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Adorning with Oral Ornaments and its Implication on Orthodontic Treatment: A Review of the Literature and Case Reports.

Soyoye OA^a, Abegunde OO^b, Otuyemi OD^c.

Abstract

The prevalence of perioral/oral body modifications has been on the increase in recent years with the dental impact documented. This paper aimed to review the literature regarding the use of various types of oral ornaments and to highlight the clinical implication for orthodontic treatment. Two case reports of female orthodontic patients who presented with silver and gold rings fitted between their teeth were also presented.

The literature contains a limited number of studies, case reports, and reviews describing a wide variety of dental ornaments and complications that could arise following their use. One of the cases presented with an adverse effect associated with the use of dental ornaments. Intra-oral examination of the patient revealed a 2mm space between the lower right central and lateral incisors following the loss of one of the fitted rings, and a shift in the lower dental centre line. Patients need better information on the potential complications associated with the use of oral ornaments. Dental practitioners should educate patients about potential side effects and possible oral, dental, and orthodontic complications.

Keywords: Oral Ornaments, Orthodontic implications, Orthodontic treatment

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Introduction

Enhancing dento-facial appearance has become an integral part of orthodontics and dentistry generally in recent years.¹ This development has paved the way for the growth of modern materials and techniques. However, adornment with tooth jewellery is fast becoming one of the latest unprofessional methods of improving dental appearance in the society today. Humans have always felt the need to modify their bodies by

permanent or temporary means, for different reasons.¹

Nowadays, people are becoming increasingly self-conscious of their appearance and smile, looking for various treatments including body art and cosmetic dental treatments. This is to achieve the desired aesthetic appearance and attention, make a fashion statement, and be unique in the society. Dental aesthetics is not only considered a sign of beauty, but also a sign of wealth and higher social status.¹ Tooth decorations such as tooth jewellery and tattoos have also been used by patients in different parts of the world to enhance dental aesthetics.²⁻⁴ In recent years, the use of orthodontic brackets as tooth decorations or “decorative braces” has emerged.⁵

Tooth decoration refers to “the process of deliberately changing or altering natural tooth tissue

for reasons other than treating a disease". As dentists, therefore, it is not uncommon to come across people who demand something more than just treating oral diseases. Like any other treatment, dental treatments have become one of the necessary aspects of attaining good quality of life.⁶

Despite different reports regarding the use of dental ornaments in many parts of the world, there is a scarcity of data regarding its knowledge and practice among dentists in Nigeria. The purpose of this paper was to report two cases and review the literature on the subject of dental adornment and highlight its implication for orthodontic treatment.

Case report 1

A 25-year-old female student presented in the Orthodontic unit of the Department of Child Dental Health at the Obafemi Awolowo University Teaching Hospital, Ile-Ife, Osun State, Nigeria for a routine orthodontic assessment.

Clinical assessment

Extraoral findings: The patient had a straight facial profile and a class I skeletal pattern. The labiomental groove was marked with a normal nasolabial angle and the lips were competent with Jackson's classification lip pattern of 3/1.

Intraoral examination: This showed a full complement of all the permanent dentition with an upper midline diastema measuring about 5mm. The lower labial segment showed a 2mm space between

the lower right central and lateral incisors, and a silver ring between the lower left central and lateral incisors. (Figure 1) The ring spanned from the coronal part of the teeth to the interdental gingivae. The incisal relationship was class I with overjet and overbite of 2mm respectively. The canine relationship was class III on the right and class I on the left. The lower centre line was shifted to the left side by about 2mm.

Further enquiry about the presence and purpose of the silver ring on the patient revealed that it was inserted for cosmetic reasons, to improve her facial appearance and self-esteem. The patient revealed that she had two rings fitted, but the ring fitted between the lower right central and lateral incisors fell off a few months after fitting, leaving behind a space between the teeth. On further questioning, she said the rings were fitted by a beautician. She went further to reveal that she was attracted by the appearance and beauty of the ring the first time she saw it being worn by her close relative who later introduced her to the beautician. She claimed she paid a sum of six thousand naira (N6,000) to have the rings fitted. The rings were fitted using a plier and the procedure lasted twenty minutes. She also gave a history of pain during the process of insertion which lasted for a period of three days, but later subsided.



Figure 1: Extraoral and intraoral photographs of case 1.

Case report 2

A 35 year- old trader presented at the orthodontic clinic for an orthodontic assessment.

Intraoral examination showed missing third molars in all quadrants. The upper labial segment showed 3mm space between the upper left lateral incisor and canine, two gold rings between the upper left central and lateral incisors, and between the upper left lateral incisor and canine.

The patient revealed that the rings were fitted by a beautician a year before her presentation in the

orthodontic clinic. She also revealed that the purpose of fitting the ring was purely for beauty and fashion. The patient claimed that her self- esteem had greatly improved following the insertion of the rings. The fitting of the rings was done using a plier and the procedure lasted for a period of twenty-five minutes. She gave a history of sharp pain during the insertion which lasted for about five days but later subsided without the use of analgesics. It cost her a sum of six thousand naira (N6,000) to get the two rings fitted.



Figure 2: Intraoral photographs of case 2.

A Visit to the Beautician's Workshop

A visit to the beautician workshop showed a well-decorated room with many beauticians busy with various cosmetic works being carried out on customers.

On interrogation, one of the beauticians provided insight into a wide range of cosmetic activities available in their practice. She listed a number of activities from body massage, to body piercing and tooth whitening.



Figure 3: Advertising billboard depicting a wide range of the beautician's activities.

Discussion

Discussion and/review of the literature.

The use of body art such as tooth rings, intraoral jewelry, tooth tattoo and piercing of oral and perioral tissues has gained much popularity among adolescents and young adults. Tooth jewelry existed as far back as 2500 B C when it was practiced among the ancient people of southern North America, Egypt and China.⁷ During this period, it was used as a part of the religious rituals and traditions, tribal identification and survival purposes. But today, it is more concentrated on cosmetic function, regaining momentum as a fashion and style statement by many young people. It is a cosmetic dental procedure in which a diamond or any other stone or ring is attached to the tooth surface in order to gain a spark and to look more fashionable.⁸ With the increasing interest in cosmetic dentistry, the use of dental jewelry is gaining importance by the day.

Tooth jewelry, a form of self-expression, has been shown to add special confidence to smile, especially when professionally done.⁹ Aesthetics is believed to be enhanced with the use of tooth jewelry and by doing so, elevates the patients' self esteem and self confidence. Nevertheless, tooth jewelry is perceived

to be indicated only in patients with good oral hygiene and low caries index.

Types of Tooth Jewelry

The various tooth jewelry commonly used include tooth gems, grill jewelry, dazzlers and twinkles, veneer jewelry, tooth rings, tongue studs, lip studs, lip rings, cheek studs and fashionable braces.

Tooth gems

A tooth gem is a crystal glass mounted on a thin foil of aluminum. They help in creating spark and are available in different shapes and colours. (Fig.2) Available shapes include round crystals, gold letters and numbers, and gold facings. Tooth gems are available in nine different colours; diamond, rainbow, ruby, sapphire, emerald, emerald green, aquamarine, pink, and sapphire light.⁹ The desired design can be bonded directly on the tooth surface in a manner similar to the bonding of an orthodontic bracket. It can be removed anytime or can be replaced with any other stone, as there's no drilling involved in the procedure. These crystal glass stones are available in two different sizes, 1.8 mm and 2.6 mm in diameter and ideally for short term attachment.



Fig.4: Tooth Gem

Dazzlers and twinkles

These are the collection of 24-carat gold and white gold jewelry filled with special glass or precious stones and are available in different designs. (Fig.3) The stones are attached directly or embedded in precious metal and then attached to teeth. The metal on which the stones are attached are available in various shapes and sizes.¹⁰

Twinkles are specially designed to be bonded to the tooth and their patented backside is similar to an orthodontic bracket which makes them last longer.

The most commonly used teeth for attachment are the maxillary incisors and canines.



Figure 5: Twinkles

Tooth rings

Another option which helps in the establishment of the standard of living among youngsters is the use of tooth rings. This is similar to tooth gems but the procedure is a little different from tooth gems. In dental rings, a small hole is placed towards the disto-incisal corner of the maxillary incisors and the ring is hung through it. (Fig.4) The most commonly preferred teeth are the maxillary central incisors and the size of the perforation depends on the thickness of the ring selected. Sometimes these rings are embedded with precious stones.

While selecting the diameter of the ring, the available overjet is taken into consideration to avoid occlusal interference. The rings are sometimes made to connect the two central incisors or the central incisor to the lateral incisor.¹¹



Figure 6: Tooth Ring

Dental grills

Grills are most popular with American hip-hop stars and rappers. This is tooth jewelry worn by 18 to 35 year old hip-hop artists and disco jockeys to add on to the extravagance of their performance. It is believed to symbolize monetary success, which is especially important for the social underclass. They are made of solid metal such as gold, silver, or platinum and can also be used with precious stones. Most commonly, they are used to cover the entire section of the maxillary and mandibular anterior teeth. (Fig.6)

The design, positioning, and material is completely unique to the individual. Earlier, they were fitted permanently after tooth preparation but nowadays grills are generally removable.¹²



Figure 7: Dental Grill

Dental tattoo

Dental tattoo, also known as tooth Tattoo, is an ornamental design on teeth. It involves the application of various shades of porcelain in various designs like heart symbols and pets carved on dental ceramic crown and bridge before cementation to the teeth. (Fig.7)



Figure 8: Dental Tattoo

Removable tooth jewelry

The stones are permanently mounted on an invisible glass clear micro-skin which fits accurately onto the teeth. This requires neither etching nor preparation of the teeth. The impression is made and the micro-skin is fabricated in the lab on which the precious stones are attached. This is removable by the patient and can be fitted back when necessary.

Veneer jewelry

Veneer jewelry is made from precious jewelry, mostly gold and platinum. Tooth preparation is done to accommodate the metal veneer which is mostly embedded with precious stones. The teeth preferred for such kinds of jewelry are the cuspids and the bicuspid.

Fashion and/decorative braces

“Fashion braces” are braces that serve as fashion statements without any therapeutic effects of conventional braces. They have unique or aesthetic bracket designs and have become a popular option for many people. Due to the high cost and the belief that orthodontic treatment is an elective luxury, braces have become a sign of financial prosperity and a symbol of status, wealth, and style in some South Asian countries.¹³ Fashion braces are largely provided by dental professionals, however, cheap braces or braces like jewelry are also now available at a much lower cost, and can be fitted in a dental office by general dentists, non-dental practitioners, or even at home.¹⁴ A recent study in Saudi Arabia showed that 74% of decorative braces are not placed by dentists, but rather by the patients themselves, or a friend or family member, using over-the-counter glue.⁵

These fashion braces may have positive or negative impacts on the Oral Health Related Quality of Life (OHRQoL) of individuals. A recent study by Hakami et al¹⁵ showed changes in the OHRQoL of people

wearing braces for fashion only, when compared to those wearing it for therapeutic purposes. The fashion braces group reported significant positive impacts on the psychological and social domains compared to the therapeutic braces group. In addition, the fashion braces group reportedly showed even lower levels of psychological discomfort and disability, which means that fashion braces may indeed help people feel more confident and satisfied with themselves.



Figure 9: Fashion braces with superglue



Figure 10: Removable fashion braces with clasps

Clinical Implications of Dental Ornaments on Orthodontic Practice.

Orthodontic tooth movement is made possible by application of light but prolonged forces. Since most of these tooth jewelries are worn on the tooth surfaces, they can apply pressure to the teeth in a manner similar to the light prolonged forces in the natural environment, including the lips, cheeks, or tongue resting against the teeth. They therefore have the same potential as orthodontic forces to cause the teeth to move to a different location.¹⁶

Tooth jewelry can sometimes cause ulceration of the lips with subsequent interference with lip function. Injury to the soft tissue of the lip could result in scarring and contracture, causing the incisors in this vicinity to move lingually as the lip tightens against them.¹⁶ The ball of the laberette or lip barbell from a tooth-ring rubbing against the mandibular anterior teeth has been shown to cause dehiscence of the facial gingiva in that area.¹⁷⁻¹⁹

Other common complications associated with tooth jewelry and oral piercings include difficulty in speech, swallowing or chewing, and localised tissue overgrowth. Localised tissue overgrowth has been shown to increase the risk of keloid tissue formation.²⁰ Keloid tissue can cause facial asymmetry because of growth restriction on the affected side.²¹

Other complications associated with dental jewelry include metal hypersensitivity, which presents as an allergic reaction affecting the soft tissue. Severe metal hypersensitivity can cause severe soft tissue reaction with subsequent healing by scarring and unwanted tooth movement.^{22,23}

Fixed grills are very difficult to clean; therefore, causing plaque and calculus accumulation underneath them, which could result in periodontal breakdown and eventual tooth loss. In addition, a dental grill can result in chipped teeth, gum recession, and abrasion to adjacent teeth, as well as damage to

the enamel of the opposing teeth- all these result in unpleasant aesthetics. Another complication associated with the use of dental grill is dental caries, gingivitis, and other issues in the gingival margin especially, which if not properly handled could result in tooth loss and spacing in the arch. Unwanted tooth movement could also result from dental grills, especially removable grills worn throughout the day.

If the jewelry type used is too small the ring placed could cut off the blood supply to the surrounding soft tissue causing pain and swelling. On the other hand, if the ring used is too large or heavy, it could lacerate the oral soft tissues, which tend to heal by scarring and this may cause asymmetry.¹¹ The presence of a ring in the oral cavity also stimulates excess saliva production, causing prolonged drooling. Tooth jewelry could cause inflammation and reduced taste sensation. There have been reported cases of gingival recession and loss of alveolar bone in the anterior mandibular region with the use of tooth jewelry.²⁴ Tooth rings inserted in the contact point of two teeth could cause spacing in a manner similar to the action of orthodontic separators, as seen in one of the cases reported in this study, and subsequent drifting of the adjacent tooth, and/or a shift in the dental centre-line. In addition, despite the psychological and social benefits reported with the use of fashion braces, Hakami et al¹⁵ reported in their study that the fashion braces group showed greater functional limitation and physical disability than both the therapeutic and control groups. In other words, people with fashion braces had more problems pronouncing some words, felt their sense of taste worsened, had unsatisfactory diets, and had to interrupt meals due to their braces. In addition, adverse effects on dentition such as unwanted tooth movement, root resorption, caries, and white-spot lesions are some of the potential harms that can result when decorative braces are used.

Unsupervised tooth movement could result in traumatic occlusion which could cause gingival recession.²⁵ In addition, moving teeth without proper treatment planning can move these teeth out of the bone envelope, resulting in bone dehiscence and recession.²⁶ The use of superglue in bonding most of the dental jewelry is toxic and can cause hypersensitivity reactions, swelling, and inflammation of the oral mucosa.²⁷ Furthermore, the use of superglue and other Cyanoacrylates in the oral cavity should be discouraged. This is because when used in bonding, they polymerise via an exothermic reaction which can cause thermal injuries to both the teeth and oral mucosa.²⁸

Conclusion

Though people may prioritise the psychosocial benefits obtained by wearing dental ornaments, the long-term physical and functional consequences are worth thinking about. As health care providers, there is a need to educate the general public about the potential harm and possible oral, dental, and orthodontic complications that could arise from the use of these ornaments

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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.

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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.

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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.

Personal Viewpoint

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.

Notes, News and Events of Interest

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.

Abstract and Key Words

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 Discussion⁴.

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.

Results

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.

Discussion

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.

Contributions to joint-authorship

In the case of multiple author-ship, authors are expected to state clearly their contributions to the paper being considered for publication in terms of study initiation, design including methodology, data collection, analysis and final write-up. The editorial board reserves the right to remove any author's name if the contribution is insignificant.

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References should be numbered consecutively in the order in which they are first mentioned in the text.

References are identified in text, tables, and legends by Arabic numerals in parentheses. References cited only in tables or in legends to figures should be numbered in accordance with the sequence established by the first identification in the text of the particular table or figure.

The titles of journals should be abbreviated according to the style used in Index Medicus. Authors are required not to use abstracts, unpublished observations and personal communications as references. References to papers accepted but not yet published should be designated as "in press"; authors should obtain written permission to cite such papers as well as verification that they have been accepted for publication.

The references must be verified by the author against the original documents. The Uniform Requirements style (the Vancouver style) is based largely on an American National Standards Institute (ANSI) standard style adapted by the NLM for its databases.

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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Tables

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. Explanatory matters are placed in footnotes, not in the heading. In footnotes all nonstandard abbreviations that are used in each table should be explained adequately. Statistical measures of variations should be identified such as standard deviation and standard error of the mean. Be sure that each table is cited in the text. If data are used from another published or unpublished source, it is necessary to obtain permission and acknowledge them fully.

Figures and Instructions

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-and-white 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. Letters, numbers and symbols in photographs should be clearly legible.

Each figure should have a label pasted on its back indicating the number of the figure, author's name, and an arrow to mark the top and left side of the figure.

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Legends for illustrations should be typed or printed out in double-space, starting on a separate page, with Arabic numerals corresponding to the illustrations.

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Units of Measurement

Measurements of length, height, weight, and volume should be reported in metric units, i.e., meter(m), gram(g), or liter(l) or their decimal multiples.

Milliliter or deciliter should be expressed as ml or dl.

Red and white blood cell counts are to be expressed as $63 \times 10^6 / \text{mc l}$ and $\times 10^6 / \text{mc}$ respectively. Temperatures should be given in degrees Celsius and blood pressures in millimeters of mercury (mmHg). All hematological and clinical chemistry measurements should be reported in the conventional system or in terms of the International System of Units (SI).

Abbreviations and symbols

Only standard abbreviations are used in the text while avoiding abbreviations in the title and abstract.

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:

Declaration of Originality and Transfer of Copyright

(Please download from Nigerian Association of Orthodontists (NAO) website <https://www.nao-ng.org/>)

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