"EVALUATION OF ESTHETIC OUTCOME AFTER SIMULATED RHINOPLASTY AND GENIOPLASTY IN CLASS II TREATED PATIENTS – A COMPARATIVE STUDY"

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Dissertation

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(BRANCH – V)

Under the Guidance Of

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My Family

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Dr. Charles jude

ABSTRACT

Introduction:

Facial aesthetics are considered of paramount importance, as social insufficiency is the common cause for patients to seek the help of an orthodontist. Orthodontists in general commonly place great value on cosmetic outcomes than on malocclusion treatment outcomes. Surgical camouflage, such as rhinoplasty and genioplasty as an adjunctive orthodontic operation, has resurfaced in recent years intending to improve profiles. As a result, the orthodontist must design treatment around the patient's soft tissue adaptability and shapes. This study aims to assess the esthetic outcome after simulated Rhinoplasty, Genioplasty, and Rhinoplasty -Genioplasty in class II treated patients with a convex profile

Methodology:

A total of 41 people (20 men and 21 females) under the age group of 18 and 35 were included in the study. Post-treatment cephalograms and the profile photographs at rest after treatment were used in this study. Simulations for rhinoplasty, genioplasty, and combined rhinoplasty and genioplasty were done. These photos were evaluated by laymen and orthodontists for esthetic outcome after the procedure.

Results:

The aesthetic ratings of four profiles were compared using the Mann-Whitney U test. The statistical significance was kept at a value of 0.05 or less. The results showed that following both rhinoplasty and rhinoplasty with genioplasty, the mean aesthetics scores of the patient's profile improved significantly compared to the patients' original profiles ($p<0.001$), based on the opinions of all observers. There was a considerable

difference in the mean score of the patient's profile following genioplasty, according to laypeople and orthodontists' opinions. The mean score for each profile, however, did not change substantially between the two groups ($p>0.05$). There was a substantial change in the mean score of the patient's profile after rhinoplasty ($p<0.001$), according to laypersons and orthodontists' perspectives.

Conclusion:

The following conclusions can be drawn from the findings of this study:

When it came to the desirable facial profile, orthodontists and laypeople had similar opinions. Both rhinoplasty and genioplasty improve the patient's facial profiles' attractiveness. When compared to chin argumentation surgery, nasal hump eradication surgery improves the profile of patients with convex features. When compared to a nose with a convex profile, a straight nose is more attractive in persons with a convex face (hump).In convex faces, simultaneous nasal hump removal and chin argumentation treatments resulted in the largest improvement in facial profile attractiveness.

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INTRODUCTION

Facial aesthetics are considered of paramount importance, as social insufficiency is the common cause for patients to seek the help of an orthodontist. Certain malocclusions require exemplary orthodontic treatment which if left untreated will cause major setbacks socially and psychologically. Therefore, the major goal of "orthodontic treatment" necessitates considering all the aspects of Jackson's triad. Therefore, the primary objectives of orthodontic treatment are to provide a pleasant facial look, improve occlusal relationships, and maximize the stability of these outcomes.[1]

Orthodontists in general commonly place great value on cosmetic outcomes than on malocclusion treatment outcomes. As a result, various studies on the subject of facial profile attractiveness have been conducted in the past to identify the factors that have a significant impact on facial beauty.[2]

Facial beauty is linked to psychological well-being and success, and one of the primary reasons for patients visiting orthodontic offices is to improve their appearance.

Previously, hard tissue structures were given a lot of attention, but soft tissue has come to define the constraints of orthodontic treatment in terms of aesthetics, function, anchoring design, retention, relapse, and stability, so there is a shift in paradigm from angles to soft tissue profile in recent years.[2] Esthetics are also improved through growth modification and surgical orthodontics.[3]

As a central feature of the face, nasal size and symmetry are inextricably tied to facial beauty. However, an ideal nose is difficult to contour due to structural differences in inner components and various thicknesses of soft tissue envelopes. Rhinoplasty can be done for both functional and aesthetic reasons. Rhinoplasty is a surgical operation that is used to improve the appearance of the nose. The procedure also tries to maintain or restore nasal function if the patient's airflow has been limited owing to an obstructive condition.

Failure to address the relationship between the nose and the chin during the preoperative examination of rhinoplasty is a common mistake.[4] The chin is subject to morphological anomalies in the sagittal (retro genius or pro genius), vertical (excess or insufficient height), or transversal (heterogenous) axes. Genioplasty, which can be done alone or in combination with other maxillomandibular osteotomies, can rectify these deformities by changing the position of the chin bones in three planes. In aesthetic surgery, genioplasty is a beneficial technique that can often be combined with other procedures to provide the best aesthetic result.

Aesthetic attractiveness is a subjective concept that varies by age and society. Despite the efforts of numerous studies to define conditions that would lead to a "beautiful" face, the results may not always be as desired.[5] When doing face correction surgery, a reduced chin, insufficient lower facial height, or a protruding mandible might lead to less-than-satisfactory results. A considerable number of patients seeking rhinoplasty have mid-lower face dysmorphism, according to research. The most common features seen in pre-rhinoplasty patients include a recessive chin, a procumbent lower lip, an exaggerated labio-mental fold, and decreased or increased facial height.[6]

Surgical camouflage, such as rhinoplasty and genioplasty as an adjunctive orthodontic operation, has resurfaced in recent years intending to improve profiles. As a result, the orthodontist must design treatment around the patient's soft tissue adaptability and shapes. Class II patients account for a major portion of orthodontic patients. Given the diverse and unpredictable effects each has on the facial profile and soft tissues after treatment, deciding between extraction, non-extraction, camouflage, and orthognathic surgery are some of the most difficult components of orthodontic treatment planning for these individuals. Camouflage therapy is a common treatment option for people with minor skeletal discrepancies.

However, once treatment is completed, the patient's profile may become convex.[7] Because of their position on the face, the nose and chin are regarded as key components of the smile framework, and attention to their soft tissue profile may affect the beauty of the facial profile; therefore, they should be taken into account while considering orthodontic treatment.

Patients who agree to the camouflage treatment are occasionally advised to have rhinoplasty and genioplasty surgeries done as well. To achieve the desired improvements in facial appearance, adjustments to both the nose and the chin may be required.[8]

The proper treatment of nasal abnormalities is one of the most difficult parts of facial cosmetic surgery. Jacques Joseph, the “father of modern” rhinoplasty, meticulously examined each stage of his rhinoplastic surgeries (Aufricht, 1969). In skeletal class II malocclusion, the nose normally follows the overall convexity of the face. Rhinoplasty is a technique that changes the shape or function of the nose for cosmetic reasons. The achievement of an optimum nasolabial angle is a significant

anatomical component and endpoint in achieving a successful and aesthetically attractive result in rhinoplasty surgery.

What constitutes an aesthetically acceptable nasolabial angle has been debated by many experts. The nasolabial angle has been described as ranging between 90 and 120 degrees in the past.[9] The nasal profile is one of the most important defining elements in the management of class II patients. In a patient with a prominent nose, the camouflage treatment plan does not give a particularly beautiful appearance.

In class II patients, on the other hand, a nasal hump is common. In skeletal class II malocclusion, the nose's form is usually dictated by the face's overall convexity. If a hump deformity is present, it should be transected by the dorsal line from the tip to the nasion. (Aufricht, 1969; Brown and McDowell, 1951).[10]

Nasal and jaw malformations are inextricably related, and orthognathic surgery can have a major impact on the nasolabial envelope, necessitating rhinoplasty in some cases.[11] The decision on whether to conduct rhinoplasty concurrently or in stages with orthognathic surgery must then be made. Patients with malocclusion have discovered that single-stage orthognathic surgery with rhinoplasty is an effective way for full rehabilitation.[12]

A well-balanced and harmonious facial appearance requires a chin that is the proper size, shape, and contour. However, altering the chin will result in both known and unpredictable alterations to the balance of maxillomandibular morphology, dental connection, and soft tissue envelope, all of which must be considered before proceeding with the planned treatment.

As a result, the “art and science” of surgically altering the chin, whether alone or as part of a larger change in face Osseo cutaneous morphology, is an important characteristic of orthognathic surgery.[13]Genioplasty, which involves modifying the chin's contour through “osseous manipulation or implant augmentation”, is the most common cosmetic procedure today. [14]

The chin, along with the nose, is an important component of facial aesthetics and one of the key factors of facial profile balance. When the chin has the right size, shape, and position, it can enhance the face's natural harmony and symmetry, even masking less-than-ideal jaw connections. Multiple surgical treatments performed alone or in combination, are used to correct the lower face and neck.

Individual anatomy, such as bone structure, muscle architecture, soft-tissue distribution, and skin quality, is used to determine which operations are most suited. The major fraction of these operations involves pleasant enhancing methods. Procedures like genial augmentation (genioplasty via an osteotomy, as well as genial implants or fillers) and genial reduction are examples of genial enhancements.

Hyperactive chin musculature, labial incompetence, lip strain, past alloplastic implant failure due to infection and obstructive sleep apnea are all indications for genial improvements. It is also widely believed, and this author's practice, that augmentation requiring more than 4 to 6 mm requires a genial enhancement. When the chin is too long in the vertical or horizontal planes, whether desired or undesirable, the profile can represent masculinity and strength, whereas when it is insufficient, it can convey frailty and femininity. The influence of the chin on face proportions and aesthetics should not be overlooked by the patient or the surgeon.[15]

Rhinoplasty and genioplasty are popular procedures for improving the appearance of the face. After rhinoplasty and genioplasty, a concave facial profile can be changed into an orthognathic one. A patient with a disproportionately big nose and reduced chin may benefit from rhinoplasty and genioplasty.

Rhinoplasty and genioplasty are two surgeries that can be performed concurrently. There are various advantages to combining rhinoplasty with genioplasty surgery. The patient does not need a second surgical session because of the simultaneous nose-chin corrective surgery, which reduces postoperative discomfort and lowers the overall cost. Furthermore, when an osteotomy is done to correct the chin, there is a higher level of predictability and stability, and there are few to no problems, except for temporary inferior alveolar nerve hyposensitivity. Furthermore, genioplasty can stretch submandibular soft tissues with better aesthetic outcomes. [16]

The use of alloplastic implants gives much less predictability for a long-term fixed position, can cause bone resorption, and leaves a submental scar when placed from an extraoral approach. Considering these results, single-session rhinoplasty and genioplasty should be proposed to the patient every time the aesthetic surgeon sees the coexistence of nose and chin deformities.[17]

As a result, this study contributes to patients' motivation for adjunctive surgical treatments such as genioplasty and rhinoplasty to improve the facial aesthetic look of the face after orthodontic treatment in “class II patients” with convex profiles. Because soft tissue morphology differs by area and ethnicity, it's crucial to assess it in the “North Karnataka population”.

Thus, this study contributes to the incorporation of adjunctive surgical procedures such as genioplasty, rhinoplasty, and combined genioplasty and rhinoplasty, which are more appropriate for the North Karnataka population, as well as serving as a motivating tool for patients with convex profiles who have undergone orthodontic treatment.

Also, the judgment of orthodontists and laypersons is of prime importance because an orthodontist will look into the mathematical and anatomical aspects of the structures before and following the adjunctive procedures whereas the layperson will look into the overall beautification of an individual before and the changes after the procedures. Therefore, the formulation of this study will not only benefit the orthodontists but also the community in case they wish to opt for these procedures keeping in mind their facial needs throughout treatment.

AIM AND OBJECTIVES

AIM

- To assess the esthetic outcome after simulated Rhinoplasty, Genioplasty and Rhinoplasty -Genioplasty in class II treated patients with convex profile.

OBJECTIVES

1. Evaluation of esthetic outcome after simulated rhinoplasty on facial profile in class II patients
2. Evaluation of esthetic outcome after simulated genioplasty on facial profile in class II patients
3. Evaluation of esthetic outcome after simulated rhinoplasty and genioplasty on facial profile in class II patients
4. Comparing the esthetic outcome after simulated rhinoplasty, genioplasty and rhinoplasty-genioplasty on facial profile in class II patients.
5. Assesment of opinions for simulated rhinoplasty and genioplasty among orthodontist and layperson

REVIEW OF LITERATURE

RHINOPLASTY

John E. Griffin(2004) [18]Stated that Rhinoplasty is, without a doubt, the most difficult facial aesthetic treatment. The key to success is a thorough examination of the nose's surface features.

Cankaya et al. (2019)[19] investigated the impact of different nose forms on the perception of facial aesthetics in skeletal class II female patients after camouflage treatment and orthognathic surgery. From the department's collection, a pre-treatment profile shot of a skeletal class II adult patient was chosen. With the help of computer software, two fabricated pictures were generated to illustrate orthognathic surgery and camouflage treatments. Three profiles (pre-treatment, post-camouflage, and post-orthognathic surgery) and six nose types were used to create a total of 18 created images. The three groups (orthodontists, plastic surgeons, and laypeople) were given the images were asked to provide an attractiveness score to each one ranging from 0 to 100, with 0 indicating the least appealing and 100 indicating the most attractive. People in the general public believed that having a convex-bridged nose was a more serious issue than having a retrognathic profile. Overall, nose form should be considered during the treatment planning phase for skeletal and dental orthodontic procedures.

EricW.Cerrati et al (2017)[20] investigated The effect of increasing nasal tip projection on lip projection Between October 1, 2014, and September 25, 2015, 20 patients underwent primary rhinoplasty intending to increase tip projection. Photographs taken before and after surgery were analysed. They discovered that

increasing nasal tip projection generates an increase in upper lip projection that is detectable. This new causal relationship has been applied to our filler injection arsenal as a novel technique to attain the desired result of a more youthful upper lip.

Choi et al (2018) [21]wanted to discover the best NLA for an Asian population based on the degree of upper lip protrusion. Using a photoshop application, each participant's left-side lateral image was used to simulate six alternative tip angles. A perpendicular line to the Frankfort line in each image was used to adjust the angles of upper lip protrusion to 10, 20, and 30 degrees; subsequently, the NLAs was changed to six different angles (from 75 to 110 degrees) for each of the three angles of upper lip protrusion for each model. Using presentation software slides, new altered images of nasal tips, six for the male model and six for the female model, were created and presented in random order. After that, 120 Korean raters were asked to pick their favourite image from the slides. According to the degree of upper lip protrusion in an Asian population, the recommended NLA was adjusted to a more acute angle.

Ozkan (2019)[21] stated that The anterior shift of the mandible produced by orthognathic surgery did not result in a substantial change in the scores given by lay individuals for convex nose profiles. There was a considerable rise in the aesthetic scores given by all groups when surgical or camouflage therapy was not used and only rhinoplasty was performed for these profiles.

Arli et al (2020)[22] studied The effects of rhinoplasty procedures on facial and smile aesthetics.

A total of 27 adult patients were involved in the study. Gingival length (GL), maxillary incisor-upper lip distance (MIULD), right and left inter-lip distance (ILD),

and right and left gingival pocket depth (GPD) were all measured in a full grin and at rest and rounded to the nearest millimeter same clinician took all measurements at baseline, as well as at the 1st and 6th months after surgery. Significant reductions were found in the left and right GLs in full smile, left and right MIULD, and left ILD at the postoperative 1st month, and in the GL, left and right MIULD, and left and right ILD at the postoperative 6th month, as compared to baseline values. Finally, rhinoplasty procedures can improve smile aesthetics by altering the GL, resulting in increased patient satisfaction.

In patients with malocclusion, **Glushko et al. (2017)**[23] investigated the effectiveness of one-stage orthognathic surgery with rhinoplasty. A total of 54 patients with various forms of malocclusion were included in the study. One-stage orthognathic surgery and rhinoplasty were performed on 28 individuals (25 patients rhinoplasty is performed simultaneously with orthognathic surgery, three patients rhinoplasty was performed delayed). Rhinoplasty was not performed on the remaining 26 patients for a variety of reasons. In the instance of rhinoplasty, it was reintubation followed by rhinoplasty after the orthognathic surgery. Closed rhinoplasty was the only procedure used. All patients had picture registration in the stages before and after surgical treatment to evaluate the success of the treatment. They concluded that one-stage orthognathic surgery and rhinoplasty is an excellent way for fully rehabilitating malocclusion patients.

Saleh et al (2012)[24] measured patient quality of life after rhinoplasty concerning nose appearance and function with the use of the modern structural and functional surgical approach. They performed a retrospective chart review with prospective follow-up.

All patients with rhinoplasty in the past 5 years by the senior author were identified. Patients who simultaneously underwent additional nasal surgery were excluded. McNamara test was used to compare preoperative and postoperative clinical evaluations. Paired t-tests were used to evaluate questionnaire scores preoperatively and postoperatively from the nasal obstruction symptom evaluation and rhinoplasty outcome evaluation. They concluded that Modern rhinoplasty techniques that depend on a strong structural framework of grafts compared with the traditional reduction rhinoplasty techniques significantly improve patient quality of life concerning nose function and appearance.

Raffaini et al. (2018) [25]looked at the safety and efficacy of functional intranasal operations as well as aesthetic rhinoplasty with bimaxillary surgery. The author conducted a retrospective cohort analysis on patients who received combined rhinoseptoplasty and bimaxillary surgery by a single surgeon between April 2006 and 2015 at a private practise setting (Face Surgery Center, Parma, Italy). A 12-month follow-up was required at the very least. Bimaxillary orthognathic surgery, functional nasal surgery, and cosmetic rhinoplasty were all performed on the patients. Cosmetic rhinoplasty can dramatically alter our patients' appearance, whereas orthognathic surgery corrects jaw skeletal defects and lays the framework for face harmony. When both processes are used together, the single findings are amplified reciprocally, considerably improving the final results.

Edward I. Lee (2013)[26] concluded that Genioplasty, whether through implant augmentation or osteotomy, is an important part of the aesthetic change of the face. It can be done alone or as part of a formal orthognathic surgery.

Ferretti et al(2016)[27] in their study found that osteotomy should be done in a horizontal plane for only anterior chin augmentation or reduction. The shape of the mental area and the depth of the labiomental fold will be influenced by the height of the osteotomy.

Mariana Bolio Casas et al(2018)[28] concluded that a wide range of studies, including clinical, radiological, study models, and photograph exams, is used to determine how to execute an optimal treatment for a class II adult patient. The face traits that are crucial for diagnosis and treatment plan can be quantified by a careful examination of these images. Adults with a Class II division 1 malocclusion may benefit from sagittal osteotomies of the mandible combined with pre-and post-surgical orthodontics because occlusal sagittal relations are corrected and the hard and soft profiles are straightened in a harmonious manner, which is the main goal of treatment in patients with a convex facial profile.

Proffit(1981)[29] in his study found that Nonextraction orthodontics followed by chin advancement can often treat the borderline extraction patient with an excellent nasolabial angle, projecting lower incisors, and a deficient chin better than any orthodontic extraction regimen.

Saied Sadeghian et al (2018)[30] conducted A cephalometric study of 30 class II patients with convex profiles and nasal humps who had undergone camouflage treatment discovered that both rhinoplasty and genioplasty improved the attractiveness of patients' facial profiles, with simultaneous nasal hump elimination and chin argumentation procedures providing the greatest improvement in facial profile attractiveness in convex faces.

Dario Bertossi (2013)[31] in his study concluded that The integrated approach to facial profile correction is a successful treatment for achieving a more harmonious and consistent therapeutic outcome. The chin bone measurements have a recurrence rate of less than 1 mm, which is relevant to substantiate this argument. When looking at a patient's profile, the nasal-cervical relationship is very important in determining an aesthetically proportionate face.

The patient's face may lack aesthetic beauty even after a successful rhinoplasty. For patients with microgenia, combined rhinoplasty-genioplasty is frequently the best option. It gives the highest level of patient satisfaction while having a low recurrence rate.

Skinazi et al(1994)[32] in their study found that the nose contributed more to the overall beauty of a female profile than it did to a male profile. The chin was a critical feature that had a significant impact on the attractiveness of male facial profiles, according to the same study. Both the top and lower lips contributed equally to the attractiveness of male and female facial features, according to the study. Women, on the other hand, had a much more convex profile than men, who had a relatively straight profile.

Kiranantawat et al (2015)[33] concluded that A useful communication tool between patients and doctors is the computerised preoperative simulation of rhinoplasty results using Adobe Photoshop. It also aids surgeons in developing a precise preoperative plan, enhancing the likelihood of a successful rhinoplasty.

Wolfgang Mühlbauer and Charlotte Holm(2016)[34] conducted a study in which 120 patients who had corrective rhinoplasty were tracked for one to five years after surgery. On a scale of 1 to 4, the authors and patients compared the "virtual" with the

surgical results, with 1 indicating "identical," 2 indicating "similar," 3 indicating "approximate," and 4 indicating "bad." The authors rated 70 percent of the surgical results as identical or similar vs 80 percent of the patients, 25 percent as approximate versus 14 percent as approximate, and only 5 percent as poor versus 2.5 percent as poor. The authors have been using computer imaging with increasing enthusiasm for more than 5 years; it has shown to be a great tool for communicating prospective outcomes to patients during consultation and surgery planning. The extra time required is worth it. Even for non-experts, the available software programs are affordable and simple to use.

According to **Cassetta et al (2020)[35],** the best therapy is determined not only by a precise diagnosis but also by an evaluation of aesthetic and psychological factors.

Volpato et al (2020)[36] did a study to analyse orthodontists, laypeople, and patients' perceptions of facial aesthetics in patients with various profiles. At the start of orthodontic therapy, 120 patients (81 females, 39 males; mean age) were chosen from private clinics. According to the type of facial profile, the patients were separated into three groups of 40. Based on the facial convexity angle recorded on the initial cephalometric tracings, the groups were divided into straight, concave, and convex profiles. Patients judged the pleasantness of solely their frontal (smiling and at rest) and profile face pictures using a 5-point Likert scale. Using the same scale, a group of 30 orthodontists and 30 laypeople assessed the patients' face pleasantness. Patients with various profiles were scored with acceptable faces by laypeople and patients themselves, they concluded. Orthodontists, on the other hand, had a different perspective, putting a lower value on pleasantness. When orthodontists judge face aesthetics in the profile view, dissimilar profiles have an impact.

Mossaz et al. (2009)[37] compared laypeople's and professionals' perceptions of soft tissue profiles in Class III adults, as well as which cephalometric variables are likely to influence the profile assessment score (PAS). The study included lateral head films and colored profile photographs of 18 skeletal Class III Caucasian adult patients (10 males, 8 females with a mean age of 24.5 years) before surgery, as well as nine adult Caucasian patients (four males, five females with a mean age of 27.4 years) with a dental Class I occlusion and no major skeletal discrepancy. The head films were digitised after being traced by hand. Computer software was used to calculate several cephalometric variables. Using a 10-graded visual analogue scale (VAS) and a standard profile for calibration, 18 laypeople and 18 orthodontists evaluated each printed profile photograph aesthetically. They concluded that, in comparison to orthodontists, laypeople were less critical of the Class III and reference profiles in general.

Duarte et al(2018)[38] investigated the facial profile regarded attractive by white Brazilians, confirming common traits and, as a result, guiding orthodontists in terms of facial aesthetics. They agreed. Even though the evaluators' aesthetic notions are very similar, laypeople appear to favour more concave features when compared to the other categories.

MATERIALS AND METHOD

SOURCE OF DATA-

Sample consisting of a total of 41 individuals – 20 males and 21 females – between the ages of 18-35 years were included.

The study included individuals residing in Belagavi city and neighbouring areas who have reported to the Department of Orthodontics, KLE VK Institute of Dental Sciences, Belagavi.

Formula:

Same photographs assessed by two assessors (Laypersons and Orthodontists)

Mean of rating by orthodontist = 3.68

Mean of rating by layperson = 3.44

Standard deviation in orthodontist = 0.5

Standard deviation in layperson = 0.57

Effect size = -0.448598130841122

Power (%) = 80

Alpha Error (%) = 5

Sided = 2

Required sample size = 41 should be taken

Alpha Error (%)	Power (%)	Sample Size (n)
1	80	62
	90	77
5	80	41
	90	54

$$n_{pairs} = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2}{\Delta^2} + \frac{Z_{1-\alpha/2}^2}{2}$$

$$Where\ \Delta = \frac{\bar{x}_2 - \bar{x}_1}{SD}, \qquad SD = \frac{S_1 + S_2}{2}$$

$Z_{1-\alpha/2} = 1.96$

$Z_{1-\beta} = 0.84$

INCLUSION CRITERIA:

- Subjects who completed orthodontic treatment (fixed mechanotherapy 0.022X.028 MBT) in the Department of Orthodontics at KAHER's KLE VK Institute of Dental Sciences, Belagavi.
- Orthodontically treated class II patients with convex profile.
- Age >18<35
- Camouflage treatment plan (non-surgical)

EXCLUSION CRITERIA:

- Subjects with a history of any systemic disease.
- Subjects with any facial asymmetry or deformity.
- Subjects requiring surgical and/or functional orthodontic treatment.
- Cleft case
- Subjects that have undergone any surgical procedure in addition to the orthodontic treatment for augmentation of facial esthetics (genioplasty, rhinoplasty, lip fullness corrections, Botox injections, etc.)

INFORMED CONSENT:

Consent was taken from all the subjects whose records were taken up for the study.

METHOD:

PROCEDURE:

A total of 41 people (21 males and 20 females) between the ages of 18 and 35 were evaluated, all of whom had completed orthodontic treatment at KAHER's KLE VK Institute of Dental Sciences in Belagavi.

A Canon 1300 D DSLR camera with a 90 mm macro lens and in-built flash was used to capture profile photographs of the patients. Only post treatment cephalograms and the profile photographs at rest after treatment were used in this study. (Figure 1 a and b)

Fig 1 a

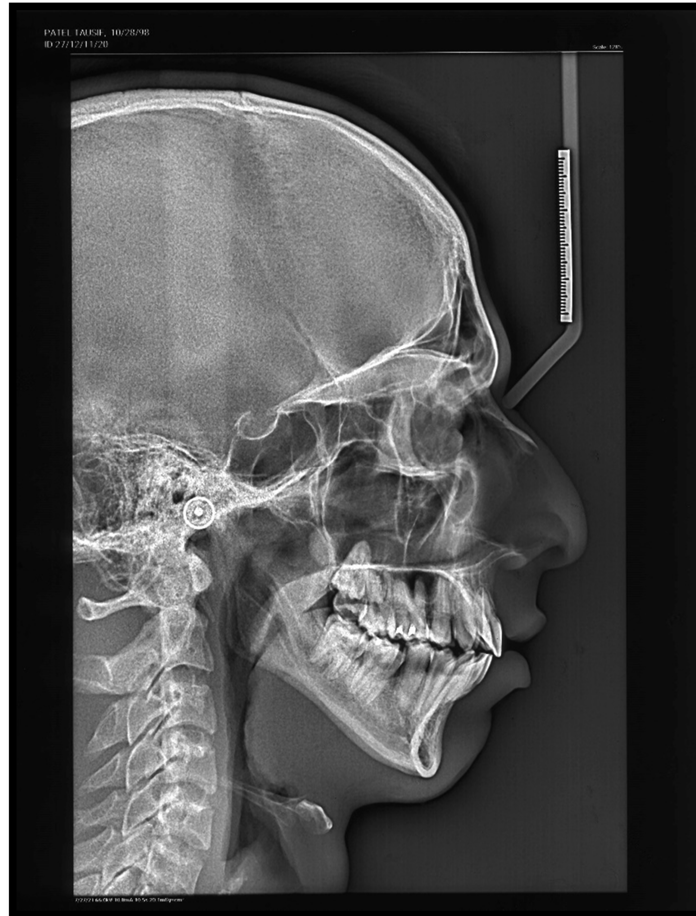


Fig 1 b

Lateral cephalograms were scanned and digitized using EPSON Scanner (Epson Perfection V800 Photo) and dolphin imaging software(version 11.95) respectively.

The cephalogram of each patient was digitized using dolphin imaging software and landmarks were marked (fig 2).

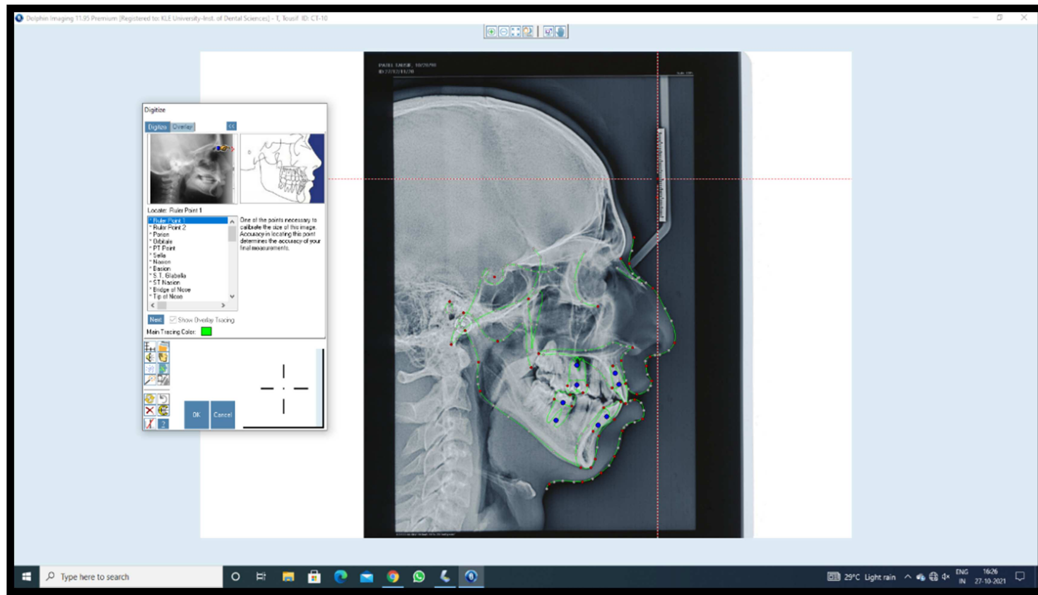


Fig 2

The post treatment lateral photograph was uploaded into the dolphin imaging software. (fig3)

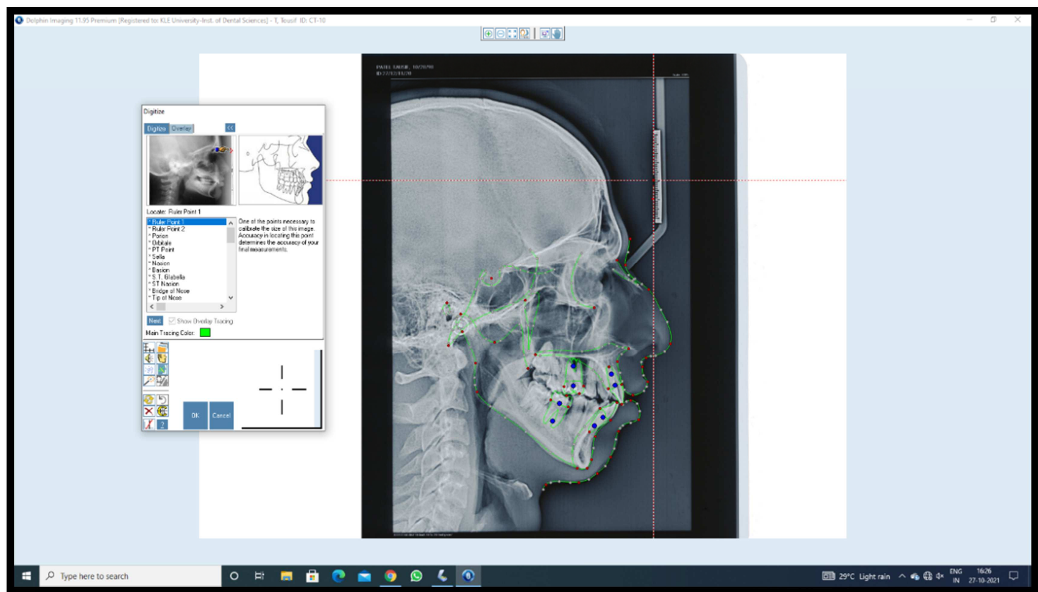


Fig 3

Superimposition of lateral photograph and cephalogram was done using dolphin imaging software. (fig4)

Fig 4

Simulation of the chin position of the patient is done with dolphin imaging software. Prediction of genioplasty was carried out on the hard tissue. The bony advancement of the chin was carried out based on the S-line of the patient. The amount of soft tissue advancement was determined by the values predicted by the software program (fig 5).

Fig 5

This image depicted simulated genioplasty compared with the initial and was represented as image B.

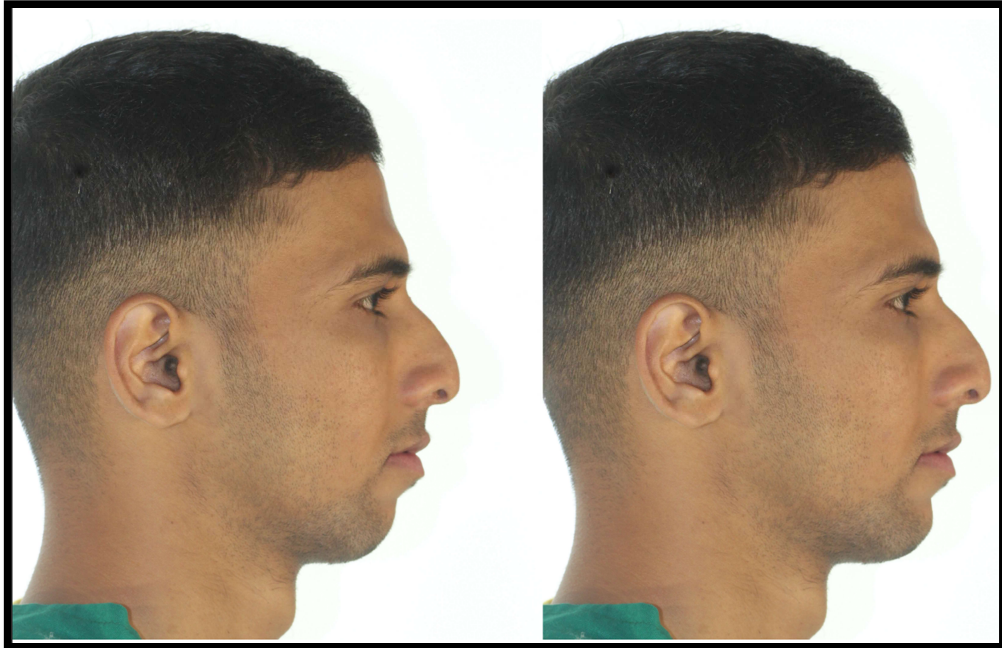


Fig B

The selected soft tissue landmarks intended for surgery were soft/above nasion, nasion, below nasion, bridge of nose, above pronasale, pronasale, and below pronasale. Surgery consisted of only the elimination of the nasal hump and creation of a mild concavity to straight bridge on the dorsum of the nose, without manipulating the patients' pronasale point.

During the consultation, Adobe Photoshop was used to open the profile view photo. The command key and the "j" key were used to duplicate the patient's photo in the second layer (Fig.c2).

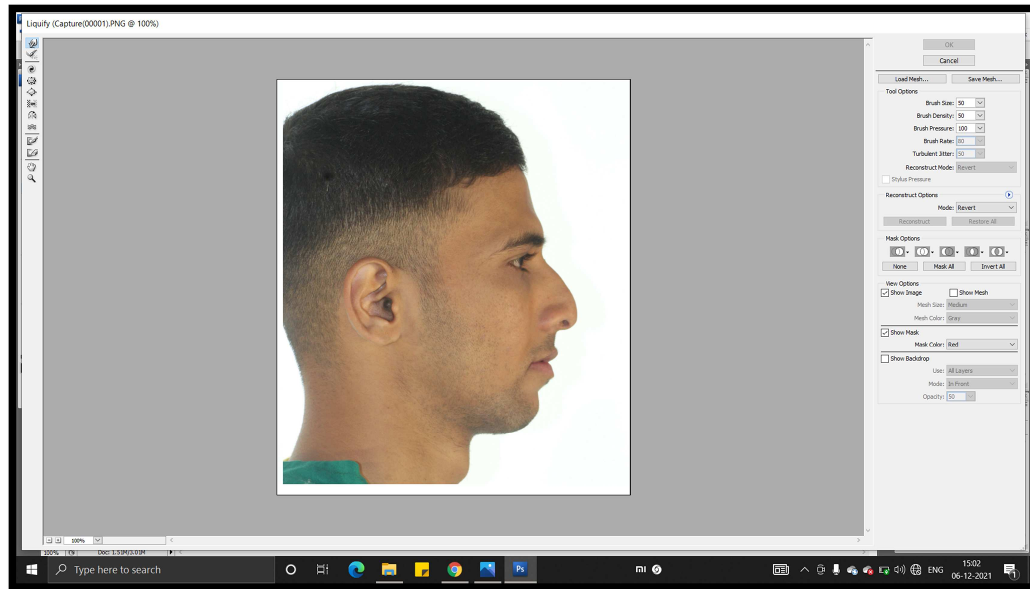


Fig c2

The newly formed second layer was modified by the "liquify" photo filter or using the command, shift, and "x" keys together. (Fig.c3).

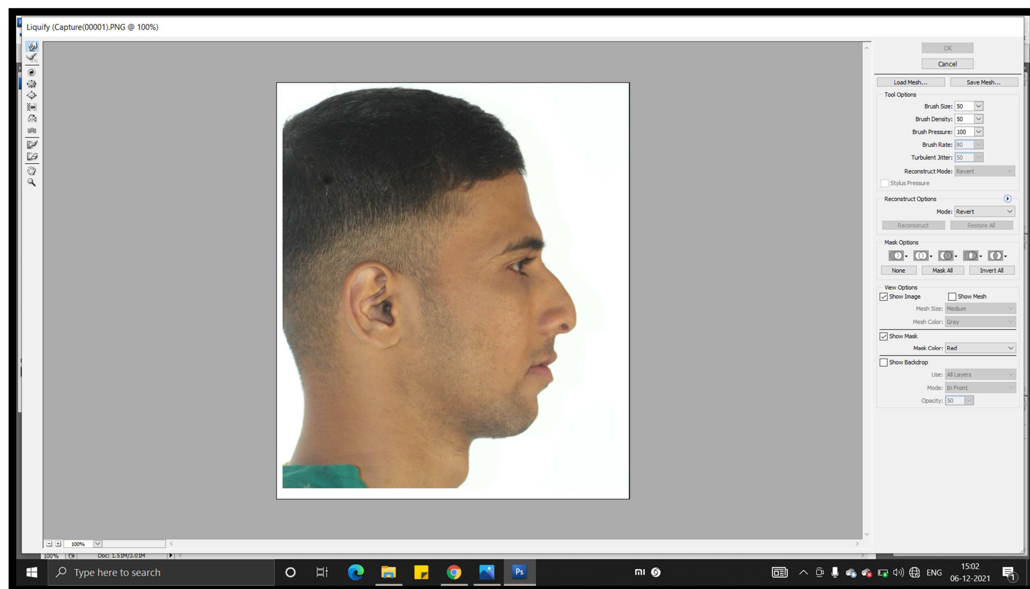


Fig c3

A new window was opened after selecting the liquify filter, and the circular morphing brush appeared. (Fig c4)

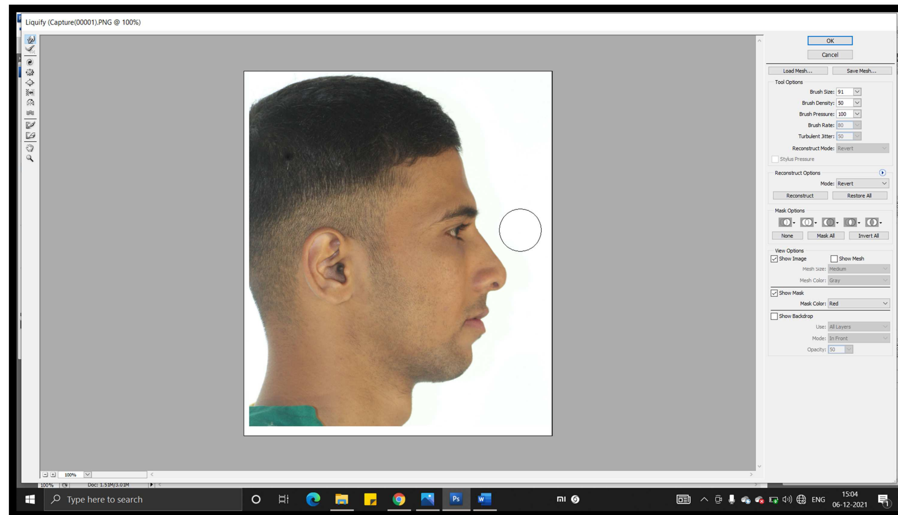


Fig c4

The brush size can be reduced or increased by adjusting the brush size. The photo morphing process was repeated until the patient and surgeon were both pleased. A surgeon must be aware of the potential and constraints of the actual surgery vs the produced photo while performing photo morphing.

This image representing rhinoplasty was called image C.

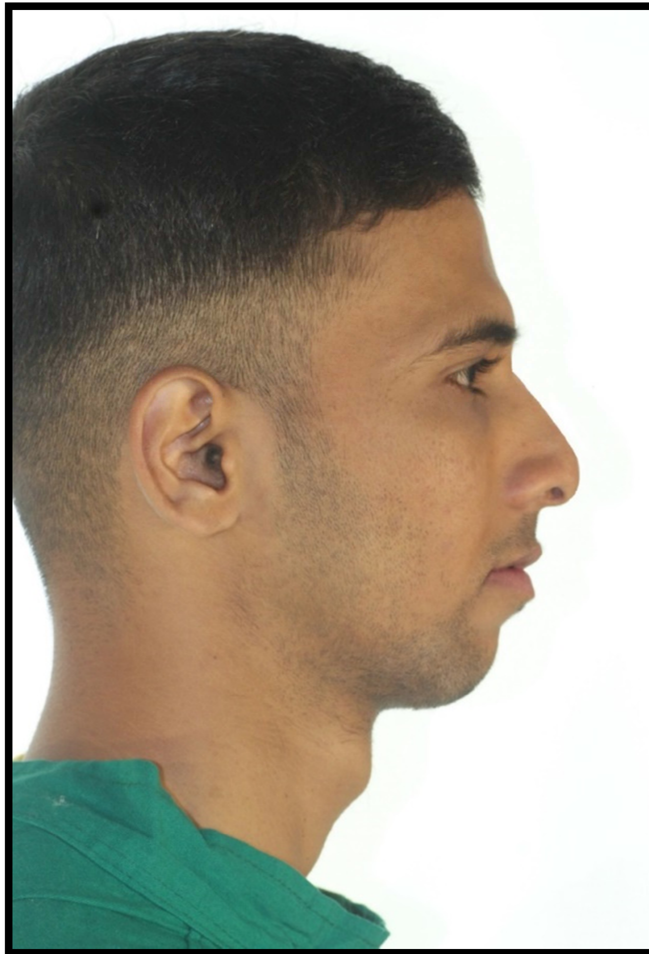


Fig C

To predict genioplasty and rhinoplasty, both previous surgeries were carried out using the same values in the transverse and vertical dimensions. This image representing rhinoplasty plus genioplasty was called image D.

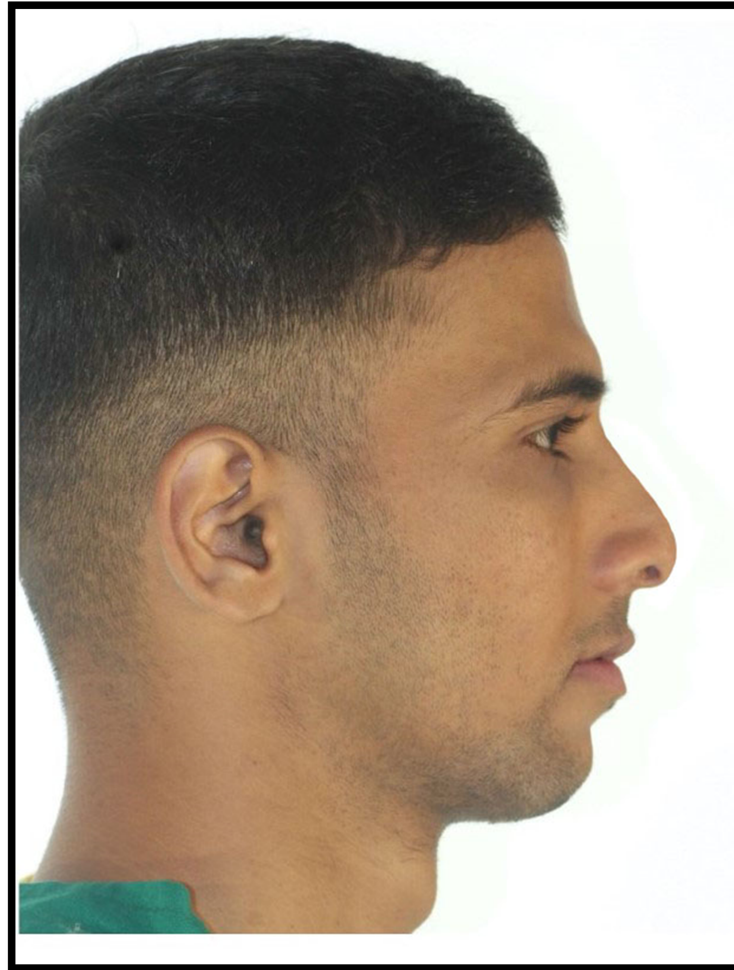


Fig D

All of the captured photographs were combined into a Microsoft PowerPoint presentation file with 45 slides. Each presentation featured four photographs of a single subject. The pictures were chosen at random. At the top of each slide, the patient's code was mentioned. The first four slides were duplicates of slides chosen at random and were therefore excluded from the statistical analysis. They were solely

employed to prepare the viewers' minds and sight so that they could make better judgments. For 60 seconds, the first slide was shown. The second slide was shown for 48 seconds, then the rest of the slides were shown for 40 seconds (10 seconds for each image). There was no way to go back or stop the slides from being displayed automatically. Two panels of observers were used: orthodontists and laypeople. The first panel consisted of ten orthodontists (five men and five women) who all attended the same university. There were ten laypeople (five males and five females) who worked in fields other than art and dentistry. All of the observers were from the same city. A questionnaire with 45 boxes was presented to each observer. Each box held four VAS scores, each of which corresponded to a single image on each slide. On a 5-point VAS, (Fig 6) the observers were asked to score the beauty of each image. Two randomly selected observers repeated the process after two weeks under identical conditions and evaluation criteria to examine the test's reliability.

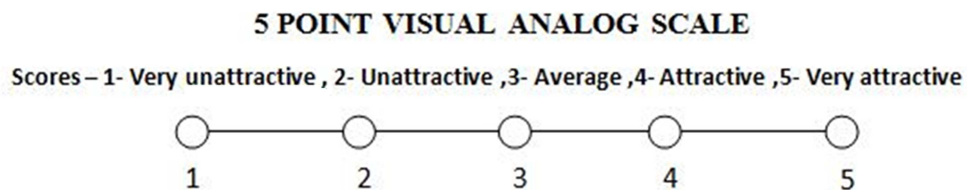


Figure14: Visual Analogue Scale[67]

The Examiners were divided into two groups –

1)10 laypeople

2)10 orthodontists.

Individuals in these two groups ranged in age from 18 to 35 years old. To avoid bias, laypeople were chosen from a literate and financially secure class of people who had little or no expertise of the topic.

The orthodontists were chosen among the faculty and alumni of KLE University's KLE VK Institute of Dental Sciences, Belagavi's Department of Orthodontics.

The images were shown on a screen using a PowerPoint presentation, with each image lasting 30 seconds and a 20-second interval between them.

The data was then compiled in Microsoft Excel and statistical analysis was performed.

RESULTS

After analysing the statistical and graphical data layman gave the initial image a mean aesthetic score of 2.69 ± 1.030. While orthodontists scored the initial image as 2.54 ± 0.674. The mean aesthetic score by laymen for the genioplasty image was 3.10 ± 0.775. While the orthodontists scored the genioplasty image as 3.08 ± 0.695. The mean aesthetic score by laymen for the rhinoplasty image was 3.55 ± 0.778. While the orthodontists scored the rhinoplasty image as 3.21 ± 0.569.

The mean aesthetic score by laymen for the combined genioplasty and rhinoplasty image was 4.14 ± 0.990. While the orthodontists scored the combined genioplasty and rhinoplasty image as 3.80 ± 0.763.

Table 3 & Graph 3 represents the mean aesthetics scores of each profile based on the panel of observers. The highest mean aesthetics scores among all observers belonged to rhinoplasty plus genioplasty image (3.97 ± 0.8), followed by rhinoplasty image (3.38 ± 0.6), genioplasty image (3.09 ± 0.7), and the initial image of the patients (2.6 ± 0.8) in descending order. There were significant differences in the mean aesthetics scores between the orthodontists and the laypersons ($p<0.05$).

The mean score for each profile was not significantly different between male and female observers ($p>0.05$).

The aesthetic ratings of four profiles were compared using the Mann-Whitney U test. The statistical significance was kept at a value of 0.05 or less. The results showed that following both rhinoplasty and rhinoplasty with genioplasty, the mean

aesthetics scores of the patient's profile improved significantly compared to the patients' original profiles ($p<0.001$), based on the opinions of all observers.

There was a considerable difference in the mean score of the patient's profile following genioplasty, according to laypeople and orthodontists' opinions. The mean score for each profile, however, did not change substantially between the two groups ($p>0.05$). There was a substantial change in the mean score of the patient's profile after rhinoplasty ($p<0.001$), according to laypersons and orthodontists' perspectives.

There was a higher rise in the mean aesthetics scores following the two adjunctive operations (rhinoplasty and genioplasty), based on the judgments of all observers, than when only one of the surgeries was performed ($p<0.001$).

Table 1(Mean Scoring Done by Orthodontists)

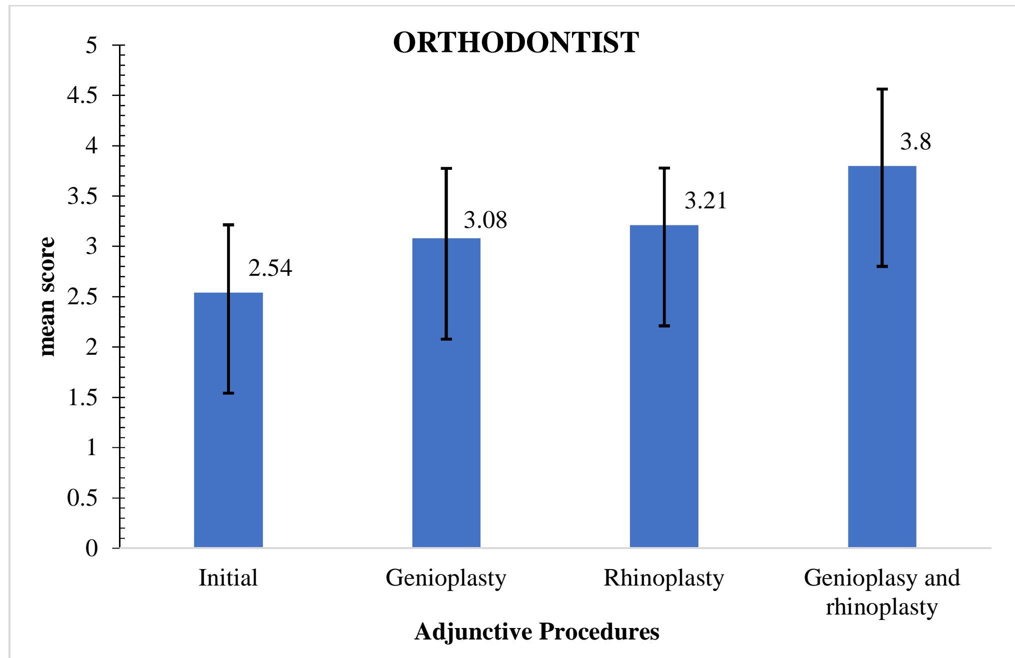
Layman	Minimum	Maximum	Mean	Std. Deviation
Initial	1	5	2.69	1.030
Genioplasty	1	5	3.10	.775
Rhinoplasty	2	5	3.55	.778
Genioplasty and Rhinoplasty	2	5	4.14	.990

Table 2 (Mean Scoring Done by Orthodontists)

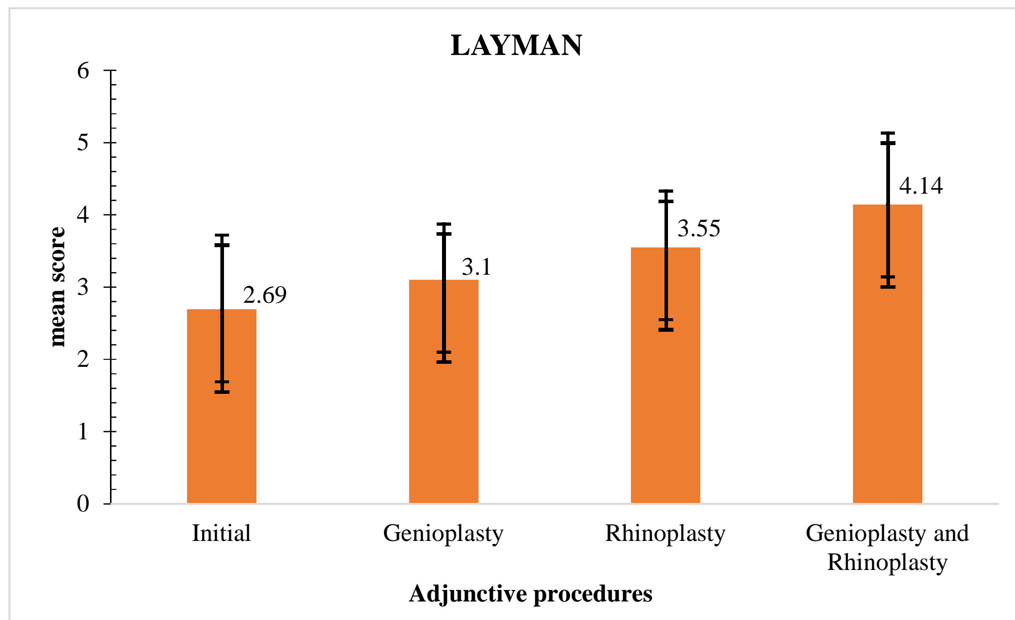
Orthodontist	Minimum	Maximum	Mean	Std. Deviation
Initial	1	4	2.54	.674
Genioplasty	1	4	3.08	.695
Rhinoplasty	2	4	3.21	.569
Genioplasty and rhinoplasty	2	5	3.80	.763

Table 3 (Comparison of Scoring Between Orthodontists and Laymen)

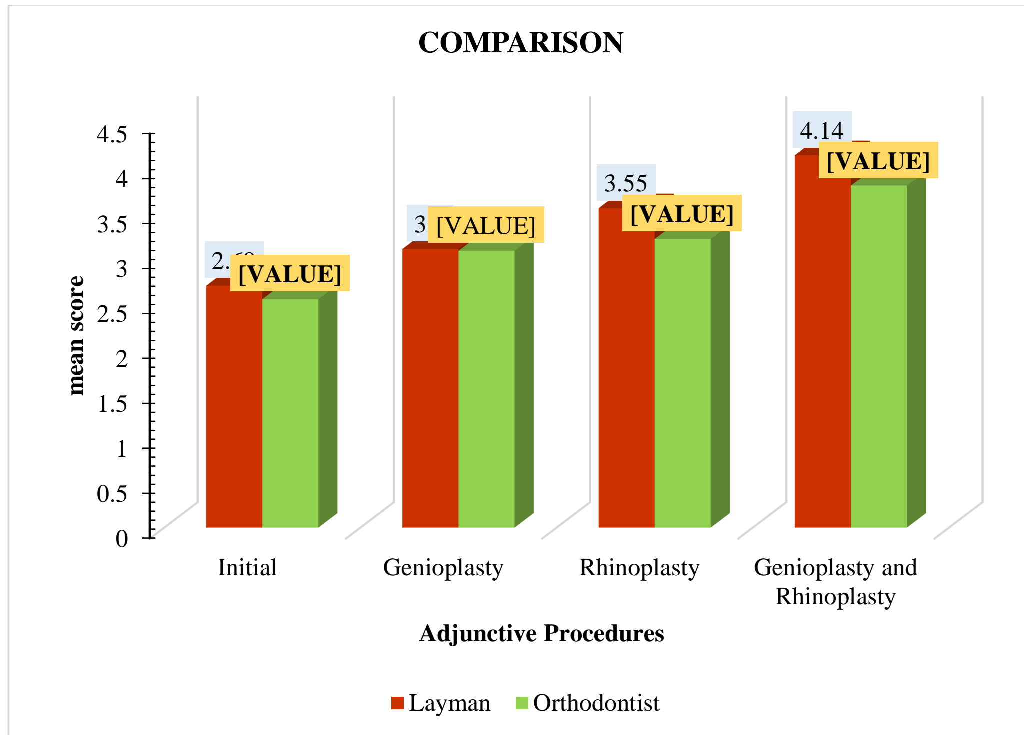
Comparison	Test groups	Mean	Std. Deviation	p-value
Initial	Layman	2.69	1.030	
	Orthodontist	2.54	.674	.310
Genioplasty	Layman	3.10	.775	
	Orthodontist	3.08	.695	.680
	Total			
Rhinoplasty	Layman	3.55	.778	
	Orthodontist	3.21	.569	**.000***
	Total			
Genioplasty and Rhinoplasty	Layman	4.14	.990	**.000***
	Orthodontist	3.80	.763	
	Total			



Graph 1 represents the mean scoring given by orthodontist



Graph 2 represents the mean scoring given by layman



Graph 3 comparing the mean score given by orthodontist and layman

DISCUSSION

In Western literature, beauty is still one of the most debated terms. Margaret Wolfe Hungerford stated that “beauty is in the eye of the beholder,” while William Shakespeare noted that beauty is “bought by judgment of the eye” in Love’s Labour’s Lost.[39] Immanuel Kant remarked that “the beautiful is that which pleases universally without a concept” in an early treatise, entitled Critique of Judgement.[40] Perhaps beauty is an intangible concept that can't be explained. This perception will, without a doubt, continue.

Although the evaluation of facial beauty is subjective and based on artistic sensibilities, it is widely accepted that facial attractiveness perceptions are multidimensional, with genetic, environmental, and cultural roots.[41,42]

In calculating optimal facial measurements, anthropometric or photogrammetric approaches are well recognised to be preferred to cephalometric methods.[43] Knight and Keith also proposed that a set of ranked images taken by non-clinicians be used as the standard to reflect the general public's perception of facial beauty. The aesthetics of plastic surgery rely heavily on the subjective opinions of the general population.[44]

Esthetics has become a necessary component of the imagined treatment objective to get an acceptable outcome. Because an orthodontist's perception of aesthetics differs from that of a layperson, the patient's perception of the face must be addressed before treatment can begin. Furthermore, treatment objectives should prioritize a balanced and harmonious face profile above strict adherence to skeletal and dental norms.[45]

Growth modification (dentofacial orthopaedic and functional therapy), camouflage treatment (extraction and non-extraction therapy), and orthognathic surgery in extreme discrepancies are all options for dentoskeletal adjustments. With advancements in computer imaging, an orthodontist can efficiently plan and execute an orthognathic patient's therapy while also setting realistic goals. Surgical options such as maxillary advancement, maxillary alveolar setback, maxillary superior repositioning, mandibular advancement, mandibular setback, and adjuvant soft tissue surgical procedures (genioplasty, rhinoplasty, and cheiloplasty) can be used to achieve optimal dentoskeletal and facial aesthetics, depending on the severity of the dentofacial deformity and aesthetic demands.[45]

The effect of rhinoplasty and genioplasty on the attractiveness of the facial profile was assessed individually and simultaneously in this study. The findings revealed that, according to orthodontists and laypeople, the varied surgical techniques had a considerable impact on the facial profile aesthetics.

After nasal hump correction rhinoplasty, the patients' facial profile attractiveness was enhanced. Another study in an Iranian community found that having a large nose is not deemed attractive, and it also leads the lips to appear retruded. In several countries, including Brazil, Yemen, Saudi Arabia, the United Kingdom, and China, a less prominent nose with a higher nasal tip and a more obtuse nasolabial fold is more acceptable, according to other studies.[46]

Furthermore, it has been said that a straight nasal dorsum is more attractive than a convex dorsum in people with a class II normal profile and that these patients would benefit from surgical correction of a convex dorsum.[47] The results of the

present study with a convex face revealed that a straight nose is more attractive than one with a convex profile (hump).

The "Keystone region" is a 4 to 5 mm overlap between the nasal bones and the upper lateral cartilages. This anatomical landmark is critical for the dorsal contour's aesthetics and should be addressed precisely during surgery. If a dorsal hump is present, an objective assessment should be performed to determine whether it is cartilaginous, osseous, or mixed.

The majority of these patients will require dorsal reduction methods. In some instances, augmentation of the dorsum is required rather than decrease. A rasp, an osteotome, or an ultrasonic instrument can be used to reduce the bone dorsum, according to the surgeon's preference. The dorsum should feel smooth and straight when finished, or there may be asymmetries afterward.

In their study, Ju Jang et al found that East Asians prefer a nose with a prominent tip and a well-augmented nasal dorsum and that the notion of redistribution is important in managing convex dorsum in East Asians.[48] Rezaei et al evaluated patient happiness after rhinoplasty after one month and three months, concluding that there is a strong association between general satisfaction and patient satisfaction with the nasal hump or upward slanting of the nose.[49]

In comparison to laypeople, orthodontists were more critical of the photographs, according to Sena Esteves et al. The majority of the sample was rated visually acceptable by laypeople unless a substantial difference was noticed, however, orthodontists scored based on several aspects of facial aesthetics such as facial profile, proportions, and symmetry. Overall, reviewers with a lower literacy level expressed

more satisfaction with the procedure. Rhinoplasty surgery enhanced the patient's quality of life in terms of nose function and look great.

In dentofacial patients, genioplasty is the most common adjunctive cosmetic surgery.

According to the findings of this study, patients' facial profile aesthetics improved following genioplasty compared to before treatment, according to the assessments of orthodontists and laypeople; nevertheless, such an increase in aesthetic appearance was not statistically significant. However, it was found to be statistically significant in a previous study by Sadeghian et al.

According to laypeople's opinions, genioplasty improved the patients' facial profile aesthetics greatly. These findings are in line with those of an Indian study, which found that people prefer straight profiles with prominent chins, and that profiles with SNB angles of 78° had more pronounced chins and were more appealing. [50] Furthermore, males with large chins in their facial features were thought to be more beautiful in Turkish[51], Italian[52], Brazilian[53], and Arab communities[54].

The majority of candidates perceived the straight profile as their true profile, even though many of them were in the convex and concave divisions.[54] Patients who had orthognathic surgery alone or in combination with genioplasty had statistically significant improvements in overall satisfaction with their facial appearance, whereas patients who had genioplasty alone did not. Patients who had orthognathic surgery combined with genioplasty had a greater improvement in chin satisfaction than patients who had genioplasty alone.[55] This outcome is equivalent to the findings of the

current investigation. Genioplasty treats both psychological and aesthetic concerns, improving postoperative quality of life dramatically.[56]

According to the findings of this study, the facial profile aesthetics improved following simultaneous rhinoplasty and genioplasty, based on the judgments of all observers. Furthermore, the most aesthetic facial profiles were created following simultaneous rhinoplasty and genioplasty, followed by rhinoplasty alone and genioplasty alone, according to all observers, which was comparable to the Sadeghian et al. study. Both professionals and laypeople prefer straight profiles, according to studies conducted on whites, African Americans, and Yemenese populations.[57,58] In addition, orthodontists in Asian communities had a more favourable impression of more straight facial features.[60,61]

It was noted that Individual diversity existed, and the desire for simultaneous rhinoplasty and genioplasty did not hold for all face profiles. These findings show that the beauty of a facial profile is not only determined by the shape of the nose and chin. Other face features could have a variety of aesthetic effects. As a result, rhinoplasty, nasal hump removal, genioplasty, and chin augmentation are not required procedures for all patients seeking to improve their appearance.

In this study, the laymen rated the individuals greater aesthetics evaluations than the orthodontist, which is consistent with the findings of other investigations. [59-63] When comparing orthodontists to laypeople, it was discovered that orthodontists were more critical of the photos. The majority of the sample was deemed visually acceptable by laypeople unless a substantial difference was noticed, however, orthodontists scored based on several aspects of facial aesthetics such as facial profile, proportions, and symmetry. Overall, reviewers with a lower literacy level expressed

more satisfaction with the procedure. This was in contrast to a study by Sadeghian et al, who found that orthodontists gave higher aesthetic scores than laypeople. On the contrary, orthodontists have developed more rational and achievable criteria based on their experience in the promotion of aesthetics; on the other hand, the general public's ideal mental image has been influenced by Hollywood celebrities. Other studies have found that laypeople are more interested in judging the faces as normal or more beautiful than orthodontists and surgeons.[64]

The viewpoint of laypeople appears to be more important and should be considerate while treatment is being planned. In general, there was no difference in the preferred facial profile of the two panels' observers. In both groups, the most aesthetic facial profile was achieved after simultaneous rhinoplasty and genioplasty, indicating that the final result in terms of aesthetics is not very related to individuals' backgrounds; technical educations do not ultimately change the background; and finally, orthodontists' aesthetics goals with the nose and chin are consistent with the aesthetic viewpoint of the community's ordinary members. The findings of this study are in line with those of other studies conducted in different populations, including the Iranian population.[47,65]

Facial aesthetics evaluation is a subjective and difficult task. It's tough to come up with objective standards for judging face appearance. Several elements, such as the impact of cultural diversity and the community, make impartial judgements and establishing criteria for evaluating aesthetics challenging.[66] To reduce cultural differences, the observers in the present study were chosen from the department of orthodontics “KLE VK Institute of dental sciences”, Belagavi. When compared to qualitative descriptions of aesthetics, the use of numeric scores and quantification of

criteria in the field of facial aesthetics and attractiveness increases the sensitivity of judgments made. However, such quantification could contribute to observers' biases.[67]

We used the Visual Analogue Scale (VAS) to evaluate the aesthetic scores in this study. VAS is the most obvious of all the strategies used to quantify emotions since it eliminates the bias caused by scoring on a numeric scale and an equal appearing interval scale.[68] The VAS has previously been used to assess opinions on various elements of dentofacial appearances, such as facial profile aesthetics, dental aesthetics, smile aesthetics, and so on. This method is simple, quick, and straightforward. However, this does not negate the fact that it has flaws and limitations of its own.[69] Regardless of genuine preferences, observers tend to spread their responses across the full scale and avoid the ends at the anchor points.[68,69]

Compared to verbal analogues, they appear to be more effective. The constraints of using VAS are similar to those of using words to describe anything. However, there is no guarantee that the interval between two descriptive terms is the same in the mind of an observer when words are used for descriptions (such as very appealing, attractive, moderate, and not attractive). Furthermore, the usage of similar phrases by various observers does not necessarily imply that their opinions are comparable. As a result, visual analogues appear to be more successful than verbal analogues.[67]

In The present study, we have used dolphin imaging software (version 11.95) to simulate genioplasty in this investigation. One of the most extensively used software for virtual surgical planning is Dolphin Imaging. From a lateral perspective, the Treatment Simulation software module helps you to prepare, diagnose, and present situations. Continuous interactive programs for rapid and easy assessments

and treatment planning are included in multidisciplinary VTO Wizards. It's the ideal platform for interdisciplinary clinicians to collaborate and visualise outcomes. Both orthodontic and surgical cases can benefit from Dolphin Treatment Simulation. Dolphin Imaging software was proven to be clinically appropriate for performing virtual orthognathic surgery planning by Andressa et al in their study, which validates our current findings.

Computer technology and internet connection are now widely available. The majority of individuals, including plastic surgeons and patients, have grown up with and are familiar with this technology. People understand that computer simulations and real-life are not the same. As a result, most patients are willing to accept that the final result of surgery may differ slightly from the preoperative simulated images. Patients who are well-informed recognise that numerous factors influence the surgical result, particularly in revision rhinoplasty. Scars, destroyed structures from an earlier surgery, anatomical limitations, and other factors all play a role. More than 95 percent of patients found that using Adobe Photoshop (Adobe Systems, Inc. San Jose, CA) as a preoperative simulator facilitated communication and promoted understanding.

An insightful perspective will give an elaborative idea of the most acceptable procedures which in turn would be a motivational tool for the patients undergoing these procedures. Also, this makes orthodontist well aware regarding the most acceptable procedures by the patients to understand the compliance and ease of convincing in the benefit of the patients.

CONCLUSION

Given the subjective nature of aesthetics appraisal and the complicating factors in this regard, the following conclusions can be drawn from the findings of this study:

- When it came to the desirable facial profile, orthodontists and laypeople had similar opinions.
- Both rhinoplasty and genioplasty improve the patient's facial profile's attractiveness.
- When compared to chin argumentation surgery, nasal hump eradication surgery improves the profile of patients with convex features.
- When compared to a nose with a convex profile, a straight nose is more attractive in persons with a convex face (hump).
- In convex faces, simultaneous nasal hump removal and chin argumentation treatments resulted in the largest improvement in facial profile attractiveness.

SUMMARY

The purpose of this study was to evaluate the esthetic outcome after simulated Rhinoplasty, Genioplasty, and Rhinoplasty Genioplasty in class II treated patients with a convex profile. The study included 41 samples that were assessed by laymen and orthodontists for simulated rhinoplasty, genioplasty, and rhinoplasty combined with genioplasty.

The Mann-Whitney U test was used to compare the esthetic scores of four profiles. The results, based on the opinions of all the observers, showed that following both rhinoplasty and rhinoplasty plus genioplasty, the mean esthetics scores of the patient's profile improved significantly compared with the patients' initial profiles. Based on the opinions of laypersons and orthodontists, there was a significant change in the mean score of the patient's profile after genioplasty. However, The mean score for each profile was not significantly different between both the groups. Based on the opinions of laypersons and orthodontists, there was a significant change in the mean score of the patient's profile after rhinoplasty. Based on the opinions of all the observers, there was a greater increase in the mean esthetic scores after the two adjunctive surgeries (rhinoplasty along with genioplasty) compared with the situation when only one of the surgeries was carried out.

As a result, this study contributes to patients' motivation for adjunctive surgical treatments such as genioplasty and rhinoplasty to improve the facial aesthetic look of the face after orthodontic treatment in class II patients with convex profiles.

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ANNEXURE – I - ETHICAL CLEARANCE CERTIFICATE

Research and Ethics Committee
KLE V K INSTITUTE OF DENTAL SCIENCES
KLE University

Accredited 'A' Grade by NAAC Placed in Category 'A' by MHRD (GoI)

Nehru Nagar, Belagavi - 590 010, Karnataka State

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FAX: 0831-2470640 E-mail:principal@kledental-bgm.edu.in

Sl. No. : 1317

CERTIFICATE

This is to Certify that the synopsis titled EVALUATION OF AESTHETIC OUTCOME AFTER SIMULATED RHINOPLASTY AND GENIOPLASTY IN CLASS-II TREATED PATIENTS IN NORTH KARNATAKA POPULATION - COMPARATIVE STUDY *Submitted by Dr.* CHARLES · JUDE *P. G. Student / Staff, Guided by* DR · ANAND · BADAVANNAVAR *from Department of* ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS *has been critically evaluated by committee members and granted ethical clearance to conduct the above mentioned study*

Date :

Member Secretary
Research and Ethical Committee
KLEVK Institute of Dental Sciences
Belagavi

Chairman
Research and Ethical Committee
KLEVK Institute of Dental Sciences
Belagavi

ANNEXURE – II - CONSENT FORM

CONSENT FORM

DEPARTMENT OF ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS

K.L.E.V.K INSTITUTE OF DENTAL SCIENCES, NEHRU NAGAR, BELAGAVI-590010

Title...

I, ____ aged ____ have been informed about the study in the language that I can understand.

I agree to give my child's personal details like name, age, sex, address, previous dental history and the details required for the study to the best of my knowledge.

I will co-operate with the dentist for my child's intra oral and extra oral examination.

I will follow the instructions given by doctor during the study.

I will permit the investigator to utilize the information given by me and the results obtained from this study for presentation and publication.

I will not claim any returns in the study. My participation is with my own will and wish.

I have read, gone through and understood the above information given by the doctor about the study.

I have entered and signed this application.

signature:

Address:

Phone no:

Dentist name:

Dentist signature:

Address :

Phone no:

ANNEXURE – III - SCORING SHEET BY ORTHODONTIST

LAYMEN	INITIAL	GENIOPLASTY	RHINOPLASTY	GENIOPLASTY+RHINOPLASTY
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ANNEXURE – IV - SCORING SHEET BY ORTHODONTIST

ORTHODONTIST	INITIAL	GENIOPLASTY	RHINOPLASTY	GENIOPLASTY+RHINOPLASTY
1				
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ANNEXURE – III - PHOTOGRAPHS

panel	initial	rhinoplasty	genioplasty	rhino+genic
orthodontist				
laypersons				

ɔ

panel	initial	rhinoplasty	genioplasty	rhino+genic
orthodontist				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

ɔ

panel	initial	rhinoplasty	genioplasty	rhino+genic
layperson				
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ANNEXURE -VI- MASTER CHART (ORTHODONTIST)

figures	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio		initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio		initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio
1	3	3	4	4	2	4	3	4	2	3	4	5	3	3	4	4	3	4	3	4	3	4	3	4	2	3	4	5	3	4	4	5	2	3	4	3	2	2	3	4
2	3	3	3	3	2	2	3	2	1	2	3	4	2	2	3	3	3	3	4	3	3	3	4	3	1	2	3	4	2	3	3	3	1	3	3	4	3	3	2	3
3	3	4	3	4	2	4	4	5	3	4	3	4	1	3	3	3	3	3	4	4	3	3	4	4	3	4	3	4	3	4	3	5	2	3	4	4	3	3	4	4
4	3	4	4	4	2	3	3	4	3	4	4	5	3	4	4	4	3	3	3	4	3	3	3	4	3	4	4	5	2	3	3	4	3	3	3	5	3	3	3	4
5	3	3	3	3	2	2	3	4	3	4	4	5	3	3	4	4	4	3	4	4	4	3	4	4	3	4	4	5	3	3	4	5	2	3	3	4	2	2	3	4
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9	3	3	3	3	2	3	3	4	3	4	3	4	2	3	3	3	3	4	3	4	3	4	3	4	3	4	3	4	2	3	3	5	3	3	4	4	2	2	3	3
10	3	3	3	3	2	3	3	4	2	4	3	4	2	3	4	4	3	4	3	4	3	4	3	4	2	4	3	4	2	3	3	3	2	3	3	5	2	3	4	4
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12	3	4	3	4	2	3	3	4	2	4	3	5	1	3	4	4	3	3	4	3	3	3	4	3	2	4	3	5	2	2	2	3	3	4	4	4	2	2	3	4
13	3	3	3	3	2	3	3	3	2	4	4	5	2	3	4	4	3	3	3	3	3	3	3	3	2	4	4	5	3	2	2	3	3	3	3	4	3	2	3	3
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figures	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio		initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio		initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio
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ANNEXURE -VI- MASTER CHART (LAYMEN)

figures	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio
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figures	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio	initial	rhinoplasty	genioplasty	rhino+genio
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