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The Art of Smile Design: Enhancing Beauty with Gingivectomy: A Case Report

Dr. Naseem Jahan[1], Dr. Zeba Rahman Siddiqui[2], Dr. Sanjay Gupta[3], Dr. Ashutosh Srivastava[4]

[1,4]Post Graduate Student, Department of Periodontology and Oral Implantalogy, Career Post Graduate Institute Of Dental Sciences & Hospital, Lucknow, U.P, India.
[2]Associate Professor, Department of Periodontology and Oral Implantalogy, Career Post Graduate Institute Of Dental Sciences & Hospital, Lucknow, U.P, India.
[3]Professor and Head, Department of Periodontology and Oral Implantalogy, Career Post Graduate Institute Of Dental Sciences & Hospital, Lucknow, U.P, India.

Abstract:
Smile aesthetics play a crucial role in shaping perceptions of beauty and attractiveness. A healthy and attractive smile can significantly boost both appearance and confidence. Effective smile design helps create a harmonious relationship between dental and soft tissues, which is vital for achieving the desired esthetic outcomes. Excessive gingival display, or gummy smile, can be a common concern for many. Gingivectomy is primarily indicated for addressing gingival enlargements, which can occur due to various conditions like hyperplasia or inflammation. The procedure aims to remove the excessive gum tissue. This helps create a healthy, functional gingival contour following the excision. Gingivectomy can either be done using a scalpel or laser depending on the procedure.
In this case smile design was successfully implemented to restore gingival contours through gingivectomy using conventional scalpel techniques. This approach not only enhances the likelihood of achieving a beautiful and harmonious smile but also ensures a smoother recovery process for the patient.]

Keywords: Smile Designing; Gummy Smile; Gingivectomy

INTRODUCTION:

Gingival enlargement is a common symptom of gingival disease. Gingival enlargement can be classified based on etiological factors and pathological changes[1]. Other factors like local factors as well as systemic factors, the most important of which is the local factors, namely bacterial plaque. Clinical signs that appear are enlarged gingiva, smooth, shiny, soft consistency, red color and the edges appear rounded[2].
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[3]. 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.

Gingivectomy is commonly performed with an external bevel incision. It was described by Goldman in 1951. A gingivectomy is a periodontal surgery performed to treat severe cases of gum disease, also known as periodontitis, that do not respond to antibiotics or root planing alone. This procedure is essential when the gums have stretched away from the teeth, creating deep pockets. Plaque and tartar form in these pockets, causing gum disease. If the disease is left untreated, it progresses that it damages the roots of the teeth and potentially leads to tooth loss. The gingivectomy procedure is designed to remove loose or diseased gum tissue in order to prevent tooth loss.

Gingivectomy is thought to be introduced as an official periodontal therapy when the idea of periodontal etiology shifts from bone to soft tissue. This is mainly due to Kronfeld in 1935, who emphasized that periodontal disease is not a disease of the bone. The pocket is viewed as a pathologic entity rather than a physiologic entity and thus needed to be eliminated. Gingivectomy can be done via mechanical or chemical, with aim to eliminate the pocket to restore form and function.

Treatment that can be performed in patients with gingival enlargement is gingivectomy. Gingivectomy is the excision or removal of gingival tissue by removing the lateral wall of the socket which aims to eliminate the socket and gingival inflammation, to eliminate gingival enlargement and gingival inflammation, to obtain a gingival that is physiologically, functionally and aesthetically good. Advantages gingivectomy is a simple technique, that can eliminate the pockets completely, improve accessibility and visibility for thorough calculus elimination, gingival morphology thorough calculus elimination, predictable gingival morphology as we desired[4,5,6,7,8,9].

INSTRUMENTS REQUIRED:

- Diagnostic instruments: Mouth mirror, periodontal probe.
- Periodontal pocket markers.
- Bard-Parker blade with blade holders.
- Periodontal Knives, scissors, and nippers:
  - Kirkland gingivectomy knife.
  - Orban's interdental knife.
  - Goldman fox periodontal scissors.
  - Goldman fox nippers.
- Gingivoplasty diamond burs.
- Curettes.

INDICATIONS

1. Suprabony pockets
2. An adequate zone of attached gingiva
3. Suprabony Periodontal abscess.
4. Pseudo Pockets
5. Gingival enlargement
6. Areas of Limited access
7. Unaesthetic or asymmetrical gingival topography
8. For exposure of soft tissue impaction to enhance eruption

9. To facilitate restorative dentistry
10. To establish physiologic and gingival contours post ANUG and flap procedures.

CONTRAINDICATIONS

1. Infrabony pockets
2. An inadequate zone of Keratinized Gingiva
3. Need for osseous resection and inductive techniques
4. Highly inflamed or edematous tissue
5. Areas of esthetic compromise
6. Shallow palatal vaults and prominent external oblique ridge.
7. When extensive bone surgery is required.
8. Patients with poor oral hygiene.

POSSIBLE RISKS AND COMPLICATIONS GINGIVECTOMY IS ASSOCIATED WITH THE FOLLOWING RISKS AND COMPLICATIONS:

1. Bleeding, which can occur during and after the surgery.
2. Pain and swelling of gums.
3. Infection at the surgical site.
4. Blood clot.
5. Abscess in the periodontal area.
6. Bone necrosis can occur in chemosurgery patients.
7. Damage to the surrounding healthy tissue if electric current or chemicals are used.
8. Damage to the nearby nerves.
9. Tooth sensitivity to cold temperature.
10. Plaque buildup recurrence, especially if the diseased gum tissue was not totally removed.

HISTORY

1742- Fauchard described the procedure to remove excessive tissue.
1921- William Ziesel- pyorhea examination; gingivectomy the rationale and treatment.
1928- Ward- surgical eradication of Pyorrhea.
1935- Kronfeld – autopsy study of periodontitis
1939- Orban- indication technique and postoperative management of gingivectomy in post operative periodontal pocket.
“cutting with knives and scissors, electrocoagulation or the use of thermocautery or short waves or chemical cauterization. In removing the free gum margin, we must be sure to remove entire gum to the bottom of the pocket, no more, no less.”

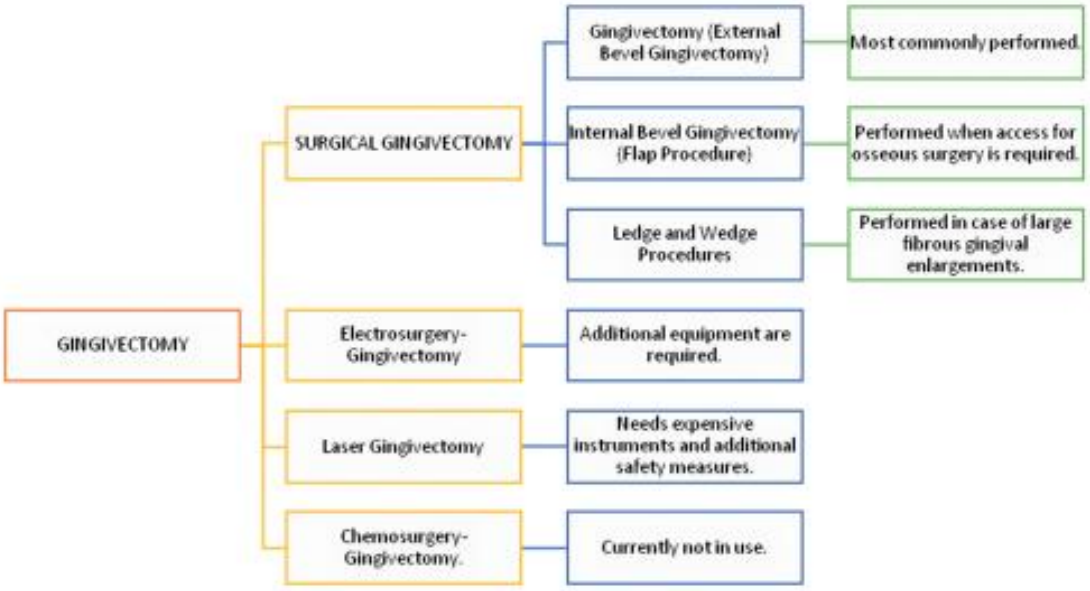
- Probing depth more than 3mm surgical
- Less than 3mm non-surgical

1952- Ramfjord- review article on gingivectomy.
1955- Weaurhaug- zero depth cannot be maintained.

METHODS – TECHNIQUES

Techniques:

- Scalpel
- Electrode
- LASER
- Chemical
- Cryosurger



Two phases:

1. Presurgical phase
2. Surgical phase

PRE-SURGICAL PHASE:

- The objective of the pre-surgical phases
- To totally eliminate local factors,
- To reduce gross inflammation to obtain fibrotic tissue favourable to healing, an
- To have better assessment of the zone of attached tissue
- Pocket depth and topography is also evaluated
- Other factors that is carefully reviewed are oral hygiene compliance, caries rate, an patient expectation. The next phase would be the actual surgery.

SCALPEL – SURGICAL GINGIVECTOMY ARMAMENTARIUM

- Krane Kaplan Pocket Marker
- Orban periodontal knife
- Kirkland Knife
- Waerhaug knife
- Bard – parker handle & blades

- Supra & subgingival scalers
- Curettes

STEPS IN- SURGICAL GINGIVECTOMY:

- Anaesthetize area
- Mark the pocket
- Resect the gingiva
- Remove granulation tissue
- Remove calculus
- Place periodontal pack

CLINICAL CASE REPORT

A 22-year-old female patient visited Department of Periodontics, Career Dental College and Hospital, lucknow with chief complains of the gum of upper and lower front teeth were not in the same height, unpleasant smile which made the patient uncomfortable Thus, patient is expressing concerns about the aesthetics of her smile, particularly due to her short upper and lower front teeth. Given her history with no systemic disorders, no history of drug use, and no food allergies.

The pretreatment photographs (Fig.1) illustrate the patient's initial dental condition. When relaxed, the patient displayed a prominent gummy smile, characterized by over 4 mm of gingival exposure in the incisor area. Additionally, the images reveal bilateral Class I canine and molar relationships, accompanied by a slightly deep overbite.

Figure 1: Preoperative view showing excessive gingival display

Based on the clinical examination findings, it appears the patient presents with an excessive gingival display, commonly known as a "gummy smile." The presence of incisal and canine guidance without any premature contacts or shifts suggests that the occlusion is stable, which is a positive sign for surgical intervention. The absence of temporomandibular joint symptoms and normal border movements indicates that the patient's mandibular function is within normal limits, which further supports the suitability for treatment. Given the patient's medical history is non-contributory and no contraindications to surgery were noted, it seems appropriate to consider a surgical approach to address the excessive gingival display.

After the completion of phase 1 therapy, and reinforcement of oral hygiene instructions, gingivectomy procedure was done after 1 week of phase 1 therapy.

Figure 2: Marking of bleeding points and external bevel incision given

Figure 3: Overgrown gum tissue

Figure 4; Immediately after gingivectomy

Figure 5; Gingivectomy done in upper and lower jaw

1. Procedure began by giving local anesthesia and marking of bleeding points with krane kaplan pocket marker
2. Using a #15 blade, external bevel incision was made on the labial aspect of the tooth to outline the new tooth length and gingival curvature.
3. The incision begins at the mesial and distal line angles of each tooth, forming a crescent-shaped piece of soft tissue on the labial aspect of each tooth.
4. Saline irrigation was done.

5. Medications prescribed.
6. Patient recalled to the department after 2 weeks and healing was satisfactory.

A B

Figure 6 (A). Before gingivectomy procedure (B). 2 weeks control post gingivectomy procedure

DISCUSSION

Gingival overgrowth is most common consequence following chronic inflammation, drug induced, systemic diseases and conditions. This overgrowth is sometimes causes discomfort for the patient as it interferes with the patient's normal parafunctional activity, such as mastication and speech. Gingival overgrowth also results in poor esthetics, as the gingival enlargement leads to the covering of up to one third to two third of the entire tooth. This gingival overgrowth also hampers with the patient's ability to maintain proper oral hygiene, resulting in accumulation of plaque and calculus, which results in pseudopockets or suprabony pockets[10].

The key to success and confidence, smile designing has emerged as a powerful tool for patients with facial or dental discrepancies[11]. Conventional procedures for gingivectomy involve the use of scalpel, electrosurgery, or a laser. However, scalpel offers advantages like the ease of use, precise incision with well-defined margins, uneventful healing, no unwanted lateral tissue damage and is economic. Whereas advanced treatment modalities like laser and electrocautery have advantages over the scalpel like immediate hemostasis, but they also have many disadvantages in relation to lateral heat damage, delayed tissue healing, skill of the operator andhigher cost. Although laser has advantage overelectrocautery such as less lateral heat damage, betterwound healing, and can be used in close proximity to bone as compared to electrocautery.

Funde S and Baburaj MD in their comparative study between scalpel, laser, and electro cautery employed for the treatment of gingival enlargement concluded that conventional scalpel treatment could be considered as a better option in terms of precise incision line, faster healing at much lower cost and seems to be beneficial for routine surgical procedures like gingivectomy[12].

Gingivectomy: The excision of a portion of the gingiva; usually performed to reduce the soft tissue wall of a periodontal pocket. - (Glossary of periodontal terms, 2001

- External bevel gingivectomy: Gingivectomy procedure is referred to as external bevel gingivectomy as it is carried out with an external bevel incision.
- Internal bevel gingivectomy: It is a flap procedure carried with internal bevel incision.
- Unembellished gingivectomy: An external bevel gingivectomy performed using a Kirkland knife with no additional procedure.

Gingivoplasty: A surgical reshaping of the gingiva. (Glossary of periodontal terms, 2001) - to create physiologic gingival contours, with the sole purpose of recontouring the gingiva in the absence of pockets.

Gingivectomy and gingivoplasty establish harmonious gum lines, prevent GE, and sustain good oral hygiene. The gingivectomy technique is a simple method that most patients find acceptable, obtaining satisfactory results in aesthetics and harmony according to the correct indications[13]. Performing a gingivectomy with a scalpel offers several advantages. The technique is relatively straightforward, allowing precise incisions on the predetermined marginal gingiva. Additionally, healing is typically excellent and rapid compared to other methods. However, there are drawbacks to this technique, including the possibility of bleeding that occurs during the surgical procedure so that it interferes with the operator's view. In addition, the presence of pain after surgery and the possibility of a prolonged healing process are factors that need to be considered[14]. The present case is regarded as a successful therapy when the chronic GE is corrected aesthetically by scalpel surgical gingivectomy and gingivoplasty.

CONCLUSION

Gingival enlargement is inflammation that occurs in the gingiva due to local factors, namely bacterial plaque. Treatment gingival enlargement that does not shrink after scaling, root planing, curettage and polishing then a gingivectomy which will result in good gingival morphology and aesthetics morphology and gingival aesthetics. Plaque control is the key to the success of gingivectomy so that there is no recurrence of gingival enlargement. Determination of the etiologic factor is very important in order to determine the management of gingival enlargement. Gingivectomy is an action to remove gingival enlargement and to make it easier for patients to maintain oral hygiene in maintaining oral hygiene, supportive periodontal therapy periodically to see if there is a recurrence in the future

An aesthetically pleasing appearance was achieved in this case by performing gingivectomy to recontour and relocate the gingival margin. Thus, through smile design not only aesthetics but also functional competency is maintained.

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