بسم الله الرحمن الرحيم

◔◔◔◔◔

تم رفع هذه الرسالة بواسطة / مني مغربي أحمد

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

3D Evaluation of Smile and Soft Tissue Changes in the Dental Esthetic Zone Following Upper Lip Dermal Fillers Injections of Skeletal Class 3 Orthodontically Treated Adult Females

A Thesis

Submitted to Faculty of Dentistry

Ain Shams University for Partial Fulfillment for the

Doctor's Degree in Orthodontics

Submitted by

Ghada Youssry El Saeed

B.D.S., October 6 University (2004)
M.D.S., Cairo University (2013)

Faculty of Dentistry
Ain Shams University
2022

Supervisors

Dr. Noha Ezzat Sabet

Professor of Orthodontics
Faculty of Dentistry, Ain Shams University

Dr. Islam Tarek Hassan

Professor of Orthodontics
Head of Orthodontic Department
Faculty of Dentistry, Ain Shams University

Dr. Ibrahim Mazen Negm

Assistant Professor of Orthodontics
Faculty of Dentistry, Ain Shams University

Dr. Dalia Mohamed Al Boghdady

Lecturer of Orthodontics
Faculty of Dentistry, Cairo University

Acknowledgment

I wish to express my deepest thanks, gratitude and appreciation to **Dr. Noha Ezzat Sabet,** Professor of Orthodontics, Faculty of Dentistry, Ain Shams University, for her, kind guidance, encouragement, endless and outstanding support.

I am deeply thankful to **Dr. Islam Tarek Hassan,** Professor of Orthodontics, Head of Orthodontic Department, Faculty of Dentistry, Ain Shams University, for his sincere efforts, meticulous supervision, generous help and assistance to finish this work.

Special thanks to **Dr. Ibrahim Mazen Negm,** Assistant Professor of Orthodontics, Faculty of Dentistry, Ain Shams University for his supervision and guidance.

Last but not least my sincere thanks and appreciation **to Dr. Dalia Mohamed Al Boghdady,** Lecturer of Orthodontics, Faculty of Dentistry, Cairo University, for her supervision, encouragement, valuable instructions active participation and guidance throughout this work.

Dedication

This work is dedicated to . . .

My **family** for their endless support and for always being there for me.

List of Contents

List of Tables

List of Tables cont...

List of Figures

List of Figures cont...

List of Figures cont...

Introduction

The smile is one of the most dignified God's gifts to the humanity. Recently the dental society has recognized the importance of an attractive smile as a response to the enormous social demand for a bright welcoming smile. So, one of the major orthodontic goals is to help people reach their attractive smile.

People seek orthodontic treatment to correct any soft tissue imperfection; not only for correcting skeletal and/or dental defects. Correcting these problems in terms of "orthodontic principles" is not quiet satisfying to the patients now. They pursue the beauty of a captivating youthful smile, and the soft tissue profile balance and harmony.

The aesthetic zone is composed of the gingival contour, the buccal corridors, the framing of the lips, along with the size, shape, position, and color of the displayed teeth. The range of the aesthetic zone is defined by the movement of the upper and lower lips during smiling, facial expression, and speech. On the other hand, essentials of the smile involve, the interaction and relationship between the teeth, the framework of the lips as well as the gingival display.[1]

"My smile is not attractive"- The recently arising concern of people. The markedly increased attention and spotlight brought on the topic of beauty standards has increased the esthetic demand and awareness of people. Beauty in terms of facial attractiveness, the power of a balanced smile that captures the eyes has recently become one of the main objectives of orthodontic treatment for both the orthodontist and the patient.

Achieving a harmonious balanced soft tissue profile is sometimes difficult specially when a camouflage treatment is intended. Facial attractiveness of Class III female patients is usually less rated than both Class I and Class II malocclusions. Skeletal class 3 patients are usually presented with concave facial profile, retrusive nasomaxillary area and upper lip with/without protrusive lower face. Their main concern is usually the profile rather than the occlusion which is frequently one of the orthodontist's most difficult challenges.

Thus, an adjunctive procedure to the perioral structures following the orthodontic treatment might be required to get the optimal esthetic results. This can be achieved by dermal fillers, Botulinum Toxin A (BOTOX) injections or by surgical soft tissues procedures.

Over the last decade, fillers have been broadly used to correct cosmetic deformity. Fillers are basically substances which can provide volume to the skin that has lost most of its natural volume. The fillers can basically be of 2 types – biodegradable and synthetics ones. The biodegradable ones are temporary and can be resorbed by the body by time while the synthetics ones are more permanent ones which the body can't resorb. The dermal fillers are differentiated according to their source and their ability to produce antigenicity. The fillers should be retrievable in case the patients have an adverse reaction to it. If the patient is getting fillers for the first time it is advisable to get biodegradable ones so that the host's reaction can be detected. Unlike Botox, Fillers cannot be injected in the muscles [2].

Fillers could be implemented to augment the mild deficiencies in the skeletal component that impacts the soft tissue drape. The retrusive upper lip in patients with skeletal class 3, giving the remarkable feature of mid face

deficiency and concave profile, can be enhanced by dermal fillers hence inducing natural results and maintaining self-identity.

Evaluation of soft tissue dimensions and its changes showed a great development over decades and greatly improved since the introduction of 3D imaging methods, which are now widely and frequently used to give a thorough representation for the soft tissue and craniofacial details. 3D noninvasive laser facial scanning was the modality of choice that provided imaging of the external facial morphology.

There is a paucity of data in the literature as far as potentials of dermal fillers in enhancing the soft tissue appearance and the smile esthetics. Consequently, this study was performed to evaluate the smile and soft tissue changes in the dental esthetic zone following hyaluronic acid dermal fillers injections of the upper lip in orthodontically treated skeletal class 3 adult female patients.

The main inquiry and challenge that arises after the completion of orthodontic treatment and the implementation of the treatment using dermal fillers; to what extent would this affect patient's smile, soft tissue profile and satisfaction.

Review of Literature

Modern orthodontics deal not only with the classical dental and skeletal aspects, but also with the smile and facial appearance. A complicated interaction between dental and skeletal structures on one hand and the overlaying soft tissue envelop on the other hand.

For the sake of clarification; light will be shed on the following main focuses in the review of literature:

I. Smile characteristics

    1. Components of balanced smile.

    2. Features of an ideal smile.

II. Effect of soft tissue thickness and different treatment modalities on soft tissue profile for skeletal class 3 patients.

III. Adjunctive aids for soft tissue correction after orthodontic treatment.

   – Uses of injectables in orthodontics

   – Lip augmentation

    1- Surgical approach

    2- Fillers augmentation

      a) Collagen fibers

      b) Autologous fat injection

      c) Hyaluronic acid fillers

IV. Adverse effects and complications

V. Smile and soft tissue assessment methods.

   – Smile assessment

   – Soft tissue assessment