

Facial wrinkles and its treatment

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Abstract

Objective Ageing process and gravity are the mainstay of etiological factor resulting in facial wrinkles. There are two types of wrinkles on the face; dynamic and static. Most of the wrinkles are distributed on the frontal view of the face and neck and treatment options depends on location and types of wrinkles. The face is divided into three parts; upper, middle and lower third. Invariably, the client desire is to treat these wrinkles non surgically, moreover the surgical procedures do not address these frontal, periorbital and particularly glabellar facial wrinkles. This study aim for various types facial wrinkles distributed on the upper face are dynamic i.e. forehead area, glabellar or frown wrinkles and periorbital wrinkles including crow's feet, nose (bunny lines) etc. The static wrinkles are distributed over the lower part of face includes nasolabial folds, marionette lines, perioral wrinkles etc.¹ The present study therefore aims to evaluate the efficacy and safety and to present results with new innovative office based non surgical cosmetic surgery procedures.

Material and Methods We have treated 155 clients in Faisal Hospital, Faisalabad with facial wrinkles during three years period from Jan 2015 to Dec 2017. This is a prospective cross sectional randomized observational study. The treatment modalities applied on these clients includes botulinum toxin, hyaluronic acid dermal fillers. It is quite common in our practice using techniques of platelet rich plasma (PRP), RF microdermabrasion, chemical peelings and photoepilation (LASER/ IPL) etc. for the facial rejuvenation.

Results The results achieved with these innovative office based techniques are highly satisfactory in the range of 80-100%, assessed by visual analogue scoring system by client and doctor.

Conclusion We recommend these techniques for all age group clients either alone or in combination for the treatment of facial wrinkles.

Key words

Wrinkles, face, chemical peel, treatment, botulinum toxin, filler.

Introduction

With maturity skin gradually presents lines, wrinkles, and folds that become more pronounced with time. The main etiological factors are ageing, environmental effect, smoking.^{1,16,17}

The patient present with various types of facial wrinkles, mainly dynamic wrinkles also known

as active wrinkles, static wrinkles also known as passive wrinkles. Coarse (deep) wrinkles, fine (superficial) wrinkles also classified by Fitzpatrick in 1988, according to location of the wrinkles on the face i.e. periorbital, perinasal, perioral wrinkles, whether superficial or deep (**Table 1**).

Clients presenting for the first time seeking facial wrinkles treatment after the age of 40 have mixture of dynamic and static component (**Figure 1**). Single treatment modality to treat facial wrinkles may not provide satisfactory results, the combination of treatment modality may provide optimal facial rejuvenation.

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Table 1 Fitzpatrick classification of facial wrinkles

Class	Score	Wrinkling	Degree of Elastosis
I	1-3	Fine wrinkles	Mild (fine textural changes with subtly accentuated skin lines)
II	4-6	Fine to moderate depth wrinkles, moderate number of lines	Moderate (distinct papular elastosis, individual papules with yellow translucency, dyschromia)
III	7-9	Fine to deep wrinkles, numerous lines, with or without redundant skin	Severe (multipapular and confluent elastosis, thickened yellow and pallid cutis rhomboidalis)



Figure 1 Upper face wrinkles

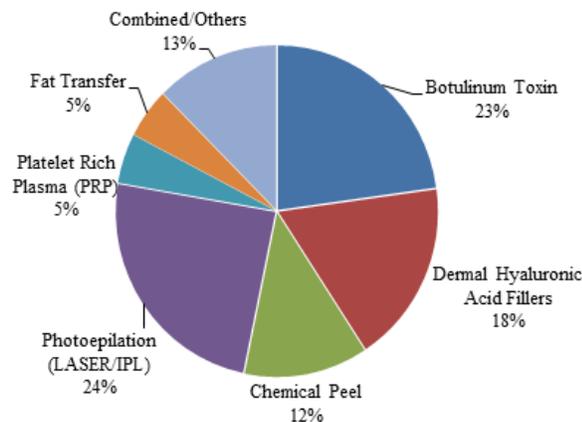


Figure 2 Treatment modality

The most commonly used procedures for facial wrinkles includes botulinum toxins, dermal hyaluronic acid fillers, chemical peel, photoepilation (IPL & LASER), PRP, fat transfer and combined procedures. The results for these treatment modalities are temporary in nature either 4-6 months or upto one year. To maintain the desired results, the sessions of these procedures required to be continue life long and

sun protection with replenishing creams.

Material and methods

This is a prospective descriptive study of three years from Jan 2015 to Dec 2017 and this study was conducted at Faisal Hospital, Faisalabad, Pakistan. The inclusion criteria was compliant clients with all kind of facial wrinkles of either gender male or female presented in the clinic for facial rejuvenation. The exclusion criteria include non compliance, allergic reaction, pregnancy & breast feeding, neuromuscular disorder, certian medication (aminoglycosides antibiotics, spectinomycin, muscle relaxant, anticoagulant) etc.

This study include total no of patients 184 and total no of 578 consecutive sessions performed with various treatment modalities (**Figure 2**). Age distribution ranges from 17 years to 63 Years. There were 39 (19.6 %) male and 148 (80.4%) female. The written informed consent was obtained and pre/ post procedures photographs were obtained where indicated. All the patients were assessed by using visual analogue scoring system by client and doctor to check post procedure satisfaction level at one week interval.

Results

With the treatment modalities used botulinum toxins, hyaluronic acid dermal fillers, photoepilation (IPL and LASER), chemical peel etc. (**Table 2**). The satisfaction level of client and doctor achieved in the range of 80–100% by using visual analogue scoring system.

The highest level of satisfaction achieved with these non surgical cosmetic surgical procedures with minimal or no complications corroborate evidence to include these techniques for facial rejuvenation in clinical practice.

Table 2 Treatment Modalities

Treatment Modality	Number of Patients			Total
	2015	2016	2017	
Botulinum Toxin	7	18	17	42 (23%)
Dermal				
Hyaluronic Acid	8	11	14	33 (18%)
Fillers				
Chemical Peel	5	6	8	23 (12%)
Photoepilation (LASER/IPL)	20	10	15	45 (24%)
Platelet Rich Plasma (PRP)	2	3	4	9 (5%)
Fat Transfer	2	3	4	9 (5%)
Combined/Others	4	10	9	23 (13%)

Discussion

Aging is a process that is inevitable. As people get older, their skin gets thinner, drier, and less elastic, and less able to protect itself from

damage. This leads to wrinkles, creases, and lines on the skin. The skin lose its elasticity with age and gravity effect and facial skin present with variety of wrinkles.^{1,18,19}

A number of avoidable, environmental factors also contribute. Exposure to ultraviolet (UV) light, for example, through sunbathing, tanning booths, and outdoor sports increases the chance of developing wrinkles earlier. UV light breaks down the collagen and elastin fibers in the skin. These fibers form the skin's connective tissue. They are located under the surface of the skin and support the skin.^{1,2} Breaking down this layer causes the skin to become weaker and less flexible. The skin starts to droop, and wrinkles appear. Glogau classified facial wrinkles into four groups (Table 3).³

Table 3 Glogau Classification of Photoaging

GROUP	CLASSIFICATION	TYPICAL AGE	DESCRIPTION	SKIN CHARACTERISTICS
I	Mild	28-35	No Wrinkles	Early photo aging: mild pigment changes, no keratosis, minimal wrinkles, minimal or no makeup
II	Moderate	35-50	Wrinkles in Motion	Early to moderate photo aging; early brown spots visible, keratosis palpable but not visible, parallel smile lines begin to appear, wears some foundation
III	Advanced	50-65	Wrinkles at Rest	Advanced photo aging: obvious discoloration, visible capillaries, visible keratosis, wears heavier foundation
IV	Severe	60 & up	Only Wrinkles	Severe photo aging: yellow/grey skin color, prior skin malignancies, wrinkles throughout - no normal skin, cannot wear make-up because it cracks and cakes



Figure 3 (a) Before dermal filler (b) One week after the HA filler

People who work in the sunlight have a higher chance of early wrinkles. Jobs that involve this type of exposure include fishing and farming. Sailors, golfers, beach lifeguards, and gardeners may also be more prone to skin aging.

Regular smoking accelerates the aging process of skin, because of the reduced blood supply to the skin. Alcohol dehydrates the skin, and dry skin is more likely to wrinkle.

The Botulinum toxin derived from *Clostridium Botulinum* Type A, B, C. Botulinum toxin type A, commonly known as Botox, Permanently degenerate nerve ending in the muscle, thereby inhibiting the release of acetylcholine that cause muscles to contract. It is used to treat a number of medical conditions including migraine/headache, as well as wrinkles.^{4,14,15}

It is injected in small doses into the targeted muscles. If the muscles can no longer tighten, the skin flattens, giving a less wrinkled and smoother appearance.

Botox can decrease the dynamic wrinkles on the forehead, the frown lines between the eyes, and "crow's feet," around the corners of the eyes. It start to have effect after 2–3 days of injecting botulinum toxin into the muscle and full effect appears after one week. The effect generally last for 4–6 months, so life long repeated injections required to maintain the desired effect of botox.

In most areas of the body, the layers from outside to inside are: epidermis, dermis, fat, fascia, muscle, periosteum, bone. Thus, in most sites, one needs to pass the injection needle through skin, fat, and fascia to reach the muscle. However, the *Orbicularis oculi* has a unique anatomy. The arrangement from outside to inside is: epidermis, dermis, muscle (*orbicularis oculi*), fascia (septum), fat. Thus the target muscle in the periocular area is just under the

skin, and a very thin skin at that area. Therefore, injections into the *orbicularis oculi* should be very superficial.⁴

The Wrinkle severity rating scale (WSRS) was validated in 2004 by Day et al. as a new clinical outcome instrument for quantitative assessment of facial skin folds, in particular the nasolabial folds.^{3,4}

The treatment for static (passive) facial wrinkles most commonly with the most safe agent hyaluronic acid (HA) dermal filler. The HA is normally present in the skin, loss of this substance give rise to initially fine wrinkles, ultimately with the ageing and gravity result into deep coarse static wrinkles.

The HA is derived from the natural source streptococcal fermentation process. It is safe as compared to other filler i.e; Collagen, Ca hydroxylapatite. The injected hyaluronic acid gradually reabsorb and is effective for nine months to one year. The viscosity of hyaluronic acid depends upon the crosslinking system (**Figure 4**).

The superficial wrinkles, may be treated more safely with a less viscous hyaluronic acid with lower G-prime properties hence reducing the risk of the Tyndall effect or the filler being visible or lumpy after injection.^{5,6,21,22}

Chemical peel is a chemical solution is applied to the skin to peel away the dead cells on the surface of the skin. The author have introduced newer formula into the world of chemical peeling according to the depth of peeling agent penetration (**Table 3**).

Chemical peels are used to treat fine lines and wrinkles, skin discoloration usually on the face but also on the neck, trunk and hands. A chemical peel can be done alone or in

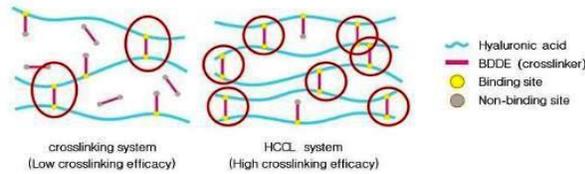


Figure 4 Hyaluronic acid crosslinking system

Table 4 PAKPEEL

<i>Superficial</i>	<i>Medium</i>	<i>Deep</i>
TCA 15 gm	TCA 10 gm	TCA 35 gm
Croton oil	Mandelic acid 5 gm	Septisol
Sesame oil	Salicylic acid 15 gm	Glycerin
Distill water	Sesame oil	Croton oil
	Croton oil	Distill water
	Distill water	



Figure 5(a) Before Treatment



Figure 5(b) 3 months after treatment

combination with other cosmetic procedures and results are enhanced if the correct pre-treatment and post-treatment products are used.^{7,8}

Platelet rich plasma (PRP) is defined as a volume of autologous plasma that has a platelet concentration above baseline.^{9,12} As such, PRP

contains not only a high concentration of platelets but also the full complement of clotting factors, cytokines and platelet derived growth factors.^{10,12}

From last few years, PRP is successfully used in numerous skin care applications including skin rejuvenation (overall improvement in skin texture and firmness) superficial and deep wrinkles of the face. It may be used in association with other treatment modalities such as laser, radiofrequency or fat grafting to improve clinical outcomes.¹¹

Photoepilation (LASER & IPL) resurface the skin by removing the superficial layers of skin, hence removing fine lines and wrinkles. The nonablative laser is a novel photoepilation system designed to alleviate facial rhytids without injuring the epidermis.¹²

The combined treatment of radiofrequency (RF) microdermabrasion, chemical peel and hyaluronic acid filler provide superior result in selected group of patients (**Figure 5a&b**) as compared to single treatment modality.^{12,20-22}

Judicious use of medication, topical retinoids are derived from vitamin A, and they are said to reduce fine wrinkles, some pigmentations, and skin roughness. Home care products help to stimulate skin renewal and sun protection is recommended.

This type of medication can make it easier for the skin to burn sunlight, so the patient needs to use it with a skin-care program to protect the skin. Possible adverse effects include dryness, itching, a burning sensation, tingling, and redness. Slight to modest results may sometimes be obtained from retinol, alpha hydroxy acids, kinetin, coenzyme Q10, copper peptides, antioxidants, hydrolytic enzymes and nutritional supplement.²³

Conclusion

These non surgical office based cosmetic surgical techniques help lowering biological age to keep younger and fresh looking face by reducing facial wrinkles. These techniques are excellent for all age group clients either alone or in combination for the treatment of facial wrinkles making healthier and happier life, maintaining the younger beautiful face life long and improve the psychology of the client.

References

1. Diana C Calderone, Neil AFenske; The clinical spectrum of actinic elastosis. *J Am Acad Dermatol* 1995; 32(6): 1016-1024.
2. Oakley A. Facial lines and wrinkles, Waikato Hospital, Hamilton, New Zealand, 2004.
<<https://www.dermnetnz.org/topics/facial-lines-and-wrinkles/>>
3. Glogau R.G. Aesthetic and anatomic analysis of the aging skin. *Semin. Cutan Med Surg* 1996; 15: 134.
4. Anthony V Benedetto. *Botulinum toxin in Clinical Dermatology*, Edition 2005, p 43.
5. Day DJ1, Littler CM, Swift RW, Gottlieb S. The wrinkle severity rating scale: a validation study. *Am J Clin Dermatol* 2004; 5(1): 49-52.
6. Muhn C, Rosen N, Solish N, Bertucci V, Lupin M, Dansereau A, Weksberg F, Remington BK, Swift A. The evolving role of hyaluronic acid fillers for facial volume restoration and contouring: a Canadian overview. *Clin Cosmet Investig Dermatol* 2012; 5: 147-58. doi: 10.2147/CCID.S30794. Epub 2012 Oct 5.
7. Inja Bogdan Allemann, Leslie Baumann. Hyaluronic acid gel (Juvéderm) preparations in the treatment of facial wrinkles and folds. *Clin Interv Aging* 2008; 3(4): 629–634.
8. Brian P M, Brad M, Gary M, Gaylon M. The Etiology of Prolonged Erythema after Chemical Peel. *Dermatol Surg* 1998; 24(3): 337–341.
9. Alam M, Iqbal MJ, Akhtar R. Chemical Peels: What to Treat and Expect? *J Dermatol Plast Surg* 2017; 2(2): 1013.
10. Marx R E, Platelet-Rich Plasma (PRP): What is PRP and What Is Not PRP? *Implant Dentistry* 2001; 10(4): 225.
11. Eppley BL, Pietrzak WS, Blanton M. Platelet-rich plasma: a review of biology and applications in plastic surgery. *Plast Reconstr Surg* 2006; 118(6):147e-159e.
12. Turzi A & Regan Lab team, PRP standardisation & cells therapies, 2017, 11.
13. Gregg M et al; Treatment of Facial Rhytids with a Nonablative Laser: A Clinical and Histologic Study 1999; 25(6): 440-444.
14. Carruthers A et al; Improvement of Tension-Type Headache When Treating Wrinkles With Botulinum Toxin A Injections; *HEADACHE J Headache Pain* 1999; 39(9): 662-665.
15. Garcia A, Fulton JE Jr. Cosmetic denervation of the muscles of facial expression with botulinum toxin: a dose-response study. *Dermatol Surg* 1996; 22:39
16. Morita A. Tobacco smoke causes premature skin aging. *J Dermatol Sc* 2007; 48(3): 169-175.
17. Leea J Y, Kim Y Kb, Seo J Y et al. Loss of elastic fibers causes skin wrinkles in sun-damaged Loss of elastic fibers causes skin wrinkles in sun-damaged human skin. *J Dermatol Sc* 2008; 50(2): 99-107.
18. Lemperle G, Holmes R E, Cohen S R et al. A Classification of Facial Wrinkles; *Plast Reconstr Surg* 2001: 1736.
19. Fitzpatrick TB. The validity and particularity of sun-reactive skin types I through VI. *Arch Dermatol* 1988; 124(6): 869–871.
20. Kulick M. Evaluation of a combined laser-radio frequency device (Polaris WR) for the nonablative treatment of facial wrinkles. *J Cosmet Laser Ther* 2005; 7(2): 87-92.
21. Eung Jung Ko, Hyuk Kim, won-Seok Park et al; Correction of midface volume deficiency using hyaluronic acid filler and intradermal radiofrequency. *J Cosmet Laser Ther* 2015; 17(1): 46-8.
22. Artzi O, Loizides C, Verner I, Landau M. Resistant and Recurrent Late Reaction to Hyaluronic Acid-Based Gel. *Dermatol Surg* 2016; 42: 31.
23. Maryam Borumand, Sara Sibilla. Effects of a nutritional supplement containing collagen peptides on skin elasticity, hydration and wrinkles. *J Med Nutr Nutraceut* 2015; 4(1): 47-53.