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INTRADERMAL MICROBOTOX FOR IMPROVING *SKIN QUALITY* IN THE LOWER THIRD OF THE FACE AND NECK: A SYSTEMATIC REVIEW FOCUSING ON TECHNICAL, ANATOMICAL, AND SAFETY ASPECTS

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Abstract: Improving *skin* quality—including texture, micro-relief, sheen, visible pores, oiliness, and visual uniformity—has become a central therapeutic goal in cosmetic dermatology, especially in the lower third of the face and neck, regions with high anatomical complexity and functional risk in case of improper diffusion of botulinum toxin (BRANDT; BOKER, 2003; JABBOUR *et al.*, 2017; YOUN *et al.*, 2022). Microbotox (intradermal microdroplets of botulinum toxin type A) has been proposed to modulate skin attachments and superficial muscle fibers, aiming at natural *skin quality* outcomes (WU, 2015; KAUR *et al.*, 2022; KASSIR *et al.*, 2023). This systematic review (with structured narrative synthesis) summarized the mechanisms, technique, efficacy, and safety of intradermal microbotox for *skin quality* in the lower third and neck. The corpus included nine mandatory audited references, the study detailing dilution/microvolumes in an associated protocol (BERTOSSI *et al.*, 2019), and four additional audited references that expand the evidence base for quantitative skin improvement, lifting effect, oiliness, and erythema (DIASPRO *et al.*, 2020; NG; LELLOUCH, 2022; ROSE; GOLDBERG, 2013; YEH; SHIH; HUANG, 2025). The findings support biological plausibility and clinical evidence for improved texture/sheen and smoothing of superficial cervical changes, as well as indirect benefits in soft tissue contour and ptosis when the application remains superficial (WU, 2015; AWAIDA *et al.*, 2018; KASSIR *et al.*, 2023; NG; LELLOUCH, 2022). Safety critically depends on the intradermal plane, microvolumes, patient selection, and anatomical mastery, especially of the platysma and perioral regions (BRANDT; BOKER, 2003; AWAIDA *et al.*, 2018; YOUN *et al.*, 2022).

Keywords: microbotox; botulinum toxin; skin quality; lower third of the face; neck; platysma.

Introduction

Botulinum toxin type A has become established in aesthetic treatment for its role in reducing dynamic wrinkles via muscle chemodenervation, expanding to neck and lower face rejuvenation techniques targeting the platysma and mandibular contour (BRANDT; BOKER, 2003; JABBOUR *et al.*, 2017; KASSIR *et al.*, 2023). Parallel, the concept of *skin quality* has gained centrality because it reflects skin attributes perceived by the patient—texture, brightness, uniformity, pores, and oiliness—which often determine the overall impression of "young skin" (WU, 2015; KAUR *et al.*, 2022; BERTOSSI *et al.*, 2019).

In the lower third of the face and neck, the pursuit of *skin quality* is particularly challenging because the region combines often thinner skin, intense dynamics, the influence of the platysma on the skin envelope, and the risk of adverse events due to diffusion when the toxin reaches deep planes (BRANDT; BOKER, 2003; YOUN *et al.*, 2022; AWAIDA *et al.*, 2018). In this scenario, microbotox (intradermal/superficial microinjections often distributed in a grid pattern) has been proposed to weaken superficial fibers and modulate skin attachments, with the aim of improving texture and sheen while maintaining naturalness (WU, 2015; KAUR *et al.*, 2022; RHO; GIL, 2021).

Despite widespread use, there is heterogeneity in protocols (concentration, microvolume, point density, use of lidocaine, and anatomical delimitation), as well as variation in objective outcomes for *skin quality* in the neck/lower face, which justifies a systematic synthesis focusing on reproducible parameters and safety (WU, 2015; AWAIDA *et al.*, 2018; KAUR *et al.*, 2022; RAHMAN *et al.*, 2024). Additional audited literature reinforces the relevance of the topic by providing quantitative evidence of skin aesthetic improvement (DIASPRO *et al.*, 2020), a systematic synthesis of the "lifting effect" in microbotulinum (NG; LELLOUCH, 2022), a clinical study on oiliness (ROSE; GOLDBERG, 2013), and a meta-analysis for erythema in rosacea with intradermal application (YEH; SHIH; HUANG, 2025).

Methodology

Design and registration

Systematic review with structured narrative synthesis, adopted because it deals with a body of evidence with diverse designs (crossover clinical trial, technical review, associated preliminary study, reviews, and meta-analyses) and because there is high heterogeneity of protocols and *skin quality* outcomes (WU, 2015; AWAIDA *et al.*, 2018; KAUR *et al.*, 2022; RAHMAN *et al.*, 2024; NG; LELLOUCH, 2022).

Clinical images from the author's collection were included for technical documentation purposes (marking, application, and immediate post-treatment). The patient authorized the scientific use of the photographs through informed consent, with anonymization and no identifiable data, in accordance with good ethical practices for clinical publications.

PICO question

- P (Population): adults undergoing cosmetic procedures in the lower third of the face and/or neck (BRANDT; BOKER, 2003; JABBOUR *et al.*, 2017).
- I (Intervention): microbotox/mesobotox with intradermal/superficial application of botulinum toxin type A (WU, 2015; AWAIDA *et al.*, 2018; KAUR *et al.*, 2022).
- C (Comparator): placebo, internal control, or other toxin techniques for the neck/lower face (e.g., Nefertiti lift), when available (AWAIDA *et al.*, 2018; BRANDT; BOKER, 2003).
- O (Outcomes): *skin quality* domains (texture/micro relief, shine, pores/sebum, erythema/inflammatory conditions), overall aesthetic measures, and safety (WU, 2015; RHO; GIL, 2021; RAHMAN *et al.*, 2024; YEH; SHIH; HUANG, 2025; YOUN *et al.*, 2022).

Sources and eligibility of the corpus

Nine mandatory audited references were included, along with a study detailing preparation/dilution and microvolumes in an associated protocol (BERTOSSI *et al.*, 2019) and four additional audited references for expanding evidence for *skin quality* in central domains and overall measurement/effect (DIASPRO *et al.*, 2020; NG;-LELLOUCH, 2022; ROSE; GOLDBERG, 2013; YEH; SHIH; HUANG, 2025).

Eligibility was defined by: (i) description of intradermal/superficial microbotox; and/or

(ii) focus on the lower face/neck; and/or (iii) explicit discussion of mechanisms/safety applicable to *skin quality* outcomes (WU, 2015; KASSIR *et al.*, 2023; YOUN *et al.*, 2022; RHO; GIL, 2021; NG; LELLOUCH, 2022).

Operational definition of Microbotox

For the purposes of this review, Microbotox was defined as the application of botulinum toxin type A by multiple microinjections into the intradermal plane (or immediate dermis-superficial fiber interface), with the intention of modulating skin attachments (e.g., sweat/sebaceous glands) and superficial fibers that insert into the dermis, aiming to improve *skin quality* and preserve naturalness (WU, 2015; KAUR *et al.*, 2022; BERTOSSI *et al.*, 2019).

This definition was anchored in the technical description of microbotox applied to the lower third/neck (WU, 2015), intradermal operation in a clinical trial of the lower face/neck (AWAIDA *et al.*, 2018), and the technical description in a combined protocol (BERTOSSI *et al.*, 2019).

Practical criteria for intradermal plane and correct execution

Execution was considered adequate when the technique described signs compatible with superficial deposit, notably:

- whitish papule/bleb ("tiny blanched weal/bleb") at the injection site; and
- resistance to the plunger, suggesting that the needle tip was not in the deep subcutaneous/intramuscular layer (WU, 2015; AWAIDA *et al.*, 2018; BERTOSSI *et al.*, 2019).

Standardization of these criteria is particularly relevant in the neck and lower third because it reduces the risk of diffusion to deep structures and functional events (BRANDT; BOKER, 2003; YOUN *et al.*, 2022; AWAIDA *et al.*, 2018).

Proper execution is defined by clinical signs of superficial deposition, including the formation of a small whitish papule ('bleb') and a feeling of resistance to the plunger, criteria described as useful for avoiding deep planes and unwanted diffusion in the neck (WU, 2015; AWAIDA *et al.*, 2018). Figure 1 illustrates the intradermal application performed by the author.

Figure 1 – Demonstration of intradermal application of microbotox with serial microinjections, showing papule formation ("bleb") as a clinical criterion for superficial plane and depth control. **Source:** author's collection.

The criteria of bleb and resistance were adopted as clinical markers of intradermal plane and technical reproducibility in the neck/lower face (WU, 2015; AWAIDA *et al.*, 2018; BERTOSSI *et al.*, 2019).

Data extraction

The following were extracted: toxin used, preparation (reconstitution, final concentration), adjuvants (e.g., lidocaine), plane, needle/device, density of points (injections per syringe/area), interval/grid when described, anatomical delimitation, outcomes, and adverse events (WU, 2015; AWAIDA *et al.*, 2018; BERTOSSI *et al.*, 2019; KASSIR *et al.*, 2023).

Quality assessment/risk of bias

Quality was interpreted according to the design:

- crossover clinical trial on the lower face/neck (weighing inherent limitations of the design and regional measurements) (AWAIDA *et al.*, 2018);
- technical/preliminary studies (focus on reproducibility, anatomical consistency, and safety) (WU, 2015; BERTOSSI *et al.*, 2019);
- reviews and meta-analyses (greater weight given to systematic syntheses of intradermal BoNT-A and reviews of the lower face/neck) (RAHMAN *et al.*, 2024; NG; LELLOUCH, 2022; KASSIR *et al.*, 2023).

Standardized outcomes and justification

Skin quality was treated as a multidimensional construct, prioritizing:

1. Texture/micro relief (including cervical crepiness) as the primary outcome, in line with the rationale for microbotox in the neck/lower face and the objective of superficial modulation of the skin envelope (WU, 2015; AWAIDA *et al.*, 2018; KAUR *et al.*, 2022; KASSIR *et al.*, 2023).
2. Pores/oiliness as a minimum secondary outcome, supported by specific evidence in oily skin and mechanistic rationale for skin appendages (ROSE; GOLDBERG, 2013; RHO; GIL, 2021; RAHMAN *et al.*, 2024).
3. Uniformity/erythema when applicable, supported by meta-analytic synthesis in rosacea with intradermal application (YEH; SHIH; HUANG, 2025) and consistent with microbotox reviews (KAUR *et al.*, 2022).
4. Overall aesthetic evaluation/satisfaction, relevant when the benefit is global and refinement (AWAIDA *et al.*, 2018; NG; LELLOUCH, 2022).
5. Safety as a mandatory outcome in the neck/lower third due to functional risk associated with diffusion and anatomy of the platysma/perioral region (BRANDT; BOKER, 2003; YOUN *et al.*, 2022; AWAIDA *et al.*, 2018).

Results

Characterization of the body of evidence included

The core evidence specific to the lower face and neck includes:

- a crossover clinical study comparing microbotox and Nefertiti lift (AWAIDA *et al.*, 2018);
- descriptiontechnical/originalwithstandardizationofpreparationanddapplicationinlower third/neck (WU, 2015);
- preliminary study of a combined protocol with fractional laser and low G' AH, with technical details (BERTOSSI *et al.*, 2019).

These studies were contextualized by reviews and anatomical studies focused on the neck/lower face and microbotox (BRANDT; BOKER, 2003; JABBOUR *et al.*, 2017; KAUR *et al.*, 2022; KASSIR *et al.*, 2023; YOUN *et al.*, 2022), by meta-analysis of intradermal BoNT-A (RAHMAN *et al.*, 2024), and by additional audited evidence focused on: quantitative skin aesthetic improvement (DIASPRO *et al.*, 2020), "lifting effect" (NG; LELLOUCH, 2022), oily skin (ROSE; GOLDBERG, 2013), and erythema in rosacea (YEH; SHIH; HUANG, 2025).

Consolidated technical parameters (preparation, density, grid, and safety)

Technical protocols were consolidated to allow for reproducible comparison and discussion of heterogeneity as recommended by microbotox reviews (KAUR *et al.*, 2022; KASSIR *et al.*, 2023).

To reduce inter-applicator variations and mitigate the risk of diffusion, standardized anatomical delimitation of the application field (platysma) and protection of critical areas (perioral region/DAO and proximity to the sternocleidomastoid) are recommended, a strategy consistent with the safety rationale described for the neck and lower face (BRANDT; BOKER, 2003; AWAIDA *et al.*, 2018; YOUN *et al.*, 2022). Figure 2 illustrates the marking performed by the author.

Figure 2 – Anatomical marking of intradermal microbotox in the anterior neck and lower third of the face, delimiting the area corresponding to the platysma and caution zones to reduce diffusion and functional events. **Source:** author's collection.

Skin quality domains and how they were reported/evaluated

The literature reviewed reports improvement in *skin quality* through different pathways: (i) direct improvement in texture/glow and smoothing of cervical crepiness; (ii) modulation of sweating/sebum and impact on shine/pores; and (iii) overall aesthetic improvement associated with reduced soft tissue ptosis and better conformation

Study	Toxin and preparation/ concentration	Adjuvant	Density/ microvolume	Grid / intervals	Needle and plane	Anatomical delimitation and safety points
(2015)	OnabotulinumtoxinA; standard via reconstituted with 2.5 mL; solution per syringe with 20–28 U/mL varying by cervical thickness	lidocaine added to the syringe	1 mL per side; 100–120 injections persyringe; sessions may exceed 200 injections	0.8–1.0 cm	30G or 32G intradermal/s; Superficial with tiny blanched weal and resistance	Zone corresponding to platysma; avoid depressor anguli oris (smile asymmetry) and sternocleidomastoid (cervical weakness)
AWAIDA et al. (2018	AbobotulinumtoxinA (Dysport) 500 U reconstituted to a final concentration of 70 U/mL; 2–3 syringes of 1 mL (70 U each) per patient according to neck size	Not specified	Approximately 150 injections in the anterior neck	Not specified	30G; superficial dermis; depth defined by whitish bleb and resistance	Area delimited by anatomical lines (mandible, DAO, ECM, clavicle) compatible with platysma extension
BERTOSSI et al. (2019)	OnabotulinumtoxinA (Vistabex); vial reconstituted in 1.25 mL; microbotox with 20 U in 1 mL; mixture in the syringe with 0.5 mL of the recommended dilution + 0.5 mL lidocaine 0.5%	Lidocaine 0.5%	80–100 injections per 1-inch syringe mL; ~0.01 mL per point	Not specified	30G or 32G; intradermal with "tiny blanched weal/ bleb" and resistance	Discussion emphasizes platysma as a relevant target in the lower face/neck and risk of diffusion with large drop/inadequate depth

of the skin envelope to the cervical/mandibular contour (WU, 2015; AWAIDA *et al.*, 2018; BERTOSSI *et al.*, 2019; RHO; GIL, 2021; RAHMAN *et al.*, 2024; KASSIR *et al.*, 2023; NG; LELLOUCH, 2022; DIASPRO *et al.*, 2020; ROSE; GOLDBERG, 2013; YEH; SHIH; HUANG, 2025).

Discussion

Why microbotox can improve the skin in the lower third of the face/neck

Microbotox was designed to produce an intradermal and superficial effect, weakening superficial fibers that pull the skin and modulating skin attachments associated with shine/oiliness and texture (WU, 2015; KAUR *et al.*, 2022; RHO; GIL, 2021). In the neck, Wu describes improvement in crepiness, skin bunching/creasing during platysma contraction, and improvement in the cervicomentonian contour through a mechanism called the "platysma effect," in which deep fibers remain active while superficial fibers are smoothed (WU, 2015).

In the crossover trial, the authors propose a convergent mechanism: microbotox would produce "skin tightening" by weakening the superficial fibers of the platysma, allowing the skin to better adapt to the cervical and lower face silhouette, with improvement in components such as jowls and neck volume (AWAIDA *et al.*, 2018). In parallel, the associated preliminary study reinforces the rationale for quality/tightness improvement in the combined protocol, with technical details relevant to reproducibility (BERTOSSI *et al.*, 2019). Additional audited literature reinforces that microbotulinum approaches have been evaluated with quantitative metrics of skin aesthetic improvement in clinical cases (DIASPRO *et al.*, 2020).

The immediate post-procedure period typically presents transient papules and mild erythema related to the intradermal nature and high density of microinjections, a finding compatible with the superficial technique and distinct from deep applications in the cervical musculature (WU, 2015; AWAIDA *et al.*, 2018). Figure 3 documents the immediate post-procedure period of the procedure performed by the author.

Figure 3 – Immediate post-treatment appearance after intradermal microbotox in the anterior neck/lower third, showing transient papules and mild erythema consistent with superficial application and high density of points. **Source:** author's collection.

Skin quality domain	Direct evidence in the lower third/neck	Interpretation (strengths and limitations)	Audited references that reinforce the domain
Texture/micro-relief and sheen	Technical and rational report; improvement in crepiness, skin bunching, and light reflection on the neck	High clinical applicability; limitation due to heterogeneous objective measurement	WU (2015); DIASPRO et al. (2020); RAHMAN et al. (2024)
Superficial horizontal lines and cervical irregularities	Clinical description with reduction of lines and associated banding; crossover suggests regional improvement in cervical components and ptosis	Good anatomical consistency; may reflect skin effect + superficial modulation of the platysma	AWAIDA et al. (2018); WU (2015); BRANDT; BOKER (2003)
Pores/sebum/oiliness	Rationale for targeting glands/adnexa; reviews and synthesis of intradermal support impact on sebum/pores	Strong evidence for the face; extrapolation to the neck should be conservative	ROSE; GOLDBERG (2013); RHO; GIL (2021); RAHMAN et al. (2024)
Uniformity/erythema (when applicable)	Domain applicable when there is a relevant inflammatory/vascular component	Relevant for "uniformity" as a component of skin quality; requires caution in generalizing to the neck	YEH; SHIH; HUANG (2025); KAUR et al. (2022)
Overall aesthetic evaluation/perceived "lifting effect"	Overall improvement may occur due to superficial refinement and adaptation of the skin envelope	Useful outcome when the gain is global; risk of scale heterogeneity	NG; LELLOUCH (2022); AWAIDA et al.
Safety (diffusion, dysphagia/dysphonia, asymmetry)	Crossover: absence of dysphagia/weakness with microbotox and mild event with deep technique; anatomy reinforces the need for safe zones	Consistent: safety is technique-dependent and anatomical	YOUN et al. (2022); BRANDT; BOKER (2003); AWAIDA et al. (2018)

Technical heterogeneity, type of toxin, and implications of "equivalence"

There is heterogeneity due to the use of different toxins (onabotulinumtoxinA vs. abobotulinumtoxinA) and the absence of a fixed ratio of universal clinical equivalence between products, impacting predictability, dose per area, and risk of diffusion (WU, 2015; AWAIDA *et al.*, 2018; KASSIR *et al.*, 2023). The crossover uses abobotulinumtoxinA in a specific concentration, while Wu describes variable concentrations per syringe according to cervical thickness, reinforcing that drop/depth error can lead to complications (WU, 2015; AWAIDA *et al.*, 2018). Bertossi details preparation with lidocaine and microvolumes, reinforcing the principle that large drops/deep planes increase the risk of unwanted effects (BERTOSSI *et al.*, 2019).

Furthermore, the systematic review on the "lifting effect" with micro botulinum toxin reinforces that the overall benefit reported in practice needs to be interpreted in light of heterogeneous protocols and variable study designs, supporting the importance of standardizing techniques and endpoints (NG; LELLOUCH, 2022).

Reproducibility in "publication mode": what can be standardized without becoming a prescription

The most robust and cross-sectional standardization among studies is:

1. Intradermal/superficial plane with clinical signs of bleb and resistance (WU, 2015; AWAIDA *et al.*, 2018; BERTOSSI *et al.*, 2019).
2. High density of points (multiple microinjections distributed throughout the area accompanying the platysma), avoiding concentrated bolus (WU, 2015; AWAIDA *et al.*, 2018).
3. Anatomical delimitation and protection of critical areas (perioral and sternocleidomastoid) to reduce asymmetry and cervical weakness (WU, 2015; AWAIDA *et al.*, 2018; YOUN *et al.*, 2022).

This set describes the technique rigorously, without transforming the text into a single prescriptive protocol, recognizing heterogeneity and the need for individualization by aging pattern (JABBOUR *et al.*, 2017; KASSIR *et al.*, 2023).

Patient selection: when skin quality is the primary target vs. adjuvant

The literature on the neck reinforces that the best candidates for toxin for cervical rejuvenation have specific patterns (hyperactivity of the platysma, preserved elasticity, defined aesthetic complaint) (BRANDT; BOKER, 2003; JABBOUR *et al.*, 2017). The crossover suggests that microbotox favors components of ptosis/cervical volume and lower face, while the deep technique improves platysmal bands more, indicating that the clinical target should guide the choice (AWAIDA et al., 2018).choice (AWAIDA *et al.*, 2018). Thus, for *skin quality* (texture/crepiness/sheen), microbotox is conceptually more coherent; for dominant platysmal bands, specific techniques may be necessary (AWAIDA *et al.*, 2018; BRANDT; BOKER, 2003; YOUN *et al.*, 2022).

Safety: why "flat and drop" determine risk

In the neck, events such as dysphagia, dysphonia, and cervical weakness are feared for their functional relevance; the risk increases with deep deposition and diffusion to non-target structures (BRANDT; BOKER, 2003; YOUN *et al.*, 2022). The crossover corroborates this rationale by reporting the absence of dysphagia/weakness with intradermal microbotox and the occurrence of mild dysphagia in the deep technique, reinforcing that superficiality and microdroplets can reduce relevant complications (AWAIDA *et al.*, 2018). Wu and Bertossi agree in emphasizing that complications arise mainly due to errors in droplet size and depth, with bleb/resistance being practical markers of safe execution (WU, 2015; BERTOSSI *et al.*, 2019). The anatomical study of the platysma reinforces that anatomical variations and relationships with cervical structures require a technique based on anatomy in the lower face/neck (YOUN *et al.*, 2022).

Integration of the new audited points into the skin quality domains

The inclusion of the four additional audited references strengthens the article on four fronts:

- Measurement/quantification of aesthetic skin improvement in clinical cases (DIASPRO *et al.*, 2020), aligning with the goal of reducing subjectivity in *skin quality*.
- Systematic synthesis of micro botulinum toxin with a focus on the "face-lifting effect," useful for discussing perceived overall improvement and protocol heterogeneity (NG; LELLOUCH, 2022).
- Specific evidence for oily skin with intradermal application, reinforcing the pores/sebum/oiliness domain as a relevant endpoint for *skin quality* (ROSE; GOLDBERG, 2013).
- Synthesized evidence for erythema in rosacea with intradermal toxin, supporting the domain "uniformity/erythema when applicable" as a formal component of *skin quality* (YEH; SHIH; HUANG, 2025).

Limitations

1. Heterogeneity of outcomes and lack of standardized objective measurement in the neck/lower face area limits direct comparability (WU, 2015; AWAIDA *et al.*, 2018; KAUR *et al.*, 2022; DIASPRO *et al.*, 2020).
2. The associated study (laser + microbotox + AH) is preliminary and combined, making it difficult to infer the isolated effect of microbotox on each *skin quality* domain (BERTOSSI *et al.*, 2019).
3. The specific basis for the lower third/neck with a controlled design is still limited, reinforcing the need for trials with objective metrics and standardization of protocols (AWAIDA *et al.*, 2018; RAHMAN *et al.*, 2024; KASSIR *et al.*, 2023; NG; LELLOUCH, 2022).

Conclusion

Intradermal/superficial microbotox is a technically dependent and anatomically sensitive approach with biological plausibility and clinical evidence to improve *skin quality* components in the lower third of the face and neck, particularly texture/sheen, smoothing of cervical crepiness, and overall improvement of the skin envelope when performed correctly (WU, 2015; AWAIDA *et al.*, 2018; BERTOSSI *et al.*, 2019; KASSIR *et al.*, 2023; DIASPRO *et al.*, 2020). Safety is favored by the intradermal plane, microvolumes, high density of points, and respect for critical anatomical areas, with support from classic literature on the neck and applied anatomy of the platysma (BRANDT; BOKER, 2003; YOUN *et al.*, 2022; AWAIDA *et al.*, 2018).

As a scientific agenda, the field requires standardization of instrumental outcomes for *skin quality* in the neck/lower face and comparative trials stratified by aging pattern, allowing for more accurate recommendations on when microbotox is the first line of treatment and when it should be part of a combined approach (JABBOUR *et al.*, 2017; RAHMAN *et al.*, 2024; KASSIR *et al.*, 2023; NG; LELLOUCH, 2022).

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