4 Open bite <4 mm with functional difficulties
4.8 Increased overbite with evidence of dental or soft tissue trauma
4.9 Upper labial segment gingival exposure ≥ 3mm at rest
4.10 Facial asymmetry associated with occlusal disturbance

3. Moderate Need for Treatment

3.3 Reverse overjet ≥0 mm and < 3 mm with no functional difficulties
3.4 Open bite <4 mm with no functional difficulties
3.9 Upper labial segment gingival exposure < 3mm at rest, but with evidence of gingival/periodontal effects
3.10 Facial asymmetry with no occlusal disturbance

2. Mild Need for Treatment

2.8 Increased overbite but no evidence of dental or soft tissue trauma
2.9 Upper labial segment gingival exposure <3mm at rest with no evidence of gingival/periodontal effects
2.11 Marked occlusal cant with no effect on the occlusion

1. No Need for Treatment

1.12 Speech difficulties
1.13 Treatment purely for TMD
1.14 Occlusal features not classified above

Assessing the Role of Gender on Parents' Decision on Orthodontic Treatment for their Children

Okeke AC, Ndukwe AN, Onyejiaka NJ

Abstract

Background: To determine the influence of gender on parents' decision to bring their children for orthodontic treatment.

Methods: This was a questionnaire-based descriptive cross-sectional study of 85 parents aged 20 to 62 years, who brought their children for orthodontic treatment at a tertiary hospital in Enugu, Nigeria. Data on sociodemographic profile and its association with gender preference for orthodontics treatment was collected.

Results: Eighty-five participants aged 20 to 62 years were involved in the study with mean age of 43.18 ± 9.23 years. Forty-three (50.6%) of the participants were between 40-49 years. Fifty-one (60%) were females, 35(41.2%) were civil servants and 73(85.9%) believed that orthodontic treatment was necessary in both genders. Married parents were significantly (p-value 0.043) more likely to prefer orthodontic treatment for female children than the males. Seventy-five (88.2%) will attend to their female child first if finances at a particular time would be sufficient to attend to only one child. More female children 51(60%) were brought to the clinic than the males 34(40.0%).

Conclusion: Most participants preferred that their female children got orthodontic treatment than the males if their finance was sufficient to attend to only one child. but this was not significant. Greater awareness of the need for equal attention to be paid to the correction of malocclusion in both male and female children should be encouraged

Keywords: Orthodontics; Gender Identity; Malocclusion; Child

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Introduction

Gender identity bias in developing countries has not gone unnoticed. Previous studies have documented disparities in within-the-house resource allocation of parents between sons and daughters especially in developing countries.[1,2] In general, findings suggest that parents spend less on girls' education and females have a lower probability of being enrolled in school than males.[3,4] Similarly, studies suggest gender identity differences in nutrition, health status, mortality rate, and access to healthcare which are skewed against the female child.[5,6] This study contributes to the literature by examining whether the gender identity bias of parents predicts their real-life decision-making regarding their allocation of money for the treatment of malocclusion for either their male or female child when their finances are able to pay for a child per time.

Malocclusion which is defined as an abnormality of the teeth or a mal-relationship of the dental arches beyond the variety of exactly what is accepted as regular[7] is a common healthcare need in both males and females.[8] It has a range of descriptions including, scattered teeth, underbite, overbite open bite, spaces and crowding. It has a growing prevalence in most parts of the world.[9] In 2020 Lombardo et al.[10] reported a world prevalence of malocclusion of 56% with Africa having the largest prevalence of 81%. In Nigeria, Ajayi[11] reported a prevalence of malocclusion of 84.1% among secondary school children.

Numerous complications are associated with the presence of malocclusion. It affects appearance,

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chewing, swallowing and sometimes the temporomandibular joint functions.[12,13] Rebelo et al.[14] had reported that malocclusion predisposed children to taunting by peers thereby dampening their morale to be regular at school. Similarly, the presence of malocclusion has been linked to unemployment especially where the job description required social interaction.[15] The choice of friends, including whether a person is considered for marriage or not has also been linked to the presence or absence of malocclusion and so is the risk of developing mental disorders.[15,16]

These complications combine to form the factors that drive a patient's desire for orthodontic treatment. However, cultural, socioeconomic and family backgrounds also form factors associated with the desire and readiness to commence orthodontic treatment.[17] In parts of Africa where there is little or no insurance cover for the correction of malocclusion through orthodontic treatment, most patients have to pay out of pocket. The average cost of orthodontic treatment in Nigeria as at 2024, using an exchange rate of 511.23 Naira to 1-dollar,[18] is $1956. With a minimum wage of about $708 per annum for Nigerian civil servants, it is obvious that the decision to undergo the correction of malocclusion by commencing orthodontic treatment must be carefully thought through by parents. This is made worse by the hereditary nature of malocclusion, where in some families, more than one child may present with malocclusion. In such cases there must be factors that guide the decision of parents in deciding which child gets the treatment.

Despite the similar reported improved quality of life in males and females after orthodontic treatment[19] and the increasing call for equity and justice[20], in Africa, parents often make treatment decisions regarding their children based on gender identity.[21] One study had reported that female children were given priority by parents when it concerns orthodontic treatment need.[22]

There is a dearth of information on the influence of gender of child on parent's choice in bringing them for orthodontic treatment when their finance would be sufficient to attend to only one child per time.

Materials and methods

The study was carried out in Enugu State which is one of the 36 states in Nigeria. It is located in the south eastern region of Nigeria. It is bounded by Kogi and Benue states to the North, Ebonyi to the East, Abia to the south and Anambra to the West. It is situated on latitude 6° 27` 10`` north of the equator and 7° 30` 40`` East of the Greenwich Meridian.

The study participants were parents who brought their children to the University of Nigeria Teaching Hospital (UNTH), Ituku-Ozalla for orthodontic treatment. UNTH is the only tertiary health institution that offers orthodontic services in the region. Patients are therefore referred to UNTH for orthodontic care from other health care facilities in the region. The study design was descriptive cross-sectional study. All parents who brought their children for orthodontic treatment at the UNTH and gave written consent to participate in the study were recruited consecutively. The dependent variable was sex preference for orthodontic treatment, while age, sex, education level, marital status and occupation were the independent variables.

The sample size of 85 was calculated using the formula; N=t2x p (1-p)/m2.[23] Where N is the required sample size, p is the prevalence (5.8%) of malocclusion.[24] M is the margin of error at 5% standard value of 0.05, t is the confidence level at 95% precision, while standard value is 1.96. Thus, N= 1.962 x 0.058 (1-0.058)/0.0025 =84. However, 85 participants were recruited into the study.

Prior to the study, ethical approval was obtained from the “000” Health Research and Ethics Committee. Approval number is: UNTH/HREC/2024/01/642. The structured self-administered questionnaire was given to the participants to fill in the waiting room. The questionnaires were collected immediately after completion.

The collected data were entered into a computer and subjected to statistical analysis using the Statistical Product for Service Solution (SPSS) version 25.0. Descriptive statistics which entailed frequency, percentage, mean and standard deviation was used. Association between sociodemographic characteristics of the parents and perceived gender identity preference for orthodontics treatment, was also conducted. Test of significance was done at 0.05 level of significance using Chi-square test.

Results

Eighty-five participants participated in the study. 43(50.6%) of the study participants were between 40-49 years with a mean age of 43.18 ± 9.23 years. As shown in figure 1, seventy-three (85.9%) participants believed that orthodontic treatment was necessary in both genders. More female 51(60%) than males 34(40.0%) children, were brought to the clinic to access orthodontic treatment as shown in figure 2. Table 1 shows that more than half of the study participants; 51 (60%) were females, 35 (41.2%) were civil servants and married parents were significantly (p=0.043) more likely to prefer orthodontic treatment for their female children than the males. As shown in table 2, seventy-five (88.2%) participants said they will attend to their female child first if their finances at a particular time would be sufficient to attend to only one child. The need to "look fine" topped 52(61.2%) the reason for their decision.

Table 1: Association between Sociodemographic Characteristics of the Parents and perceived sex preference for Orthodontics treatment

Sociodemographic variables	Sex preference for Orthodontics treatment				Chi-square	p-value
	Male n(%)	Female n(%)	Equality n(%)	Total n(%)		
Age group(years)						
20-29	0(.0)	0(.0)	4 (100.0)	4(4.7)		
30-39	0(.0)	2(9.5)	19 (90.5)	21(24.7)		
40-49	0(.0)	7(16.3)	36 (83.7)	43(50.6)	2.71	0.608
50-59	0(.0)	3(23.1)	10 (76.9)	13(15.3)		
>60	0(.0)	0(.0)	4 (100.0)	4(4.7)		
Parent's sex						
Male	0(.0)	7(20.6)	27 (79.4)	34(40)	1.95	0.162
Female	0(.0)	5(9.8)	46 (90.2)	51(60)		
Level of education						
Primary	0(.0)	0(.0)	1 (100.0)	1(1.2)		
Secondary	0(.0)	1(33.3)	2 (66.7)	3(3.5)	1.08	0.576
Tertiary	0(.0)	11(13.6)	70 (86.4)	81(95.3)		
Marital status						
Married	0(.0)	11(15.3)	61 (84.7)	72(84.7)		
Single	0(.0)	0(.0)	11 (100.0)	11(12.9)	8.13	0.043*
Divorced	0(.0)	0(.0)	1 (100.0)	1(1.2)		
Separated	0(.0)	1(100.0)	0 (.0)	1(1.2)		
Occupation						
Civil servant	0(.0)	7(20.0)	28 (80.0)	35(41.2)		
Clergyman	0(.0)	0(.0)	2 (100.0)	2(2.4)		
Farmer	0(.0)	0(.0)	1 (100.0)	1(1.2)	4.86	0.433
Healthcare worker	0(.0)	2(6.7)	28 (93.3)	30(35.3)		
Self employed	0(.0)	3(25.0)	9 (75.0)	12(14)		
Student	0(.0)	0(.0)	5 (100.0)	5(5.9)		

*Statistically significant

Table 1 shows that marital status of parents also had a significant association on the preferred gender (X^2=8.13, P=0.043).

Table 2: Influence of limited resources on choice of sex for treatment of malocclusion with reasons

Variables	Sex preference for Orthodontics treatment				Chi-square	p-value
	Male n(%)	Female n(%)	Equality n(%)	Total n(%)		
With Limited resources which sex will receive attention first						
Male	0(.0)	0(.0)	10(100.0)	10(11.8)	1.83	0.172
Female	0(.0)	12(16.0)	63(84.0)	75(88.2)		
Factors considered by parents in the choice of child to receive treatment when financial resources are limited						
Need to look fine	0(.0)	8(15.4)	44(84.6)	52(61.2)	0.21	0.900
It will improve their chance of getting married	0(.0)	1(14.3)	6(85.7)	7(8.2)		
Other reasons	0(.0)	3(11.5)	23(88.5)	26(30.6)		

Table 2. On the possibility of the role of limited resources playing a role in influencing the sex that gets treated first, the results show that though 88.2% of the study participants opted to attend to the orthodontic need of the female child first, this choice was not significantly associated with the availability of resources (X^2= 1.83, P=0.172).

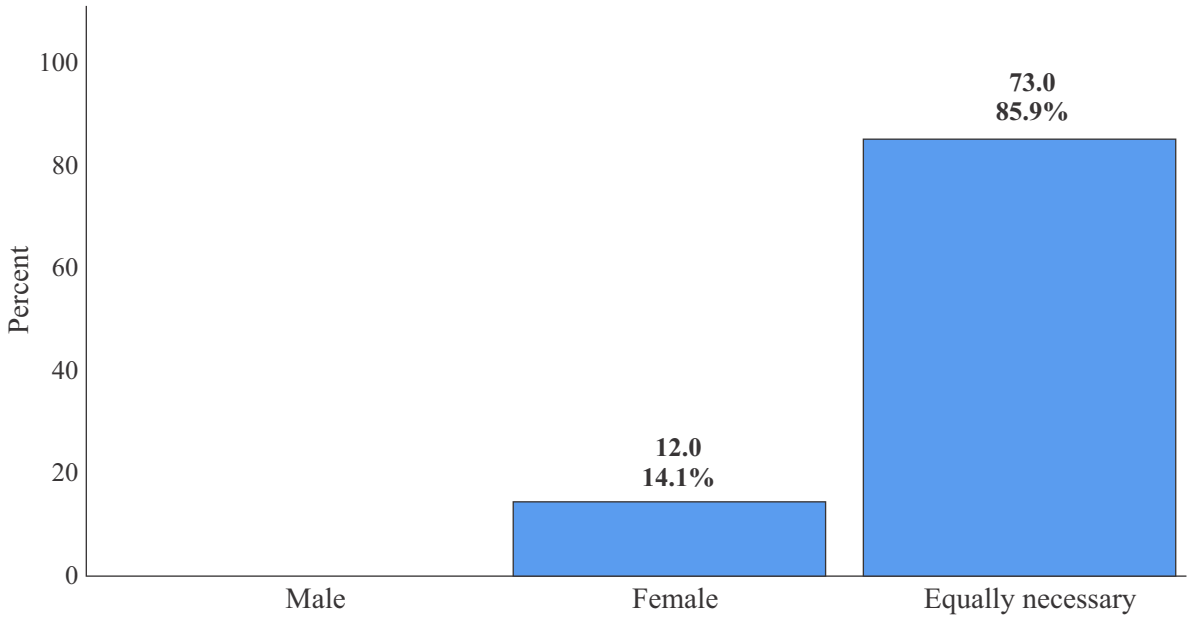


Figure 1: Gender Preference for Orthodontic Treatment

Indicates that 73 (85.9%) study subjects believed that orthodontic treatment was necessary in both gender while 12 (14.1%) believed it was more necessary in females.

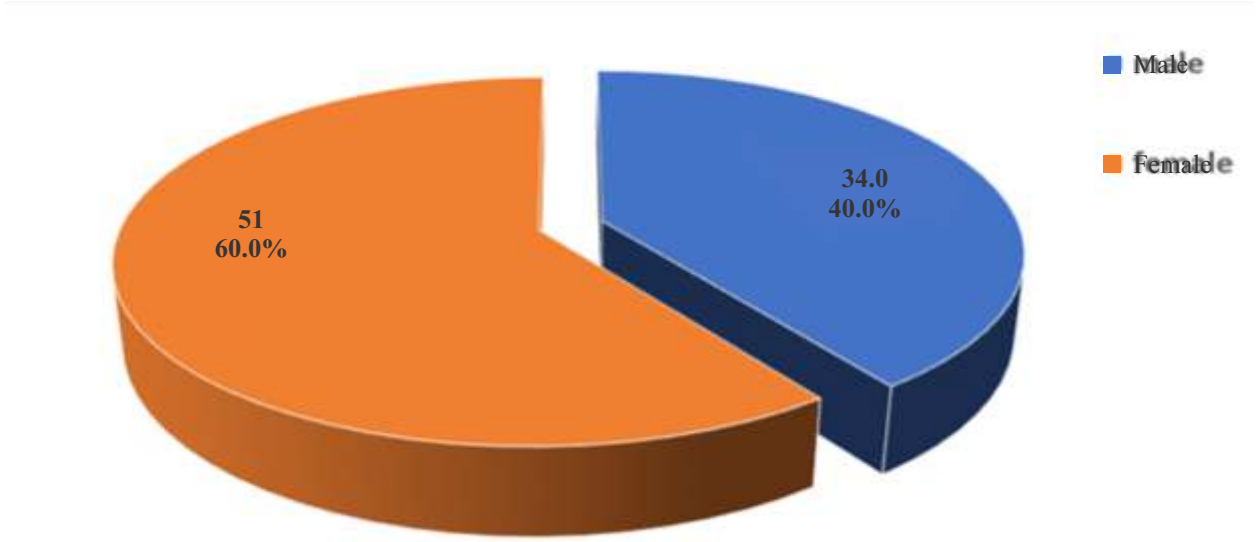


Figure 2: Gender identity of the child brought to the orthodontic clinic

Shows that 51 (60%) children brought to the clinic were females while 34 (40%) were males

Discussion

Gender identity-based bias is reported across a large spectrum of healthcare including emergency, inpatient, outpatient and preventive care mostly in Asia, Africa and South America.[25] Gender based discrimination has been linked to various cultural and socioeconomic factors.[26]

Similarly, reasons for initiating orthodontic treatment varies across cultural and socioeconomic backgrounds,[27] as seen by the various approaches to treatment or non-treatment for different forms of malocclusion including midline diastema.[27]

Initiating orthodontic treatment may also be influenced by parent's age, gender, level of education and the availability of resources or a lack of it.[28,29] In the present study however, age and gender identity of participants had no effect on the choice of gender of child to be treated. The highest number of respondents was seen within the 4th decade of life, unlike in Asia where Felemban et al.[30] reported that 65.6% of parents who brought their children to the orthodontic clinic were aged 18–30 years. The finding in the present study may be because the women in the southern part of Nigeria were the study was carried out are not known to marry early as compared with their Northern counterparts.[31]

The greater number of female parents who brought their children to the clinic in the present study is similar to the finding in a previous study[29] carried out in Nigeria in which about two-thirds of the parents who brought their children to the clinic were female parents. This may be due to the more child keeping role of mothers in the study environment. It may also be an indication of the greater concern of female parents about aesthetics more than their male counterparts, especially since the females were more social media users than their male counterparts.[32]

Parental motivation especially that of the mother has also been reported to be a key motivation in initiating orthodontic treatment in children.[29,33]

Most of the respondents who came to the clinic with their children had a tertiary education. This may be as a result of a higher level of awareness about orthodontic treatment among the more educated and is similar to the report from a previous systematic review.[27] However, level of education of participants had no effect on the choice of gender of child to be treated. This is contrary to the report from Ganatra & Hirve[34] in which parents bias towards the boy child was not influenced by level of education.

Likewise, occupation had no effect on the parents' favoured gender for treatment unlike the report from

a previous study conducted India where occupation had no impact on preferred gender for healthcare.[34]

In assessing for the role of a child's gender identity in influencing his/her being brought to the orthodontic clinic by the parents, we note that specific studies pertaining to the impact of gender identity as it concerns which child is brought for orthodontic care is scarce in the literature. In the present study, majority of the participants said that gender identity would not influence their decision to bring their children for orthodontic treatment. As such, they would bring their children to the clinic once they felt a need irrespective of the child's gender. However, previous studies reported gender identity bias in access to healthcare which are skewed against the female child.[5,6]

When asked about the influence of a child's gender in bringing him/her for orthodontic treatment in a situation where finances at a particular time would be sufficient to attend to only one child, most stated that they will chose to attend to the female child. The above finding may be as a result of a lack of government's provision of definite free health and social care facilities in the environment where the present study was carried out, as the availability of money had been reported in a previous study[29] as a factor in parents' decision to seek healthcare for their children. The finding in this study validates that which was previously reported by Rose, (2000)[35] in which poverty or resource constraint was a source of parental gender identity bias in time allocation. Similarly, the report from a previous study[22] also stated that though there is an equal need for orthodontic treatment in males and females, even in wealthy homes, females were more likely to get treatment because the parents and their female children set the standard for beauty.

When the participants were asked the reason for which they will prefer the treatment of their female child before the male, more than half of them said it was because the female child had more need to look fine. This finding also relates with the report of a previous study in Nigeria which reported that malocclusion can reduce the chance of a female getting a spouse.[15]

Conclusion

Many participants showed preference for the female children having orthodontic treatment than the males if their finance was sufficient to attend to only one child at a particular time. Married parents are more likely to prefer orthodontic treatment for their female children than the males. Greater awareness of the need for equal attention to be paid to the correction of malocclusion in both male and female children should be encouraged.

Authors' Contributions

This work was carried out in collaboration among all authors. Okeke, Azubuike C. was involved with Conceptualization, Original Draft Preparation, Writing, Methodology and Investigation. Ndukwe, Anne N. contributed to the Conceptualization, Original Draft Preparation and Formal Analysis. Onyejaka, Nneka K.was involved with Conceptualization, Methodology, Review and Editing. All authors read and approved the final manuscript.

All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Data Availability: The data used to support the findings of this study can be made available upon request to the corresponding author.

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Two Phase Orthodontic Treatment of Class II Division 1 Malocclusion Complicated by an Ellis Class IV Fractured Central Incisor - A Case Report

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Abstract

This study reports a case of a 10-year-old boy who presented with a chief complaint of not liking the arrangement of his teeth and the discoloration of an anterior tooth. Mother also complained of a lower lip sucking habit which he performed occasionally and a one year history of trauma to his anterior tooth which was untreated. On assessment, a diagnosis of Angle's class II division 1 malocclusion on skeletal pattern 2 complicated by Ellis class IV fracture of tooth 11, proclined 11 and 21, incompetent lip seal, increased overjet, deep and traumatic overbite, buccal crossbite of 24, moderate spacings in the upper anterior segment, mild crowding in the lower anterior segment, rotated teeth and exaggerated curve of spee in the lower arch was made.

A multidisciplinary treatment plan of Orthodontic and Paedodontic management with a two-phase orthodontic treatment was done. Phase 1 orthodontic treatment was a functional appliance treatment phase using Frankel 2 appliance while Phase 2 was an upper and lower arch fixed orthodontic appliance treatment (non-extraction protocol) after a root canal treatment of tooth 11 had been carried out. Retention was achieved using a combination of upper and lower fixed lingual retainers and an upper Hawleys' retainer.

Conclusion: This study presented a successful orthodontic-endodontic intervention in the management of a 10-year-old boy with Angle's class II division 1 malocclusion on skeletal pattern 2 complicated by a devitalized upper central incisor over a period of 27 months.

Keywords: Functional appliance, multidisciplinary, orthodontic-paedodontic interphase, trauma, Two phase orthodontic treatment.

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Introduction

Class II division 1 malocclusion poses a functional, aesthetic or psychological challenge to individuals with this condition.[1] This form of malocclusion has a prevalence of 1.6% in Benin City,[2] 1.7% in Northern Nigeria,[3] 3.9% in Rivers State[4] and 14% in South-West Nigeria[5]. It has a wide variation in its skeletal and dental presentation amongst which includes proclined maxillary incisors, increased overjet, deep overbite, narrow maxillary arch, mesial positioning of the maxillary molars, short lips, prognathic maxilla and retruded mandible.[1,6,7]

Class II division 1 malocclusion has been found to be a predisposing factor to maxillary incisor trauma.[8] This orofacial trauma results in fractured, discoloured, displaced or avulsed anterior teeth and can have significant negative effect on children.[8, 9] Thus, early orthodontic treatment of Class II division 1 malocclusion to prevent incisor trauma has been recommended.[8,10]

ORIGINAL ARTICLE

This case report presents a multidisciplinary two-phase orthodontic treatment of a 10-year-old boy with class II division 1 malocclusion complicated by an Ellis class IV trauma to the right maxillary central incisor. The Orthodontist utilized a Frankel 2 functional regulator and fixed orthodontic appliance treatment non-extraction protocol while the Paediatric Dentist carried out a root canal treatment on the traumatized tooth. Successful two-phase orthodontic treatment for this complicated condition has been sparingly reported in the south-south region of Nigeria.

Case report

This is the case of a 10-year-old boy who presented to the Paediatric Dental clinic of the University of Benin Teaching Hospital accompanied by his mother. His presenting complaint was "I don't like the way my teeth looks, and I have a discoloured tooth." There was a positive history of digit sucking habit which the mother claimed was discontinued about 6 years prior to presentation. Mother said he then developed a lower lip sucking habit which he performs occasionally. There was also a positive history of trauma to his anterior teeth as a result of a fall one year prior to presentation which was left untreated. Patient claimed the condition did not affect his relationship with friends neither did it affect his speech or mastication. He had no medical history of note, and this was his first dental visit.

On examination, he was in a normal state of health, his face was bilaterally symmetrical, facial profile was convex. He had a class 2 skeletal pattern, lips were complete but incompetent with a Jackson score of 1/0. He was in the mixed dentition stage with teeth 11, 12, 14, 55, 16, 21, 22, 63, 24, 65, 26, 31, 32, 33, 34, 75, 36, 41, 42, 43, 85, 46 present. Teeth 11 and 21 were proclined, 31 and 41 were distolabially rotated and 11 was also discolored. He had an incisal class II division 1 relationship, with an overjet of 15mm on the right and 13mm on the left, overbite was deep and traumatic. There was moderate spacing in the upper anterior segment of 5mm, mild crowding in the lower anterior segment of 3mm with an exaggerated curve of Spee in the lower arch. He also had an Angle's class II molar relationship on the right and left with a buccal crossbite of 24.

Periapical radiograph of tooth 11 revealed signs of pulp chamber calcification and external root resorption, while the dental panoramic radiograph revealed the presence of the complete complement of the permanent dentition in the bone. Lateral cephalometric radiograph revealed an SNA of 84^{o} ($85.5^{0} \pm 3.5$) which was normal, SNB of 77^{0} ($82.7^{0} \pm 3.0$) which implied a mandibular retrognathism, ANB of 7^{0} ($2^{0} – 4^{0}$) which implied a class 2 skeletal pattern, upper incisor to Frankfurt plane of 132^{0} ($119^{0} – 127^{0}$) which implied a maxillary incisor proclination, lower incisor to mandibular plane of 97^{0} ($96^{0} – 104^{0}$) which was within normal range, interincisal angle of 100^{0} ($108^{0} – 116^{0}$) which implied a bimaxillary proclination, Frankfurt mandibular plane angle of 29^{0} ($20.8^{0} \pm 3.1^{0}$) which implied a high angle, lower facial height proportion of 60.2% (50-60%) which implied a slightly increased lower face and a cervical vertebrae maturation stage 3.

A multidisciplinary assessment by the Orthodontists and Paedodontist made a diagnosis of Angle's class II division 1 malocclusion on skeletal pattern 2 complicated by Ellis class IV fracture of tooth 11, proclined 11 and 21, incompetent lip seal, increased overjet, deep and traumatic overbite, buccal crossbite of 24, moderate spacing in the upper anterior segment, mild crowding in the lower anterior segment, rotated teeth, exaggerated curve of spee in the lower arch was made.



Figure 1: Pretreatment Extraoral Photographs



Figure 2: Pretreatment intraoral photographs

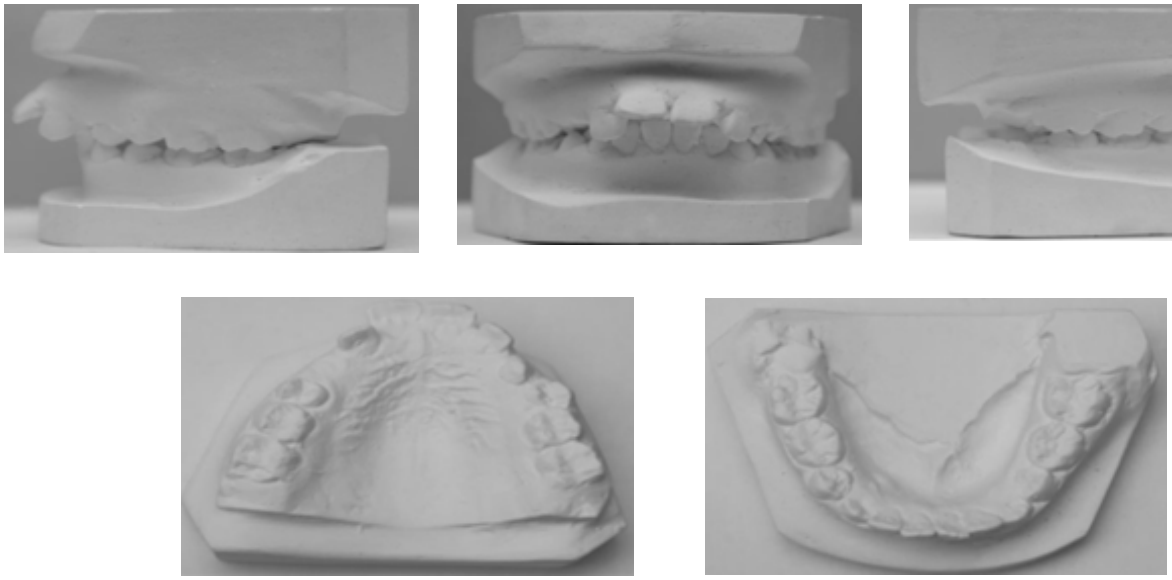


Figure 3: Pretreatment study model

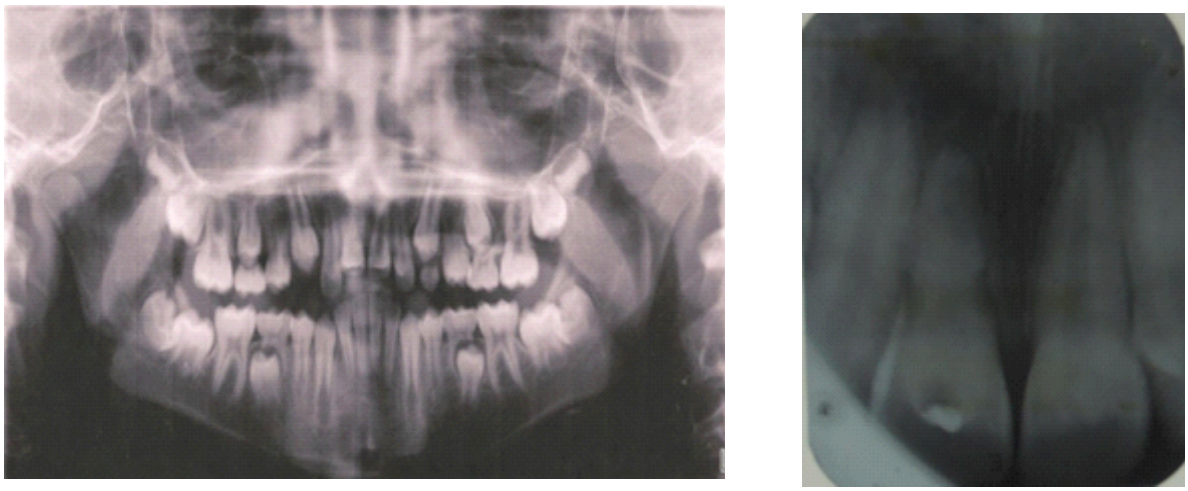


Figure 4: Pretreatment dental panoramic and periapical radiograph

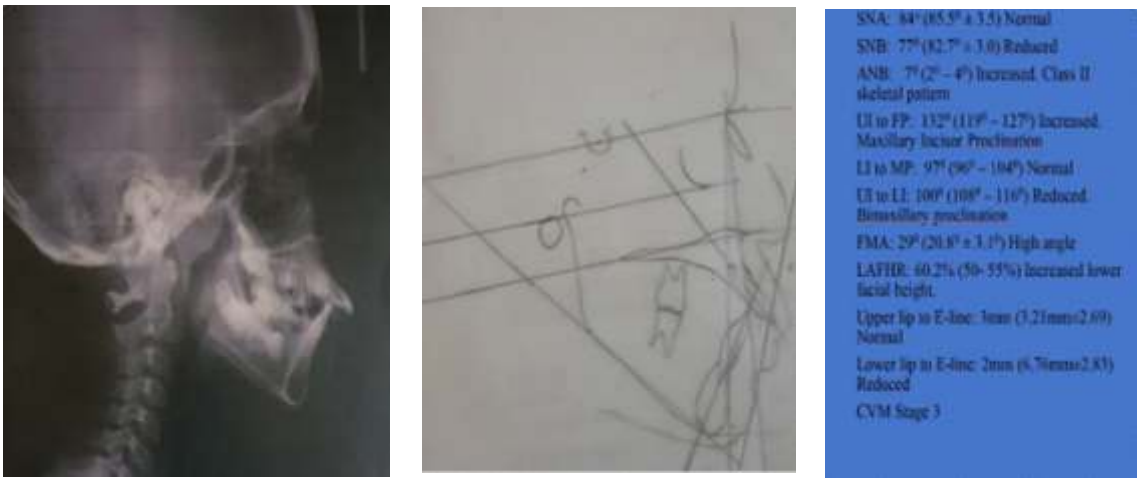


Figure 5: Pretreatment lateral cephalometric radiograph

Treatment objectives

The treatment objectives were to: a) treat pulpally necrosed tooth, b) correct skeletal discrepancy, c) achieve lip competence, d) align malaligned teeth in the upper and lower arches, e) achieve normal overbite, f) achieve normal overjet, g) close spaces in the upper anterior segment, h) achieve class I molar relationship and i) achieve a stable occlusion.

Treatment options/alternatives

The following were treatment alternatives available for the patient

1. Orthodontic-Paedodontic multidisciplinary management: Two phase orthodontic treatment: Phase 1- Functional appliance treatment: Phase 2 - Upper and lower arch fixed orthodontic appliance treatment (non-extraction) with root canal treatment of tooth 11
2. Orthodontic-Paedodontic multidisciplinary management: Full upper and lower arch fixed orthodontic appliance treatment with extraction of teeth 14 and 24 when patient is in the permanent dentition stage with root canal treatment of tooth 11.
3. Orthodontic-Paedodontic multidisciplinary management: Clear aligner therapy with extraction of teeth 14 and 24 when patient is in the permanent dentition stage with root canal treatment of tooth 11.

Due to a favourable cervical vertebrae maturation stage 3 (circumpubertal growth spurt), mixed dentition stage, lower lip sucking habit and motivation of the patient, treatment option 1 was selected.

Treatment Progress (Phase 1)

Patient's root canal treatment was carried out at the Paediatric dentistry clinic and then referred to the Orthodontic clinic where a Frankel 2 appliance was fabricated after making an alginate impression and taking a bite registration. Patient was instructed to wear the appliance for at least 18 hours a day and other post insertion instructions were given. After 5 months on the Frankel 2 appliance, the overjet was reduced from 15mm on the right and 13mm on the left to 9mm on the right and left. Another Frankel 2 appliance was then fabricated. After another 4 months of the Frankel 2 appliance wear, overjet was reduced from 9mm to 6mm. Functional appliance treatment was then discontinued and upper and lower arch fixed orthodontic appliance treatment commenced. Total treatment time for functional appliance treatment with Frankel 2 was 9 months.

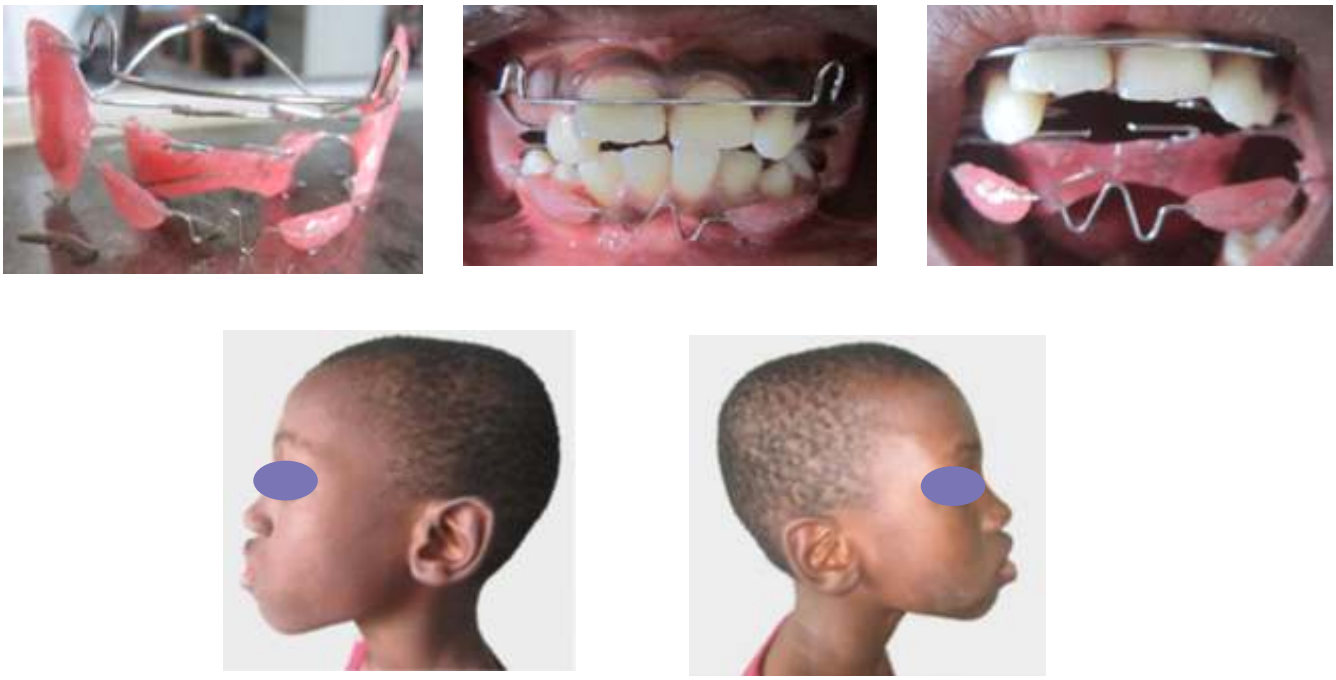


Figure 6: Treatment progress Photographs

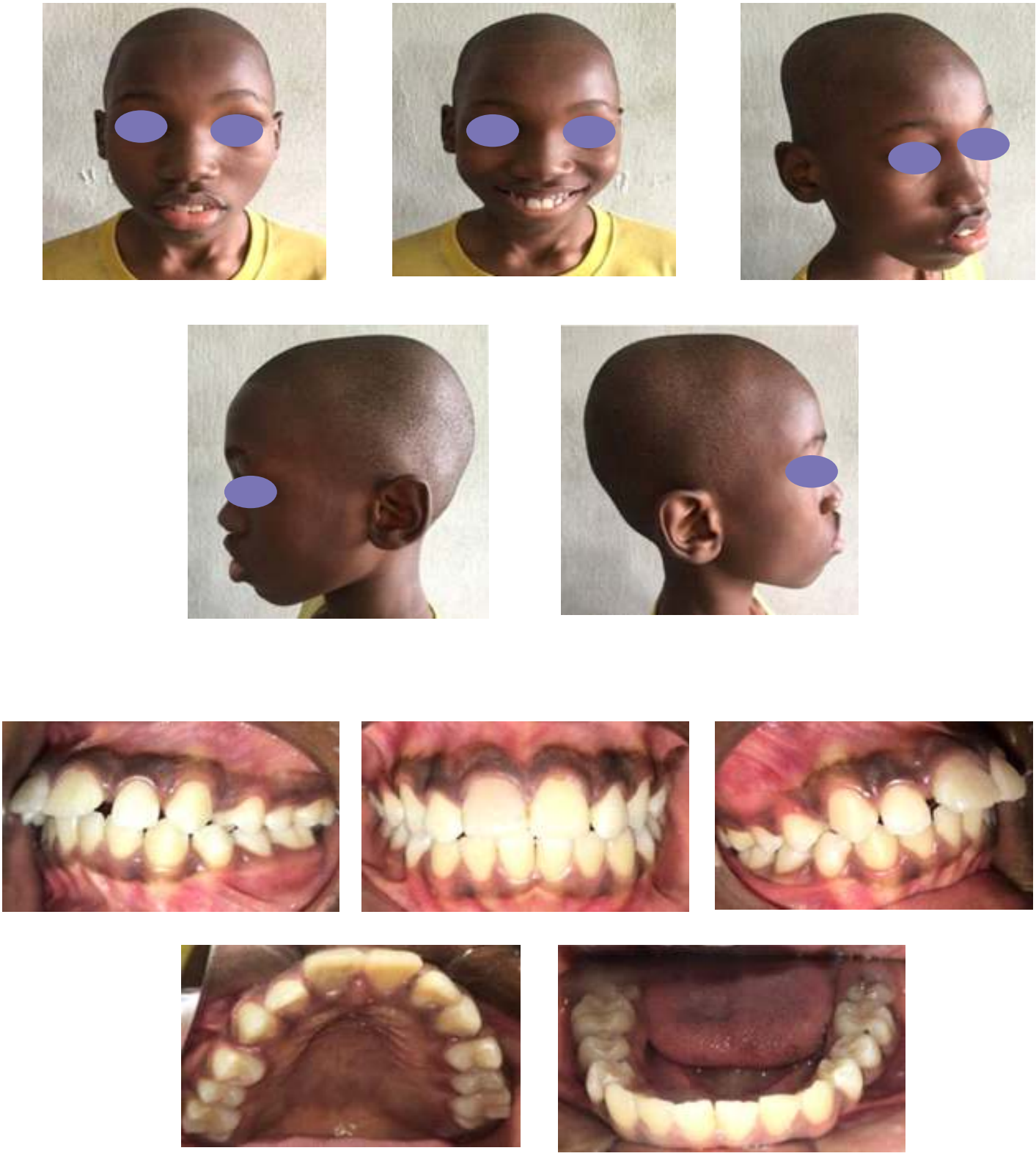


Figure 7: Post functional appliance treatment photographs



Figure 8: Post functional appliance treatment models



Figure 9: Post functional appliance treatment lateral cephalometric radiograph



Figure 10: Post functional appliance treatment dental panoramic radiograph

At the conclusion of phase 1 treatment (functional appliance treatment), patient had an Angle's class I malocclusion on skeletal pattern 1 complicated by: bimaxillary proclination, incompetent lip seal, increased overjet, incomplete overbite, mild crowding in the lower anterior segment, mild spacings in the upper anterior segment and distolabially rotated 31 and 41. The treatment objectives of the upper and lower arch fixed orthodontic appliance treatment were to: Align mal-aligned teeth, achieve normal overbite, achieve normal overjet, achieve competent lip seal and achieve a stable occlusion.

Full upper and lower arch set up was done using the Preadjusted edgewise technique Roth 022X 030 prescription. The starting arch wire was 0.014 Nitinol (Niti) on the upper and lower arches. The arch wire sequence followed was 0.014Niti, 0.016Niti, 0.018Niti, 0.018Niti reverse curve, 0.020 stainless steel, 0.017X0.025 Stainless steel and 0.019X0.025 stainless steel arch wire. Elastic chain was placed on the upper arch from upper right 1st permanent molar to upper left 1st permanent molar. Vertical elastics were prescribed on the posterior segment for proper interdigitation. At 18months 1 week, treatment objectives were achieved as patient and parents were satisfied with treatment outcome. Upper and lower arches were debonded and debanded.

Retention was achieved using a combination of fixed lingual retainers in the upper and lower arches with an upper Hawley's retainer.



Figure 11: Treatment progress photographs



Figure 12a: Treatment outcome photographs



Figure 12b: Treatment outcome photographs

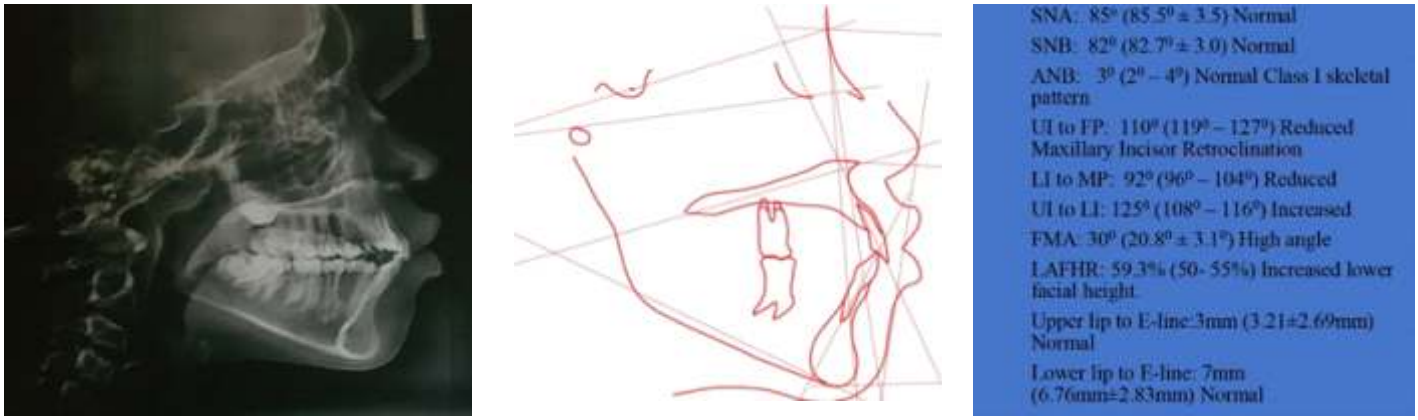


Figure 13: Post treatment lateral cephalogram

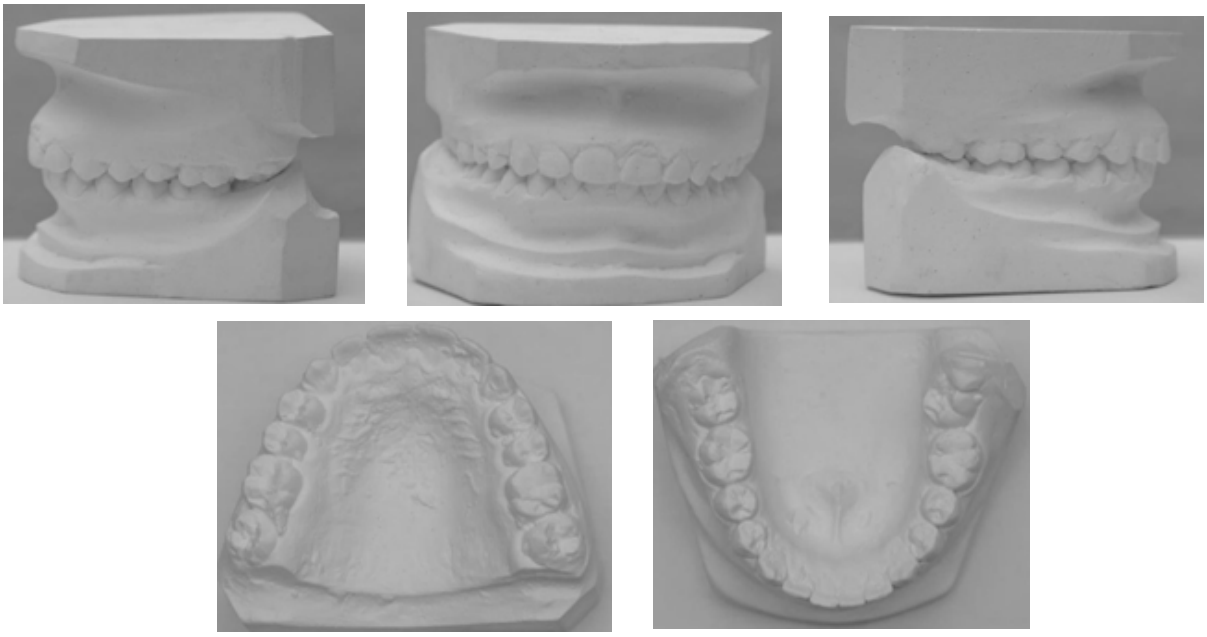


Figure 14: Post treatment models



Figure 15: Retention photographs

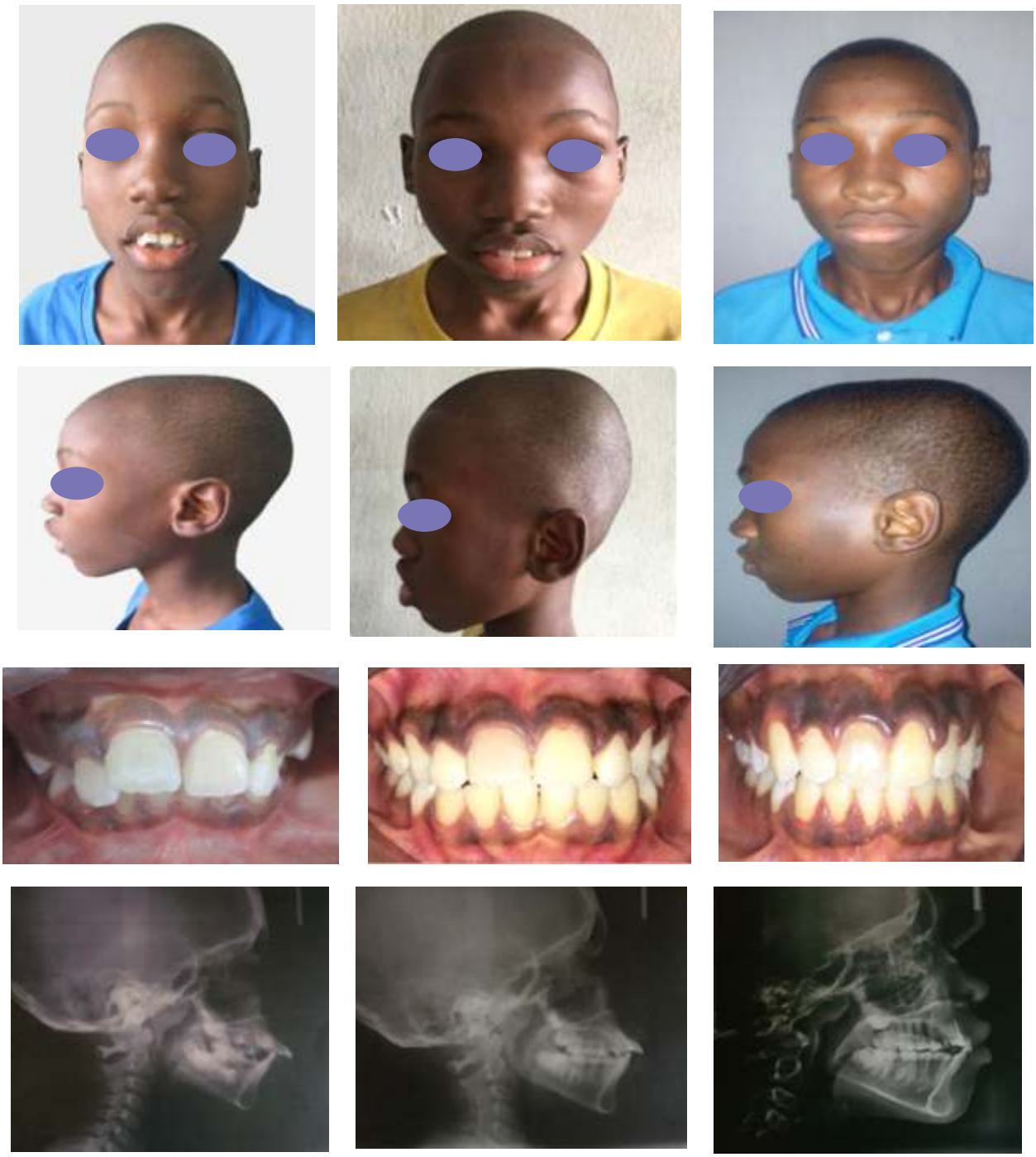


Figure 16: Treatment outcome comparison

Discussion

There are mainly two treatment modalities for class II division 1 malocclusion which are: one phase upper and lower fixed orthodontic appliance treatment and two-phase orthodontic treatment comprising functional appliance treatment followed by an upper and lower arch fixed orthodontic appliance treatment.[11] The one phase orthodontic treatment which is also referred to as a camouflage therapy is usually performed in patients with little or no growth potentials.[11, 12] It may require tooth extractions and treatment outcome may be associated with unpleasant retroclination of the maxillary incisors and proclination of the mandibular incisors.[11] The two-phase orthodontic treatment however aims at reducing or eliminating the skeletal basal bone discrepancy associated with class II division 1 malocclusion.[12] This is usually carried out in patients with growth potentials.[12] This could reduce or eliminate the need for tooth extractions for correction of the malocclusion.[11,12]

Among contemporary functional appliances, Frankel 2 is one of the most popular.[13] It is the most commonly used tissue borne appliance which is named after the inventor Rolf Frankel.[13,14] It utilizes the philosophy of elimination and redirection of orofacial musculature to bring about the advancement of the mandible thereby correcting the malocclusion.[14] Although a minimum wear time for functional appliances to achieve an orthopaedic effect has not been precisely determined, a wear time of 8 to 15 hours per day is recommended.[15-17] This therefore requires a level of compliance and motivation. This patient was encouraged to wear the appliance for at least 18 hours a day which probably resulted in a favourable phase 1 treatment time. This patient was in the circumpubertal growth spurt and was motivated for treatment which probably resulted in the translation of the SNB and ANB from 77 degrees and 7 degrees respectively to 81 degrees and 4 degrees respectively after the functional appliance treatment phase. The above patient also did not require extraction treatment protocol to correct the malocclusion.

Class II division 1 malocclusion which is a predisposing factor to maxillary incisor trauma has been reported to be more common in boys than girls.[6,18,19] Tooth devitalized by trauma has also been found to be more prevalent than avulsed tooth in class II division 1 malocclusion cases.[6] This is in consonance with the findings in this case report. The patient presented was a 10-year-old boy and his right central incisor was devitalized due to trauma. Therefore, it is beneficial to have early screening of malocclusion and provision of preventive measures against orofacial trauma.

Retention in orthodontics entails that teeth are maintained in optimal aesthetic and functional position after treatment.[20, 21] Retention phase therefore is crucial for stability of treatment results.[20] Fixed retainers are commonly used in the retention phase due to their advantage of better aesthetics, less need for patient cooperation and effectiveness for long term retention.[22] They are also indicated in cases with spaces in the anterior segment [23] and cases in which lower inter-canine width is changed.[24] Due to the long term desire for retention and the spaces closed during treatment, upper and lower fixed lingual retainers were given for retention. Hawley's retainer which is composed of an acrylic component with a labial bow and two Adams clasp attached has an advantage of controlling incisor root torque.[25] This characteristic engendered us to make use of the Hawley's retainer for retention in this patient.

Conclusion

This case report presents a successful multidisciplinary intervention involving orthodontic-endodontic treatment in the management of a 10-year-old boy with Angle's class II division 1 malocclusion on skeletal pattern 2 complicated by a devitalized upper central incisor. Endodontic treatment was used for the pulpally involved tooth, while functional appliance was used to correct the skeletal discrepancy, and fixed orthodontic appliance was then used to correct the occlusal anomalies. Retention was a combination of upper and lower fixed lingual retainers with an upper Hawley's retainer. Total treatment time was 27 months 1 week.

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ORAL PRESENTATIONS

ABSTRACT ONE

Oral Health Disparities in Orthodontics

Moninuola A. Ernest

Introduction: There are values for equal opportunity and equality for all citizens in a country. These values are embedded at the core of many national constitutions as the foundation of modern society. One stark manifestation of economic and social inequality is the disparities that exist in oral health status especially Orthodontic care.

The myths concerning Orthodontic treatment are that it is for the exclusive reserve of the rich and poor people are so plagued with poverty and the ravaging associated diseases that facial and dental aesthetics are not their concern. However, this paradigm is changing due to globalization.

Causes: Disparities exist in coverage, availability, and access to Orthodontic oral care services. This may include early diagnosis, prevention, and basic treatment which are grossly inadequate or completely lacking. Var ious causes are Socioeconomic status, Family Income, Occupation, Geographical area-based measures of deprivation, Racial /Ethnicity, Cultural differences, Employment and Education.

Strategies: Removing the myths that promote disparity, expanding the number of health care settings, strengthening the oral health workforce, expanding capabilities of existing providers and promoting models that incorporate other clinicians, improving the knowledge skills and abilities of providers to serve diverse patient population,

supporting the collection of data stratified by sex and race that pertain to Orthodontics, collaboration with essential sectors like social and welfare services, educational services, employment opportunities, debt management and financial planning advice.

Conclusion: There is the need to reduce differences that exist among specific population groups in the attainment of full Orthodontic health potential.

ABSTRACT TWO

Evaluation of Awareness Of Malocclusion And Knowledge Of Orthodontic Treatment Among Secondary School Students in Enugu, South East Nigeria.

Ndukwe AN[a], Okeke AC[a], Obi In[a], Onyejaka Nk[a]

Background: Malocclusion is the malalignment of teeth which affect adolescents and adults psychosocially thus warrants the need for orthodontic treatment.
Aim: To evaluate the awareness of malocclusion and the knowledge of orthodontic treatment among students.
Method: This was a descriptive cross-sectional study in which questionnaires were administered to senior secondary students in a private school. Data obtained was analyzed using SPSS version 21. P-value =0.05 were considered significant.
Results: Two hundred students participated in the study with males 102(51%) and females,98(49%). Although less than half of the students 45% (90) have heard the term "malocclusion", majority of them understood that malalignment of teeth can adversely affect chewing (69%), speaking 70.5% and self-esteem 80.4%. There was no significant difference between males and females in the awareness o malocclusion (p=0.510).
A good number of students 78.2% (154) were aware of orthodontic treatment, even though only 24% (48) had visited the Orthodontist. Significantly more males had visited the orthodontist than females (p= 0.031). One hundred and twelve students (56%)think orthodontic treatment is important for the treatment of malocclusion, however only 36% (72) were willing to undergo treatment. There was no difference between males and females in their willingness for treatment(p=0.372.)
Conclusion: Majority of the students were aware of the effects of malocclusion. Many of them also knew that malocclusion can be managed by orthodontic very few of them were willing to undergo treatment. Therefore, the need for public education to improve the acceptability of orthodontic treatment among the population cannot be overemphasized.
Keywords: *Malocclusion, Orthodontic treatment, Awareness, Knowledge*

ABSTRACT THREE

Knowledge and Attitude of Teachers Towards Orthodontics and Orthodontic Treatment

Odah GE[a],Umeh OD[b], Isiekwe IG[b], DaCosta OO[b], Utomi IL[b], Sanu OO[b]

Background and Aim: Children and adolescents constitute a large numnber of orthodontic patients. Teachers can play a role in introducing orthodontic care to children as they spend a lot of time with them. The aim of this study was to determine the knowledge and attitude of teachers towards orthodontics and orthodontic treatment.
Methods: This was a descriptive cross-sectional study. Data collection was done via a structured questionnaire comprising 33 questions administered to 72 teachers in 2 public schools in Surulere, Lagos State. Descriptive and inferential statistical methods were employed to interpret the data with statistical significance set at P<0.05.
Results: About 76.4% of the teachers were aware of orthodontics with braces (69.4%) being the most identified orthodontic treatment method. About 40% of teachers demonstrated good knowledge about orthodontics while 58% had poor knowledge. Approximately 43.1% believed treatment lasts more than 24 months, while 39.7%believed it spans between 12-24 months. Most respondents (62.5%) agreed that malaligned teeth affect

appearance, reduce confidence (69.4%) and affect speech (61.1%). Most agreed that orthodontic treatment improved oral health (70.8%),appearance (69.4%), and function (61.1%). About half (47.2%) had noticed the need for orthodontic treatment in their students, and had advised them to seek orthodontic care (37.5%). Female teachers exhibited a significantly more positive attitude to orthodontic treatment than the males.
Conclusion: There was general poor knowledge of orthodontics among the teachers with females demonstrating a more positive attitude than males. Teachers can play an important role in motivating students towards accessing orthodontist care.

Keywords: ***Knowledge, Attitude,*** *Teachers, Orthodontics, Orthodontic Treatment*

ABSTRACT FOUR

A Comparative Study on the Accuracy of Manual Cephalometric Analysis versus Digital Cephalometric Analysis - A Pilot Study

Sylvia Etim[a], Marian Otalo Orikpete[b]

Background and Aim*:* There is a recent surge in software and smartphone applications specifically developed for easier cephalometric analysis. This study aims to compare the accuracy and reliability of linear and angular measurements made using a digital tracing (OneCeph) app against the conventional manual tracing
Methods*:* This was a 3- months cross-sectional study of 25 pre-treatment lateral cephalometric radiographs of patients presenting at the orthodontic clinic of UPTH for treatment. Measurements of ten cephalometric parameters [SNA, SNB, ANB, UI to NA (linear and angular), LI to NB (linear and angular), inter-incisal angle, upper lip to S-line and lower lip to S-line] using Steiner's analysis were made both manually and with a smartphone application (OneCeph) and compared statistically. SPSS version 25was used for data analysis with significance level set atp <0.05.Paired t-test was used to compare the measurements obtained by both methods.
Results*:* Lateral cephalometry of twenty-five patients, females (16, 64%), males (9,36%) with mean age 16.68 +/-6.19 years were involved in the study. There was no statistically significant difference in the measurements obtained for the various parameters [SNA, SNB, ANB, Ul to NA (linear and angular), LI to NB angular, inter-incisal angle, upper lip to S-line, and lower lip to S-line] using both methods, except for the Lower incisor to NB linear measurement with P=0.038.
Conclusion*:* The findings of this study suggest that digital cephalometric analysis using the OneCeph app may be a reliable, accurate, and easy-to-use alternative to manual cephalometric analysis.
Keywords*:* Cephalometric analysis, Software, Digital method ,Manual method, OneCeph

ABSTRACT FIVE

Pattern and Trends of Paediatric Tooth Extractions in Kano, Northern Nigeria: Implications For Policy and Practice

Okolo CC,[a*] Malami AB,[a] Mohammed M,[b] Adeyemo YI[a]

Background: The study examined tooth extraction patterns among children in Kano, Northern Nigeria,identifying key reasons and factors. It also explored the implications of these findings for dental policies and practices in the region.
Methods*:* A retrospective analysis of patient records from the paediatric dental clinic at Aminu Kano

Teaching Hospital was conducted for patients treated between January 2021and December 2023. Data were collected on patient demographics, FDI tooth number and tooth type extracted (primary/permanent), and reason for extraction. Descriptive analyses and chi-square tests were performed using SPSS version 20.

Results: A total of 1556 teeth were extracted from 1140 children aged 1 to 16 years (male-to-female ratio 1.1:1). Single tooth extraction accounted for 71.4% of cases, while 28.6% involved multiple tooth extractions. Dental caries was the most prevalent reason for extraction (62.7%), followed by orthodontic reasons (29.6%) and traumatic dental injuries (7.7%). Maxillary anterior teeth were commonly extracted in children aged 1-5years,while mandibular posterior teeth were predominantly extracted in older age groups ($p < 0.05$).Permanent maxillary central incisors and mandibular first molars, as well as deciduous maxillary second molars and mandibular first molars, were the most frequently extracted teeth.

Conclusion: The study identifies dental caries, orthodontic issues, and dental trauma as major causes of tooth extractions. Age-related patterns highlight the importance of targeted preventive strategies, early interventions, and comprehensive dental programs to improve children's oral health in Kano and Northern Nigeria. Access to affordable dental care and evidence-based policies are crucial.

Keywords: Tooth extraction, dental caries, orthodontics, traumatic dental injuries, oral health policy.

ABSTRACT SIX

Artificial Intelligence in Orthodontics: Current Advances and Limitations

Adetola Babalola,[1] Oromakinde Akinwumi,[2] Victor Johnson,[1] Mobolaji Abdulateef ,[3]
Somoye Victor,[1] Nicholas Aderinto[4].

Background and Aim: Orthodontics, a specialized branch of dentistry focused on study and treatment of malocclusion has had further significant technological improvements with the advent of artificial intelligence (Al). Al enhances diagnostic accuracy, treatment planning, and better treatment outcome. This review aims to evaluate the current advances in Al applications within orthodontics and highlight its limitations.

Methods: A narrative review was conducted by searching PubMed, Google Scholar, Cochrane Library, Science Direct, and DOAJ. Relevant studies from 2014 to February 2024 were included, focusing on Al in orthodontic diagnosis, treatment planning, and cephalometric analysis. Studies were filtered for randomized controlled trials, interventional, and observational research.

Results: Nineteen studies were reviewed, showing Al's impact on improving diagnostic accuracy and treatment outcomes in orthodontics. Al systems, such as convolutional and artificial neural networks, demonstrated high accuracy in orthodontic treatment planning, automated cephalometric analysis, and 3D dental model assessments. However, challenges such as data scarcity, bias, and variability in performance during mixed dentition stages were identified.

Conclusion: Al offers transformative potential in orthodontics, particularly in diagnosis and treatment planning. However, limitations regarding data availability and algorithmic reliability need to be addressed. Collaboration among dental professionals and Al researchers is crucial to overcoming these barriers and optimizing Al's application in orthodontic care.

Keywords: Artificial Intelligence, Orthodontics, Diagnosis, Machine Learning, Cephalometrics.

ABSTRACT SEVEN

Pattern Of Malocclusion In Adult Orthodontic Patients Seen In University College Hospital Ibadan A Six Year Review.

Temisanren OT, Lawal OA, Ajibade FA, Nkwocha FG, Kosoko JO, Baraya Zakka G, Ojo AA

Background: The assessment of the different malocclusion patterns, their occurrences,and the treatment need can aid in understanding the problem in a location and help in planning awareness, and preventive and interceptive treatment measures.

Aim: To assess the pattemn of malocclusion among adult patients who presented for treatment at the University College Hospital Ibadan Orthodontic Unit.

Methods: A retrospective study involving patient records from the Orthodontic Clinic at the University College Hospital Ibadan, Nigeria,between September 2013 and December 2019. Patients' Demographic data and information on their dental and occlusal features, were obtained from their hospital records and analyzed using SPSS version 26.

Results: Three hundred and twenty-two patients' records (mean age 26.05(±8.085)) were included in this study showing that 89.4% of the patients sought orthodontic treatment following aesthetic reasons. The majority of the patients (76.7%) had Angle's class I malocclusion, and 87% were skeletal pattern 1. 39.8% presented with midline diastema of varying dimensions.37.3% had an incompetent lip seal, and crowding in the upper arch was 49.7%. Overjet was increased in 25.8% of patients. 35.7% had anterior crossbite. Overbite was decreased in 37.3% of patients, while 22.4% had incomplete overbite.

Conclusion: Aesthetics was the main reason for attendance followed by functional complaints.Angles class I was the most prevalent pattern of malocclusion,followed by Angles class llI malocclusion, compared to Angles class II which was the least prevalent.

ABSTRACT EIGHT

Assessment of Dental Aesthetics and Prevalence of Psychosocial Effects of Malocclusion among Adolescents and Young Adults in Northwestern Nigeria.

Sa'Ad KM,[1] Aborisade AO,[2] Ogbozor BE,[3] Adeyemi TE[4]

Background: Dental aesthetics generally affect individuals' feelings and their perception by the society. Alterations in aesthetics of dentofacial region largely by malocclusion can affect quality of life and psychosocially debilitating to the young people.

Objectives: This study evaluated the prevalence and severity of psychosocial burden among adolescents and young adults with malocclusion in Kano State; it also evaluated the correlation between malocclusion, quality of life and psychosocial impact on affected individuals.

Methods: 316 adolescents and young adults aged 13-25years from selected secondary schools in Kano metropolis and undergraduate students in Bayero University, Kano were assessed for severity of psychosocial burden of malocclusion, psychosocial impact of dental aesthetics and oral health related quality of life (OHRQoL) using self-rated Aesthetic Component (AC) of the Index of Orthodontic Treatment Need (IOTN) and Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) and Oral Health Impact Profile (OHIP-14) questionnaire respectively.Descriptive statistics, Wilcoxon rank sum and Pearson's Chi-squared tests were used for statistical analysis.

Results: Over 63% of the respondents recorded a high PIDAQ grade. 54.7% felt no perceived need for orthodontic treatment, 34.8% reporting a moderate need for treatment and only 10.4% reporting a definite need for treatment. 67.1% expressed nil negative impact of their perceived malocclusion on their OHRQOL while 32.9%reported a negative impact on their OHRQOL. The IOTN-AC is mildly correlated with aesthetic concern (0.13), psychological impact (0.18) and with OHIP-14. However,there is a positive relationship between aesthetic concern and psychosocial impact.

Conclusion: Self-perception of dental esthetics in adolescents and young adults is related to their dental self-confidence, OHRQoL, and their social and psychological well-being.

Keywords: ***Malocclusion,*** *Psychosocial, Dental aesthetics, Oral Health Related Quality of Life (OHRQOL)*

ABSTRACT NINE

Radiographic Assessment of Prevalence and Pattern of Dental Anomalies in A Nigerian Population

daCosta OO, Koledoye OA, Orenuga OO

Lagos University Teaching Hospital, Idi-araba, Lagos, Nigeria

Background: Dental anomalies are pathologies which occur as a result of disturbances during odontogenesis. They are seen in both primary and permanent dentitions with varied prevalence based on geographical area and race. They can be developmental or congenital, they may occur in isolation or part of a syndrome.

Aim: To assess the prevalence, pattern and distribution of dental anomnalies seen in a group of orthodontic and pediatric dental patients.

Methods: This was a descriptive cross-sectionaI study of 1001 dental patients aged 6 to 45 years who attended various dental clinics in Lagos metropolis. Patients'panoramic radiographs were evaluated for the presence of dental anomalies. Data was entered and stored using Microsoft excel and analyzed using IBM Statistical Package for Social Sciences Statistics for window version 26.0

Results: The sample comprised 521 (52%) females and 480 (48%) males with a median age of 10.83 years, interquartile of 8.92-12.75years. A total of 220 participants (22%) had at least one dental anomaly. The most frequent anomaly was impacted teeth 9.8%, followed by hypodontia 6%, microdontia 1.8%,taurodontism 1.1%,ectopic teeth 1%, macrodontia 0.5% and germination 0.3%.

Conclusion: The most common dental anomaly was impacted teeth being the maxillary canines. Anomalies were more common in the maxilla than in the mandible.

Keywords: *Dental anomalies, Panoramic radiographs, Prevalence.*

ABSTRACT TEN

A Report of Soft and Hard Tissue Cephalometric Values of Hausa Fulani Subjects in Kano: A Cross-sectional Study

Oguchi CO,[1] Jibril M,[2] Yahaya A, [2] Adeyemi TE,[2] Alhassan J,[2] Bukar AS

Background and Aim: To analyze and interpret cephalometric measurements from a population of Hausa Fulani patients attending a clinic in Kano, examining potential differences across gender and age groups.

Methods: Cephalometric data from patients (age range: 8-40 years) were analyzed. Descriptive statistics, correlation analysis, independent t-tests for gender comparisons, and one-way ANOV/A for age group comparisons were performed on key cephalometric measurements.

Results: Mean values for key measurements were: SNA 86.26° (±5.56°), SNB 81.39°(±5.67°), and ANB 5.02° (±2.89°). Significant gender differences were found in SNA (p=0.0374), SNB (p=0.0111), and UIFP (p=0.0417). Age-related differences were observed in SNA (p=0.0210), SNB (p=0.0122), and IIA (p=0.0426). Strong correlation was found between SNA and SNB, with moderate negative correlation between SNB and ANB.

Conclusions: The population showed a tendency towards Class II skeletal relationships and vertical growth patterns. Significant gender and age-related differences in certain cephalometric measurements suggest the need for demographic considerations in orthodontic treatment planning for this population.

Keywords: *Cephalometry, Orthodontics, Malocclusion, Facial Bones, Nigeria.*

ABSTRACT ELEVEN

Cleft Care Providers Knowledge and Perception of Cleft Orthodontics In Nigeria

Chikaodi O,[1] Isiekwe I G,[2] Muhammad J,[3] Jamilu A,[3] daCosta O,[2]

Background and Aim: Interdisciplinary team care remains the mainstay of comprehensive management of orofacial clefts. Previous reports have indicated a shortage of some key team members in most cleft teams in Nigeria especially Orthodontists. It is important to determine if this shortage is due to inadequate number of specialists alone or a lack of knowledge of the role of Orthodontists in cleft care. This study aimed to determine the knowledge and awareness of the role of orthodontics in the management of patients with clefts. among cleft care providers in Nigeria.

Methods: This was a cross-sectional study carried out using self-administered questionnaires distributed among members of the Nigerian Association of Cleft lip and palate, during the Annual General meeting held in July 2024. Data analysis was done using SPSS version 20 and summarized using tables and charts.

Results: A total of 100 responses were recorded, with 55% female, and 45%males. Maxillofacial surgeons were present in 88% of the teams, and Orthodontists in 66% of teams reported. While 71% of respondents had worked with an Orthodontist in their team, 54% carried out lip tapping and 52%performed mixed dentition Orthodontics in their centres. Most respondents attached very high importance to Orthodontic procedures in the management of orofacial clefts.

Conclusion: A large proportion of cleft care providers in Nigeria had knowledge of the role of orthodontists in care for patients with orofacial clefts, however, only about half of these had seen any sort of cleft orthodontic service in their centres.

Keywords: ***Orofacial clefts, Team care,*** *Awareness.*

ABSTRACT TWELVE

Pattern Of Malocclusion seen in Orthodontic Patients at the Aminu Kano Teaching Hospital, Kano: A 5-year Retrospective Study

Oguchi C, Muhammad J, Abdulahi II, *Aliyu MA, Adeyemi TE, Yahaya A, Isiekwe IG

Aminu Kano Teaching Hospital, Kano, Nigeria

Background: In the North-Western region of Nigeria, the awareness of dental health and its role in facial beauty is increasing. The aim of this study was to assess the pattern of malocclusion traits in orthodontic patients attending the Aminu Kano Teaching Hospital (AKTH), Kano State, Nigeria.
Methodology: This was a 5-year retrospective cross-sectional study. The study population comprised of all orthodontic patients seen in AKTH between 2018 and 2023.The study was carried out in accordance with the declaration of Helsinki.
Results: A total of 106 patients were seen comprising 66% (70) females and 34% (36)males. The mean age of the patients' seen was 13years. Angles Class I malocclusion was the most common occlusal relationship, seen in 64.2% of the patients, with Class II and Class IlI malocclusion seen in 29.2% and 7.6%, of the patients, respectively. Anterior segment crowding was recorded in 29.2%,while spacing was recorded in 30.1% of the patients seen. About one third of the respondents presented with a deep bite, while 16% presented with an anterior open bite. One third (31.1%) of the patients presented with a history of oral habits, with the commonest being nail-biting habit. About 17% of the patients seen were adults.
Conclusion: A wide variety of occlusal traits were seen in the patients seen in AKTH over a 5year period, with Class I malocclusion and anterior segment crowding being the commonest occlusal traits seen. Most of the patients seen were children, with adults forming less than 20% of the total patient population seen.
Keywords: *Malocclusion, Observational Study, Northwest Nigeria*

ABSTRACT THIRTEEN

Non syndromic Familial Hypodontia in a Nigerian family: A Case Series in LUTH.

Adeloye AY,[1] Utomi I L,[2] Umeh Od[2]

Background: Hypodontia is a multifactorial dental anomaly that can occur in isolation or as part of a genetic syndrome. It is used to describe the phenomenon of congenitally missing teeth. Hypodontia refers to the absence of less than six teeth. It is a dental anomaly commonly associated with malocclusion, unfavourable aesthetics, periodontal damage, insufficient alveolar bone growth, mastication and speech problem. Treatment is usually complex, multidisciplinary and expensive.
Aim: A case series of hypodontia within a family involving a 38-year-old mother and her two daughters, ages 10 years and 7 years who presented at the Orthodontic unit, Lagos University Teaching Hospital [LUTH], with malocclusion.

Method: Clinical examination of the three cases was done with dental mirrors and probes. Informed consent and assent were taken before investigation. Panoramic radiographs were taken to investigate and ascertain the true absence of clinically missing teeth in all 3 cases.
Results: Case 1 reported absence of teeth 12 and 22, whereas case 2 reported absence of teeth 12,22, 44,45 and 35. Case 3 reported absence of teeth 12 and 22.There were no clinical features associated with any syndrome. Final diagnosis of non-syndromic familial hypodontia was made. Agenesis led to malocclusion and aesthetic disturbances. Cases were offered orthodontic treatment with interdisciplinary dental approach.
Conclusion: This report elucidates that hypodontia may be familial. Early detection, diagnosis and management can be planned to reduce the effects of complications associated with congenital absence of teeth.
Keywords: *Congenital absence, familial, hypodontia, incisor, premolars,* ***tooth agenesis.***

Pictures from the Conference













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West African Journal of Orthodontics is a peer-reviewed journal published by affiliated Orthodontic Groups and Associations in the West African Sub region. The journal gives priority to reports of outstanding clinical and experimental and epidemiological works on malocclusion, dento-facial defects as well as important contributions related to common orthodontic problems in children, adolescents and adults worldwide.

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This journal reserves the right to satisfy itself regarding the specific role of each listed author to justify authorship. All authors must give signed consent to publication (Appendix 1).

Competing Interest

Competing interest for a given manuscript exists when the author has ties to activities that could inappropriately influence his or her judgment, whether or not judgment is in fact affected. Financial relationships with industry for example, through employment, consultancies, stock ownership, honoraria, expert testimony, either directly or through immediate family, are usually considered to be the most important competing interests. However, conflicts can

Original Article

Original articles should report original research relevant to basic and clinical orthodontics including randomized trials, intervention studies, studies of screening and diagnostic tests, cohort studies, cost effectiveness analyses and case control studies. While reporting randomized controlled trials (RCT), authors must attempt to be in conformity with the consolidated standards of reporting trial.

(CONSORT) statements

Each manuscript should be accompanied with a structured abstract (divided into background, methods, results and conclusions) in no more than 250 words. Four to five key words to facilitate indexing should be provided in alphabetical order along with the abstract. The text should be divided in sections on introduction, methods, results, discussion and conclusion.

Acknowledgment section may be included where necessary. Number of tables and figures should be limited to the very relevant ones and may be compressed if necessary. The typical text length for such contributions is 2500-3 500 words (excluding title page, abstract, tables, figures, acknowledgments and references).

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Short accounts of original studies are published as brief reports. The text should be divided into sections, i.e., abstract, introduction, methods, results and discussion.

Abstract should be of 100-150 words highlighting the aims, methods and main results along with 3-4 key words.

The text should contain no more than 1500 words, 3 illustrations or tables and up to 20 references, preferably recent publications.

Review Article

State-of-the-art review articles or systematic, critical assessments of literature are also published. Normally a review article on a subject already published in the West African Journal of Orthodontics is not accepted for a period of 3 years.

The typical length for review articles is 2000-3000 words, excluding tables, figures, and references.

Authors submitting review manuscripts should include a structured abstract of around 200 words describing the need and purpose of review, methods used for selection, extraction and synthesis of data, and main conclusions.

Clinical cases highlighting uncommon malocclusion condition, orthodontic treatment techniques are published as case reports. Single case reports are usually not accepted, unless some new or unusual aspect regarding aetiopathogenesis, diagnosis or management is brought out that adds to the existing body of knowledge. The text should not exceed 1000 words and is divided into sections, i.e., abstract, introduction, case report and discussion. The number of tables/figures should be limited to 2. Ten recent references are acceptable. A maximum of 3 or 1 author is permitted from the principle and each of the associated departments respectively. Thus, case reports from only one investigative department can have a maximum of 3 authors.

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Letters commenting upon a recent article in the West African Journal of Orthodontics are welcome.

Such letters should be received within 6 months of the article's publication. At the editorial board's discretion, a letter may be sent to authors! experts for comments and both letter and reply may be published together. Letters may also relate to other topics of interest to orthodontists and others, and/or useful clinical observations. Letters should not be more than 400 words. The number of authors should not exceed 2, including the authors' reply in response to a letter commenting upon an article published in this journal.

Images Section

A short text of about 150 words depicting the condition with color photographs (vide infra) is needed.

Normally only clinical photographs are accepted but accompanying skiagrams or pathological images could also be considered for publication.

Photographs should be of high quality, clearly identify the condition and preferably add to the existing knowledge.

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Such articles are published on topical orthodontic issues including social aspects. It is expected that the authors have sufficient credible experience on the subject for giving viewpoints. These should not exceed 1500 words.

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Announcements for conferences, symposia, meetings or courses may be sent for publication in advance. The announcements should provide title, date(s) and place of the event and contact address, telephone, and email

occur for other reasons, such as personal relationships, academic competition and intellectual passion. If any of the authors have accepted reimbursement for attending symposium, a fee for speaking, fee for organizing educational reach, funds for a member of the staff of consultation fees from an organization that may in: way gain or lose financially from the result of the study, review, editorial or letter, a competing interest would be deemed to exist. If any of the authors had been employed by an organization that may in any way gain or lose financially from the publication, or if any of them hold stocks or shares in such an organization, competing interest would be deemed to exist. If competing interest exists, the author(s) must disclose them while submitting the manuscript.

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The second page should carry an abstract in case of original article (250 words), review article (200 words), brief report (100-150 words), and case report (50 words), respectively. For original article and reviews, the abstract should be structured as detailed earlier. For brief reports, the abstract should state the purpose of the study, basic methodology, main findings (giving specific data and statistical significance) and key conclusion(s). Below the abstract, authors should provide 3-5 key words for indexing; terms from the Medical Subject Headings (MESH) list of Index Medicus should be used. The basic structure of a paper follows the well known acronym IMRAD, which stands for Introduction (what questions was asked), Methods (how was it studied), Results (what was found) and Discussion[4].

Introduction

The introduction must clearly state the question that the author(s) tried to answer in the study. It may be necessary to briefly review the relevant literature.

Only cite those references that are essential to justify the proposed study.

Materials and Methods

The methods section should describe, in a logical sequence, how the study was designed (e.g., how randomization was done), carried out (e.g., how subjects were chosen or excluded, ethical considerations, accurate details of materials used, exact drug dosage and form of treatment, etc.) and data were analyzed (e.g., an estimate of the power of the study, exact test used for statistical analysis, etc.).

For standard methods, appropriate references are sufficient, but if standard methods are modified these should be clearly brought out.

Authors should provide complete details of any new methods or apparatus used (manufacturer's name and address in parentheses).

Ethics

When reporting experiments on human subjects, authors should indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1964, as revised in 2000.

They should indicate whether the study was approved by the Institutions' Ethical Committee, and whether informed consent was obtained from the study participants. They should not use patients' names, initials, or hospital numbers, especially in illustrative material. This journal reserves the right to reject a manuscript on ethical grounds, on the basis of recommendations of its "Ethical Committee", even if the research has been cleared by the institutional ethical committee. Moreover, when reporting experiments on animals, authors should indicate whether the institutional and national guide for the care and use of laboratory animals was followed.

Statistics

Authors should describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. When possible, they meet to quantify findings and present them with appropriate indicators of measurement error or uncertainty (such as confidence intervals). Actual P values are provided rather than stating as just <0.05 or >0.05 etc. References for the design of the study and statistical methods should be to standard works when possible (with pages stated) rather than to papers in which the designs or methods were originally reported. Any general-use computer programs used should be specified and statistical terms, abbreviations, and most symbols be defined.

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This section should include only relevant, representative data and not all information collected during the study. Major findings should be presented clearly and concisely. Text, tables, and illustrations should be used sensibly while avoiding repeating in the text all the data depicted in the tables or illustrations and emphasizing or summarizing only important observations. Tables and figures should be restricted to those needed to explain the argument of the paper and to assess its support. It is necessary to cite the tables in the text and type them on separate sheets. It may also be useful to mention what the study did not find.

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Discussion ordinarily should not be more than one third of the total length of the manuscript. This section should include a summary of the major findings, their relationship to other similar studies, limitations of methods and implications of these findings in future research. Conclusions should be linked to the goals of the study. Unqualified statements and conclusions which are not completely supported by the data should be avoided. Authors should also refrain from making statements on economic benefits and costs unless their manuscript includes economic data and analyses.

Acknowledgements

In acknowledgements section, it is suitable to list all contributors who do not meet the criteria for authorship, such as a person who provided purely technical help, writing assistance, or a department head who provided only general support. Financial and material support should also be acknowledged.

Groups of persons who have contributed materially to the paper but whose contributions do not justify authorship may be listed under a heading such as "clinical investigators" or "participating investigators", and their function or contribution should be described, for example, "served as scientific advisers", "critically reviewed the study proposal", "collected data", or "provided and cared for study patients". A written consent is required from all the persons acknowledged, indicating their acceptance for the same.

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Journal Article

List all authors when 6 or less. When 7 or more, list only first six and add et al. Ngan P, Yiu C, Hu A, Hagg U, Ei SHY, Gunel E. Cephalometric and occlusal changes following maxillary expansion and protraction. Eur J Orthod 1998; 20: 237-254.

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Each table should be typed in double-space on a separate sheet of paper. Tables not submitted as photographs must be numbered consecutively (Arabic numerals) in the order of their first citation in the text, with a brief but self explanatory title for each.
Each column should have a short or abbreviated heading.
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Figures should be professionally drawn and photographed; freehand or typewritten lettering is unacceptable. Instead of original drawings, X-ray films, and other material, sharp, glossy, black-andwhite photographic prints of high quality are necessary, usually 127x 173 mm (5x7 in) but no larger than 203x254 mm (8x10 in) For color illustrations negatives or positive transparencies are provided, along with color prints. It is preferable to have the photograph in portrait form rather than in landscape form to fit easily into one column.
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The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement. Year, month, day, hour, minute and second should be abbreviated as yr, mon, d, h, mm, and s in tables respectively.

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Appendix 1:

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