Current Trends and Clinical Insights in Dermal Filler

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***Abstract*—This Dermal fillers are becoming more commonly utilized for enhancing the soft tissues of the face and hands. The growing popularity of dermal fillers for rejuvenation purposes has resulted in an increase in reports of related complications. Treatment options designed to prevent and reverse facial aging have gained significant popularity. There is a range of injectable fillers available for addressing the aging midface, including hyaluronic acid, calcium hydroxylapatite, poly-L-lactic acid, and polymethyl methacrylate. The advantages of injectable fillers include diminished patient discomfort and quicker recovery times. The rise in filler procedures within the realm of minimally invasive cosmetic surgery has corresponded with a heightened occurrence of related side effects. A thorough understanding and careful management of these side effects are essential for reducing complications and ensuring patient safety in filler procedures.**

Index Terms— Dermal filler, Rejuvenation, Complication, Midlife, Injectable filler.

I. INTRODUCTION

All Dermal fillers, often referred to as soft tissue fillers, wrinkle fillers, or injectable implants, are mainly utilized for the treatment of wrinkles and folds and to restore lost soft tissue volume due to disease and the natural process of aging. [1] The diminished production of collagen from aging fibroblasts and damage to collagen alters the skin's overall structure [2][3]. External factors contributing to aging—primarily sun exposure, along with tobacco use and the effects of gravity—can worsen the signs of dullness, discoloration, and wrinkling visible on the skin. The reduction of subcutaneous volume caused by these factors is a defining characteristic of an aging face. In the midface area, the deepening of nasolabial folds and marionette lines near the mouth results from the sagging of surrounding fat pads [4]. Additionally, aging leads to significant loss of deep facial fat that provides structural volume and support for the midface, which significantly affects the projection of the cheekbones (5). The era of solely treating the nasolabial fold with a single filler injection has passed, making way for a more sophisticated approach that emphasizes thoughtful, restrained, and effective filler application. Important considerations for filler use include enhanced deep-volume augmentation, combined techniques, natural-looking results, and safety precautions. Today's market offers skin fillers categorized as biodegradable or resorbable, lasting from months to years, and those that are permanent or non-resorbable. Biodegradable options can be further split into two groups:

(1) nonpermanent fillers, also called replacement fillers (such as collagen, hyaluronic acid, and biological fillers), which provide short-term effects typically lasting several months to a year before being absorbed through macrophage activity.

(2) semi-permanent fillers, known as stimulatory fillers (such as polylactic acid and calcium hydroxylapatite), offering longerlasting aesthetic improvements for several years with minimal side effects. These often stimulate a foreign body reaction that triggers fibroblast activity and collagen formation at the injection site. Permanent implants (including polymethylmethacrylate, silicone, and hydroxyethylmethacrylate) can deliver sustained revoulumization results and may also prompt fibrogenesis and collagen production, although they carry a higher risk of complications. Skilled and experienced plastic surgeons or dermatologists are essential for proper injection [6][7][8]. The quest for the perfect facial filler began over a century ago. The practice of soft-tissue augmentation started in 1893, when Neuber first introduced autologous fat transfer for facial imperfections (9). A few years later, paraffin was commonly injected for cosmetic improvement. This method gained significant popularity until patients began experiencing severe foreign-body reactions[10]In the 1940s, Japan, Switzerland, and Germany were the first countries to use liquid silicone for cosmetic purposes. It was also effectively being utilised in the US starting in the 1960s. Reports of serious side effects and complications have prevented the US Food and Drug Administration (FDA) and European Economic Area (EEA) nations from approving it for cosmetic use, despite its efficacy as a soft-tissue filler. [11, 12].An entirely new era of soft-tissue augmentation began in the 1980s with the use of bovine collagen for cosmetic purposes. The number of authorised face fillers in the US and outside has increased significantly in only the last five years. Autologous fat, collagens, hyaluronic acid (HA), and biosynthetic polymers are currently the four main kinds of products that are most commonly employed. These injectable face fillers are made in a lab or made from an animal or bacterium (xenogenic implants), another human (allogenic implants), or the patient themselves (autologous implants). When referring to injectables, it is usual practice to refer to all fillers as "dermal" fillers. Some fillers, specifically the biosynthetic polymers and products more suitable for deeper flaws, are more appropriately referred to as subcutaneous soft tissue materials, even though many of the products used for superficial defects are injected directly into the dermis. In order to prevent palpability and the possibility of persistent nodularity and/or contour irregularities, products that are primarily used for deeper lesions should not be injected into the dermis. This distinction is crucial. [13] [14] [15] [16]. The advice to "avoid doing harm" should be kept in mind when utilising injectable face fillers. Therefore, the following three requirements should be met by the perfect filler:

I Safety: It should have a limited potential for abuse and not be immunogenic, carcinogenic, teratogenic, or infectious.

II Efficacy: It should feel and appear natural and provide long-term, reproducible benefits.

III Usefulness: It should be affordable, simple to use, and detachable (or self-remitting) if necessary or desired. [15] [16].

Dermal Filler injection areas:-

Categorisation of skin fillers Currently, there are an estimated 160 filler products available worldwide, produced by more than 50 distinct manufacturers. 3. Generally speaking, dermal fillers are categorised into temporary, semi-permanent, and permanent fillers according to their duration of action and biodegradability [1].
Absorbable or biodegradable fillers that are either temporary or semi-permanent • Impacts Biodegradable fillers are fillers that progressively breakdown and are resorbed by the body, giving rise to transitory or semi-permanent effects. Collagen, hyaluronic acid (HA), calcium hydroxyapatite (CaHA), and polylactic acid (PLLA) are a few types of biodegradable fillers. The US Food and Drug Administration (FDA) authorised collagen as the first injectable filler for face enhancement. 3. Collagen fillers have become outdated and are mostly being replaced with HA fillers due to their short-lived (on average, 3–4 months) effects.N acetyl glucosamine and glucoronic acid combine to form HA, a polysaccharide found naturally in skin and cartilage. [18]. Its
hydrophilic properties give the skin a smoothing and moisturising effect. [1] The most popular biodegradable fillers at the moment are HA derivatives, which are derived mostly from bacteria and rooster combs. Depending on a number of factors, including cross-linking, concentration, particle size, and source, their effects often last six to eighteen months. [18]
Permanent effects of non-biodegradable (non-absorbable) fillers Non-biodegradable fillers cause the skin to react like a foreign body, which in turn promotes the formation of collagen. Polymethylmethacrylate (PMMA), silicone, and polyalkylimide

(BioAlcamid, Polymekon, Brindisi, Italy) are a few examples of non-biodegradable fillers. These nonbiodegradable fillers have permanent effects that may result in long-lasting items, medical procedures, and problems that can be difficult to handle. [1]. Nowadays, a wide variety of dermal fillers are employed for both medical and cosmetic objectives in standard clinical practice. The various kinds of materials available and the names of some of the most popular brands

Table-1:Different types of materials on market and some most widely used product

Material	Brand Name	Duration and Biodegradability
Autologous fat		Temporary and biodegradable
Hyaluronic acid	*Restylane®, Restylane Perlane®, Restylane Lipp®, Restylane Touch®, Restylane Vital®* Macrolane® 20, 30 Juvederm Ultra 1, 2, 3®, Juvederm Voluma® Hylaform®, Hylaform Plus®, Hylaform Fineline® Others: Rofilan Forte®, Matridur®, Puragen®, Glytone®, Isogel®, Prevelle®, etc	Temporary and biodegradable
Collagen	Zyplast®/Zyderm® (bovine) Cosmoderm®/Cosmoplast® (human) Evolence®, Permacol®, Fibroquel® (porcine)	Temporary and biodegradable
Calcium hydroxylapatite	*Radiesse®*	Semipermanent and biodegradable
Poly-L-lactic acid	Sculptra®/New Fill®	Semipermanent and biodegradable
β-tricalcium phosphate with hyaluronic acid	Atlean®	Semipermanent and biodegradable
Polyacrylamide gel	Aquamid® Bio-Alcamid®	Permanent and not biodegradable
Polymethyl methacrylate	Arteplast®, Artecoll®, Artefill® Dermalive®/Dermadeep®	Semipermanent and not biodegradable
Dimethylsiloxane polymers	Silicone	Permanent and not biodegradable

Not every dermal filler is authorised for use in cosmetic procedures. European and American regulations frequently diverge. The primary indication for these goods Facial rejuvenation is a topic in dermatology. Less frequently used are medical indications for conditions like face lipoatrophy. Dermal fillers are categorised as temporary, semipermanent (where the duration is at least 18 months), or permanent based on how long they stay in tissue. They can also be categorised based on the makeup of the product. The main components are poly-L-lactic acid, calcium hydroxylapatite, polymethyl methacrylate, animal or synthetic hyaluronic acid (HA), collagen (human, pig, or cow), and polyacrylamide gel. [19] [20] [21]

The various ways in which these fillers work and how long the filler material stays in tissue before being absorbed are where they differ from one another. There is a rational reason why temporary fillers are the kind most frequently utilised for cosmetic purposes. Since ageing is a dynamic process, it is not advisable to fix a flaw permanently at one moment in time. The best way to address the ageing indications as they arise is to use fillers as needed. Over 85% of dermal filler surgeries are carried out with HA derivatives, per data released by the American Society of Aesthetic Plastic Surgery. [22]

BIODEGRADABLE FILLERS

Biodegradable fillers are temporary substances that can be used to increase volume for a few months to a year before being broken down by the body. A temporary inflammatory reaction to skin fillers with accompanying oedema is partially to blame for the volume impact. These volume effects, however, will go away quickly after injection. [23] [24]. Although neocollagenesis and subsequent fibroblast activation can also contribute to volume augmentation, they only partially engraft filler into the surrounding tissue. [25] [26] Currently available biodegradable fillers on the market include injectable poly-L-lactic acid (PLLA), calcium hydroxylapatite (CaHA), bovoine collagen, and hyaluronic acid (HA).

Hyaluronic Acid

HA is found in the human body as an extracellular matrix component under normal conditions. With a strong affinity for drawing in and holding onto water molecules, this polysaccharide is a glycosaminoglycan disaccharide made up of repeated and alternating units of D-glucuronic acid and N-acetyl-D-glucosamine [27]. After injection, HA filler materials can significantly increase soft tissue because of their hydrophilic qualities. The volume of exogenous HA injected has a direct impact on the initial filling effect, but it has also been demonstrated that HA has an indirect effect by activating dermal fibroblasts once it is deposited in the dermis. The hydration capacity at equilibrium of currently available HA dermal fillers varies according on the HA content, cross-link density, and manufacturing technique. Some of the products that dermatologists and plastic surgeons recommend are listed below.

1. The most widely used dermal filler now is Restylane®, which received FDA approval in December 2003. Restylane® has been shown in a pivotal multicenter, double-blind clinicafibroblast to be both safe and efficacious in treating nasal creases. [28]

The FDA approved Perlane®, a more viscous form of Restylane®, in 2007. Medicis Pharmaceutical Corporation distributes Restylane® and Perlane® in the United States, whereas Q-Med AB manufactures both products in Sweden. They are derived from Streptococcus equi cultures and crosslinked with 1,4-butanediol diglycidyl ether using a patented technique, resulting in a final concentration of 20 mg/mL. They are based on "nonanimal stabilised hyaluronic acid." This manufacturing procedure yields a translucent, viscous, beaded gel that is chemically identical. [29].

2.New injectable HA dermal fillers Juvéderm™ Ultra and Juvéderm™ Ultra Plus were authorised by the FDA in September 2006 and are marketed by Allergan, Inc. Juvéderm Ultra and Juvéderm Ultra Plus received a label extension from the FDA in June 2007 (Allergan, Inc. 2007). Both products have a concentration of 24 mg/mL of HA thanks to a revolutionary crosslinking method called Hylacross. A stronger formulation, Juvéderm™

Ultra Plus has a greater crosslinked component of 8% as opposed to 6% in Juvéderm™ Ultra. This innovative recipe creates a non-beaded, softer, more viscous gel that is meant to increase durability. According to clinical evidence, the results of a single Juvéderm™ Ultra or Juvéderm ™ Ultra Plus treatment can linger for up to 12 months. [30] [31] [32]

1 The FDA authorised ElevessTM, the newest HA, in July 2007. It was produced by Anaka Therapeutics, MA, USA, and was based on a proprietary method for chemically modified non-animal HA that includes 0.3% lidocaine hydrochloride in the therapy syringe. At 28 mg/mL, this product has the highest HA content on the market. [31, 32].

BOVINE COLLAGEN

Zyderm® and Zyplast®, both manufactured by Allergan Inc. In Santa Barbara, California, USA, are the two most popular bovine collagen products. The first collagen to be marketed as a filler was bovine collagen, which is biodegradable and transitory. Skin testing is required prior to therapy. According to some writers, two skin tests should even be conducted, separated by two to four weeks. [33]

CALCIUM HYDROXYLAPATITE

It is predicted that between 3% and 5% of patients evaluated before starting treatment would experience local hypersensitivity reactions. For superficial rhytides, Zyderm® is recommended, whereas Zyplast® is for deeper rhytides or deformities. Due to reports of local cutaneous necrosis brought on by intra-arterial injection of Zyplast®, the product should never be used in the glabellar region. [34]. There have been reports of a shorter duration of efficacy when treating nasolabial folds compared to HA fillers. [35]

One special substance that can be used as both a collagen biostimulator and a replacement volumiser is calcium hydroxylapatite (CaHa) [36]. CaHa is a biodegradable, naturally resorbable, nontoxic, nonantigenic, and long-lasting filler substance that has the same composition as human bone and teeth. This makes it ideal for biocompatibility and efficacy. [37]. By immediately adding volume, stimulating a fibroblastic response, and serving as a framework for newly created collagen following natural resorption and excretion, CaHa's biostimulatory effects function. [38] [39, 40]. In 2006, Radiesse (Merz Pharmaceuticals GmbH, Frankfurt am Main, Germany)

received FDA approval to treat lipoatrophy and moderate to severe midface creases and folds in HIV patients.Radiesse has been extensively researched in the field of facial cosmetic medicine and uses a 30:70 ratio of CaHa microspheres to aqueous carrier gel [37][41][42].

Poly-L-lactic Acid

A synthetic polymer that is both biocompatible and biodegradable makes up the transient dermal filler known as poly-L-lactic acid. There is no need for a skin test prior to treatment. The sole product of this kind that is sold commercially is called Sculptra® (Dermik Laboratories, Berwyn, PA, USA) in the United States and New Fill® (Sanofi Aventis, Paris, France) in Europe. Poly-L-lactic acid is one of the fillers that works by activating fibroblasts to promote the synthesis of new collagen [43]. Consequently, with time, the volume in the treated area rises. This effect has been investigated in a mouse model and documented in a number of isolated human cases that have been published in the literature.It has been discovered that the amount of collagen present keeps growing during follow-up at three and six months; breakdown of the poly-L-lactic acid is seen after a longer period, between eight to thirty months, while type I collagen keeps growing. [44]. 9 to 24 months after its introduction, the polylactic acid still degrades. Instead of being enzymatic, degradation entails metabolism into carbon dioxide and water. However, the de novo collagen may still be present in the tissue, and it has been found up to 24 months following treatment. [44] [45]

Non_biodegradable fillers(permanent fillers) _

PMMA, silicone, polyacrylamide hydrogel, polyvinylpyrrolidone silicone suspension, polyalkylimide gel, polyvinyl hydroxide microspheres suspended in polyacrylamide gel, and other materials are examples of permanent fillers. Permanent fillers may produce long-lasting revolumization effects because they are nonresorbable. Although granulomas and other problems are more common with subcutaneous injection of such filler, they may also stimulate fibrogenesis and collagen formation. [46]

Silicone

The FDA has not approved any silicone product for soft tissue augmentation; the main indication for FDA-approved products is retinal detachment with removal of the material after reattachment; liquid silicon is not used off label; and for decades, terrible complications have been reported from silicone injections into breasts, leading many authorities to ban its use. Adverse effects have also been noted after use for facial tissue augmentation. [48][49][50] Following illegal silicone injection, the silicone embolism syndrome has been observed, with a 24% chance of death. [51] The symptoms and signs of the “silicone syndrome” include dyspnoea, fever, cough, haemoptysis, chest pain, hypoxia, alveolar haemorrhage, and altered consciousness.[51]

Polyacrylamide Gel

Aquamid and Bio-Alcamid are the two most well-known polyacrylamide gel products.
The composition of Bio-Alcamid® (Polymekon, Milan, Italy) is 4% polyalkylimide and
96% water. In general, deep flaws are treated using it. The non-absorbing hydrogel Aquamid® (Contura International, Copenhagen, Denmark) is made up of 97.5% water and 2.5% polyacrylamide. Deep flaws can also be fixed using this device. Aquamid’s use is becoming less common because of its high risk of complications and the fact that it frequently causes granulomas. [52] For the past 20 years, aquamid has been widely used for body sculpting and soft tissue augmentation. [53] Comprising 2.5% cross-linked polyacrylamide (PAAG) and 97.5% water, Aquamid is a hydrogel that is both
biocompatible and nonabsorbable. Acrylamide monomers and N, N’methylenbisacrylamide are polymerised to create the gel. [53]

Polyvinylhdyroxide microspheres Suspended in polyacrylamide gel

This permanent filler, which has primarily been utilised for lip augmentation, is made up of a suspension of six polyvinylhydroxide microspheres in 2.5% polyacrylamide gel (Evolution; ProCytech SA). Other than the finding provided by Lemperle et al., there are no reports of negative reactions to this infrequently used filler. [54]

Other Permanent Products

Additional long-term products on the market include Profill® (Laboratoires Filorga, Paris,
France), which is made of polyoxyethylene and polyoxypropylene; Advanta® (Atrium
Medical Corporation, NH, USA), which contains expanded polytetrafluoroethylene; and Metacrill® (Nutricel Laboratories, Río de Janeiro, Brazil), which is made of polymethyl methacrylate spheres suspended in carboxygluconate gel.

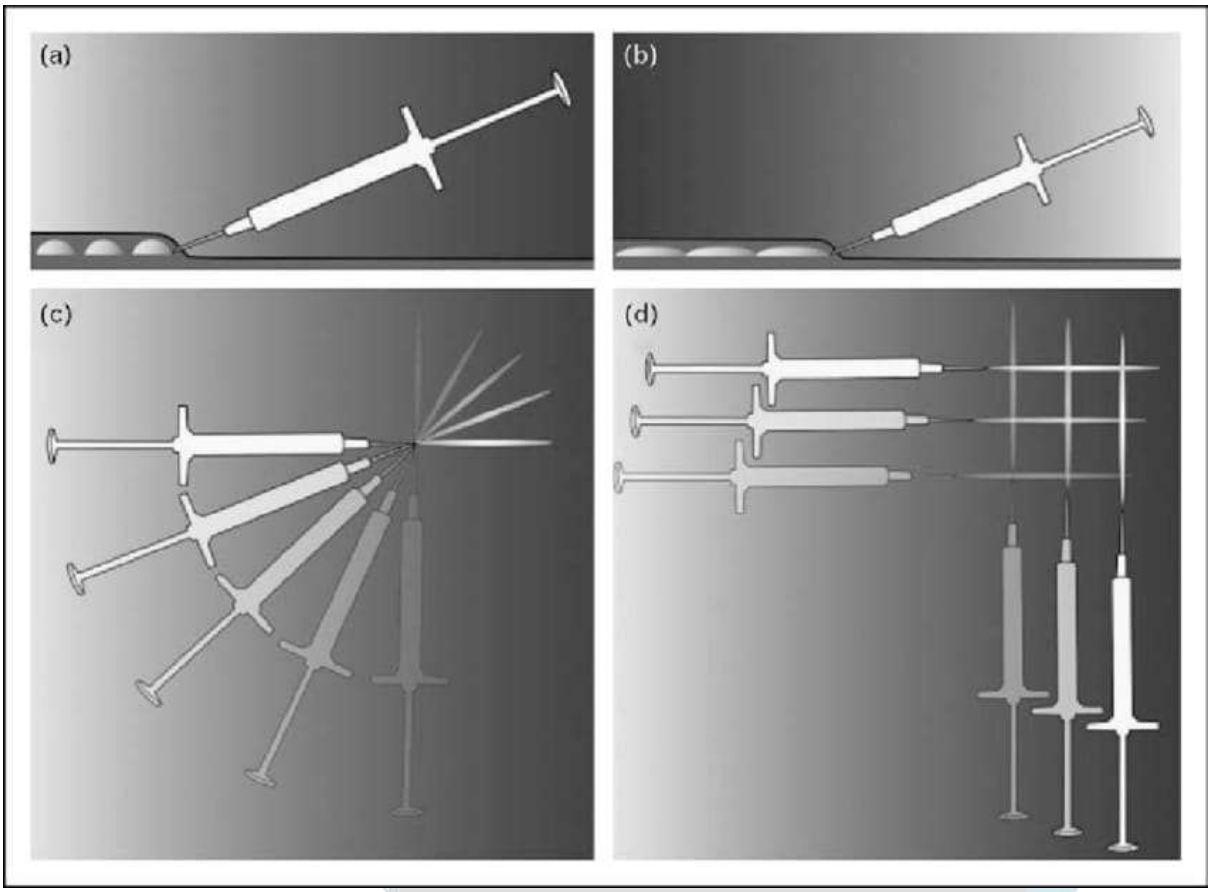
Injection Techniques for Dermal Fillers Pre-treatment

Preparation and General Recommendations Pre-treatment

Preparing for therapy in advance is crucial to reducing risks and undesirable side effects. To make sure that their expectations are reasonable, patients need to be adequately informed. Pre-treatment photos should be acquired wherever feasible, and written informed consent must always be acquired. It is usually essential to have a thorough medical history that includes any adverse or hypersensitive reactions to drugs, especially anaesthetics. Dermal fillers are not advised for use in immunocompromised people, patients with autoimmune illnesses, or those on specific medications, such as interferon. They are also contraindicated during pregnancy and lactation. [55] During the 10 to 14 days before treatment, patients should be advised not to take any medications that could raise their risk of bleeding. Vitamin E-containing vitamin complexes and nonsteroidal anti-inflammatory medications should also be avoided. [56]

Injection Techniques

Injecting dermal fillers requires a certain level of competence and expertise. Selecting the filling agent that is most appropriate for each patient and anatomical location is crucial, as is figuring out how much filler should be injected. [57] The majority of injectable dermal fillers come with a disposable plastic syringe and LuerLok fitting, along with a sterile needle gauge suitable for the viscosity of the filler. The depth of injection is determined by the defect’s depth; in general, the deeper the defect, the more viscous the filler. Serial puncture, linear threading, fanning, and crosshatching are recorded for injection. [58] .



a) Serial puncture; (b) linear threading; (c)Radial fanning; (d) cross-hatching (from Rohrich et al. [58]

Serial puncture

Several injections are made along the fold or wrinkle during a serial puncture. To avoid anomalies, these should be positioned sufficiently close to one another. Additionally, rubbing the area will aid in the even distribution of the product. [59] Although tiny spaces can be sculpted with massage, the injection sites should be sufficiently close to one another to create a continuous, smooth bead. This method works well for glabella, philtrum augmentation, shallow forehead rhytids, acne scars, and nonsurgical rhinoplasty. [58]

LINEAR THREADING

Threading that is linear Anterograde injection, also known as the push-ahead technique, occurs when the needle is advanced, whereas retrograde injection occurs when it is withdrawn. Small blood vessels are dislocated by anterograde delivery, but more uniform placement is possible with retrograde delivery; the choice is mostly up to the operator. For the vermillion contour and nasolabial folds, linear threading works well. [58] Correcting isolated rhytides or folds, such the nasolabial fold, is the primary use of this procedure.

RADIAL FANNING

The tunneling technique is used to deposit filler threads in the radial fanning technique. However, another thread is deposited along the new axis and the needle is reinserted in a radial pattern before being fully withdrawn. Until the intended effect is obtained, this is repeated as needed. The malar region's volume is increased using this method. [59]

CROSS -HATCHING

Another variation of the tunneling technique is crosshatching. A grid pattern is formed by creating many parallel lines of filler throughout the treatment area, followed by a second set of parallel threads that are perpendicular to the previous set. The prejowl sulcus and Marionette Lines are corrected using this method. [59]

BENEFITS

1. Over the past few decades, there has been a significant increase in fillers and the range of dermal fillers. Soft-tissue fillers are therefore becoming more and more popular as nonsurgical face rejuvenation treatments. [60]
2. Dermal fillers are utilised for aesthetic reasons and are intended to give a person's skin fullness and volume. [61]
3. When applied correctly, these treatments reduce the most prevalent ageing symptoms, including skin creases and facial wrinkles. [61]
4. The advantages and disadvantages of each product differ, and the dangers can be reduced by utilising sterile equipment and expert injections. [60] [61] 5) Developments in face rejuvenation: dermal fillers of the toxin botulinum type restore lost facial volume or erase wrinkles in the skin, or both, to produce a desired cosmetic result. [62]
5. In addition, the hydrophilic nature of the injected filler may cause the surrounding tissues to enlarge, resulting in extravascular compression that may induce localised necrosis of skin or tissue and hinder blood circulation. [75] [76]
6. Injection-Related Blindness A serious and debilitating side effect of filler injections is blindness, which usually results from obstruction of the arteries. The primary cause of this serious consequence is the blockage of the central retinal artery, which is necessary to provide blood to the retina and optic nerve. Both synthetic fillers and autologous fat transfers can result in these occlusions. [77] [70] [78]

7. State of Imminent Necrosis
8. This first phase, which is frequently referred to as the ischaemic condition, comes before skin pustules emerge. Pain and swelling, as well as a reticular pattern of purple skin discolouration, usually appear progressively over the course of two to three days following the surgery (figure 1). [79].

Figure 1. Ischemic state with purple skin of reticular pattern.

COMPLICATIONS ASSOCIATED WITH DERMAL FILLERS

Temporary dermal fillers have a very low incidence of problems when compared to permanent filler materials. [80] [81] Although they are extremely uncommon, face filler injection complications can have disastrous outcomes. Oranges et al. Conducted a systematic study of nonpermanent face fillers. [82] The highest rates of complications were observed in the nose and nasolabial fold regions. The intricate and extensive vascular branching in these regions is probably the cause of this. Serial injections into the periosteal layer and aspiration prior to injection are useful strategies to prevent problems in this location. [82]

Early-onse Tyndall effect is one such complication that causes the skin that covers it to turn bluish. This is brought on by extremely superficial filler injections, which alter how light disperses over regions that contain the superficially injected material. [83,84] Areas with thin skin, like the lower eyelid, are more susceptible to the Tyndall effect. It is advised to use a product appropriate for the tear trough area, refrain from superficial injection, and not overfill (usually no more than 1 mL) in order to prevent this issue.[85]

After receiving permanent filler materials, granulomatous reactions are far more common than after receiving temporary fillers, which only rarely result in granulomas. Granulomas may not form right away; for instance, they may appear 14–24 months after polymethyl methacrylate microsphere treatment. [86] [87] Methacrylate fillers, like Dermalive, are injected. [88,89] In general, the causes of dermal filler issues can be separated into two categories: (i) the substance itself, and (ii) the injector and injection techniques.

ERYTHEMA AND OEDEMA

Because of the local damage, erythema and temporary oedema usually appear right after the treatment with all fillers. While oedema can continue up to a week in certain situations, erythema typically lasts a few hours. [18] The shallow use of filler material (i.e., intradermal) could possibly be the cause. [28] The symptoms of an allergic or hypersensitive reaction may include erythema and oedema. However, persistent erythema is rare and believed to be associated with mast cell Problems with dermal fillers [18]

DERMAL FILLER COMPLICATIONS [18]

Events with an early onset (up to days after the procedure):

*Reactions at the injection site, such as pain, discomfort, redness, swelling, and bruises infection, typically caused by streptococcal and staphylococcal bacteria Reactions to hypersensitivity, typically Type I Non-inflammatory lumps and abnormalities in the contours discoloration of the skin or Tyndall effect Occlusion of the arteries Events with a late start (weeks to years after surgery): Edema malar Continuous discoloration Reactions to hypersensitivity, typically Type IV infection (often caused by mycobacteria or biofilms) Granulomas of foreign bodies and inflammatory nodules Filler material migration.

CONCLUSION

Dermal fillers have been used for decades in aesthetic medicine. Dermal fillers have been used for many years to improve the Aging, appearance of line and wrinkles by making two dimensional changes and used for to correct the loss of volume in certain Areas of face. There are the wide range of side effects and complications in dermal fillers. Understanding of the natural associated complicated with help to physician to take the Necessary to prevent them and if they ever arise to be able deal with them effectively. It is also understand the need for further research, particularly long term studies, deeper Understanding of the biological mechanism involved. Further studies should consider the Advanced imaging techniques it enhances the safety and efficacy of dermal filler. Ultimately improving the patient satisfaction and outcome in cosmetic dermatology

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