Estudios y Perspectivas Revista Científica y Académica
ISSN en línea 3005-2599, Julio - Septiembre 2026,
Volumen 6, Número 3.

DOI: https://doi.org/10.61384/r.c.a.v6i3

AMBYST TECHNIQUE: A STRUCTURED ANATOMICAL VECTOR-BASED APPROACH FOR NON-SURGICAL FACIAL LIFTING USING MICROFOCUSED ULTRASOUND—A 20-PATIENT CASE SERIES WITH 20-MONTH FOLLOW-UP

TÉCNICA AMBYST: UN ENFOQUE ESTRUCTURADO BASADO EN VECTORES ANATÓMICOS PARA EL LIFTING FACIAL NO QUIRÚRGICO MEDIANTE ULTRASONIDO MICROENFOCADO — SERIE DE CASOS DE 20 PACIENTES CON UN SEGUIMIENTO DE 20 MESES

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Educación y Ciencias Sociales

Estudios y Perspectivas
Revista Científica y Académica

Estudios y Perspectivas
Revista Científica Multidisciplinaria

DOI: https://doi.org/10.61384/r.c.a..v6i3.2075

Ambyst Technique: A Structured Anatomical Vector-Based Approach for Non-Surgical Facial Lifting Using Microfocused Ultrasound—A 20-Patient Case Series with 20-Month Follow-up

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ABSTRACT

This study aimed to describe the clinical outcomes and safety of the Ambyst Technique for non-surgical facial lifting using microfocused ultrasound. A longitudinal observational case series included 20 adults with mild-to-moderate facial laxity who underwent a single treatment session. All procedures were performed by the same physician using 4.5-mm and 3.0-mm transducers according to a standardized, anatomically guided, vector-based protocol. Clinical outcomes were assessed qualitatively by the treating physician through standardized photographs obtained at baseline and at 4 and 20 months. Treatment-related adverse events were recorded throughout follow-up. Twenty patients, comprising 17 women and 3 men aged 36–60 years, completed the 20-month follow-up. Photographic assessment identified visible improvement in facial contour and skin laxity in all patients at 4 months, which remained observable at 20 months. Adverse events were mild and transient, including procedural pain, edema, tenderness to palpation, and temporary paresthesia in three patients. No major or permanent complications were observed. These findings support the clinical feasibility of the Ambyst Technique but do not establish comparative efficacy. Prospective controlled studies using validated outcome measures and independent evaluators are required to assess its efficacy and reproducibility

***Keywords*:** ambyst technique; microfocused ultrasound; non-surgical facial lifting; facial rejuvenation; facial laxity; aesthetic medicine

Técnica Ambyst: Un Enfoque Estructurado Basado en Vectores Anatómicos para El Lifting Facial no Quirúrgico Mediante Ultrasonido Microenfocado — Serie De Casos de 20 Pacientes con un Seguimiento de 20 Meses

RESUMEN

Este estudio tuvo como objetivo describir los resultados clínicos y la seguridad de la técnica Ambyst para el lifting facial no quirúrgico mediante ultrasonido microenfocado. Se realizó una serie de casos observacional y longitudinal que incluyó a 20 adultos con flacidez facial de leve a moderada, sometidos a una única sesión de tratamiento. Todos los procedimientos fueron realizados por el mismo médico utilizando transductores de 4,5 mm y 3,0 mm, siguiendo un protocolo estandarizado, guiado anatómicamente y basado en vectores. Los resultados clínicos fueron evaluados cualitativamente por el médico tratante mediante fotografías estandarizadas tomadas al inicio y a los 4 y 20 meses. Se registraron los eventos adversos relacionados con el tratamiento durante todo el periodo de seguimiento. Veinte pacientes —17 mujeres y 3 hombres de entre 36 y 60 años— completaron el seguimiento de 20 meses. La evaluación fotográfica mostró una mejoría visible en el contorno facial y en la flacidez cutánea en todos los pacientes a los 4 meses, la cual persistió a los 20 meses. Los eventos adversos fueron leves y transitorios, e incluyeron dolor durante el procedimiento, edema, dolor a la palpación y parestesia temporal en tres pacientes. No se observaron complicaciones graves ni permanentes. Estos hallazgos respaldan la viabilidad clínica de la técnica Ambyst, pero no establecen su eficacia comparativa. Se requieren estudios prospectivos controlados que utilicen medidas de resultado validadas y evaluadores independientes para determinar su eficacia y reproducibilidad

Palabras clave: técnica Ambyst; ultrasonido microenfocado; lifting facial no quirúrgico; rejuvenecimiento facial; flacidez facial; medicina estética

Recibido: 12- mayo-2026 / Aprobado: 07-septiembre-2026

INTRODUCTION

Facial aging is a multifactorial process involving progressive changes in the skin, subcutaneous tissue, superficial musculoaponeurotic system (SMAS), retaining ligaments, fat compartments, and facial skeleton. The interaction of these changes contributes to tissue descent, skin laxity, and loss of facial contour definition (Coleman & Grover, 2006; Mendelson & Wong, 2012; Rohrich & Pessa, 2007). The organization of facial layers, spaces, and ligamentous attachments also influences the distribution and mobility of the soft tissues affected by aging (Mendelson & Jacobson, 2008).

As demand for minimally invasive facial rejuvenation has increased, microfocused ultrasound (MFU) has become an option for treating mild-to-moderate facial laxity with limited recovery time. Clinical studies have reported improvements in facial and neck skin tightening, generally accompanied by transient adverse events (Alam et al., 2010; Suh et al., 2011). Recent evidence syntheses also support the clinical usefulness of MFU while recognizing variability in treatment response and the methodological limitations of the available studies (Amiri et al., 2025; Ling & Zhao, 2023).

Microfocused ultrasound produces thermal coagulation points at selected tissue depths, stimulating collagen remodeling, neocollagenesis, and progressive tissue contraction. The depth and distribution of energy depend on the transducer, treatment pattern, number of lines, and anatomical characteristics of the treated area (Alam et al., 2010; Fabi, 2015). These factors make treatment planning relevant to both clinical outcomes and patient safety.

Published protocols differ in patient selection, energy settings, number of treatment lines, anatomical targeting, vector orientation, and outcome assessment. Such heterogeneity limits comparisons across studies and prevents the definition of a single optimal protocol (Amiri et al., 2025; Contini et al., 2023; Ling & Zhao, 2023). Expert recommendations therefore emphasize individualized anatomical assessment and structured treatment planning rather than uniform application based solely on operator preference (Park et al., 2021).

The Ambyst Technique was developed as an anatomically guided, vector-based protocol intended to standardize treatment planning and energy delivery according to facial support structures.

A preliminary case report documented its technical feasibility and described sustained clinical improvement after 20 months; however, those findings were limited to one patient (Coronado García, 2026). Evaluation in a larger descriptive series is therefore necessary to characterize the clinical outcomes and adverse events observed with this protocol.

Objective

To describe the clinical outcomes and safety of the Ambyst Technique for non-surgical facial lifting using microfocused ultrasound in a consecutive series of 20 patients followed for 20 months.

MATERIALS AND METHODS

Study Design and Setting

This observational, descriptive, longitudinal, single-arm case series evaluated the clinical outcomes and safety of the Ambyst Technique for non-surgical facial lifting using microfocused ultrasound. The methodological description was structured according to recommendations for the transparent reporting of observational studies and uncontrolled case series (Kempen, 2011; Murad et al., 2018; von Elm et al., 2007).

The study was conducted at a private aesthetic center in Mexico City, Mexico. Patients were consecutively enrolled during 2024 and followed for up to 20 months, with the final assessment completed in 2026.

Study Population

The analyzed series comprised 20 adults with mild-to-moderate facial laxity who received a single treatment session and completed the planned clinical follow-up.

The inclusion criteria were:

- Age ≥18 years.
- Mild-to-moderate facial laxity.
- Treatment with a single Ambyst Technique session.
- Availability of standardized photographs obtained at baseline and during follow-up.

- Written informed consent for treatment and scientific publication of clinical information and photographs.

Patients were excluded when clinical follow-up was incomplete, photographic documentation was insufficient, or additional aesthetic procedures involving the midface or lower face were performed during follow-up.

Treatment Protocol

All procedures were performed by the same physician using the Ultherapy® microfocused ultrasound system. The protocol combined conventional treatment lines with lines distributed according to the anatomical vectors of the Ambyst Technique. Both components were applied bilaterally during the same session; therefore, they did not constitute separate treatment groups or a split-face comparison. The Ambyst vectors followed predefined anatomical landmarks and facial support structures, as previously described (Coronado García, 2026).

At a depth of 4.5 mm, 120 conventional lines and 120 Ambyst-oriented lines were delivered to each side of the face, totaling 240 lines per side, at an energy setting of 0.90 J per line. At a depth of 3.0 mm, each side received 100 conventional lines and 100 Ambyst-oriented lines, totaling 200 lines per side, at 0.30 J per line.

Clinical Outcomes and Follow-up

Clinical photographs were obtained at baseline and at 4 and 20 months after treatment. Patient positioning, lighting, camera settings, photographic projections, and background conditions were kept consistent because photographic standardization is essential for reducing variability in longitudinal aesthetic assessments (Persichetti et al., 2007).

Clinical outcomes were evaluated qualitatively by comparing baseline and follow-up photographs for visible changes in facial contour, jawline definition, and skin laxity. All evaluations were performed by the treating physician. No validated grading scale, quantitative image analysis, or blinded independent evaluator was used.

Seven patients received botulinum toxin injections exclusively in the upper third of the face beginning six months after MFU treatment as part of their routine aesthetic management. No additional procedures involving the midface or lower face were performed during follow-up.

Safety Assessment

Treatment-related adverse events were recorded throughout follow-up. The assessed events included procedural pain, edema, paresthesia, burns, nerve injury, motor impairment, infection, scarring, pigmentary changes, and permanent complications.

Ethical Considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (World Medical Association, 2025). All participants provided written informed consent for treatment, clinical follow-up, photographic documentation, and publication of their clinical information and potentially identifiable images. The confidentiality of nonpublic participant information was maintained throughout the study.

Before submission, the authors must insert the name of the ethics committee, approval or exemption number, and approval date. This information cannot be omitted or reconstructed without documentary evidence.

Statistical Analysis

Descriptive statistics were used to summarize demographic, treatment, safety, and follow-up data. Continuous variables were presented as ranges, and categorical variables as frequencies and percentages. Because this was an uncontrolled descriptive case series, no inferential or comparative statistical analyses were conducted. The findings were interpreted as clinical observations and not as estimates of comparative efficacy.

RESULTS

Patient Characteristics

The study included 20 patients: 17 women (85%) and 3 men (15%), aged 36–60 years. All participants had mild-to-moderate facial laxity and underwent a single treatment session using the combined

conventional and Ambyst vector-based protocol. All patients completed the 20-month follow-up without protocol deviations or treatment discontinuation. Their demographic and clinical characteristics are presented in Table 1.

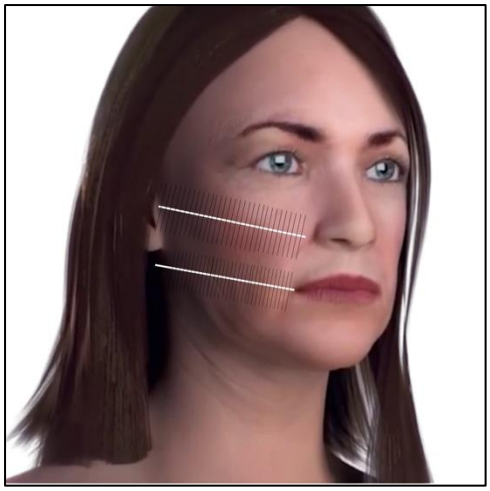
Table 1. Demographic and Clinical Characteristics of the Study Population

Variable	**Result**
Patients, n	20
Age, years (range)	36–60
Women, n (%)	17 (85%)
Men, n (%)	3 (15%)
Treatment sessions per patient, n	1
Follow-up duration	20 months
Patients completing follow-up, n (%)	20 (100%)
Patients receiving botulinum toxin in the upper facial third during follow-up, n (%)	7 (35%)
Additional midface or lower-face procedures, n (%)	0 (0%)

Note. Botulinum toxin injections were initiated at least six months after microfocused ultrasound treatment and were limited to the upper facial third.
Source. Prepared by the authors from the participants' clinical records.

Clinical Outcomes

Figure 1. Standardized anatomical vector design of the Ambyst Technique



Nota: Autoría Propia

Figure 2. Frontal view of a patient treated with the Ambyst Technique. Standardized clinical photographs obtained before treatment (left) and at the 20-month follow-up (right)

Nota: Autoría Propia

Figure 3. Clinical evolution of a patient treated with the Ambyst Technique. Standardized clinical photographs obtained before treatment, at 4 months, and at the 20-month follow-up

Nota: Autoría Propia

Figure 4. Right oblique view of a patient treated with the Ambyst Technique. Standardized clinical photographs obtained before treatment (left) and at the 20-month follow-up (right)

Nota: Autoría Propia

Figure 5. Representative clinical outcome of a male patient treated with the Ambyst Technique. Standardized frontal photographs obtained before treatment (left) and at the 20-month follow-up (right), demonstrating improvement in facial contour and reduction of facial laxity

Nota: Autoría Propia

At the 4-month assessment, the treating physician identified visible improvement in facial contour and skin laxity in all 20 patients through qualitative comparison with baseline photographs. These changes remained visible at the 20-month assessment. Because no validated clinical scale, quantitative image analysis, or blinded independent evaluation was used, the findings represent qualitative clinical observations rather than quantified estimates of treatment efficacy.

Seven patients (35%) received botulinum toxin injections exclusively in the upper facial third beginning six months after treatment as part of their routine aesthetic care. No additional procedures involving the midface or lower face were performed during follow-up.

Representative clinical outcomes are shown in Figures 2–5.

Safety Outcomes

No patient discontinued treatment because of an adverse event. All recorded treatment-related events were mild and self-limited.

All patients reported mild procedural pain, predominantly in the midface and lower face, which resolved immediately after treatment. Mild edema occurred in all participants and subsided within 24–72 hours. Twelve patients (60%) experienced tenderness to palpation in the midface or lower face, and three (15%) developed mild transient paresthesia. Both events resolved spontaneously within two weeks without pharmacological treatment.

No burns, nerve injuries, motor deficits, infections, scarring, pigmentary changes, or permanent adverse events were recorded during the 20-month follow-up (Table 2).

Table 2. Treatment-Related Adverse Events During and After Microfocused Ultrasound Treatment

Adverse event	**n (%)**	**Clinical course**
Mild procedural pain	20 (100%)	Resolved immediately after treatment
Mild edema	20 (100%)	Resolved within 24–72 hours
Tenderness to palpation	12 (60%)	Resolved within 2 weeks without medication
Mild transient paresthesia	3 (15%)	Resolved within 2 weeks without medication
Burns	0 (0%)	Not observed
Nerve injury	0 (0%)	Not observed
Motor deficits	0 (0%)	Not observed
Infection	0 (0%)	Not observed
Scarring	0 (0%)	Not observed
Pigmentary changes	0 (0%)	Not observed
Permanent adverse events	0 (0%)	Not observed

Note. Tenderness to palpation predominantly involved the midface and lower face. **Source**. Prepared by the authors from prospectively recorded safety data.

DISCUSSION

This study examined the clinical outcomes and safety of the Ambyst Technique, an anatomically guided, vector-based protocol for non-surgical facial lifting with microfocused ultrasound, in 20 patients followed for 20 months. Qualitative photographic assessment by the treating physician identified improvement in facial contour and skin laxity in all participants at 4 months, with visible

changes maintained at the final assessment. The recorded adverse events were mild and transient, and no permanent complications were observed.

These findings are consistent with previous studies reporting improvement in mild-to-moderate facial and neck laxity after focused ultrasound treatment (Alam et al., 2010; Aşiran Serdar et al., 2020; Friedman et al., 2020). Focused ultrasound creates thermal coagulation points at predetermined tissue depths while preserving the epidermal surface. The resulting collagen denaturation and remodeling can produce gradual tissue contraction and changes in facial contour (Kerscher et al., 2019; White et al., 2007). Nevertheless, the absence of quantitative measurements in the present series prevents determination of the magnitude of improvement.

The persistence of visible changes at 20 months is clinically relevant because many published studies have reported shorter observation periods. Werschler and Werschler (2016) documented improvement for up to one year following a customized vectoring protocol. The longer follow-up in the present series extends the period of clinical observation, but it does not establish that the treatment effect remained unchanged throughout those 20 months. Assessments were conducted only at baseline, 4 months, and 20 months, so variations between those time points could not be evaluated.

Published evidence also shows substantial variation in treatment depth, number of lines, energy settings, vector orientation, patient selection, and outcome assessment (Contini et al., 2023). The Ambyst Technique seeks to reduce part of this variability through predefined anatomical landmarks and treatment vectors. All procedures in this series were performed by one physician using the same protocol, which limited interoperator variation. These observations support the technical feasibility of the protocol but do not establish its superiority over conventional treatment because both conventional and Ambyst-oriented lines were administered during the same session and no control group was included.

The safety findings agree with reports describing pain, edema, tenderness, erythema, and transient sensory changes as recognized adverse effects of focused ultrasound treatment (Aşiran Serdar et al.,

2020; Kerscher et al., 2019; Suh et al., 2011). In the present series, pain and edema occurred in all patients, tenderness in 60%, and transient paresthesia in 15%. All events resolved spontaneously, and no burns, motor deficits, nerve injuries, infections, scarring, pigmentary changes, or permanent adverse events were recorded. Although this pattern suggests acceptable tolerability within the observed group, a sample of 20 patients is insufficient to identify uncommon complications.

The study's 20-month follow-up, complete participant retention, standardized photographic conditions, and consistent application by a single physician strengthen the description of the cases. Its main limitations are the small sample, single-center design, lack of a comparison group, and assessment by the treating physician without blinding, a validated scale, patient-reported outcomes, or quantitative image analysis. Previous studies have used independent evaluators and three-dimensional imaging to reduce subjective interpretation and quantify changes in facial position and contour (Friedman et al., 2020; Lu et al., 2017). Their inclusion would improve the reproducibility of subsequent evaluations of the Ambyst Technique.

Botulinum toxin injections administered to seven patients after six months were limited to the upper facial third, while the principal outcomes included facial contour, jawline definition, and lower-face laxity. This distribution reduces the likelihood of direct interference with the lower-face assessment, but its possible influence on the overall photographic appearance cannot be excluded. Selection bias also remains possible because the analysis included patients who completed the required follow-up and had adequate photographic records.

The findings should therefore be interpreted as preliminary evidence of feasibility, clinical persistence, and safety rather than proof of comparative efficacy. Larger prospective studies should incorporate a conventional-treatment control group, blinded independent evaluators, validated aesthetic scales, patient-reported outcomes, and objective photographic or three-dimensional measurements. Such designs would clarify whether anatomical vector planning provides measurable advantages over conventional microfocused ultrasound protocols.

CONCLUSIONS

In this 20-patient case series, qualitative assessment by the treating physician identified visible improvement in facial contour and skin laxity at 4 months after a single treatment session with the combined conventional and Ambyst vector-based protocol. These changes remained visible at the 20-month assessment. The observed pattern is consistent with clinical studies reporting improvement in facial or neck laxity after focused ultrasound treatment (Ayatollahi et al., 2020; Azuelos et al., 2019; Lee et al., 2012; Oni et al., 2014).

The procedure showed acceptable tolerability within the study population. Recorded adverse events were mild and transient, and no burns, nerve injuries, motor deficits, infections, scarring, pigmentary changes, or permanent complications were observed. Similar safety outcomes have been reported in controlled and observational studies of microfocused ultrasound (Alhaddad et al., 2019; Ayatollahi et al., 2020).

These findings support the clinical feasibility of the Ambyst Technique but do not establish its efficacy or superiority over conventional protocols. The small sample, absence of a control group, combined application of conventional and Ambyst-oriented lines, and lack of blinded or quantitative assessment limit causal interpretation and generalizability. Larger prospective controlled studies using validated scales, independent evaluators, patient-reported outcomes, and objective imaging are required to determine the efficacy, reproducibility, and long-term performance of the technique.

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