> “There have been studies made to quantify the amount of fat in the neck;it appears that the volumetric changes associated with the neck is an interplay of the subplatysmal and pre-platysmal fat pads.”

# MULTIMODAL APPROACH TO THE AGEING NECK

**Dalvi Humzah, Antonello Tateo,** and **Gabriel Siquier** discuss using a stable hybrid cooperative complex hyaluronic acid to treat the neck

**ABSTRACT**
The neck is now an area of aesthetic concern, there are specific structural changes that occur with age. These involve the skin, subcutaneous tissues, platysma and the deep fat compartments. To rejuvenate the neck a multi-modal approach should be considered to provide the optimal results. We describe a 3 stage assessment of the neck and a multimodal approach using a novel hyaluronic acid preparation based on stable, hybrid cooperative complexes. This is combined with different delivery techniques and botulinum toxin to provide the optimal results in the neck. These procedures and outcomes are presented in a group of patients who underwent these treatments. The outcome using botulinum toxin and a stable hybrid cooperative complex hyaluronic acid was shown to be safe and effective.

**DALVI HUMZAH, BSC(HONS), MBBS(HONS), AKC, FRCS(GLAS), FRCS(PLAST), MBA,** Consultant Plastic, Reconstructive & Aesthetic Surgeon; Ramsey West Midlands Hospital;
**ANTONELLO TATEO, MD,** Aesthetic Plastic Surgeon, Director, TB Clinic Milano;
**GABRIEL SIQUIER, MD,** Aesthetic Physician, Director, Dameto Clinics International, Amsterdam, The Netherlands

**email** info@pdsurgery.co.uk

**KEYWORDS**
Hyaluronic acid, botulinum toxin type A, neck, skin laxity, creases and wrinkles

THE APPEARANCE OF THE NECK IS currently one of the main points of interest of the aesthetic field; there are many changes to this area with ageing that require addressing with a multi-modal approach. In youth, the neck is clearly defined with smooth non-creased skin, visible structures of the medial and lateral borders of the sternocleidomastoid, and posteriorly the borders of trapezius with hollows at the suprasternal notch and supraclavicular areas[1]. During the process of ageing there are visible changes in the skin texture, underlying platysmal muscle changes, and volumetric changes in the fat layers. This initially results in visible crease lines and progressive muscle hypertonicity, which leads to attenuation of the mandibular definition and platysmal bands. There is further progressive deterioration of the skin texture and quality with associated loss of dermal structures. The associated loss of collagen and elastin causes further sagging and skin laxity[2].

There have been studies made to quantify the amount of fat in the neck,[3,4,5] it appears that the volumetric changes associated with the neck is an interplay of the subplatysmal and pre-platysmal fat pads. Other authors have described three compartments of subplatysmal fat: central, medial, and lateral[2]. How these various fat pads within the neck change with ageing is not described.

When analysing the neck in the aesthetic patient, there are three specific parameters to consider:

- The degree of skin laxity/sagging (with/without the formation of 'creases'): appear as fine lines that run parallel to each other as ageing progresses ▷

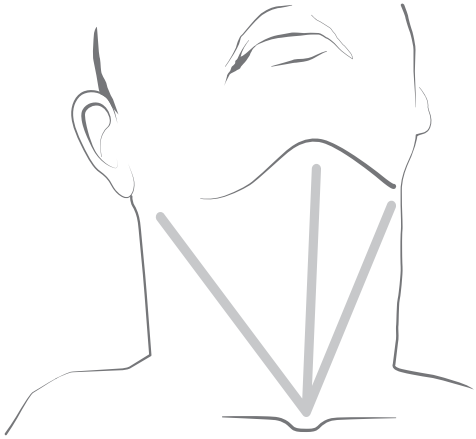
**Figure 1** The Profhilo® BAP Neck Technique

## IDENTIFYING THE 10 BAP INJECTION SITES

### Step 1: Marking the neck

**Midline indications**
Draw a line from the chin to the sternal notch

**Lateral indications**
Draw a line from the medial border of sternocleidomastoid muscle (SCM) to the sternal notch on both sides of the neck



### Step 2: Marking the points

❶ Midline between the submental border and hyoid bone

❷ Midline between the apex of Adam's Apple and bottom of thyroid cartilage

❸ Midline between the base of thyroid cartilage and sternal notch

❹ Midline at the apex of sternal notch

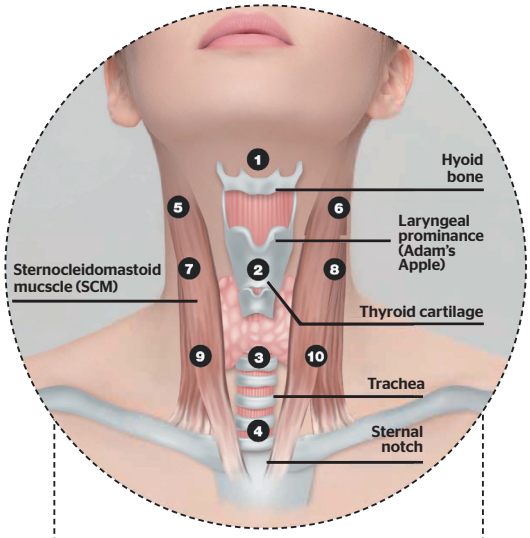
❺ ❻ Horizontal line with mandibular angle & 0.5cm lateral to medial border of the SCM

❼ ❽ Horizontal line between apex of Adam's Apple and bottom of thyroid cartilage

❾ ❿ Horizontal line between the base of thyroid cartilage and sternal notch

### Step 3: Injecting the filler

Inject 0.2ml per bolus at the superficial subcutaneous layer




**INJECTION TECHNIQUE**
Pinch skin at injection point and inject transversely across the skin. Avoid approaching skin at 90 degrees and inadvertently injecting deep to platysma. Before injecting move needle to ensure point is subdermal/intradermal

**PROTOCOL** 2 treatments with a 1 month interval, twice per year*

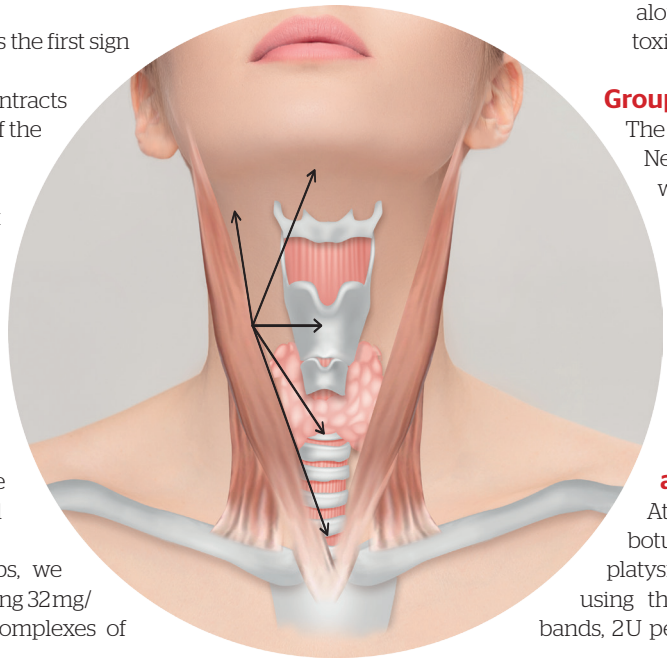
*Number of treatments and product quality depends on the degree of ageing

▷ ■ Necklace lines: horizontal crease lines etched into the skin. They tend to deepen and look more noticeable with age and appear as the first sign of ageing
■ Platysmal bands: the platysma contracts with age which causes blunting of the sharp jawline and vertical neck bands in the area.

Using these parameters the neck may be classified into three separate groups:
■ Group 1: textural changes (increased laxity) of the skin with or without necklace lines
■ Group 2: as Group 1, with platysmal bands and or loss of jawline contour
■ Group 3: as Group 2 with necklace lines, platysma hypertonicity, and advanced skin laxity/sagging.

In treating these different groups, we propose a multi-modal approach using 32mg/mL of stable hybrid cooperative complexes of high and low molecular weight hyaluronic acid (Profhilo®, IBSA Farmaceutici Italia, Srl) alone and in combination with botulinum toxin type A.

**Figure 2** Cannula insertion point and subcision



## Group 1: Profhilo® BAP neck technique

The neck was injected according to the BAP Neck Technique with 2.0mL of Profhilo® with a month between the two treatments. The 10 point BAP Neck Technique was developed in order to provide reproducible points of injection and to standardise these points irrespective of variations between patients and ensure that the injection points avoid potential injury to vital structures (*Figure 1*).

## Group 2: Botulinum toxin and Profhilo®

At the first session, a total of 50 IU of botulinum toxin was injected into the platysmal bands and horizontal lines (if present) using the following protocol: on the platysmal bands, 2U per point was injected every 1-2 cm in a ▷


**Figure 3** (A) Group 1 Before and (B) After treatment

> "We tested these three techniques with a total of 20 patients per group. All patients in these groups experienced a continuous, gradual effect with a significant clinical improvement in neck ageing."

▷ relaxed state with a subdermal bolus technique. On the horizontal wrinkles, 1-2 U per point was injected every 1-2 cm using an intradermal bolus technique in the mandibular platysma (Nefertiti Lift)[6]. Then two 2.0 mL doses of Profhilo® were injected at day 15 and day 45, respectively. Profhilo® was injected according to the BAP Neck Technique (10-point injections of 0.2 mL) (*Figure 1*).

### Group 3: Botulinum toxin and Profhilo® — cannula subcision

This group had a similar treatment with botulinum toxin A. On day 15 and day 45 Profhilo® was administered with a 25G 50 mm (TSK Steriglide) cannula: an insertion point was made 1 cm lateral to the anterior border of the sternocleidomastoid muscle, a total of 5 passes in the pre-platysmal plane (0.2 mL per thread) from the following points towards the insertion point in a retrograde line (*Figure 2*):

- Angle of jaw
- Mentum
- Thyroid cartilage
- Tracheal cartilage
- Sternal notch.

## Personal experience

We tested these three techniques with a total of 20 patients per group. All patients in these groups experienced a continuous, gradual effect with a significant clinical improvement in neck ageing.

The treatment was well tolerated and the patients were very satisfied with the overall aesthetic outcome and the duration of the results.

*Figures 3-5* demonstrates before and after examples from each group.

## Discussion

Profhilo® is a novel HA preparation based on stable, cooperative, hybrid complexes, which is the first product developed by NAHYCO® Hybrid Technology, an innovative thermal production process patented by IBSA. The production involves a mixture of 32 mg of high molecular weight HA (1100-1400 kDa) and 32 mg of low molecular weight HA (80-100 kDa). This mixture is then stabilised by a thermal process, which does not use cross-linking agents. The characteristics of Profhilo® are:

- High HA concentration (64 mg/2 mL)
- High manageability
- Optimal tissue diffusion
- Low viscosity
- No BDDE or other chemical agents
- Low inflammatory response
- Thermally stabilised natural HA with a duration similar to a weakly cross-linked gel.

Profhilo® infiltration results in a multilevel dynamic remodelling and is indicated for tissue bio-remodeling[7].

The effectiveness of Profhilo® in improving the extracellular environment was shown to:

- Maintain optimal conditions for fibroblast, keratinocyte, and adipocyte vitality
- Favour a remodelling of the extracellular matrix in terms of elasticity and support[7].

Botulinum toxin type A is a frequently used tool within the therapeutic spectrum for the treatment of hyperkinetic facial wrinkles, including those in the areas of the mouth and neck[8]. With ageing, the platysma muscle becomes hyperkinetic and hypotonic which results in vertical muscle bands and horizontal neck lines. The platysma muscle stretches the skin of the neck downward and, with the action of the depressor anguli oris, pulls down the lateral corners of the mouth. ▷


**Figure 4** (A) Group 2 Before and (B) After treatment

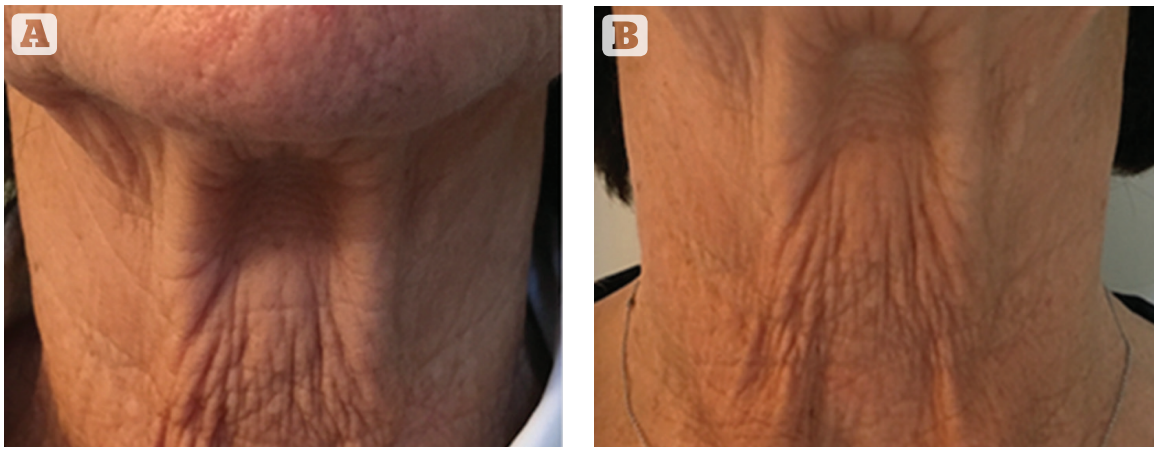



**Figure 5** (A) Group 2 Before and (B) After treatment

> "This multi-modal approach improved the aged skin of the neck, reducing skin laxity and increasing elasticity and consistency of superficial soft tissues."

▷ Botulinum toxin can be used on its own or in conjunction with other procedures. It is particularly useful in patients with platysma muscle hyperactivity[6].

Therefore, the combination treatment with Profhilo® and botulinum toxin type A can be considered a good multi-modal approach to improve the overall quality of the neck.

## Conclusion

In aesthetics there is an increasing interest in treating the ageing neck; the youthful neck includes clear skin texture and tone without laxity. The ageing process involves loss of volume, increased skin laxity, worsening texture, and wrinkling. The aesthetic treatment of the neck is of crucial importance in the overall rejuvenation programme. This multi-modal approach improved the aged skin of the neck, reducing skin laxity and increasing elasticity and consistency of superficial soft tissues.

Based on this preliminary experience, botulinum toxin type A and stable hybrid hyaluronic acid cooperative complexes when used in combination are effective and safe.

▶ ***Declaration of interest*** *The authors declare that IBSA Farmaceutici Italia Srl provided support to the preparation of the manuscript*

▶ ***Figures 1-2*** *© IBSA;* ***3-5*** *© Dr. Siquier*

### Key points

- Taking into account the degree of skin laxity, necklace lines and platysmal bands; the neck may be classified into 3 separate groups with 3 different treatments.
- Combination treatment with Profhilo® and Botulinum Toxin type A can be considered a good multi-modal approach to improve the overall quality of the neck
- Combination treatment with Profhilo® and Botulinum Toxin type A was shown to be safe and effective

## References

1. Ellenbogen R, Karlin JV. Visual criteria for success in restoring the youthful neck. Plast Reconstr Surg. 1980;66:826-837
2. Bazin R, Doublet E. Skin Aging Atlas: Volume 1. Caucasian Type. Paris, France: Med'Com Editions; 2007
3. Adamson J, et al. The surgical correction of the "turkey gobbler" deformity. Plast Reconstr Surg. 1964;34:598-605
4. Raveendran SS, et al. An Anatomic Basis for Volumetric Evaluation of the Neck. Aesthetic Surgery Journal 2012;32(6): 685 –69
5. Renaut A, et al. Distribution of submental fat in relationship to the platysma muscle. Oral Surg Oral Med Oral Pathol. 1994;77:442-445
6. Jabbour SF, et al. Botulinum Toxin for Neck Rejuvenation: Assessing Efficacy and Redefining Patient Selection. Plast Reconstr Surg. 2017;140:9e-17e
7. Agolli E, et al. Hybrid cooperative complexes of high and low molecular weight hyaluronans (Profhilo®): review of the literature and presentation of the VisionHA project. Dermatological Experiences 2018 DOI: 10.23736/S1128-9155.18.00470-3
8. Spósito MM. New indications for botulinum toxin type a in cosmetics: mouth and neck. Plast Reconstr Surg. 2002 Aug;110(2):601-11; discussion 612-3