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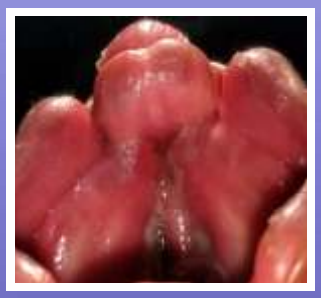

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"DENTISTRY'S FIRST SPECIALTY JOURNAL IN SUB SAHARAN AFRICA"

A Case of Bilateral Cleft of the Lip Alveolus and Palate treated with Presurgical Infant Orthopaedics using Clear Aligners

Odunsi O,[b,*] Yemitan T,[a,b] Oyewo O[b]

Abstract

Abstract

A case report on presurgical infant orthopaedic management of a 1-day-old male patient with a bilateral cleft of the lip and palate, widely separated lip segments, rotated premaxilla, significantly increased alar base width, flattened nasal tip and a severely deficient columella using clear aligners.

Treatment objectives were to reduce the size of the cleft defect, lengthen the columella, improve nasolabial aesthetics and improve the outcome of surgical repair.

After a thorough patient assessment, presurgical infant orthopaedic treatment using the NAM aligner system incorporating nasal hooks and lip taping was planned. The treatment was carried out over a period of 12 weeks, with nasal moulding initiated after six weeks of aligners therapy using a nasal hook in conjunction with the NAM aligner.

After 12 weeks of presurgical infant orthopaedic treatment, the size of the cleft defect was significantly reduced, nasolabial aesthetics was improved and a significant increase in the columella length was achieved.

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ORIGINAL ARTICLE

Introduction

Presurgical infant orthopaedics (PSIO) was introduced in the early 1900s with the primary objective of correcting the malpositioned alveolus before primary surgery in patients born with cleft lip and palate.[1,2] The concept of nasoalveolar moulding began to gain popularity in the 1950s, this was validated by the findings of Matsuo who reported that the nasal cartilage could be moulded, due to increased lack of elasticity from increased levels of maternal oestrogen, if treatment is initiated within 6 weeks of life.[3,4]

Different techniques of presurgical infant orthopaedics have been recorded. These include alveolar moulding, lip strap, nasoalveolar moulding (NAM), and lip adhesion.[5,6] The NAM appliance consists of two components: an intraoral moulding plate and the nasal component, to align and approximate the alveolus as well as mould the distorted nasal cartilage concurrently.[1,5] Moulding can be achieved using active appliances that move the separate alveolar processes into position by applying active forces on them, or by a passive appliance which allow the passive growth of alveolar processes as planned by the clinician.[5] Grayson[7] introduced the passive NAM technique, describing it as one that involved passive moulding while simultaneously repositioning the deformed nasal cartilages and alveolar processes as well as the lengthening of the

deficient columella. This technique has been subjected to modifications aimed at improving infant and caregiver comfort as well as treatment outcomes.[8–10]

The use of clear aligners for orthodontic tooth movement was introduced in 1997 by Align Technology (Santa Clara, California), and their use has been increasing, mostly in adult patients.[11] In 2019, Batra *et al*[12] reported the use of clear aligners with nasal stents for presurgical infant orthopaedics which yielded promising results while increasing the comfort and convenience of the patients. They, however, reported that the use of clear aligners was at an additional cost when compared with other PSIO techniques. This case report demonstrates the treatment of a case of bilateral cleft of the lip, palate, and alveolus, with presurgical infant orthopaedics, using clear aligners.

Presenting complaint

A day-old male patient, weight 2.90kg presented at the orthodontic clinic of the Department of Child Dental Health, Lagos State University Teaching Hospital, Lagos (LASUTH), with the chief complaint of abnormal lip and hole in the mouth, made by the parents.

Medical, Family and Social History

Pregnancy history revealed that the mother was treated for malaria around 16 weeks of gestation. He was the last of 4 children. The father was a 36-year-old laundry man, while the mother was a 31-year-old housewife. There was no positive history of cleft among the nuclear and extended families, and neither of the parents smoked or consumed alcohol.

Diagnosis

Examination showed bilateral cleft of the lips, palate and alveolus. The premaxilla was rotated, a cleft gap of 15.4 mm at lip level and 8 mm at the alveolar ridge level was observed on the right and a cleft gap of 13.2 mm at lip level and 5.9 mm at the alveolar ridge level was observed on the right. The ala and columella of the nose were collapsed. A total nostril width of 41 mm and a nostril height of 2 mm were recorded. All linear measurements were performed on clinical photographs (Figure 1) incorporating a millimeter scale to aid image calibration and prevent magnification errors using Adobe Photoshop 2020 v21.0.2.57 (Adobe Inc, San Jose, California).

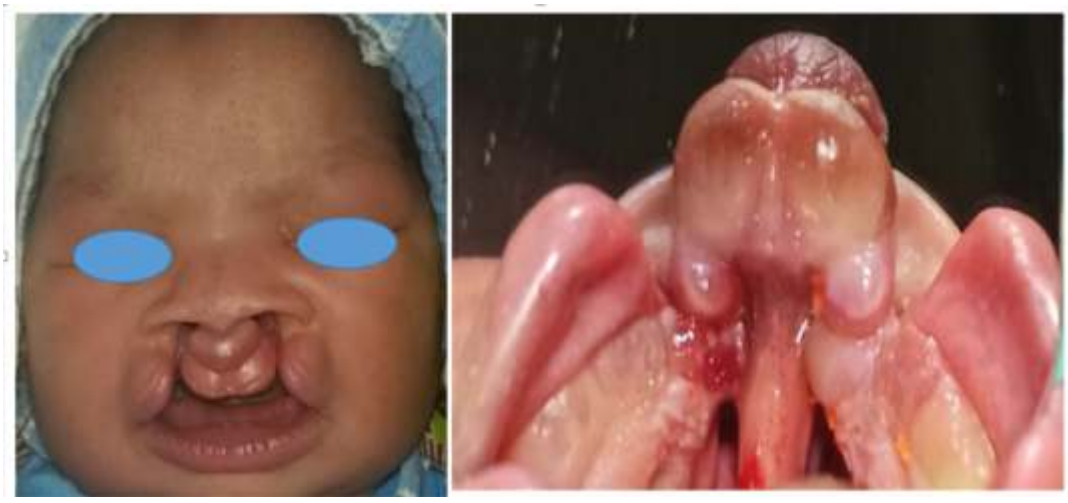

Figure 1: Pretreatment extra oral and intra-oral photographs

Treatment Objectives

The treatment objectives were:

1. To reduce the size of the cleft defect.
2. To improve the nasolabial aesthetics by approximate bilateral lip tissues, reduce the width of the nasal tip, improved nasal tip projection, and reduce nasal alar base width.
3. To lengthen the columella.
4. To align and approximate the intraoral alveolar cleft segments.
5. To improve the outcome of surgical repair of the cleft defect.

Treatment alternatives

Four alternatives were presented to the parents;

1. Extraoral lip taping to reduce the size of the cleft defect. The intraoral alveolar cleft defect will not be aligned and approximated, neither will nasolabial aesthetics be improved.
2. Extraoral lip taping combined with nasal stents to reduce the size of the cleft defect and lengthen the columella. The limitation was that the intraoral alveolar cleft segments will not be aligned nor approximated.
3. Presurgical infant orthopaedics using acrylic NAM appliance to reduce the size of the cleft defect, improve nasolabial aesthetics and align and approximate alveolar cleft defects. The disadvantages are the multiple visits required for laboratory trimming of the appliance with treatment progression, the bulky size of the acrylic baseplate plate, and the risk of adverse reactions to the acrylic plate.
4. Presurgical infant orthopaedics using NAM aligner system incorporating nasal stents and lip taping to reduce the size of the cleft defect, improve nasolabial aesthetics, and align and approximate alveolar cleft defects. This option eliminates the multiple visits for laboratory trimming, and is more comfortable for the infant without the risk of adverse reactions to acrylic. However, the limitation is in the cost of the aligners.

After a review of the risks and benefits of the options, the parents chose the more convenient method which was the fourth alternative based on the advantages of being more comfortable for the infant and easier on the parents.

Appliance fabrication

Impression Taking

An initial impression was taken with rubber-based impression material (Imprisil, Pyrax, India) using an acrylic stock tray (Figure 2(A)) with the help of a clinical assistant. The impression was taken in the orthodontic clinic, LASUTH. The infant was positioned inverted on the mother's lap and stabilized gently with the clinical assistant's hand. The heavy-bodied material was placed on the acrylic stock tray covered with a separator and the impression tray was seated in the infant's mouth to set according to the manufacturer's instructions. The impression was withdrawn and the infant's oral cavity was examined for the presence of residual impression materials. Thereafter, the separator was removed and the light body mix was syringed over the heavy-bodied impression and gently inserted into the infant's mouth and allowed to set according to the manufacturer's instructions. The set impression was withdrawn and the infant's mouth was suctioned to ensure no left-over impression material. The infant was observed to have cried throughout the process and was checked continuously for any signs of distress.

A thermoplastic special tray was fabricated from the initial impression and used to record the secondary impression (Figure 2(B)) using a rubber-based impression material (Imprisil, Pyrax, India) and the putty, followed by the light body mix in the orthodontic clinic, LASUTH.

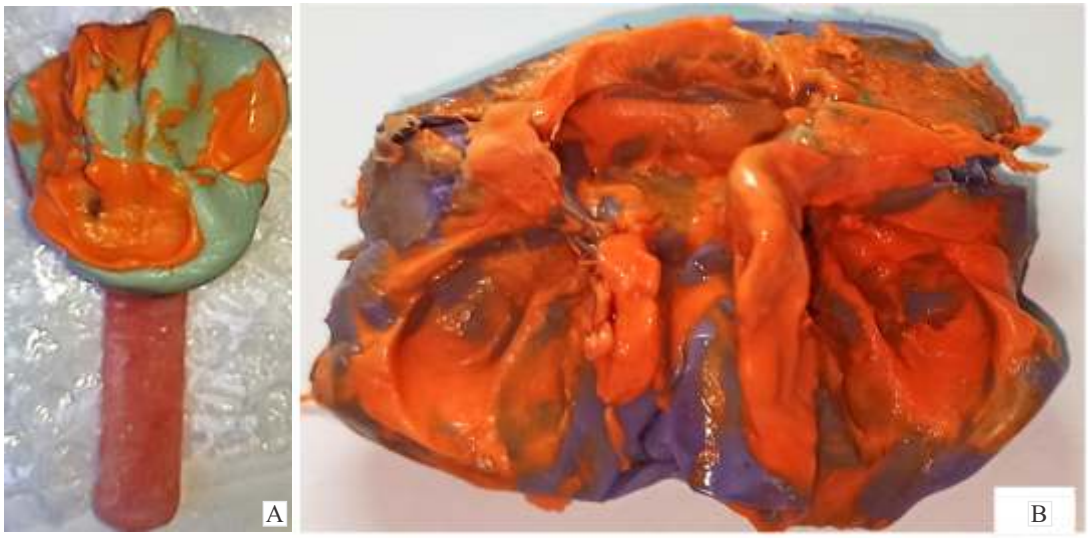

Figure 2: Photographs of rubber-based impressions. (A: Initial impression taken with an acrylic stock tray; B: Secondary impression taken with a thermoplastic special tray)

Aligners' Fabrication

A three-dimensional (3-D) model of the maxilla was made by laser-scanning the plaster model poured from the impression (Desktop Laser Scanner, Ortho Insight 3D®, TN, USA).

Using Ortho Insight 3-D software, a virtual set-up was made from the model separating the major and minor cleft segments. The number of stages required to gradually mold the segments was determined based on the amount of movement desired to produce the desired results, without exceeding 1mm per stage (Figure 3).

The set-up was exported in STL file format to a 3D printer (Sprintray Pro 3D printer, CA, USA) for manufacturing, using the Die and Model 2 Gray resin (Sprintray, CA, USA).

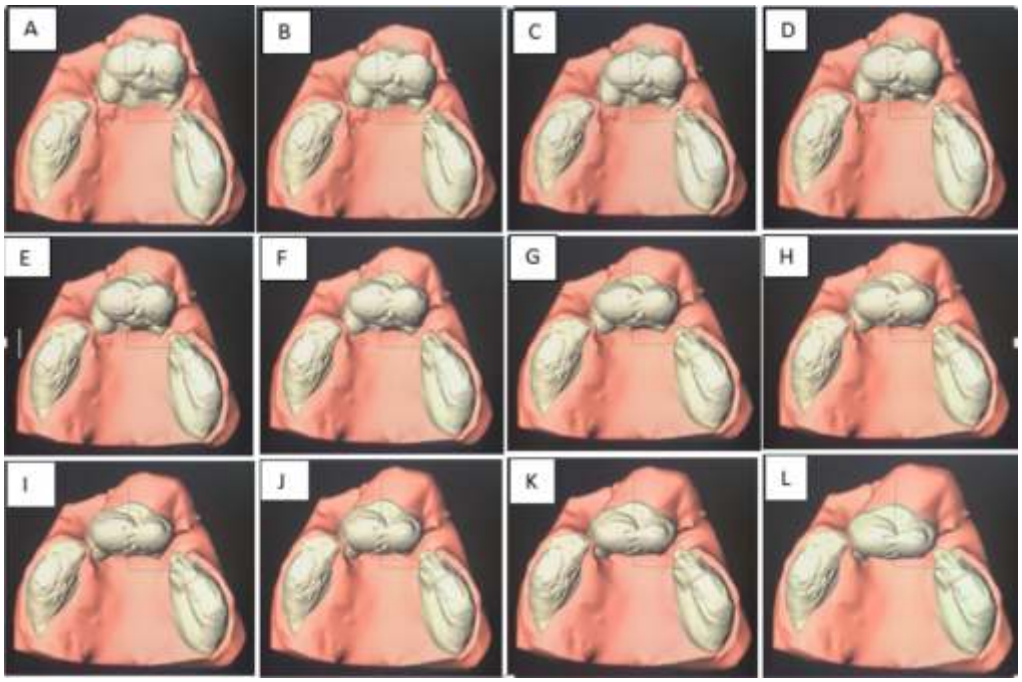

Figure 3: Photographs showing 3-D models of the maxilla (A - model for aligner 0; B - model for aligner 1; C - model for aligner 2; D - model for aligner 3; E - model for aligner 4; F - model for aligner 5; G - model for aligner 6; H - model for aligner 7; I - model for aligner 8; J - model for aligner 9; K - model for aligner 10; L - model for aligner 11)

Treatment Progress

Presurgical infant orthopaedics treatment began on the 10th of June, 2021 with the insertion of NAM aligner 0 (Figure 4). The aligners were retained naturally and retention was enhanced with denture adhesive (Fixodent, Procter and Gamble, OH, USA). On the same day, extra oral lip taping (Steri strip™, 3M Health care, MN, USA) was done and hydrocolloid dressing (DuoDERM*, ConvaTec, United Kingdom) to protect the infant's skin from irritation (Figure 4). Parents were taught lip taping and tapes were changed 2-4 times a day after feeding or whenever the tapes peeled off, to ensure continuous orthopaedic force. The parents were also trained to insert, remove, and clean the aligners. They were also instructed to keep the aligner in the mouth throughout the day and night including during feeding and to clean the aligner twice daily with a soft toothbrush and gently wipe the oral cavity with cotton wool and lukewarm water. Aligners were changed weekly in incremental steps. The patient was recalled every two weeks.

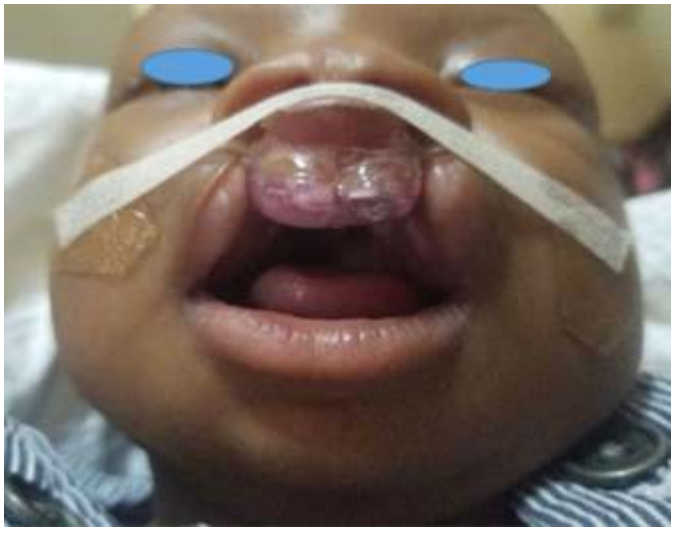

Figure 4: Extraoral photographs showing aligner and extraoral lip taping.

After six weeks of aligners therapy, nasal moulding was initiated using a nasal hook along with the NAM aligner (Figure 5). Nasal moulding of the cartilage commenced using a stent in the form of an acrylic hook in each nostril taped to the forehead with hydrocolloid dressing protection over the skin. The magnitude of the force was determined based on whether the nose tip turned white, if not, the force was increased. The tape connecting the nasal hook and the forehead was changed daily to make sure that the orthopaedic force was strong enough to elevate the nasal tip.

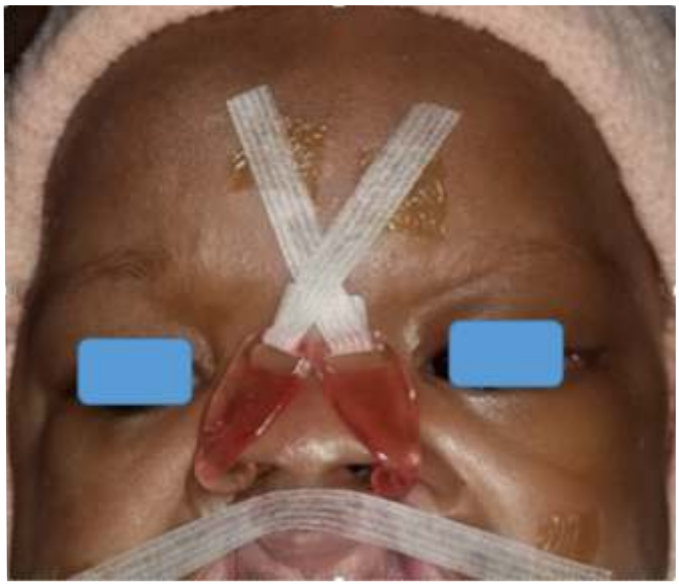

Figure 5: Patient at six weeks, showing commencement of the use of nasal hooks

Treatment results

The treatment was completed over a period of 12 weeks (3 months). Figure 6 shows treatment progress for the course of the treatment.

The size of the cleft defect was significantly reduced, the nasolabial aesthetics was improved, alignment and approximation of the intraoral alveolar cleft segments were achieved and a significant increase in the columella length was achieved, (Figure 7).

The post-treatment linear measurements are shown in Table 2. Linear measurements were performed on clinical photographs incorporating a millimetre scale using Adobe Photoshop 2020 v21.0.2.57 (Adobe Inc, San Jose, California) to aid image calibration and prevent magnification errors. The soft tissue cleft gap at the lip level was reduced by 9.3mm on the right and 7.9mm on the left. At the alveolar level, there was a 6.7mm reduction in cleft defect achieved on the right and a 4.5mm reduction on the left. The total nostril width was reduced by 10mm, the nostril height increased by 3.6mm and the severely deficient columella was increased to 3.1mm.

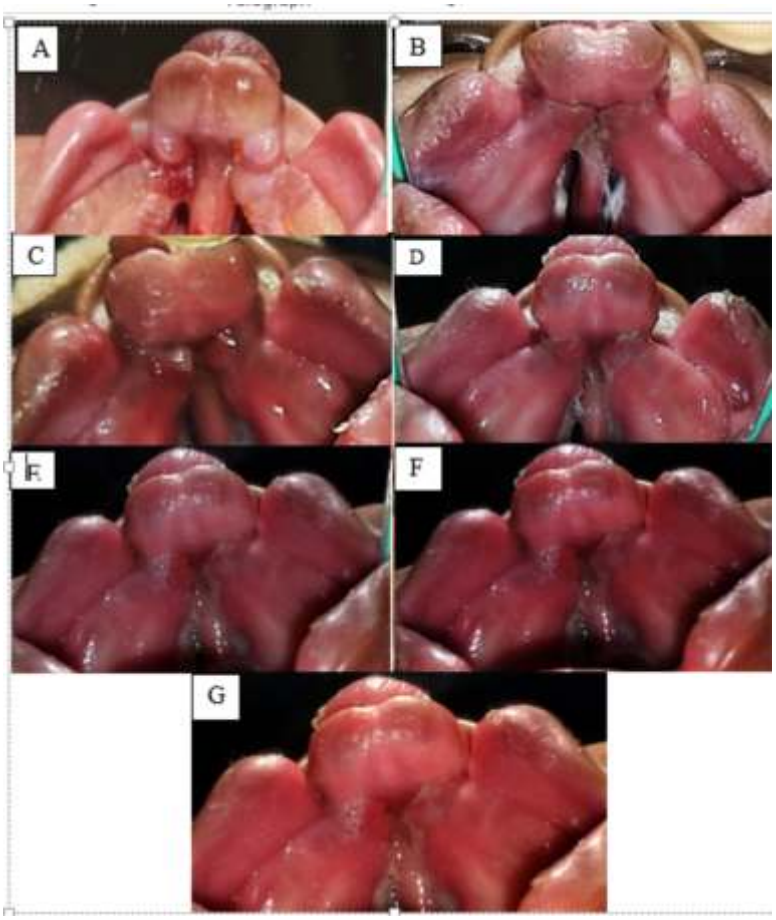

Figure 6: Intraoral photographs showing treatment progress. (A - pre-treatment intraoral photograph before insertion of aligner 0; B - after insertion of aligner 1; C - after insertion of aligner 3; D - after insertion of aligner 5; E - after insertion of aligner 7; F - after insertion of aligner 9; G - post-treatment intraoral photograph after aligner 11)

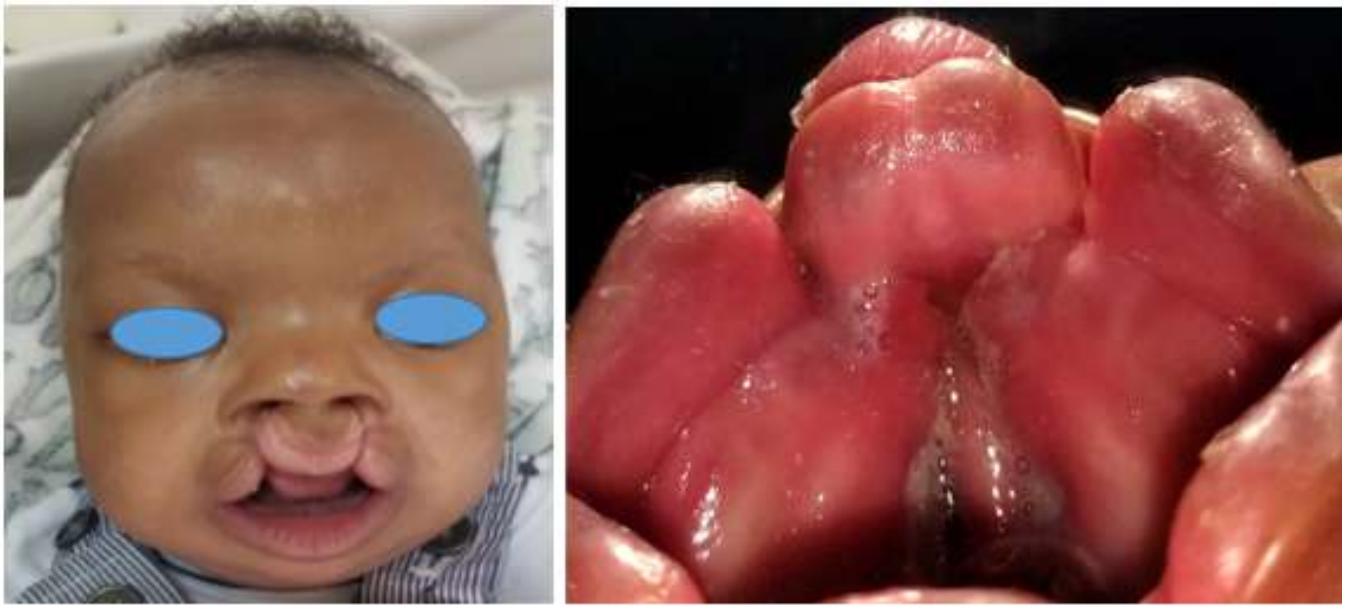

Figure 7: Post treatment extraoral and intraoral photographs

Table 1. Pretreatment and posttreatment linear measurements

Parameters (mm)			Pre treatment	Post treatment
Soft tissue cleft gap	Lip level	Right	15.4	6.1
		Left	13.2	5.3
	Alveolar level	Right	8.0	1.3
		Left	5.9	1.4
Total nostril width			41.0	31.0
Nostril height			2.0	5.6
Columella length			Severely deficient	3.1

Discussion

Presurgical infant orthopedics creates the foundation for good treatment outcome of primary lip and nasal surgery. This case shows a good treatment outcome of presurgical infant orthopedics which was achieved with NAM aligners along with nasal hooks. The success may be attributed to three factors, namely; proper patient selection – a day old infant,[3,4] comfort of the NAM aligners[12] and caregivers' comfort.[12]

Matsuo[3,4] recorded that presurgical infant orthopedics is more effective when commenced early, immediately after birth. It was suggested that the high level of estrogen during childbirth with the increased levels of hyaluronic acid, prevents intercellular cartilage matrix linkage makes the facial cartilages soft and lacking elasticity allowing for the molding.[3,4] The infant in this present case presented few hours after birth, this can be attributed to the successful treatment outcome.

The use of NAM aligners also simplifies the molding process eliminating the laboratory procedures in the Grayson technique thus making the process more convenient for the patient and the caregiver by eliminating multiple visits. In addition, the unwanted effects[12] associated with acrylic plate–such as pressure ulcers and soft tissues laceration are eliminated, in addition to the light weight of the aligners may have contributed to increased tolerance of the appliance by the infant.[12]

Taking into consideration that the NAM aligners are removable appliances, compliance of the caregivers in the use of the aligners as well as the nasal stents and lip taping could also have contributed to the treatment outcome. Nasal moulding was commenced after six weeks of aligners therapy with the NAM aligners according to the principles of Grayson and Maull,[13] which states that with alveolar gap reduction, there is improvement of alignment of the base of the nose and the adjacent lip segment. This leads to laxity of the previously tense alar rim and allow for the nasal molding to take place more efficiently.

After 12 weeks of presurgical infant orthopaedic treatment using NAM aligners, nasal hooks and lip taping; the size of the cleft defect was significantly reduced, the nasolabial aesthetics was improved, and alignment and approximation of the intraoral alveolar cleft segments were achieved as well as significant increase in the columella length (Figure 7). This is in agreement with most authors who reported that PSIO with NAM results in alignment and approximation of tissues, improved nasolabial aesthetics, increase in columella length, significantly better surgical outcome compared with patients who do not undergo NAM therapy.[1,5]

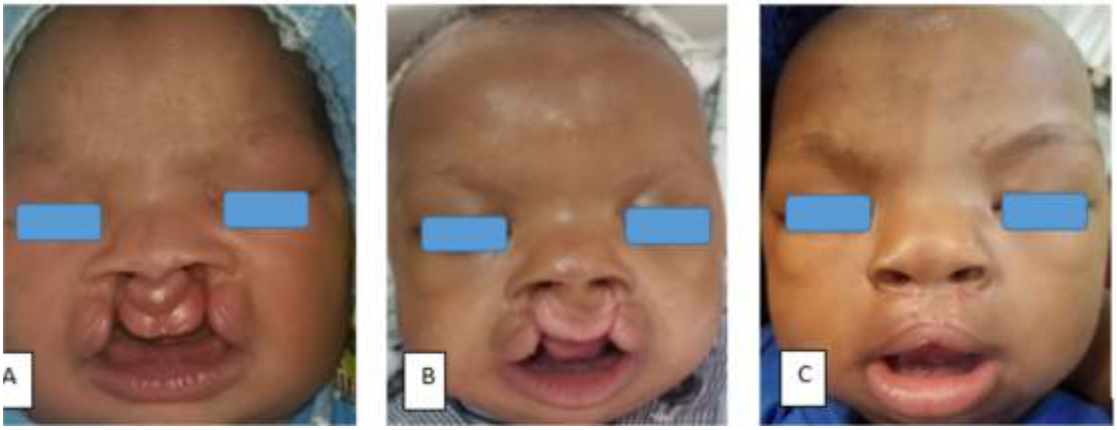

Figure 8: Extraoral photographs A: before PSIO, B: after PSIO, C: post-surgery.

Conclusion

This case has demonstrated the successful treatment of a case of bilateral cleft of the lip, palate and alveolus with presurgical infant orthopaedics using clear aligners.

References

1. Shetye PR. Presurgical infant orthopedics. Journal of craniofacial Surgery. 2012;23:210-1.
2. Hosseini HR, Kaklamanos EG, Athanasiou AE. Treatment outcomes of pre-surgical infant orthopedics in patients with non-syndromic cleft lip and/or palate: A systematic review and meta-analysis of randomized controlled trials. PloS one. 2017;12:e0181768.
3. Matsuo K, Hirose T, Otagiri T, Norose N. Repair of cleft lip with nonsurgical correction of nasal deformity in the early neonatal period. Plastic and reconstructive surgery. 1989;83:25-31.
4. Matsuo K, Hirose T. Preoperative non-surgical over-correction of cleft lip nasal deformity. British journal of plastic surgery. 1991;44:5-11.
5. Grayson BH, Wood R. Preoperative columella lengthening in bilateral cleft lip and palate. Plastic and reconstructive surgery. 1993;92:1422-3.
6. Figueroa AA, Reisberg DJ, Polley JW, Cohen M. Intraoral-appliance modification to retract the premaxilla in patients with bilateral cleft lip. The Cleft palate-craniofacial journal. 1996;33:497-500.
7. Monasterio L, Ford A, Gutiérrez C, Tastets ME, García J. Comparative study of nasoalveolar molding methods: nasal elevator plus DynaCleft® versus NAM-Grayson in patients with complete unilateral cleft lip and palate. The Cleft Palate-Craniofacial Journal. 2013;50:548-54.
8. Vinson L. The effect of dynacleft® on cleft width in unilateral cleft lip and palate patients. Journal of Clinical Pediatric Dentistry. 2017;41:442-45.
9. Krieger E, Seiferth J, Marinello I, *et al*. Invisalign® treatment in the anterior region: were the predicted tooth movements achieved? Journal of Orofacial Orthopedics. 2012;73:365-76
10. Batra P, Gribel BF, Abhinav BA, Arora A, Raghavan S. OrthoAligner "NAM": a case series of presurgical infant orthopedics (PSIO) using clear aligners. The Cleft Palate-Craniofacial Journal. 2020;57:646-55.
11. Grayson B.H., Maull D. Nasoalveolar Molding for Infants Born with Clefts of the Lip, Alveolus and Palate. In: Berkowitz S. (eds) Cleft Lip and Palate. 2006 Springer, Berlin, Heidelberg. Available at: https://doi.org/10.1007/3-540-30020-1_27. [Accessed 23 March 2022]
12. Alzain I, Batwa W, Cash A, Murshid ZA. Presurgical cleft lip and palate orthopedics: An overview. Clinical, Cosmetic and Investigational Dentistry. 2017;9:53–9.
13. Esenlik E. Presurgical Infant Orthopedics for Cleft Lip and Palate: A Review. Journal of surgery. 2015;11:313–8.

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Manuscripts should be prepared in accordance with the Uniform Requirements for Manuscripts submitted to Biomedical Journals. 2 A summary of technical requirements for preparing the manuscript is provided below:

- Three copies of the manuscript should be submitted.
- Use 1 side of standard size 21.6x27.9 cm A4, white bond paper, with margins of at least 2.5 cm on each side.
- Double-space throughout including title page, abstract, text, acknowledgements, references, tables and figure legends. Start each of these sections (in same order) on a new page, numbered consecutively in the upper right hand corner, beginning with the title page.
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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.

(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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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

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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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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 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.

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.

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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.

Organization as Author

Australian Dental Association Inc. An Australian Schedule of Dental Services and Glossary. 7th edn. Sydney: Australian Dental Association Inc., 1996.

Complete Book

Department of Health. Shifting the balance of power within the NHS: securing delivery. London: Doll, 2001.

Clayton D, Hills M. Statistical models in epidemiology. Oxford: Oxford University Press, 1993.

Farkas LG. Anthropometry of the Head and Face, 2nd Edn, New York; Raven Press; 1994

Book Chapter Lekholm U, Zarb GA. Patient selection and preparation. In: Branemark P1, Zarb GA, Albrektsson T, editors.

Tissue integrated Prostheses: Osseointegration in Clinical Dentistry, Chicago: Quintessence; 1988,199-209

Thesis and Dissertation

Yong SJ. Bone mineral density of normal Korean adults. Ph.D. Thesis. Seoul, Korea; 1989 Anozike, AN. Orthodontic treatment needs and its impact on oral health related quality of life in Lagos school children aged 12-16 years. FMCDS. Dissertation. Lagos, Nigeria; 2006

Conference Proceedings

Marshall SJ, Rixon RC, Whiteford DN, Cumming JT. The OrthoForm 3-Dimensional Clinical Facial Imaging System. Proceedings of the 15th IFHE Congress 1998; 15:83-87.

Dictionary and Similar References

Stedman's medical dictionary. 26th ed. Baltimore: Williams & Wilkins; 1995. Apraxia; p.11 9-120. Unpublished accepted material Leshner Al. Molecular mechanism of cocaine addiction. N Eng J Med. In Press 1996.

Material from Internet

World Health Organization, 2002.
www .who.intlmental-health!prevention/suicide
(accessed August 1, 2004).

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-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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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 x10 /mc l and x10/ 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).

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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.

References

1. Mother M, Schulz KF, Altman DG, for the CONSORT Group. The CONSORT statement Revised recommendations for improving the quality of reports of parallel group randomize Trials. Lancet 2001; 357: 1191-1194. (Also available from: URL: http ://www.consort-statement.orgl). Accessed June 28, 2002.
2. International Committee of Medical Journal Editors. Uniform Requirements for Manuscripts Submitted to Biomedical Journals. Ann Intern Med 1997;126:36-47. (Updated October 2001 version Available from: URL: http: //www.icmje.org/). Accessed June 28,2002.
3. JAMA Instructions for Authors. Available from URL: http :// jama.ama-assn.org/. Accessed June 28, 2002.
4. HaIl GM. Structure of a scientific paper. In: Hall GM, ds. How to write a paper. London:BMJ Books, 2000.
5. 52nd WMA General Assembly. World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. Available from: URL: http://www.wma.netl. Accessed June 28,2002.

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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