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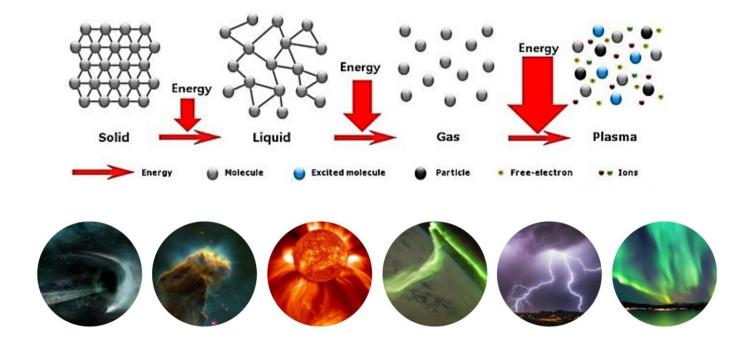
# What is Plasma?

the science and the application





- Plasma is the fourth state of matter following the state of solid, liquid and gas whereby the gaseous state has been ionized by the high temperature and high electricity in everyday environment
- The universe is consisted of 99.999% plasma









#### History of plasma in medical application

The use of plasma in medical field goes back as far as World War II to sterilize the wound and surgical equipment.



According to the latest cell biological research conducted by Munich University, plasma works separately in bacteria and human cell and while it is fatal to bacteria, it provides beneficial stimulation to human cell and helps with regeneration.

Plasma is becoming increasingly used as the next generation medical/aesthetic technology





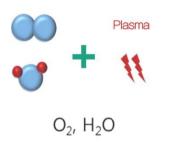
• The effect of plasma on human skin

Plasma Intensity of electrical energy (weakens with the flow) Kills the germs and bacteria by breaking the bacterial Skin Surface molecular structure Dramatically increase the skin absorption rate by **Epidermis** temporarily breaking the cell adhesion molecules (CAMs) Tightens the aged skin by balancing the membrane potential **Dermis** Stimulates the generation of collagen and fibroblasts by stimulating the circulation of water molecules and increasing the heat and friction



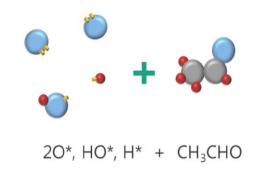


Sterilization Mechanism by Plasma Radicals (e.g.: CH3CHO)



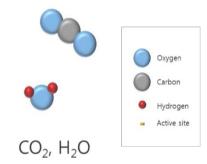
Exerting high atmospheric pressure

Exerting high heat or pressure in atmosphere creates plasma radicals with broken molecular structure



Radicals trying to stabilize

The plasma radicals in broken molecular structure are in unstable state, and work to stabilize by combining with bacterial molecules



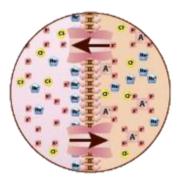
3 Sterilization

The plasma radicals combined with bacterial molecules break the bacterial molecules and turn them into molecules such as carbon dioxide and water, thereby causing effective sterilization effect





Increasing Skin Elasticity through "F-DBD" Plasma





The cells have membrane potential with the inner membrane negatively charged while the outer membrane positively charged. As the skin gets aged, the charge gets maldistributed along the membrane which changes the electrical voltage of the membrane.



Plasma Induction

02. Plasma Induced Cell

The membrane potential is affected by the potassium and sodium ion and while the potassium passes through easily, it is difficult for sodium to pass through. "F-DBD" Plasma changes the membrane potential and enables all types of ion to easily pass through the membrane and balance the potential thereby tightening the membrane (Can see the elasticity of skin through naked eye).

F-DBD (Floating Dielectric Barrier Discharge) is exclusive technology of Seoulin Medicare and it **does not require grounding**.





Plasma BT, setting the new standard in plasma device



#### **2016** / Plasma BT

Plasma Poration® Plasma Needle® F-DBD type



#### **2010** / RF-induced Micro Plasma

Using wireless frequency, induced micro plasma device



#### 2000 / Portrait

Direct argon plasma device, created cause for prohibition due to uncontrolled thermal damage



#### **1960** / Plason

Equipped with thermal and non-thermal mode, direct nitric oxide plasma cautery device



1940

Wound, medical device sterilizing non-thermal plasma device in WWII

## Plasma BT

the properties and the strength











#### **Surgical Handpiece**

Output Power 0.5 ~ 1.2W (1MOhm)



#### **Shower Handpiece**

Output Power 0.5 ~ 2W (1MOhm)







# Plasma Surgical

Delicate and precise surgical handpiece does not affect the skin cell tissue but only sublimates the skin surface and contract the skin by creating small lattice shapes around the eyelid. It can be effectively used in variety of skin problems such as acne, scar, facial skin treatment, upper and lower eyelid aesthetic surgery and eyelid lifting.





Sublimation (Ablation)

Effective on acne, scar treatment by causing sublimation on the skin surface while not affecting the cells



Breaking the Molecular Bonds

Strong sterilization by breaking the molecular structure of bacteria



Replacing the Existing lons in Tissue

Increase the skin elasticity by balancing the jons in cell tissue



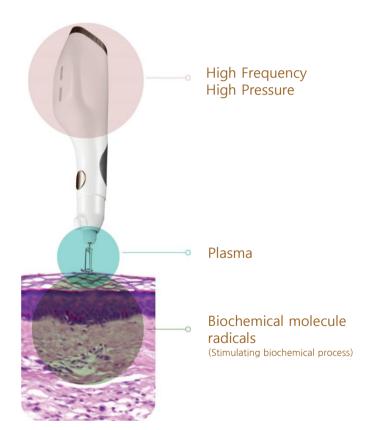
Neo-Collagenesis, Elastogen

Powerful anti-aging and preventing skin aging by stimulating the generation of collagen and fibroblasts





Plasma Surgical Operation Principle



Creating plasma by applying high-frequency, high-pressure in atmosphere

- 2 Delivering stable plasma ion to the tip of the handpiece
- 3 Stable and effective skin treatment mechanism by stimulating biochemical process in inner and outer area of biological cell





	Needle with Guide	Needle
Design	Patented Product	
Treatment Area	Ф0.3 x 15mm (0.5mm Guide)	Ф0.3 x 15mm
Usable Times	One-time use only	
Feature	Surgical Needle Guide™ which considers the most optimal spacing(0.5mm) between skin surface and plasma spray	General Surgical Needle
Description	By maintaining a regular interval with the skin, able to deliver uniform energy level	Sublimation by using sterilization needle (Requires high level of skills by the user due to absence of guide)





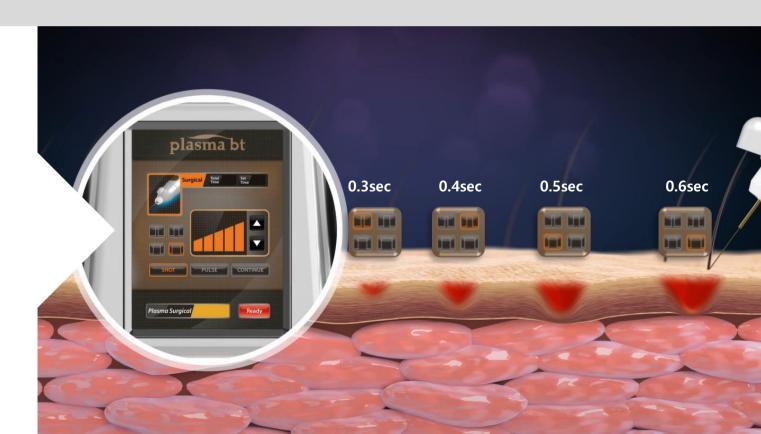


## Plasma Surgical Interface

The user-friendly interface of Plasma Surgical enables the user to directly select the plasma mode. By utilizing various modes, the user can apply more natural, precise, and delicate procedure.

#### **SHOT Mode**

- Function that delivers accurate energy during selected time
- Able to select 0.3sec / 0.4sec / 0.5sec / 0.6sec
- Apply in lifting, acnes, wrinkle improvement







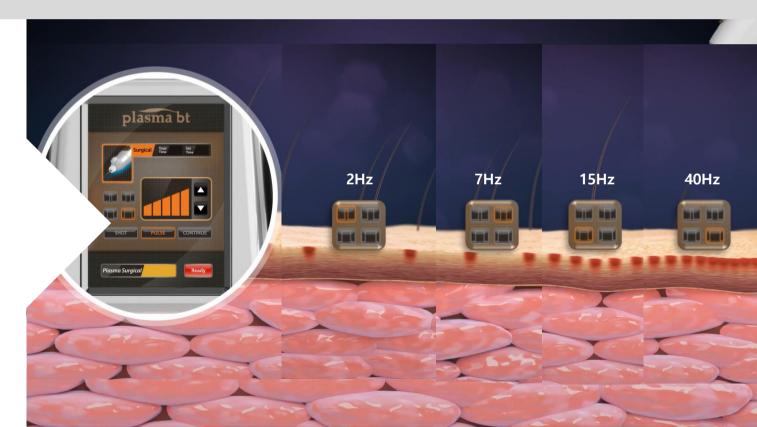


## Plasma Surgical Interface

The user-friendly interface of Plasma Surgical enables the user to directly select the plasma mode. By utilizing various modes, the user can apply more natural, precise, and delicate procedure.

#### **PULSE Function**

- Function which accurate energy in pulse
- Able to select 2Hz / 7Hz / 15Hz / 40Hz (2~40 times inject/1 sec)
- Apply on scar and stretch mark removal, lifting, wrinkle improvement









## Plasma Surgical Interface

The user-friendly interface of Plasma Surgical enables the user to directly select the plasma mode. By utilizing various modes, the user can apply more natural, precise, and delicate procedure.

## **CONTINUOUS Function**

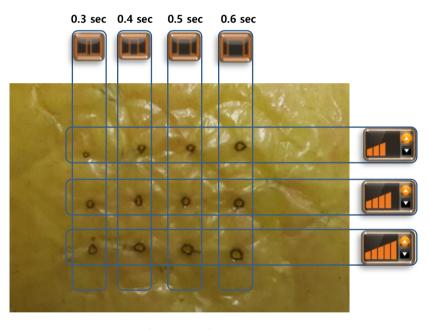
- Function which continuously inject energy while pressing the button
- Can be applied in all modes







#### Shots





[ Shot Mode ]

[ Continuous Mode ]

With precise and delicate energy injection, PIH is significantly low and controllable compared to other devices





## Plasma Poration





Plasma Poration Handpiece removes the bacteria and helps absorb essential drug to the skin tissue. A strong low-temperature atmospheric plasma on the surface of the skin sterilize the skin and the ionized radicals stimulates the skin treatment process such as skin regeneration, anti-bacteria, TDDS (Transdermal Drug Delivery System), skin whitening and collagen generation.





**TDDS** 

Inducing amazing absorption by breaking the Cell Adhesion Molecules(CAMs) that connect the skin cell



#### Toning Effect

Anti-pigmentation effect through suppressing melanin pigment and strengthening the absorption of antipigmentation cosmetics



#### Sterilization

Sterilize bacteria which cause various skin problems with powerful sterilization power



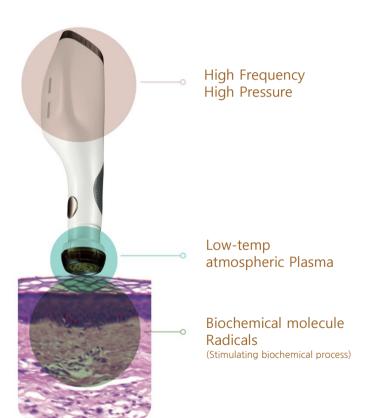
#### Skin Regeneration

Preventing skin aging by stimulating generation of collagen and fibroblasts





#### Plasma Poration Operation Principle



1 Creating low-temperature atmospheric plasma by applying high-frequency, high-pressure in atmosphere

2 Delivering stable plasma ion to the tip of the handpiece

Stable and effective skin treatment mechanism by stimulating biochemical process in inner and outer area of biological cell

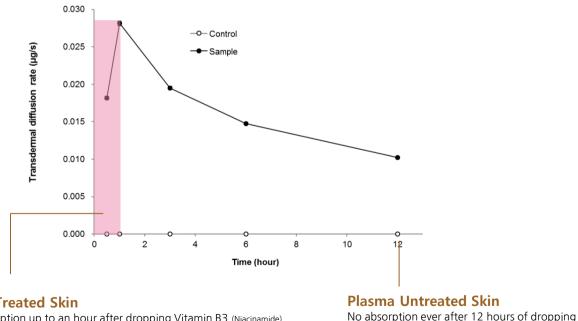






Inducing amazing absorption by breaking the Cell Adhesion Molecules(CAMs) that connect the skin cell

 Plasma Poration skin absorption test by Korea Institute for Skin and Clinical Sciences (Franz-diffusion cell)



**Plasma Treated Skin** 

Rapid absorption up to an hour after dropping Vitamin B3 (Niacinamide) (whitening cosmetic material)

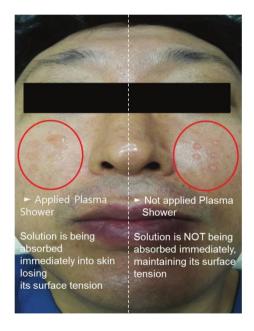


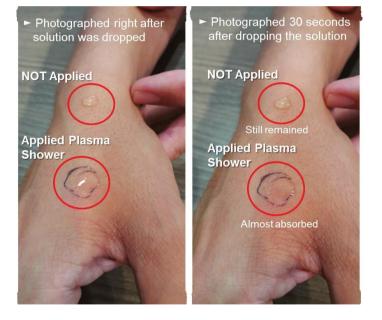


#### Plasma Poration Skin Absorption Test



Inducing amazing absorption by breaking the Cell Adhesion Molecules (CAMs) that connect the skin cell





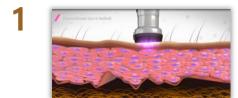




# TDDS

Inducing amazing absorption by breaking the Cell Adhesion Molecules (CAMs) that connect the skin cell

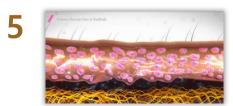
#### Plasma Poration TDDS Process



Contact Handpiece to the skin



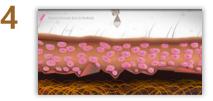
The radicals break skin cell connection by CAMs and skin protection membrane opens up temporarily



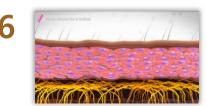
Realizing incomparable absorption rate through opened channel



Generate radicals through
Plasma Shower



rop solution



Recovery of cell wall after certain time has passed





#### Toning through rays produced by low-temp atmospheric plasma



#### Toning Effect

Anti-pigmentation effect through suppressing melanin pigment and strengthening the absorption of antipigmentation cosmetics





Maximizing the effect by using the (whitening) solution on the opened up skin after treating with plasma



Improving skin elasticity by improving cell regeneration and blood circulation by making the skin potential uniform through plasma



No Pain.! No Downtime.!





#### Toning through rays produced by low-temp atmospheric plasma



Toning Effect

Anti-pigmentation
effect through
suppressing melanin
pigment and
strengthening the
absorption of antipigmentation cosmetics





Source: Maylin Clinic (Skin tone comparison before and after Plasma Poration)





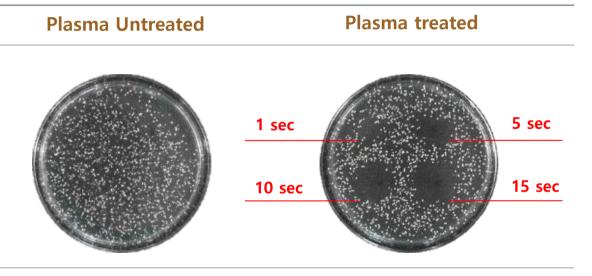


#### • P. Acnes removal experiment using plasma



#### Sterilization

Sterilize bacteria which cause various skin problems with powerful sterilization power



Treating plasma with 1 sec, 5 sec, 10 sec, 15 sec, significantly showed the sterilization effect compared to plasma untreated group

Mitigating skin trouble with sterilization function, reconstruct skin tissue and vitalize skin





#### • P. Acnes removal using Plasma BT



Sterilization

Sterilize bacteria which cause various skin problems with powerful sterilization power



Source: Lee Ji Ham Clinic (P. Acne comparison before and after Plasma Poration)

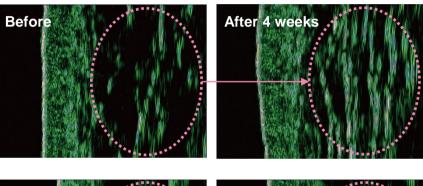




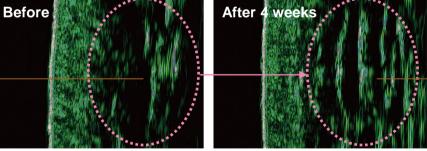
• Epidermis thickness difference after Plasma Poration



Preventing skin aging by stimulating generation of collagen and fibroblasts



Skin tissue is loose as if emptied out



The tissue becomes tightly packed

Source: Korea Institute for Skin and Clinical Sciences (Used DUB-Sin Scanner)

Due to effective skin regeneration, strengthen cell life, optimize cell regeneration cycle, reproduce cell and increase anti-aging effect





Patient

100%



#### Research on Plasma Poration by KISCS

(Korea Institute for Skin and Clinical Sciences)



Skin Regeneration

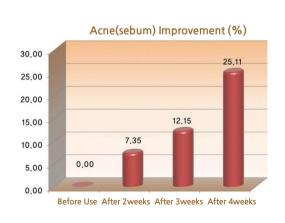
Preventing skin aging by stimulating generation of collagen and fibroblasts

• Research Title: Improvement on acnes and tightness of skin

• Research Period: 4 - 6 Weeks

• Research Group: 43 Adult Male/Female (20-50s)

• Research Result: Sebum Improvement 25.11%, Skin Tightness 14.81%









	Large Tip	Small Tip
Shape		
Treatment Area	Ф25mm (4.9 <del>di</del> )	Ф12mm (1.1 ani)
Feature	Sterilize ion and radical, skin regeneration (Wide Area)	Sterilize ion and radical, skin regeneration (Small Area)
Symptoms	Skin regeneration, lifting, wrinkle, sagging improvement, collagen remodeling, elastin production, anti-inflammatory, anti-bacteria, TDDS (Transdermal Delivery System), sterilization	
Usable Period	150 minutes	







## Plasma Poration Interface

The user-friendly interface of Plasma Surgical enables the user to directly select the plasma mode. By utilizing various modes, the user can apply more natural, precise, and delicate procedure.



#### **Shot Mode**

- Function which delivers accurate energy to selected time
- 2sec / 3sec / 4sec / 5sec selection



#### **Pulse Mode**

- Function which inject accurate energy through pulse
- 2Hz / 7Hz / 15Hz / 40Hz selection (2~40 times injection/1sec)



#### **Continuous Mode**

• Function which continuously inject energy while pressing the button

#### Plasma BT procedure application range

#### PLASMA Surgical

Removing scar, stretch marks

Upper and lower eyelid treatment

Under-eye/eyelid treatment

Eyelid lifting

Acnes treatment

#### PLASMA Poration

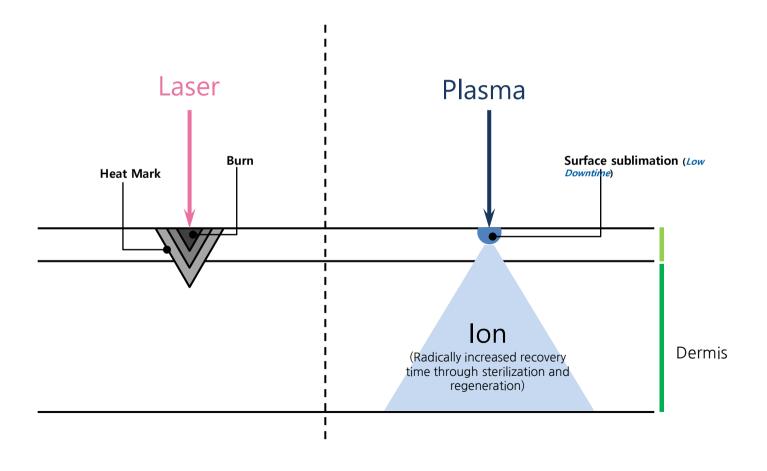
#### Common

Skin Regeneration Lifting Wrinkle improvement Skin sagging Improvement Collagen remodeling
Stimulating elastin generation
Anti-inflammatory
Anti-bacteria
Transdermal Delivery System
Sterilization effect





Comparison between Laser and Plasma







Comparison between Plasma BT and other Plasma device

	Plasma BT	Competitor Plasma Device
Procedure Convenience and Accuracy	Increased convenience and accuracy through SHOT, PULSE, CONTINOUS mode function	Limited convenience and accuracy by only categorizing into Three Energy Level
Presence of Guide Pin	Delivers uniform plasma level through guide pin which considers the most optimal spacing(0.5mm) between skin surface and plasma spray	No guide pin (Irregular plasma injection level)
Plasma Poration Function	Diverse treatment options available such as increased drug delivery, skin regeneration, and acne treatment through Plasma Poration function	No Plasma Poration function (No Plasma Poration effect)

# Plasma BT Clinical Results

the evidence of effectiveness





# Plasma Surgical





# Plasma Surgical



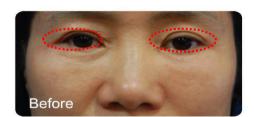




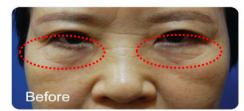




# Plasma Surgical

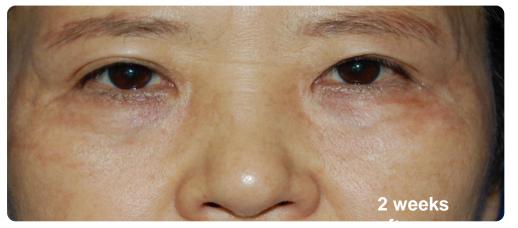






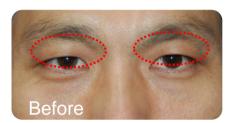


























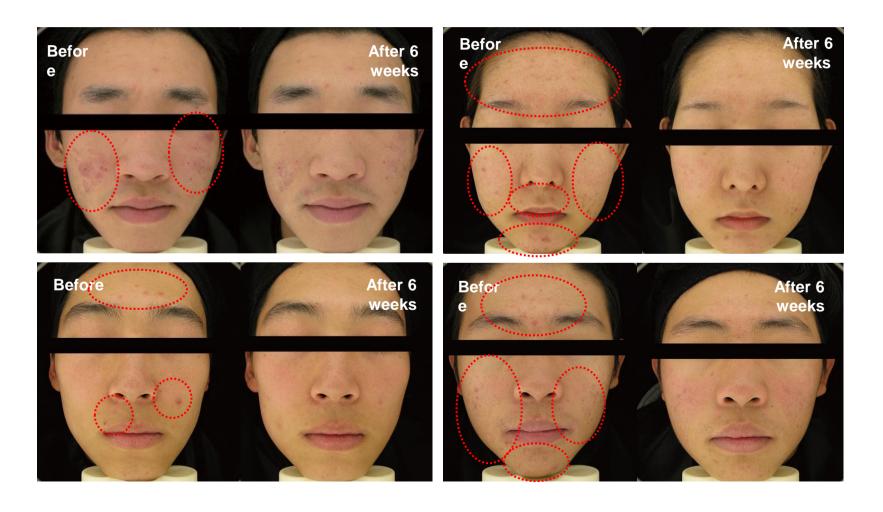


















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Plasma Poration

**Before** 



Copy rights to BeamWave Co., Ltd. in UK





**Before** 



After





**Before** 



After



# **Beautify your skin**Shower your skin with **Plasma BT**





# Reference Clinical Article

### Journal

Case Study: Treating a NSR (Non-surgical rhinoplasty) Complication.

Dr. Beatriz Molina (UK dermatologist),

Aesthetics Monthly Journal, Volume 5/Issue 1-Decemter 2017.

### Conclusion:

During Filler Injection, For practitioners who are experiencing complications where they feel like an injection of hyaluronidase might cause further pain, discomfort and irritation, I believe that delivering hyaluronidase transdermally by using Plasma Poration Treatment is a useful solution.



### Dr Beatriz Molina (UK):

- \* UK Medikas clinic (Owner Medical Director)
- KOL of GALDERMA (International Speaker and Mentor Leader)
- Founder of IAPCAM (UK)
- 2017 the Year of Medical Aesthetic (UK)



# Case Study: Treating a NSR Complication

Dr Beatriz Molina discusses her unique way of managing a vascular complication following a non-surgical rhinoplasty treatment

The majority of non-surgical techniques using hyaluronic acid (HA) dermal fillers, to rejuvenate and/or address facial disharmonies deliver safe, effective, and reproducible aesthetic results. HA dermal fillers allow for the correction of rhytids, folds, and volume deficits in response to age-related changes or disease, and they can also be used for minor corrections following surgical procedures such as rhinoplasty! Although the safety profile of HA fillers is favourable, adverse reactions can occur. Most of these are noted to be mild and transient - serious adverse events are rare. Early adverse reactions to HA fillers include vascular infarction and compromise, inflammatory reactions, injection-related events and inappropriate placement of filler material. Among late reactions are nodules granulomas and skin discoloration? Most adverse events can be avoided; a detailed understanding of facial anatomy. suitable patient and product selection, and appropriate aseptic technique can reduce the chances of them occurring. Should an adverse reaction occur, practitioners must be prepared with the knowledge and tools available for effective treatment.6

#### Non-surgical rhinoplasty procedures

Non-surgical thiroplasty (NSS) is a treasment that commonly uses HA dermal filler to shape the nose. Although it is a relatively first procedure, generally taking around 15-20 minutes, only highly experienced proceditioners should attempt this treatment, as the noise is an extremely high-risk area due to the rich vascular blood supply. For successful treatment, injectors must know the location of the relevant arteries. The facult artery comes from the external carolital and circles around the indexing accordant and circles around the orders and relatives to profess of the

mandible, anterior to the masseter. It penetrates the masseteric fascal and rese upwards toward the eye. The facial artery lies deep to the arygenaticus and risorius misciles, but superficial to the buccinator and levator angul ors. At the level of the mount, the facial artery sends two labilal arteries, inferior and superior, into the lips where they pass below the orbiculars ors. The continuation of the facial artery near the medical cantable basels the nose is the angular artery. In the nasal area, the biggest concern in terms of complications to succiously success the success of the superior sender and the superior artery to the superior artery. In the nasal area, the biggest concern in terms of complications to success the success and superior senderational structure damage. If a patient has had a surgical thinoplasty procedure and wants to slightly add to this results with demanfiller (see to the added changes of anatomical variations, they are at a higher risk of compromising the vascular supplys.)\*

#### NSR complication case study

A 4D-year-Old female patient, who I had successfully freated three three before, came to me for another NSR teatment. First ton my treatments, she had undergone a surgical rhinoplasty, but still had a small defect post-surgery that the warted to correct. Surgical rhinoplasty patients are particularly difficult to treat as their vascular supply may be compromised, so practitioners must be extremely careful when treating with filles?

On July 19, 2017, I performed the NSR treatment using a 25G cannula and a HA dermal filler. A small amount of lidocaine was firstly injected into the tip of the nose, then a 23G needle was used to facilitate an entry point for the cannula; it's important to note that only the tip off the needle was inserted. I injected 0.1ml of HA into the tip of the nose, then I injected 0.1ml into the right side. During the procedure, I noticed that there was a small area of blanching (a white discolouration) where I was injecting, on the right alar part of her nose. After injecting hundreds of poses in my 12 years' experience, this was the first time that I had seen this, Immediately, I stopped injecting, massaged the area vigorously and applied heat with warm compresses. After 30-40 seconds, there was an established blood flow of the skin and the colour went back to normal. Throughout this, the patient did not repor any pain or discomfort. I decided to stop the procedure and informed the patient of what had just happened. The choice was to observe the patient, or to use hvaluronidase

On occasion of a complication such as this, some studies suggest that practitioners should immediately use hyaluroridase and massage the area, using warm compressions if appropriate. "They also state that hyaluroridase should be njected immediately and used daily in liberal doses where signs and symptoms are present such as eyithema, pain on injection or in the days following. They note that you should treat wherever the vasculature appears compromised, not only at the site of injection, I explained the situation to the patient and discussed options with her; in particular, the use of the hyaluroridase. I was debating whether or not to inject hyaluroridase in this circumstance, as the patient was not experiencing any pain and the skin seemed to have a normal colouration and good blood flow.

We agreed that we would have a follow-up appointment in 24 hours, unless there were any changes or concerns before then. She was fully aware that she could contact me if she had any worries and I gave her my personal mobile number. I advised her to contact me if she started to experience any discomfort or pain, or if any redness appeared on the skin and I also showed her photos of what skin may look like when commonities.

The following day, the patient was not reporting any pain or skin changes. However, on the morning of July 21, which was two days' post treatment, the patient woke up and noticed some skin

Reproduced from Aesthetics | Volume 5/Issue 1 - December 2017

# 02 \_ Plasma BT | Clinical Results

# Beautify your skin Shower your skin with Plasma BT





# Reference Clinical Article

### Journal

Case Study: Treating Hair Loss

Frances Turner Traill (UK Independent Nurse Prescriber),

Aesthetics Monthly Journal, Volume 5/Issue 12-November 2018.

### Conclusion:

We believe mesotherapy offers a good treatment option for patients suffering from non-scarring alopecia and, in our experience, combining it with cold atmospheric plasma is revolutionary as it can lead to faster and more effective results, without any downtime, and the treatment is completely pain free.



### Frances Turner Traill (UK):

- Independent Nurse Prescriber
- Clinical Director of FTT Skin Clinics (UK)
- Board Member of British Association of Cosmetic Nurse (BACN)





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# Case Study:

# **Treating Hair Loss**

Nurse prescribers Frances Turner Traill and Lyndsey Loughery treat alopecia areata

Hair in many individuals can represent beauty, youth and health and, in women, hair often represents femininity. Alopecia is a dermatologic condition that affects the pilosebaceous unit in both genders. It can be extremely distressing for the individual and can Impact greatly on their quality of life, often influencing negative body Image, low self-esteem, depression, introversion and feelings of unattractiveness:

#### Case study

Our patient, a 26-year-old female, Initially presented to FTT Skin Clinics with skin issues mainly on her neck area, which we diagnosed as atopic dematitis caused by an autoimmune problem, so we referred her back to her GP for further investigation. During the indepth consultation with the patient, however, she divulged that she also suffered from an area of baldness on the crown of her head. The patient has long, glossy, auburn hair and over a period of several months prior to our visit she had noticed a distinct patch of baldness emerging when running her fingers through her hair. We measured this area to be 5x5cm, which she managed to cover up most of the time by brushing her hair over the area. The patient didn't know who to turn to in order to resolve this issue as she was unsure of the treatment possibilities. While we explained that we do offer treatment for hair loss, we recommended that she have a routine blood test when she visited her GP to aim to diagnose the cause of the hair loss before we offered any treatment

When the nations visited her GP she discussed additional concerns of non-specific tiredness, describing that she had been feeling run down, was presenting with skin issues (aforementioned atopic dermatitis), as well as her hair loss. The patient's blood test indicated Treatment options for hair loss are variable and are dependent on the that she was mildly anaemic with low B12 and was consequently treated by her GP with a course of B12 injections (hydroxycobalamin), which resulted in improvement in her tiredness and fatigue. The GP believed the cause of her hair loss was the B12 deficiency, and a lowered autoImmune system



a mild potency topical steroid (hydrocortisone 2%) for her atopic dermatitis. In addition, the GP recommended the patient started using over the counter hair treatment shampoo Nioxin for her thinning hair. The following week, as her hair patch had not resolved, she came back to our clinic for us to assist her with her hair less concerns

#### Hair loss diagnosis

Disconnels is usually based on history and examination with the clinician, exploring a history of atopy or other autoimmune disorders and family history of alopecia. We diagnose our female patients based on clinical presentation and severity, using the Ludwig Classification 2 This severity classification includes

Type 1: hair loss is considered to be mild Type 2: hair loss is considered moderate Type 3: hair loss is considered most extreme

Our patient was diagnosed as Type 1 on the Ludwig Classification as it was a solitary patch of hair loss with no other thinning areas. We diagnosed her with patchy alopecta areata, which is a recurrent nonscarring type of alopeda that can affect both sexes with approximately 50% of cases presenting in childhood and 80% starting before the age of 40.4 Alopecta areata has no known race or sex preponderance<sup>5</sup> and can manifest in many different patterns and affect any hair bearing areas. Although a medically benign condition, it can cause a great deal of psychosocial and emotional distress.6 Characteristically, the Initial lesion is a circumscribed, bald, smooth patch which may be completely devoid of hair or have scattered exclamation mark hairs with the skin being normal or slightly reddened. It is most often asymptomatic, although some patients may complain of trichodynia in the affected area 6 It is classified as an autoimmune disorder with approximately 20% of patients known to have a family history.5 Onset or recurrence of hair loss can be triggered by viral infection, trauma, hormonal change and emotional and physical stressors

type. Many hair loss treatments can produce regrowth of hair, although It has been reported in the British Medical Journal that complete reversal is never achieved." For this patient, the options we gave he were that she could either do nothing, as it may resolve on its own, or try over the counter minoxidil 5% shampoo. Although, in practice, we find that this is a variable treatment and is unlikely to completely resolve the issue. We also told her about a treatment that is new to the clinic cold atmospheric plasma combined with mospherary, which we had not used for hair loss before, but thought may help. We have had considerable experience with cold atmospheric plasma for nonsurgical lesion removal and acne treatment, however the concept of using cold atmospheric plasma with mesotherapy was relatively new. The patient was attracted to this option because it is a non-invasive treatment with no downtime or pain. After an in-depth consultation. she decided that she would try a styweek course of this combination treatment as her hair loss was causing her great distress.

Combining cold atmospheric plasma and mesotherapy For this treatment, we used the Plasma BT Shower handpiece with RRS XL Hair mesotherapy. We also offer RRS mesotherapy through microneedling, however most of our patients prefer to use

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My Face My Body Award UK 2016



Inspiration of the year Award Poland 2017

# 02 \_ Plasma BT | Patents & Medical Certificates

# **Beautify your skin**Shower your skin with **Plasma BT**







4 PLASMA related patents

ISO 13485

**GMP** 

**KFDA** 

**CE MDD** 

ANVISA

TGA

GOST-R











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