

Korean Medicine Subcision Therapies in Scar Treatment: A Retrospective, Multicenter Study at Network Clinics

Jungsang Kim^{1,2,*}, Ju-Hyun Lee^{3,*}, Dongbin Jeong⁴, Taekyung Lim⁴, Sangwoo Jung⁴, Kwongil Paeng⁴, Sangyoup Lee⁴, Hyunki Cho⁴, Seungyoup Lee⁴, Ikdu Kim⁴, Byungsoo Kang^{5,6}, Jae Hyo Kim⁷, Hongmin Chu⁸, Museok Hong⁴

¹Department of Preventive Medicine, College of Korean Medicine, Kyung Hee University, Seoul, Republic of Korea; ²Daeat Korean Medicine Clinic, Suwon, Kyunggi-do, Republic of Korea; ³Department of Medical Support, Imsil-Gun Medical Center, Imsil, Jeollabuk-do, Republic of Korea; ⁴Rodam Korean Medical Clinic Network, Seoul, Republic of Korea; ⁵Daeat Korean Medicine Hospital, Seoul, Republic of Korea; ⁶Gachon University, Seongnam-si, Gyeonggi-do, Republic of Korea; ⁷Department of Meridian & Acupoint, College of Korean Medicine, Wonkwang University, Iksan-si, Jeollabuk-do, Republic of Korea; ⁸Korean Medicine Convergence Research Information Center for Stroke, College of Korean Medicine, Wonkwang University, Gwangju, Republic of Korea

*These authors contributed equally to this work

Correspondence: Hongmin Chu, Korean Medicine Convergence Research Information Center for Stroke, College of Korean Medicine, Wonkwang University, Hyejaero 1140-23, Republic of Korea, Email hongminchu2@gmail.com; Museok Hong, Department of Korean Internal Medicine, College of Korean Medicine, Wonkwang University, 460, Iksan-daero, Iksan-si, Jeollabuk-do, Republic of Korea, Email hongbar21@hanmail.net

Purpose: This study is a retrospective, multicenter research designed to report the efficacy of Korean medicine subcision therapies in scar treatment.

Patients and Methods: Charts and photographs of 29 patients who received subcision treatment between May 2016 and June 2020 in four scar treatment network clinics were analyzed. The Qualitative Global Acne Scarring Grade System (QGASC) and the Stony Brook Scar Evaluation Scale (SBSSES) were used to objectively measure scar scores.

Results: Except for 4 patients whose GASGS and SBSSES scores remained unchanged, most patients' scars showed improvement from Visit 2 to about Visit 8. Furthermore, the degree of change for both scales was found to be statistically significant.

Conclusion: Subcision therapy using acupuncture has been found to be an effective treatment for scar, with statistically significant improvements in patients' SBSSES and QGASC scores.

Keywords: scar, Korean medicine, subcision, acupuncture

Introduction

Scars represent the physical changes in the skin barrier that occur during the wound healing process.¹ Wound healing comprises three primary stages: Inflammation, Proliferation (Tissue Formation), and Maturation (Tissue Remodeling). Particularly, scars develop during the Maturation stage, in conjunction with the phenomenon of matrix remodeling.^{2,3} Various substances within the body, such as macrophages, lymphocytes, mast cells, and growth hormones, are known to be involved in scar formation. Scar formation is a physiological phenomenon that occurs during wound healing process. However, if the wound healing process does not work properly, pathological scars that cause cosmetic and functional problems may occur.⁴ Pathological scars can be classified into contractures, extended scars, atrophic scars, hypertrophic scars, and keloid scars.^{3,5}

Existing prevention and treatment methods for pathological scars include the use of NSAIDs (Nonsteroidal Anti-inflammatory Drugs), gene therapy, Bleomycin, 5-FU (5-Fluorouracil), topical and intralesional steroids, laser therapy, silicone gel sheeting, pressure dressing, and radiation therapy.⁶ Surgical treatments that have been reported to be effective

include mechanical dermabrasion, chemical peeling, excision with linear closure, excision with grafting, full-thickness skin grafting, z-plasty, w-plasty, and flap coverage.^{1,6}

However, existing treatments for pathological scars, such as steroids, lasers, and peeling, can lead to side effects like erythema, ecchymosis, vesicles, crusts, hypo-pigmentation, skin atrophy, telangiectasia, pain, and dry skin due to epidermal damage or immune system disruption.^{7,8} Furthermore, there is a growing demand for less invasive but effective interventions for scars.⁹ Treatments for pathological scars are primarily used for cosmetic purposes but also play a significant role in improving patients' quality of life by rejuvenating and remodeling scarred skin, highlighting the importance of scar management.¹⁰

In traditional East Asian medicine, acupuncture is frequently used for pathological scar treatment.¹¹ Acupuncture subcision stimulation promotes wound healing and scar recovery, addressing scar pain and other related symptoms.^{12,13} In the field of Korean Medicine (KM), techniques such as subcision, KORA therapy, microneedle therapy system (MTS), transtherapy, and skin impediment therapy are used alone or in combination, or alongside pharmacopuncture.¹⁴ While subcision focuses on the detachment of adhesions beneath the scar, KORA therapy not only performs this detachment but also stimulates the area using cross/rotational acupuncture, creating an environment that promotes the formation of new skin tissue. Among these, subcision are being used concurrently for pathological scar treatment at certain clinics, often in combination for enhanced efficacy, with studies suggesting that the combined use of these treatments is more effective than using either treatment alone.^{15–19} These methods are being utilized from Asia and the Middle East to the United States. As a result, subcision are being presented as useful alternatives to conventional treatments.²⁰

Despite the existence of numerous case reports suggesting the effectiveness of Subcision in pathological scar treatment, there is a notable scarcity of research detailing the specific methodologies and follow-up processes associated with these procedures.

In this study, we aim to retrospectively collect and report the outcomes of pathological scar treatments utilizing Subcision, gathered from multiple Korean Medicine Clinics within Korea through a standardized protocol.

Patients and Methods

Study Design

We conducted our study on patient charts from four scar treatment network clinics (Rodam Korean Medicine clinic Gangnam branch, Hong-ik University branch, Cheonan branch, Suwon branch), focusing on patients treated between May 2016 and June 2020, who underwent treatment at least twice, with each session documented by photographs taken using the same method. If a patient's visits spanned more than six months, they were not considered to have received continuous treatment and were excluded from the analysis. However, if a patient received a single treatment and then underwent two or more treatments within one month after a period of six months, their data were included in the analysis from that point onwards.

Subcision Protocol

The Subcision protocol, also known as KORA therapy, involves the incision of subdermal fibrous tissue caused by scars through multidirectional stimulation using a special needle. By crossing the scar underneath from various angles with the incision needle, it stimulates the damaged cells, creates space in areas where the epidermal layer and subcutaneous tissue have adhered too closely, and breaks up the incorrectly bonded collagen layers to allow for new tissue formation. The procedure is carried out at intervals of 2–3 weeks, with a typical course consisting of 6–10 sessions.

The procedure is conducted with the practitioner illuminating the treatment area with strong lighting from above and behind the head of practitioner to clearly observe the size and location of the scar. The practitioner uses an assistant hand to lift the near area around the scar and a dominant hand to incise the subcutaneous tissue of the scar site. (Figure 1). The specific procedural steps are illustrated in Figure 2

Measurement

We utilized the Qualitative Global Acne Scarring Grade System (QGASC) and the Stony Brook Scar Evaluation Scale (SBSES) to objectively measure scar scores through photographs. While there are various scales for assessing scars, such

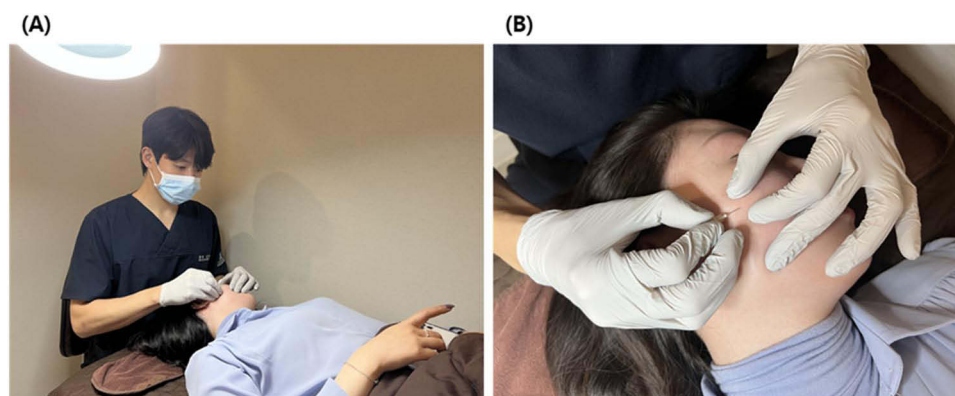


Figure 1 Overview of the Procedure Scene and a Close-up Photo (A) The posture of the practitioner and the position of the lighting (B) The hand movements of the practitioner and the direction of the needle.

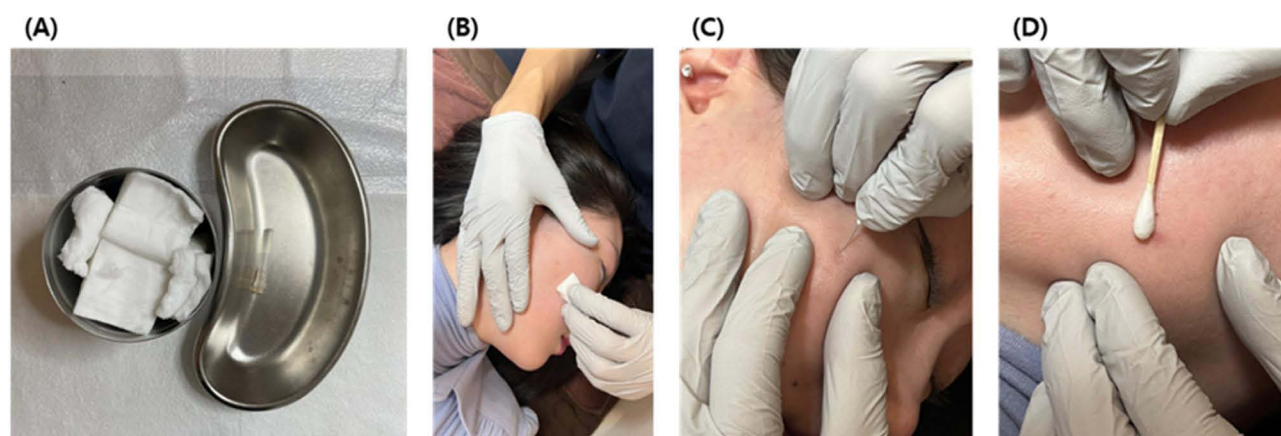


Figure 2 Preparation and Procedure of the Treatment (A) Prepare alcohol disinfectant gauze and a needle for the procedure. (B) Disinfect the treatment area. (C) Proceed with the subcision of the treatment area. (D) If there is bleeding in the treatment area, wipe it off with a disinfected cotton swab.

as the Vancouver Scar Scale and the Manchester Scar Scale, these are often designed for evaluating a wide range of scars resulting from trauma, surgery, or pressure ulcers. Given the need for tools that focus on photographic evaluation, QGASC and SBSSES were deemed appropriate for this study's assessment purposes.²¹

QGASC is a scale that categorizes the condition of patients into four levels according to acne scar severity, making it one of the most widely used scales for evaluating scars caused by acne and similar conditions. Flat scars with erythematous, hyperpigmented, or hypopigmented changes are classified as grade 1. Mild scars with shallow indentations or low elevations are grade 2. Moderate scars with somewhat deeper indentations and higher elevations are grade 3. Severe scars with significant indentations and elevations are diagnosed as grade 4.^{22,23}

SBSSES employs a five-item, observer-reported methodology for the photographic assessment of linear scars. This includes measurements of width, height, pigmentation, presence of hatch or suture marks, and the general visual impression. Each category is allocated a score of either 0 or 1, with the aggregate score ranging from 0 (indicating the least favorable outcome) to 5 (representing the most favorable outcome).^{24,25}

Evaluations using QGASC and SBSSES were primarily conducted by researchers who are Korean Medicine doctors specializing in Otolaryngology, Dermatology, and Ophthalmology, all with a major in dermatology from a University Hospital of Korean Medicine. The assessments were finalized under the verification of one Korean Internal Medicine specialist.

Results

Among a total of 22,415 patients, the analysis was conducted on 29 patients whose photographs were taken under the same conditions for each treatment and whose visit intervals were less than six months. Additionally, cases where both

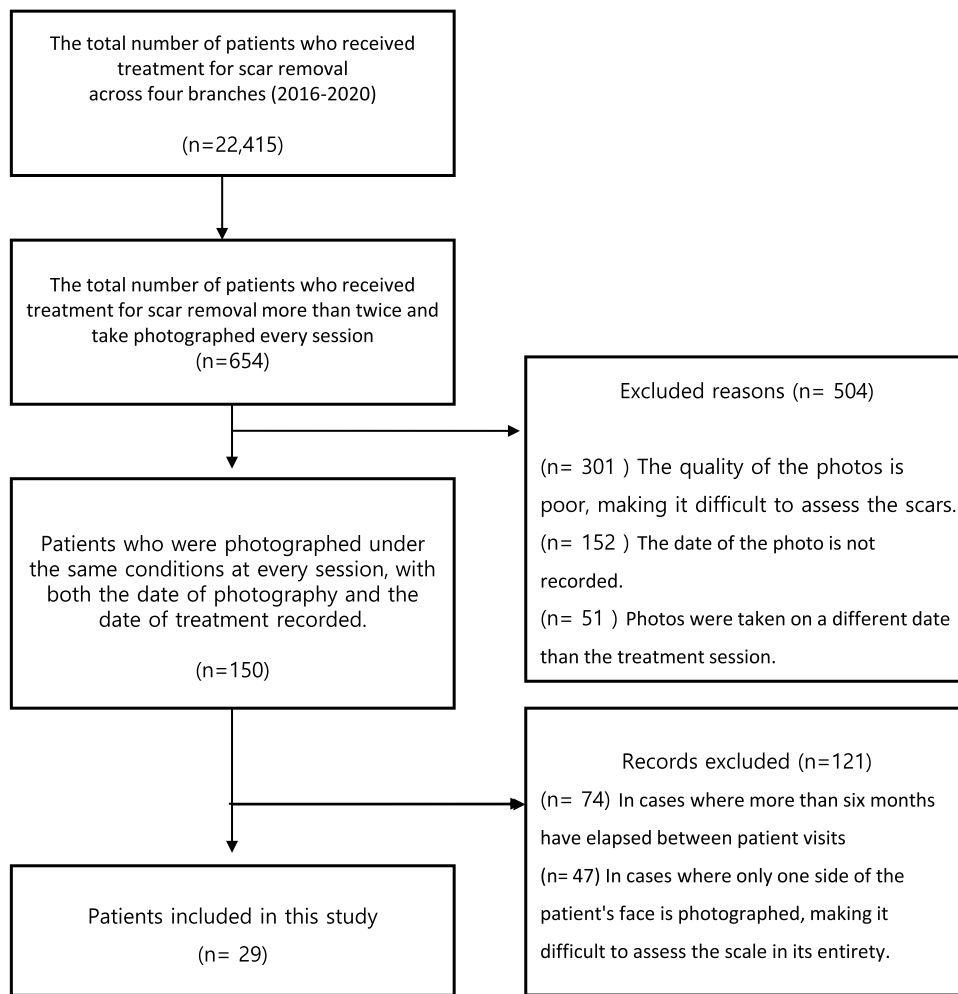


Figure 3 Flowchart of This Study.

sides of the patient’s face were not photographed, making it impossible to conduct evaluations with GASGS and SBSES, were excluded. The flowchart of the research is shown in [Figure 3](#). All scars treated with KORA therapy were atrophic scars, and the procedure can be performed on indented areas regardless of pigmentation.

The patients’ demographic information is presented in [Table 1](#); while the changes in the average scores and standard deviations of GASGS and SBSES from the first to the last visit of the included patients are displayed in [Table 2](#). For

Table 1 Demographic Data

	Total
Number (n, %)	29 (100%)
Gender	29 (100%)
Men	13 (44.80%)
Women	16 (55.20%)
Age	
10–19	0
20–29	11
30–39	10
40–49	6
50–59	2
Over 60	0
Average	34.69±9.37

Table 2 Comparison of GASGS and SBSES from First to Final Visit

	1st visit	Final Visit	P-value
GASGS Mean (SD)	3.14 (0.68)	1.86 (0.90)	<0.01**
SBSES Mean (SD)	1.90 (0.84)	3.14 (0.90)	<0.01**

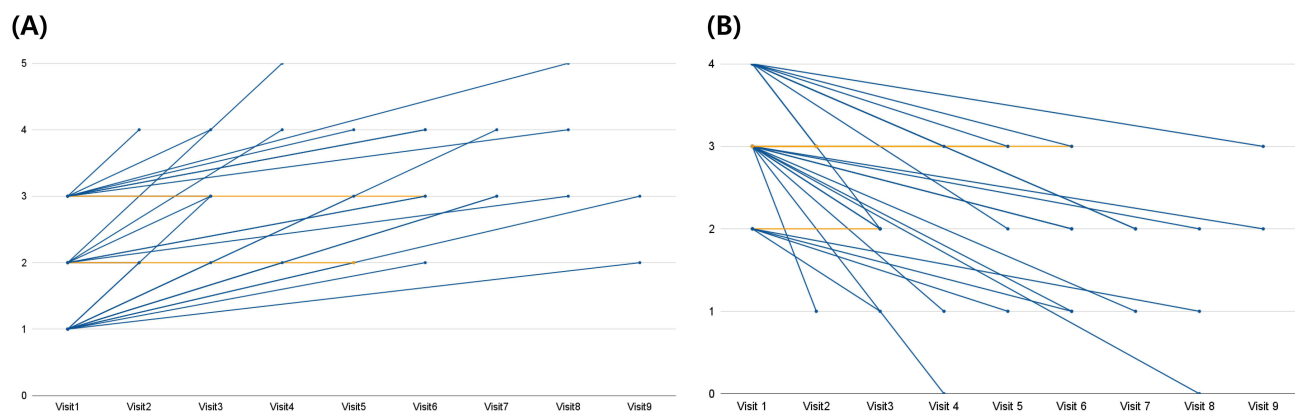
GASGS, a lower score indicates improvement in scar severity, while for SBSES, a higher score signifies improvement. Except for 2 patients whose GASGS scores remained unchanged and 2 patients whose SBSES scores remained unchanged, most patients showed improvement in their scars from Visit 2 to about Visit 8. Furthermore, the degree of change was statistically significant for both scales. The graph showing the score changes for all patients is displayed in [Figure 4](#). Number of visits and treatment times are reported in [Supplements 1](#) and [2](#). Furthermore, no side effect was reported. [Figures 5](#) and [6](#) present actual cases of improvement.

Discussion

The wound healing process is a common physiological phenomenon that occurs in all living things. However, due to genetic, physical, and environmental factors, many scars do not heal properly and become pathological. Pathological scars can appear in various forms such as hypertrophic scars, atrophic scars, and keloid scars, and usually require appropriate treatment for complete healing and recovery.^{3,5,26}

Pathological scar treatment is not only cosmetically important but also affects the pain and contracture of the adjacent skin due to scars, as well as potentially leading to depression in patients, and significantly impacting their quality of life. Despite this, current widely used pathological scar treatment methods such as dermabrasion, skin grafting, and steroid injections continue to face issues like redness, erythema, swelling, and hyperpigmentation. Among non-pharmacological scar treatment options, subcision stand out as representative methods. These approaches have been documented in traditional East Asian medicine and are utilized in modern practices as well.

Subcision are synergistic techniques enhancing pathological scar treatment through distinct but complementary mechanisms. Subcision, targeting the structural aspects of scars, especially those anchored by fibrotic strands, releases tension, allowing scars to elevate.^{27,28} Subcision operates by severing fibrous septal bands within the subcutaneous tissue, thereby releasing the reticular dermis from tethering and facilitating the deposition of new collagen fibers. This mechanism promotes an enhanced healing response, directly contributing to an improved skin texture and a smoother topography.²⁹ Similarly, microneedling promotes skin regeneration by causing micro-injuries that trigger fibroblast stimulation, leading to neocollagenesis and neolastinogenesis.^{30,31} This process thickens the dermis, smoothing out

**Figure 4** Result of Scar treatment. (A) SBSES (B) QGASC.

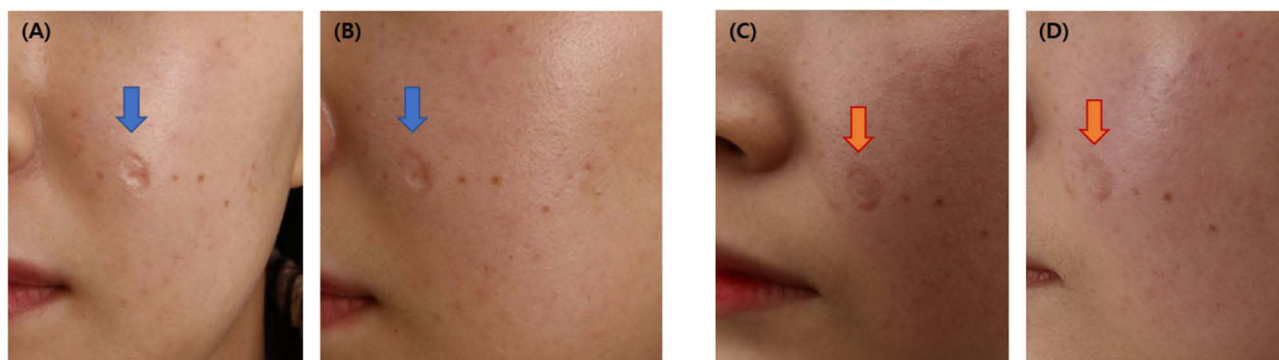


Figure 5 Example of Scar treatment. (A) Before treatment Anterior view (B) Before treatment Antero-lateral view (C) After 5-month six treatment, Anterior-lateral view. (D) After 5-month six treatment, Lateral view.

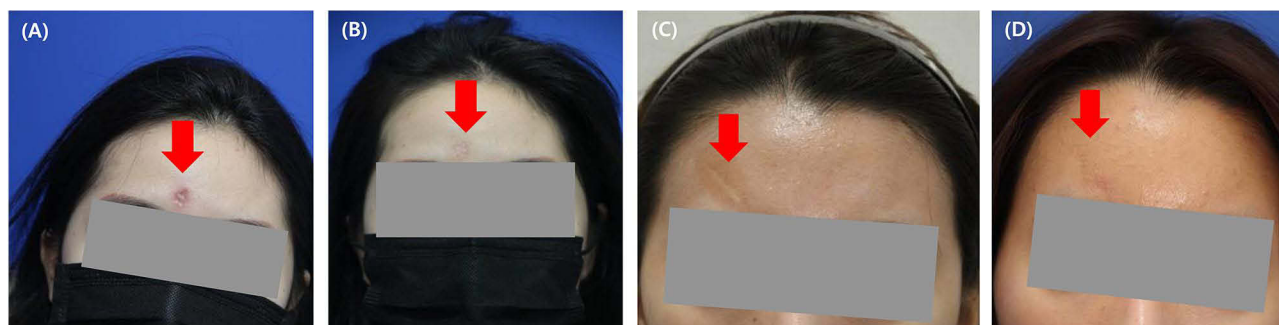


Figure 6 Another Example of Scar treatment. (A) Before treatment Anterior view (B) After 6-month six treatment, Anterior view. (C) Before treatment Anterior view (D) After 9-month 9th treatment, Anterior View.

scars by filling in atrophic areas, and initiates angiogenesis to improve blood flow and nutrient delivery, crucial for healing.³²

These techniques complement each other; microneedling addresses surface-level improvements and biochemical enhancements, while subcision rectifies deeper structural issues. Their combined use offers a holistic approach to scar management, tailored to individual scar characteristics, promising optimal patient outcomes.

Especially, these treatment methods are more affordable compared to other pathological scar treatments, more suitable for the skin characteristics of Asians, and have the advantage of being non-pharmacological.^{33,34} Dry needling is a traditional treatment used to improve scar mobility and decrease pain. Classically, the method is to encircle the lesion area with needles. The exact mechanism of dry needling is still unclear, however it is presumed to suppress local inflammation, reduce scar hyperproliferation, induce collagen formation, and stimulate reepithelialization of skin tissue.³⁵

Lubczyńska et al³⁵ reported that after dry needling treatment, scar symptoms such as pain, pigmentation, flexibility, itching, scar elasticity, thickness, regularity, and color were significantly improved. Fang et al³⁶ reported that pain caused by a 3-month-old surgical scar was effectively relieved after the traditional acupuncture treatment. Lee et al³⁷ also reported that the severity of pathological acne scars was significantly improved by using scar regeneration acupuncture and micro-needle therapy. Kim et al³⁸ who also used micro-needle therapy and subcision combined with bee venom pharmacopuncture therapy, reported that the pathological acne scars of 27 patients were significantly improved.

Although there are various case reports in Korea of pathological scar treatment using acupuncture-based subcision, there is a lack of research evaluating the outcomes using the same treatment protocol across multiple institutions with photographic or other quantitative measures. In response, our research team retrospectively collected medical records from network clinics that utilize the same subcision protocol (KORA therapy) and evaluated the photo-based results under the scrutiny of specialists, analyzing the outcomes.

This study analyzed the charts of 29 patients with pathological scars who applied subcision treatment. As a result, it was confirmed that the patients' GASGS scores decreased from 3.14 to 1.86 ($P < 0.01$), and their SBSES scores increased from 1.90 to 3.14. ($P < 0.01$). This result suggests that subcision may be an excellent alternative treatment for patients with pathological scars.

The potential significance of this study is in exploring the possibility through the collection and analysis of data from multicenter applications of a consistent protocol for pathological scar treatment using subcision techniques. Additionally, it demonstrates the potential for non-pharmacological and minimally invasive methods in pathological scar treatment. The significance of this study lies in its affirmation of the potential benefits of scar treatment.

However, this research has several methodological limitations. First, due to its retrospective design, a significant amount of data was excluded based on exclusion criteria, highlighting the need for future studies with more precise methodologies to thoroughly evaluate pathological scar treatment effectiveness. Also, the absence of a control group means the comparative effectiveness of subcision over other interventions for scar treatment remains unclear. Additionally, the QGASC, which is linked to quality of life, indicates that a score of 0 does not signify complete scar removal but rather an improvement. This suggests improvements in quality of life, not necessarily the total elimination of scars. Histopathological examination will also be needed. Also, as a retrospective study without controlled visit schedules and periods, determining the optimal frequency and timing of treatments for the best outcomes suggests the need for prospective research. Due to the limitations inherent in a case series study design, it is difficult to generalize the results. Nonetheless, this study has provided insights for the design of future prospective studies. We authors hope that the significance of this research will serve as foundational data for future multi-center prospective studies, and even randomized clinical trials.

Conclusions

The results of this study, highlighted by improvements in patients' SBSES and QGASC scores after subcision therapy using acupuncture, indicate its potential effectiveness for scar treatment. Specifically, SBSES scores decreased from 3.14 ± 0.68 to 1.86 ± 0.90 , while QGASC scores increased from 1.90 ± 0.84 to 3.14 ± 0.90 post-treatment. Acknowledging the limitations of the current dataset and the retrospective design, this research emphasizes the need for further investigation and will guide the design of future prospective studies. Further research is necessary to collect more comprehensive data, which will show effectiveness of acupuncture's role in scar management.

Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics Approval

This retrospective, multicenter study was conducted in accordance with the Declaration of Helsinki, and approved by the Wonkwang University institutional review board (WKIRB-202108-BM-059) in August 2021.

Informed Consent (for Publication)

Before starting treatment, all patients were informed of the academic use of medical records and photographs. Informed consent has been obtained from the patient to publish this paper.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no conflicts of interest in this work.

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