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Case Report

Smile Designing by Gingivectomy Using Chu's Esthetic Gauge

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Abstract

Purpose: The following case report is about the surgical management of a case of inflammatory gingival hyperplasia with a proportionate design of the anterior teeth to achieve an aesthetic appearance.

Material and Methods: A treatment was planned for smile designing using Chu's Esthetic Gauge to contour the gingiva followed by simple gingivectomy and gingivoplasty using a 15 BP blade.

Conclusion: The use of Chu's Aesthetic Gauge gave an easy and accurate measurement for esthetic designing of the anterior crowns producing a good esthetic result. This instrument is used to accurately design the gingival contours of the crowns, thus allowing an aesthetic outcome of such a surgery.

Keywords: Gingivectomy; Gingivoplasty; Smile Designing; Esthetic Dentistry; Chu's Aesthetic Gauge

Introduction

There is multiple etiology that can cause gingival enlargement. The most common is chronic inflammatory gingival enlargement when the gingiva presents clinically as soft, edematous, and erythematous. It has tissue edema and infective cellular infiltration, caused by prolonged exposure to bacterial biofilm accumulation [1]. Many's a time the chronic inflammatory gingival enlargements consist of significant fibrotic components. These do not undergo shrinkage on just scaling and root planning, hence are treated with surgical removal of the excess tissue.

Chu's Aesthetic Gauges was designed to create the proper individual tooth proportion once the incisal edge position was established.

It consists of 3 instruments

The Proportion Gauge: Consists of two tips

- **T-bar Tip:** As the name suggests, the T-bar tip looks like a T with a vertical and a horizontal arm. Hence, due to this design, it can simultaneously measure the horizontal as well as the vertical dimension of a crown.
- **Inline Tip:** This one has a long and short vertical arm. In cases of situations like crowding, it is difficult to use the T-bar. This is when the inline tip is used to measure length and width not together but independently.

The Crown Lengthening Gauge: Consists of two tips

- **BLPG tip:** This tip has redefined measurements. It is used to perform a proper crown lengthening procedure by measuring the mid-facial clinical crown along with the length of the biological crown
- **Papilla tip:** This tip assists to perform a good aesthetic position of the interdental papilla.

The Sounding Gauge: consists of one tip

- **The sounding tip:** When osteotomy is to be performed or when there is a requirement of determining the osseous crest location, the role of the sounding tip comes into place. It is used to ascertain the sulcus depth and osseous crest location.

Pathophysiology

Gingival enlargement occurs owing to the host and the environment interactions or as a response to numerous stimuli causing gingival inflammation, fibrous overgrowth, or both. Chronic inflammatory gingival hyperplasia is an enlargement of the gingiva is seen very frequently during orthodontic treatment attributable to local irritants with plaque accumulation [2,3].

Inglés E., *et al.* Gave a classification of Gingival enlargement [4].

It is as followed

- **Grade 0:** No enlargement of the gingiva
- **Grade I:** Enlargement confined only to the interdental papilla
- **Grade II**: Enlargement of the interdental papilla as well as the marginal gingiva
- **Grade III:** Enlargement covering equal to or more than three-quarters of the crown.

These enlargements cause several functional disturbances mainly difficulty in mastication, speech, aesthetic, and psychological complications.

Case Report

This case presents a 26-year-old female undergoing orthodontic treatment for a malocclusion. She developed hypertrophic gingiva in her anterior region during her treatment (Figure 1). On examination there was pseudo pocket due to gingival hypertrophy. Height of both maxillary and mandibular anterior was reduced to around 4 mm and 3 mm respectively, almost touching the orthodontic brackets with significant papillary enlargement. Treatment was planned to increase the height of crown contour by gingivectomy and gingivoplasty after proper oral prophylaxis [5,6]. For accurate measurement of the height of contour of the crowns, Chu's Esthetic Gauge was used thus to maintain the golden proportion of the anterior. The golden proportion used commonly in mathematics and geometry is a proportion of symmetry that can also be used to maintain aesthetics in incisors by calculating the width against the heights.

Sequence of treatment

The treatment was divided into three parts. On the first day, extensive oral prophylaxis was given. The patient was prescribed 0.2% Chlorhexidine mouthwash 10ml undiluted for 7 days. She was recalled after 7 days, and a subsequent pocket evaluation was done. Pseudo pockets noted were 4mm buccally. The patient was locally anesthetized by 2% lignocaine HCL 1:2,00,000 epinephrine, bilateral buccal infiltrations. Crown measurement was done using the T bar tip of Chu's Esthetic Guage from 13 to 33. (Figure 2) The average central incisor measures 8.5 mm in width by 11 mm in length, Lateral incisors (6 mm to 7 mm), and canines (7 mm to 8 mm. Each papilla height was measured by Papilla tip (Figure 3). Bleeding points were marked using a pocket marker, an External bevel incision was given joining the bleeding points and the gingival overgrowth was excised using a 15 BP Blade. Gingivoplasty was done with Castroveijo scissors. Betadine and saline irrigation were given, subsequently, hemostasias was achieved (Figure 4).

Figure 1

Figure 2

Figure 3

Figure 4

The patient was recalled after 1 week for the same procedure in the mandibular anterior. Corresponding steps were initiated from taking measurements with T-bar tip from 33 to 43. Measurements were taken according to the height and width of the mandibular anterior, (Figure 5) Papilla tip was also used (Figure 6). Bleeding points marked, subsequently, gingivectomy and gingivoplasty were done as same as in the maxillary anterior region (Figure 7). 0.2% Chlorhexidine mouthwash 10 ml undiluted for 7 days was prescribed and the patient was recalled after 1 week for evaluation of the results.

Figure 5

Figure 6

Figure 7

Results

Contouring of the crowns proportionate to each other was achieved with ease providing a pleasing result (Figure 8).

Figure 8

Discussion

As the golden proportion is a frequent ratio in symmetry, it has a foremost role in esthetic dentistry. It is a formula for evaluating the horizontal against the vertical [7].

Ricketts defined teeth proportion as "The Divine Progression" where the central incisors are 1.618 times bigger than the laterals. The laterals are 1.618 times bigger than the visible part of the canines seen from its vertical axis and so on. Similarly. The entire visible region of the anterior teeth i.e., the incisal points from maxillary canine to canine is 1.618 times to the mandibular incisors. In accordance, the anterior teeth crown to follow the golden proportion rule on their labial and palatal aspect, i.e., when the labial surface of the central incisor is sectioned into two in the proportion of 1:1.618, the 1 parts toward the gingiva is rounded and the 1.618 part is flat [8].

Periodontal therapy also comprises aesthetic treatment. Frequently associated with changes in tooth size, shape, proportion, and balance which may affect the appearance of the smile. Hence, the use of an innovative instrument mathematically designed to maintain the teeth proportion while such a procedure gives a superior result. Such an instrument is the Chu's Esthetic Guage [9,10].

Conclusion

The use of Chu's Esthetic Guage eliminated visual guessing or the need for a stent or elaborate designing of the crown on a cast. Hence, giving a predictable, faster, and cost-efficient aesthetic outcome of the surgery.

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