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Post-Cesarean Scar Management with Topical Silicone Gel: Clinical Outcomes and Clinician Feedback Survey

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ABSTRACT

Background/Aims: The rising rate of cesarean sections (C-sections) worldwide necessitates optimal postoperative scar care. This study aimed to evaluate real-world clinical outcomes associated with the use of a vitamin C ester-containing topical silicone gel on C-section scars and to evaluate patient and clinician satisfaction regarding its application and tolerability. Methods: We analyzed a retrospective case series of 12 patients with C-section scars treated with the topical silicone gel. Improvements in scar appearance were explored using patient-reported and clinician-reported satisfaction assessments obtained through study-specific questionnaires. A structured clinician feedback survey was conducted to establish agreement (≥80%) on 15 statements regarding the benefits, safety, and application protocol of the topical silicone gel. Results: Favorable descriptive observations of scar appearance and high patient/clinician satisfaction were reported, with most cases demonstrating high patient-reported and clinician-reported satisfaction. The clinician survey conveyed strong agreement (≥80% agreement on 14 of 15 statements). Key agreement points supported the gel's role in creating an optimal healing environment. Clinician feedback suggested that effective scar management under proper clinical protocol positively impacts postpartum psychological well-being. Conclusion: These findings suggest that this regimen may be a useful component of postpartum scar management and support further investigation in future studies.

Keywords: *Cesarean Section, Hypertrophic Scar, Keloid, Silicone Gel, Vitamin C Ester*

Introduction

The increasing global reliance on cesarean section (C-section) as a mode of delivery presents a critical public health challenge (Angolile *et al*., 2023; Betran *et al*., 2021), underscoring the necessity of optimizing postnatal care and recovery management. Driven by various clinical, social, and economic factors, the global C-section rate has surged dramatically, rising from an average of 6.7% in 1990 to 21.1% of all births worldwide in the latest estimates (Angolile *et al*., 2023). Eastern Asia has seen the greatest rise in C-section rates, with an increase of 44.9% in the past three decades. By 2030, C-sections are projected to account for 28.5% of all births, with 63.4% of births in Eastern Asia predicted to be delivered via C-section (Betran *et al*., 2021). While C-sections are a life-saving intervention when medically necessary, their rapid rise has not led to proportional improvements in maternal or perinatal outcomes. Rates exceeding the optimal threshold are instead associated with higher maternal and perinatal complications, long-term risks, and increased healthcare costs (Keag *et al*., 2018; Sobhy *et al*., 2019; Betran *et al*., 2021). A C-section is a major surgical procedure carrying both immediate and long-term consequences for women's health and subsequent pregnancies. Therefore, comprehensive management of C-section recovery is important in mitigating these associated risks and ensuring positive long-term health outcomes for the mother and child (WHO Guidelines Review Committee, 2018).

Scar formation is an inevitable consequence of the surgical C-section procedure. Following incision and repair, the skin undergoes a complex wound healing process that involves inflammation, cell proliferation, and remodeling, ultimately leading to scar development (Han *et al*., 2023). While most scars heal without any complications, some women may develop hypertrophic scars or keloids, which can cause both physical discomfort and psychological distress (Mathew *et al*., 2024). Understanding this process provides the foundation for evaluating and selecting appropriate scar management strategies.

Current clinical guidelines provide recommendations for the prevention and treatment of C-section scars, with the aim of minimizing adverse outcomes such as hypertrophy, keloid formation, or impaired wound function (Son and Harijan, 2014; WHO Guidelines Review Committee, 2018; Wang *et al*., 2020; Michalska *et al*., 2024). These guidelines emphasize early intervention, patient education, and the use of evidence-based treatment modalities to improve scar appearance and reduce the occurrence of associated symptoms. A range of treatment options for C-section scars are available, including pressure therapy, intralesional corticosteroids, laser therapy, surgical revision, and the use of topical agents (Son and Harijan, 2014; Karmisholt *et al*., 2017; Chua *et al*., 2019; Conti *et al*., 2020; Yang *et al*., 2023; Obiezu *et al*., 2025). Each option varies in its mechanism, accessibility, cost, and evidence base, requiring careful selection tailored to patient needs and clinical context.

Among topical agents, silicone-based gels have emerged as a first-line, non-invasive standard of care that reduces scar height, pigmentation, and pliability (Wang *et al*., 2020). However, existing evidence often generalizes results across various surgical incisions, leaving a gap in real-world data specifically focused on the unique mechanical tensions of C-section scarring (Wang *et al*., 2020). Furthermore, while gels are noted for their convenience, more research is needed to establish definitive clinical protocols and confirm their psychological impact on postpartum recovery (Wang *et al*., 2020).

This paper presents a retrospective case series evaluating the clinical outcomes associated with the use of a topical silicone gel enriched with vitamin C ester for C-section scar management, specifically focusing on aesthetic improvement and tolerability. In addition, we report findings from a structured clinician feedback survey designed to capture real-world usage patterns and practitioner experiences with this regimen.

Methods

Case Series

As this was a retrospective case series, no formal sample size calculation was performed. The 12 cases represented available cases contributed by the participating clinicians for retrospective review. Study size, inclusion and exclusion criteria, and standardized protocols were not formalized prior to data collection. The case series consisted of 12 patients who underwent C-sections. The general description or state of existing scars was recorded prior to treatment. Where available, baseline scar-related characteristics including previous hypertrophic scar or keloid history, prior C-section scarring, and relevant risk factors for abnormal scar formation were recorded descriptively. Their C-section scars were treated with a vitamin C ester-containing topical silicone gel. A sufficient amount to cover the scar was applied twice daily. Additional appropriate therapeutic modalities, such as the use of corticosteroid injections or antiseptic sprays, were followed as per clinician recommendations. The recovery process was recorded retrospectively. Clinical photographs available from routine follow-up were reviewed, including photographs taken immediately post-surgery and at approximately 10 days, 1 month, 3 months, and 6 months post-surgery, where available (Supplementary Figures S1–12). Patient-reported and clinician-reported satisfaction with scar appearance and treatment experience was explored descriptively using study-specific, non-validated questionnaires comprising four items rated on a 0–10 scale (Supplementary Tables S1–2). The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Informed consent was obtained from all participants involved in the case series for the clinical

treatment provided. Informed and written consent was also obtained from the patients for the collection and publication of clinical photographs.

Clinical Experience Survey

The 12 participating clinicians who provided the cases completed a separate clinician feedback survey on their opinions regarding the use of the topical silicone gel (Dermatix Ultra, Menarini) in C-section scar treatment. Following the case series, a structured, study-specific questionnaire adapted from a survey previously used in a published scar-management expert consensus exercise was distributed to capture their cumulative experience with the topical silicone gel (Yang *et al*., 2023).

A modified Delphi method was used during the clinician feedback discussion phase. This survey consisted of 15 statements, for each of which the clinicians were to read and independently rate each item using a three-point Likert-type response structure of: "Agree," "Neutral," or "Disagree." The clinician feedback questionnaire was adapted from a previously published 21-item scar-management expert survey, with items consolidated and modified to focus specifically on C-section scar management (Yang *et al*., 2023). The threshold for high agreement was set at ≥80% agreement (de Meyrick, 2003; Keeney *et al*., 2021). The ratings were recorded, and a list was compiled comprising the agreement level for each statement, the statements that had high agreement, and statements needing further discussion. Statements with high agreement were affirmed with minimal discussion, while statements that did not reach the threshold were discussed for clarification of the clinicians' respective perspectives. The cases presented in this paper were anonymized before discussion.

Results

A total of 12 C-section scar treatment cases were documented across multiple centers (Table 1). The patients ranged in age from 28 to 41 years, with a mean body mass index (BMI) of approximately 26.9 kg/m^2, spanning from normal to overweight categories. The cohort represented diverse ethnic backgrounds, including Vietnamese, Chinese, Thai, Indian, and Filipino patients, with varying obstetric histories (Gravida 1–3; Para 0–2). The predominant indications for C-section were elective or repeat procedures, cephalopelvic disproportion, gestational diabetes mellitus, and breech presentation.

Patient-reported and clinician-reported satisfaction was generally favorable across the cases. The questionnaire items and scoring rubrics are provided in Supplementary Tables S1–2, and case-level responses are provided in Supplementary Tables S3–4.

Table 1: C-section scar treatment case series and outcomes.

Case number	Patient details	History	Topical silicone gel-related complications and adverse effects	Observed outcome and follow-up
1	Age: 35 years; Ethnicity: Vietnamese; Gestation and parity: G2P1; Pregnancy duration: 39 weeks; BMI: 23 kg/m^2	Previous C-section complicated by keloid scar formation; medical history unremarkable; no reported conditions affecting healing; elective repeat C-section; previous incision reopened and existing keloid scar excised	None	Favorable outcome following keloid excision and topical silicone gel use was reported.
2	Age: 33 years; Ethnicity: Chinese; Gravidity and parity: G1P0; Pregnancy duration: 38 weeks; BMI: 28.7 kg/m^2	Medical history unremarkable; gestational diabetes mellitus treated with metformin; C-section performed at maternal request and due to GDM	None	Favorable scar outcome was reported.
3	Age: 32 years; Ethnicity: Chinese; Gravidity and parity: G1P0; Pregnancy duration: 34 weeks and 5 days; BMI: 21 kg/m^2	Semi-elective preterm C-section due to breech presentation and severe oligohydramnios; no identified conditions affecting healing	Mild itching during the first 2 weeks of silicone gel application; resolved with reassurance and adjunctive bland emollients	At 2 weeks, the scar appeared flatter with reduced erythema and swelling; at 3 years, the scar was minimally visible.
4	Age: 32 years; Ethnicity: Vietnamese; Gravidity and parity: G1P0; Pregnancy duration: 38 weeks and 6 days; BMI: 27.4 kg/m^2	Elective C-section due to large fetus, narrow pelvis, and labor difficulties; no identified conditions affecting healing; patient expressed concern regarding visible scarring	Mild itching during the first 2 weeks of silicone gel application; resolved with reassurance and adjunctive bland emollients	Favorable scar appearance was reported.
5	Age: 31 years; Ethnicity: Indian; Gestation and parity: G1P0; Pregnancy duration: 37 weeks and 2 days; BMI: 28.3 kg/m^2	C-section due to poor progress of labor and secondary arrest at 8 cm; no identified conditions affecting healing; patient expressed aesthetic concerns regarding visible scarring	Mild itching during the first 2 weeks of silicone gel application; resolved with reassurance and adjunctive bland emollients	Favorable scar appearance was reported.
6	Age: 34 years; Ethnicity: Vietnamese; Gravidity and parity: G2P2; BMI: Not available	Two C-sections in 2021 and 2024; no known medical or surgical conditions; concern regarding recurrence after rapid and severe keloid formation following the first C-section	None	At 6 months after the second C-section, the scar showed a favorable appearance without recurrence of the severe keloid pattern observed after the first C-section.
7	Age: 35 years; Ethnicity: Thai; Gravidity and parity: G1P0; Pregnancy duration: 38 weeks and 5 days; BMI: 26 kg/m^2	Medical history of gestational diabetes mellitus; elective C-section	None	Favorable scar outcome was reported.
8	Age: 37 years; Ethnicity: Filipino;	Previous term low transverse C-section in 2018; history of	None	Favorable scar outcome was reported at

	Gravidity and parity: G2P1001; Pregnancy duration: Not available; BMI: 23 kg/m^2	laparoscopic cholecystectomy in 2024; gestational diabetes mellitus; C-section due to arrest in cervical dilation and large baby; postpartum follow-up at 28 weeks		postpartum follow-up.
9	Age: 28 years; Ethnicity: Chinese; Gravidity and parity: G1P0A0; Pregnancy duration: 38 weeks; BMI: 24 kg/m^2	No known medical or surgical conditions; corticosteroid injection administered before wound closure	None	Favorable scar outcome was reported following corticosteroid injection and topical silicone gel use.
10	Age: 41 years; Ethnicity: Thai; Gravidity and parity: G3P1011; Pregnancy duration: 39 weeks and 1 day; BMI: 26.2 kg/m^2	Previous C-section due to cephalopelvic disproportion; no identified conditions affecting healing; history of hypertrophic scar formation despite previous treatments	None	At 3 months, the scar remained flat, without visible hypertrophy or keloid formation, and reduced pigmentation was observed.
11	Age: 36 years; Ethnicity: Chinese; Gravidity and parity: G3P2; Pregnancy duration: 28 weeks and 2 days; BMI: 30 kg/m^2	Two previous C-sections; gestational diabetes mellitus treated with insulin; mild hypertension; scarred uterus and scar hyperplasia	None	Favorable scar outcome was reported.
12	Age: 28 years; Ethnicity: Thai; Gravidity and parity: G2P1; Pregnancy duration: 38 weeks and 6 days; BMI: 30 kg/m^2	Medical history unremarkable; obesity and fetal large-for-gestational-age status; C-section due to cephalopelvic disproportion; surgical-site infection reported	None	Favorable scar outcome was reported.

C-section: cesarean section; BMI: body mass index; GDM: gestational diabetes mellitus

Overall, the available clinical records and photographs showed generally favorable changes in scar visibility, color, and appearance over the documented follow-up periods (Fig. 1-4). Three patients (Cases 3–5) out of the 12 cases experienced mild, transient itching during the early phase of topical scar management, which resolved following reassurance and adjunctive moisturization. No treatment-related serious adverse events were reported across the 12 cases.

No treatment-related cases of wound infection, dehiscence, or hypertrophic scar recurrence were recorded during follow-up. However, Case 12 had a reported surgical-site infection as part of the clinical history, and this should be distinguished from adverse effects attributed to the topical silicone gel.

Figure 1: Case 2: 32-year-old Chinese patient, G1P0, scar appearance after C-section and silicone gel treatment. A) C-section scar appearance at 1 week post-surgery. B) At 2 weeks post-surgery, the scar appeared flatter, with reduced erythema and swelling. C) At 3 years post-surgery, the scar was minimally visible in the available photograph.

Figure 2: A) Case 6: 34-year-old Vietnamese, G2P2, scar appearance after C-section and silicone gel treatment, keloid formation on first C-section scar at 12 months post-operation. B) Case 6: Second C-section scar at 6 months post-operation, with application of silicone gel. C-section: cesarean section.

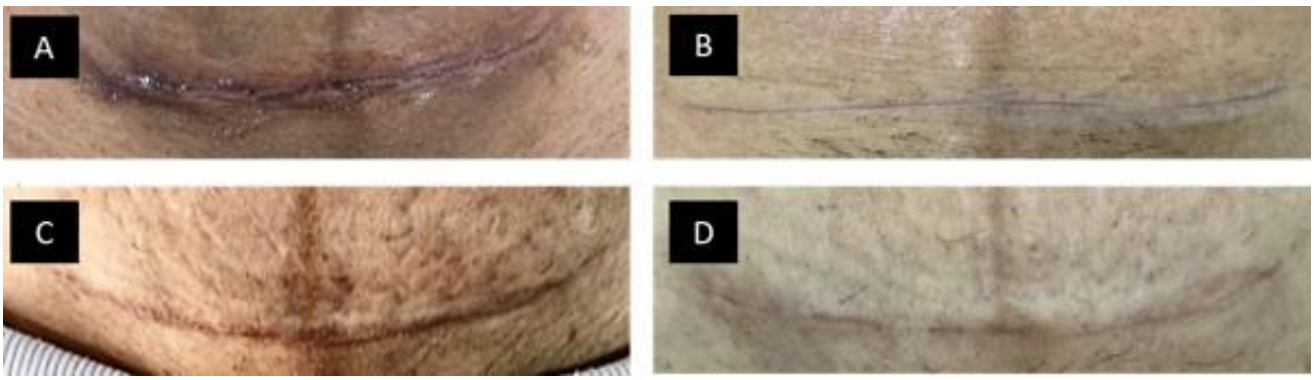

Figure 3: Case 10: 41-year-old Thai, G3P1011, scar appearance after C-section and silicone gel treatment. C-section scar appearance at A) immediately, B) 10 days, C) 1 month, and D) 3 months post-surgery. At 3 months post-surgery, the scar remained flat, with no hypertrophy or keloid formation observed. Reduced scar pigmentation was observed. C-section: cesarean section.

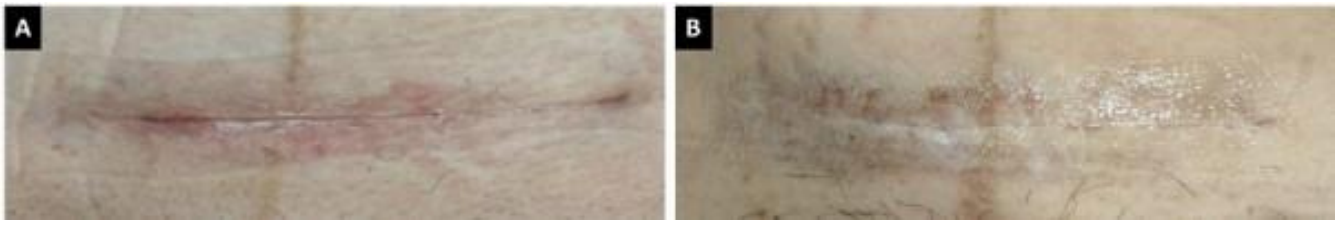

Figure 4: Signs of allergy to silicone gel sheets around the C-section scar and subsequent treatment with topical silicone gel. A) A patient exhibited an allergic reaction to silicone gel sheets, demonstrating increased redness around the wound. B) Scar appearance following subsequent use of topical silicone gel. C-section: cesarean section. This observation was obtained outside the 12-case series and is presented as an illustrative clinical observation rather than comparative evidence of reduced allergy risk.

Patient-reported and clinician-reported satisfaction was favorable across the study-specific descriptive assessments. The findings are reported descriptively, with item-level results provided in Supplementary Tables S3–4.

All clinicians completed the clinical feedback survey on the use of the topical silicone gel for C-section scar management (Table 2). The predefined threshold for high agreement was ≥80%. Agreement levels were also grouped descriptively as full agreement (100%), strong agreement (≥90%), broad agreement (≥80%), moderate agreement (≥60%), and no agreement (≤50%). Statements categorized as moderate agreement did not meet the predefined threshold for high agreement.

Overall, 14 of 15 statements reached the predefined threshold of ≥80% agreement. Complete agreement (100% agreement) was achieved for five statements, including those addressing the product's role in creating an optimal healing environment, its favorable safety and tolerability profile, and its positive impact on patient confidence and psychological well-being. Agreement levels of ≥90% were observed for seven statements reflecting clinician perceptions regarding the gel's potential to lighten, soften, and flatten scars; mitigate hyperpigmentation; support the benefits of early initiation; and provide suitability across various skin phototypes and incision types. Slightly lower agreement (≥80%) was recorded for statements emphasizing the duration of use and relief of scarring-related symptoms, while the lowest agreement (≥70%) was noted for the statement regarding ease of use and cosmetic profile compared with silicone gel sheets.

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Table 2: Clinician experience survey statement summary results (n=12).

Clinician Survey Feedback	Agree	Neutral	Disagree	Agreement (%)
Full agreement				
Statement 1: The vitamin C ester-enriched silicone gel creates an optimal environment for scar healing, potentially leading to a less prominent scar even after C-section surgeries.	12	0	0	100
Statement 7: The vitamin C ester-enriched silicone gel is well-tolerated, making it suitable for long-term use (e.g., 3-6 months or longer) as recommended for optimal C-section scar management.	12	0	0	100
Statement 8: The vitamin C ester-enriched silicone gel demonstrates a favorable safety profile and is generally well-tolerated when used on C-section scars, with minimal reported adverse effects.	12	0	0	100
Statement 11: Effective management of C-section scars with the vitamin C ester-enriched silicone gel can positively impact a patient's body confidence and overall psychological well-being postpartum, contributing to enhanced patient satisfaction with their scar outcome.	12	0	0	100
Statement 15: For patients undergoing multiple C-sections, the vitamin C ester-enriched silicone gel can help manage the appearance of new scars and potentially improve the pliability of existing scar tissue in the same area.	12	0	0	100
Strong agreement				
Statement 2: The vitamin C ester-enriched silicone gel helps to lighten, soften, and flatten the appearance of C-section scars, including those that are hypertrophic or keloid in nature.	11	1	0	92
Statement 3: The vitamin C ester-enriched silicone gel aids in minimizing the occurrence of post-inflammatory hyperpigmentation associated with C-section scars, particularly in patients with skin types prone to such discoloration with early application.	11	1	0	92
Statement 4: Vitamin C ester enrichment plays a beneficial role in C-section scar management by enhancing aesthetic outcomes, particularly through its antioxidant properties and its ability to mitigate hyperpigmentation.	11	1	0	92
Statement 5: Early initiation of the vitamin C ester-enriched silicone gel, once the C-section wound is fully closed and sutures are removed, is key to maximizing improvements in final scar appearance.	11	1	0	92
Statement 12: The convenient home-based application of the vitamin C ester-enriched silicone gel promotes consistent adherence, essential for optimizing long-term C-section scar aesthetics and symptom reduction post-delivery.	11	1	0	92
Statement 13: The vitamin C ester-enriched silicone gel is suitable and effective for use on C-section scars across a diverse range of skin phototypes and C-section incision types (vertical/horizontal).	11	1	0	92
Statement 14: The vitamin C ester-enriched silicone gel is considered a suitable first-line option for the treatment of C-section scars, providing a reliable and effective option for managing C-section scars that is safe for pregnant and breastfeeding mothers.	11	1	0	92
Broad agreement				
Statement 6: Consistent usage of the vitamin C ester-enriched silicone gel twice daily for at least 8 to 12 weeks yields the optimal outcome in C-section scar reduction and prevention.	10	2	0	83
Statement 9: The vitamin C ester-enriched silicone gel alleviates common discomforts of healing C-section scars, such as itchiness (pruritus), tenderness, and redness.	10	2	0	83

Moderate agreement				
Statement 10: The ease of use and cosmetic profile of the vitamin C ester-enriched silicone gel promotes better patient adherence to the recommended scar management regimen compared to less convenient options like silicone gel sheets for C-section mothers.	9	2	1	75

C-section: Cesarean section; Full agreement: 100% agreement; Strong agreement: ≥90% agreement; Broad agreement: ≥80% agreement; Moderate agreement: ≥ 60% agreement; No agreement: ≤50% agreement.

Discussion

Among topical therapies, silicone-based products have emerged as a widely accepted and clinically supported option for scar management. Silicone gels, in particular, have a long history of use and are distinct from silicone gel sheets in terms of application and convenience (Wang *et al*., 2020; Yang *et al*., 2023). Their mechanism of action involves creating an occlusive barrier that improves hydration of the stratum corneum, modulates collagen production, and reduces fibroblast activity, thereby improving scar appearance and pliability (Mustoe, 2008). Clinical studies have demonstrated that silicone gels, which are favored by consensus among healthcare professionals for scar recovery (Bleasdale *et al*., 2015), may reduce redness, flatten raised scars, and alleviate associated symptoms such as itching and discomfort (Mustoe, 2008; Wang *et al*., 2020; Yang *et al*., 2023).

The findings from this retrospective case series and clinician feedback survey were associated with generally favorable observed scar outcomes, tolerability, and patient-reported satisfaction regarding the vitamin C-enriched silicone gel use in the management of post-C-section scarring. C-section scarring treatment is uniquely challenging due to the anatomical location of scars, which subjects them to high mechanical tension and movement from the lower abdomen and fascial adhesions, all of which are known to promote pathological scarring (Barnes *et al*., 2018; González-Muñoz *et al*., 2024). Across the 12 cases, patients and clinicians generally reported favorable satisfaction with treatment experience and scar appearance.

While the combination of standard post-operative care and early silicone gel application was associated with aesthetically pleasing scar outcomes, such as in Cases 3 and 10 (Fig. 1 and 3), the presence of important co-interventions in certain cases limits the ability to attribute these positive outcomes solely to the gel. Notably, two cases (Case 1 and Case 6) involved patients with a history of rapid and severe keloid formation (Fig. 2A) following a previous C-section. In both instances, the use of silicone gel, either following keloid excision or as a preventative measure in the second surgery, was associated with favorable outcomes (Fig. 2B). Favorable patient-reported and clinician-reported satisfaction was also observed. These cases suggest possible utility in patients considered at increased risk of abnormal scar formation, although no

causal conclusions can be drawn. These observations align with existing literature supporting silicone-based products as a standard non-invasive option for postpartum scar management (Mustoe, 2008; Wang *et al*., 2020; Yang *et al*., 2023).

Treatment-related adverse effects reported in the 12-case series were limited to mild, transient itching in three patients during the early phase of topical scar management (Cases 3, 4, and 5). This is a known, transient side effect of silicone product application, particularly in hot climates (Nikkonen *et al*., 2001). The resolution strategy in all cases was patient reassurance and an increased moisturizing regimen with bland emollients, allowing for continued adherence. An additional observation outside the 12-case series described skin irritation during silicone gel sheet use and subsequent use of topical silicone gel (Fig. 4). As this was an isolated, non-comparative observation, it cannot establish a difference in allergy or irritation risk between formulations.

The clinician feedback survey showed that 14 of 15 statements reached the predefined threshold of ≥80% agreement. These findings indicate a high degree of agreement among the participating clinicians regarding the application, tolerability, and perceived benefits of topical silicone gel in C-section scar management. More than 90% agreed with the statement that the gel helps lighten, soften, and flatten scars, including those that are hypertrophic or keloid in nature (Statement 2). Statements 1 and 7, both achieving 100% agreement, reflected clinicians' views that the gel creates an optimal environment for scar healing and is suitable for long-term use, such as 3–6 months or longer.

Furthermore, 11 out of 12 clinicians agreed that the vitamin C ester component may contribute to aesthetic outcomes by mitigating post-inflammatory hyperpigmentation (PIH), a critical concern particularly for patients with specific skin phototypes (Statements 3 and 4). Vitamin C has recognized antioxidant and depigmenting properties (Davis and Callender, 2010; Sanadi and Deshmukh, 2020), alongside the physical occlusive effect of silicone (Mustoe, 2008). However, Yun, *et al*. (2013) evaluated a formulation combining silicone gel and vitamin C rather than isolating the independent effect of vitamin C. Accordingly, the findings of that study support the combined formulation but do not establish that vitamin C alone accounts for improvements in scar pigmentation or appearance.

The participating clinicians also felt that early treatment initiation is pivotal once the wound has fully closed and sutures are removed (Statement 5) and that consistent application twice daily for at least 8 to 12 weeks yields optimal outcomes (Statement 6: 83% agreement). Notably, they agreed that effective scar management may positively impact a patient's body confidence and overall psychological well-being postpartum (Statement 11). These statements reflect clinician perceptions rather than direct measurement

of psychological outcomes in the patients included in this case series. Nevertheless, the psychosocial burden of hypertrophic scars and keloids has been documented previously (Mathew *et al*., 2024).

Regarding the safety profile, there was full agreement on the favorable safety of the gel and minimal reported adverse effects (Statement 8). Notably, a moderate agreement of 75% was achieved for treatment adherence (Statement 10) regarding the gel's advantage over sheets. Although this was categorized descriptively as moderate agreement, it did not meet the predefined ≥80% threshold for high agreement. While patients in other studies have rated the use of topical silicone gels to be more convenient than using silicone gel sheets (Kim *et al*., 2014), patient adherence is also recognized as a major determinant of success in long-term topical therapy (Puig *et al*., 2013; Gold *et al*., 2014), and as such, actual adherence rates warrant further detailed study. New mothers often face significant time constraints and discomfort. Therefore, perceived convenience, rapid drying time, and cosmetic profile may represent relevant clinical considerations when selecting formulations intended to facilitate sustained use, although comparative adherence was not directly assessed in this study.

The primary limitation of this study is its design as a retrospective case series without a control group. This methodology inherently limits the ability to isolate the specific therapeutic effect of the gel from natural scar maturation processes or to compare its efficacy against alternative therapies. Additionally, two of the 12 cases involved adjunctive interventions such as corticosteroid injections or intraoperative scar modulation, which may have contributed to outcomes and limit the ability to attribute effects solely to the topical silicone gel. Furthermore, the relatively small number of included cases (n=12) may restrict the generalizability of the findings, particularly across a wider range of C-section incision types, scar complications, and diverse skin types, despite the clinician feedback supporting its broad applicability (Statement 13). A further major limitation is the absence of a validated objective scar assessment tool, such as the Patient and Observer Scar Assessment Scale or Vancouver Scar Scale. Retrospective application of such instruments was not considered reliable because the available photographs were collected during routine care and varied in timing, lighting, positioning, resolution, and image quality. Accordingly, the reported observations should be interpreted as descriptive rather than as standardized measurements of scar change.

Patient-reported and clinician-reported satisfaction was collected using study-specific, non-validated questionnaires. These measures were intended to describe user experience and should not be interpreted as objective measures of scar severity, healing, or comparative treatment efficacy. The clinicians who contributed the cases also completed the feedback survey, creating the potential for observer, confirmation, and reporting bias. The clinician survey therefore reflects the experience and

opinions of participating users rather than independent validation. Patient expectations may also have influenced perceptions of treatment outcomes. Follow-up timing and photographic documentation were not standardized, and some cases had incomplete or uneven follow-up. No standardized assessment of adherence, scar dimensions, pigmentation, pliability, symptoms, or postpartum psychological outcomes was performed. These limitations should be considered when interpreting the favorable observations and clinician feedback.

Despite these limitations, the present case series provides descriptive real-world information on topical silicone gel use in post-C-section scar management across a diverse group of patients and clinical settings. Larger prospective controlled studies using validated scar assessment instruments, standardized photography, predefined eligibility criteria, and independent outcome assessment are needed to establish efficacy and comparative effectiveness.

Conclusion

The case series presented here, together with structured clinician feedback, provides descriptive real-world information on the use and tolerability of a vitamin C ester-enriched topical silicone gel for C-section scar management. The study combines observed clinical outcomes with patient-reported and clinician-reported experience, highlighting the gel's possible role in scar appearance management, including pigmentation-related concerns. The clinician feedback also reflects the perceived importance of early, consistent, and sustained silicone gel use. However, the retrospective design, absence of a control group, use of non-validated satisfaction questionnaires, co-interventions, and lack of standardized objective scar assessment preclude conclusions regarding treatment efficacy. Larger prospective controlled studies using validated scar assessment instruments and standardized follow-up are needed to establish efficacy and comparative effectiveness, including the gel's potential role in managing existing scar tissue in patients undergoing multiple C-sections.

Author Contributions: NBMN, PS, RQ, BCT, SD, LKP, DNSW, JLCY, WX, WC, LTTH, and SW: Conceptualization, Data Curation, Investigation. DN and LWKC: Project Administration, Supervision. All authors contributed to data interpretation, manuscript drafting, and critical revision, and approved the final version.

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Disclaimer: The cases presented herein are based exclusively on the real-world, clinical treatment experiences of the contributing physicians and do not represent or promote A. Menarini's opinions or preferences. Please refer to the detailed package insert/ instruction for use for complete prescribing information.

Ethics Statement: The authors confirm that this study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Formal institutional ethics approval was not obtained because the study consisted of a retrospective compilation of anonymized case reports collected during routine clinical care across multiple sites. Informed consent was obtained from all participants involved in the case series for the clinical treatment provided. Furthermore, specific written informed consent was obtained from each patient for the collection and publication of their clinical photographs used to document the scar recovery process at various follow up intervals. To protect patient privacy, all cases were fully anonymized prior to the clinician feedback discussion and manuscript preparation.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Supplementary Data

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Supplementary Document

Supplementary Tables

Supplementary Table S1: Patient satisfaction survey score rubric

Criteria (patient satisfaction)	Score (1 – 10)
Scar texture & appearance (rate 1–10 based on how well the scar has healed appearance-wise)	10
Scar comfort & sensitivity (rate 1–10 based on absence of discomfort)	10
Confidence & emotional effect (rate 1–10 based on how confident you feel with the appearance of the scar with regards to your self-esteem)	10
Speed & progress of treatment (rate 1–10 based on how fast you feel the scar has healed)	10
Average:	**10**

Supplementary Table S2: HCP satisfaction survey score rubric

Criteria (HCP satisfaction)	Score (1 – 10)
Scar texture & appearance (rate 1–10 based on how well the scar has healed appearance-wise)	10
Scar comfort & sensitivity (rate 1–10 based on absence of discomfort in the patient)	10
Adverse effects (rate 1–10 based on how little side effects or adverse symptoms can be observed)	10
Speed & progress of treatment (rate 1–10 based on how fast the scar has healed)	9
Average:	**9.75**

HCP: healthcare professional.

Supplementary Table S3: Patient-reported satisfaction scores

Case	Scar texture & appearance	Scar comfort & sensitivity	Confidence & emotional effect	Speed & progress of treatment	Average
1	9	9	10	9	9.25
2	10	10	10	10	10.00
3	9	9	9	9	9.00
4	9	9	9	9	9.00
5	9	9	9	9	9.00
6	10	10	10	10	10.00
7	10	10	10	10	10.00
8	9	10	9	8	9.00
9	10	10	10	10	10.00
10	7	8	7	8	7.50
11	9	8.5	9	9	8.87
12	9	7	9	8	8.25

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Supplementary Table S4: HCP-reported satisfaction scores

Case	Scar texture & appearance	Scar comfort & sensitivity	Adverse effects	Speed & progress of treatment	Average
1	9	9	9	9	9.00
2	10	10	10	10	10.00
3	9	9	9	9	9.00
4	9	9	9	9	9.00
5	9	9	9	9	9.00
6	10	10	10	9	9.75
7	10	10	10	10	10.00
8	9	10	10	8	9.25
9	10	10	10	10	10.00
10	7	8	7	8	7.50
11	8	8.5	9	8	8.37
12	9	7	9	8	8.25

HCP: healthcare professional.

Supplementary Figures

Figure S1: Case 1: 35-year-old Vietnamese, G2P1. C-section scar appearance at 6 months post-surgery: the scar is barely visible and blends well with the surrounding skin. No textural irregularities or pigmentation issues were observed. No functional impairment was reported. C-section, cesarean section.

Figure S2: Case 2: 33-year-old Chinese, G1P0. C-section scar appearance at A) 1 day, B) 14 days, and C) 3 years post-surgery. At 3 years post-surgery, the scar turned almost invisible, and its length reduced by approximately 50%. C-section, cesarean section.

Figure S3: Case 3: 32-year-old Chinese, G1P0. A) C-section scar appearance at 1-week post-surgery. B) At 2 weeks post-surgery, a flattening of the scar along with reduced erythema and swelling were observed. C) At 6 weeks post-surgery, the scar healed well and was flat with minimal thickening at the lateral edges. C-section, cesarean section.

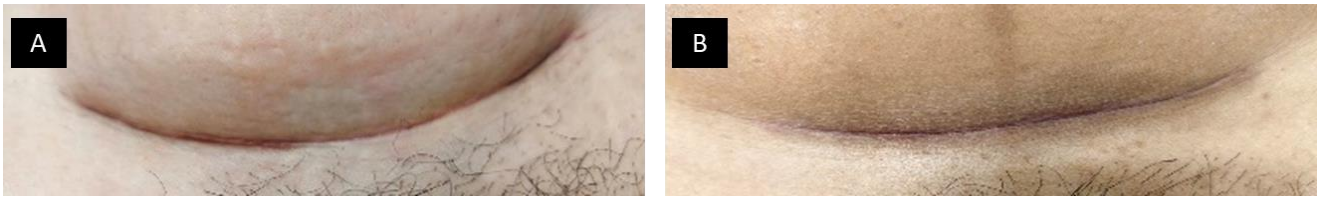

Figure S4: Case 4: 32-year-old Vietnamese, G1P0. C-section scar appearance at A) 14 days and B) 1 month post-surgery. C-section, cesarean section.

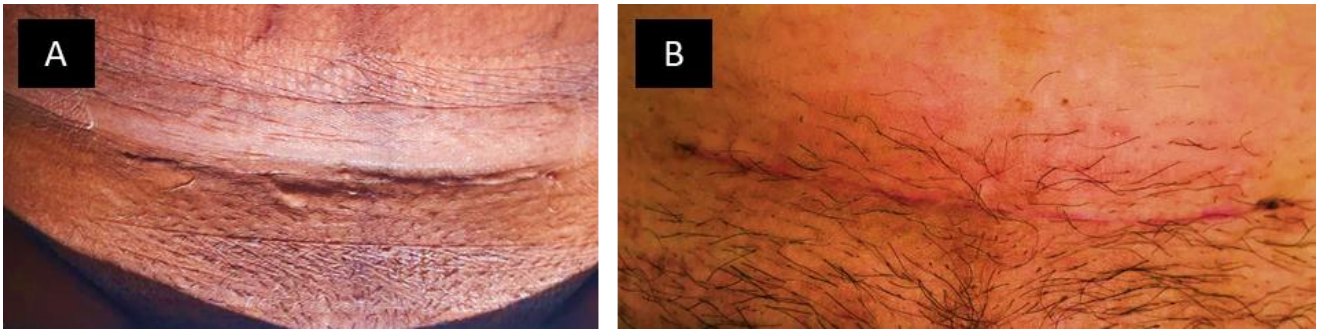

Figure S5: Case 5: 31-year-old Indian, G1P0. C-section scar appearance at A) 3 days and B) 4 weeks post-surgery. At 4 weeks post-surgery, the scar was flattened, wound was well-healed, and no hypopigmentation or wound infection was observed. C-section, cesarean section.

Figure S6: Case 6: 34-year-old Vietnamese, G2P2. C-section scar appearance at A) 5 days post-surgery. B) At 4 weeks post-surgery, the scar was soft, flat, and faded with no itching. C) At 6 months post-surgery, the color of the scar was indistinguishable from that of the surrounding skin. C-section, cesarean section.

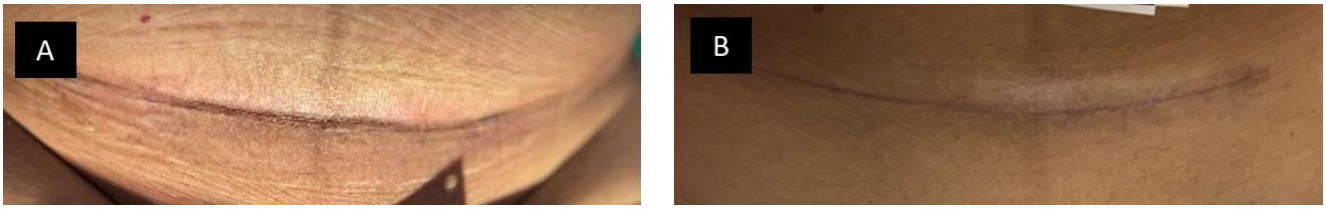

Figure S7: Case 7: 35-year-old Thai, G1P0. C-section scar appearance at A) 4 weeks and B) 8 weeks post-surgery.

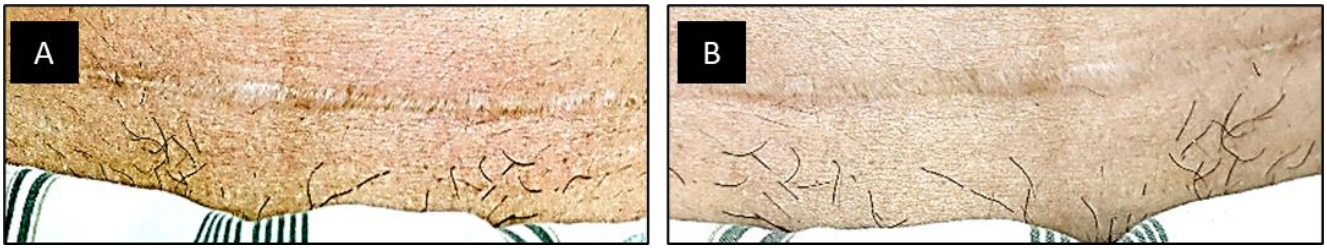

Figure S8: Case 8: 37-year-old-Filipino, G2P1. A) Post-treatment image (2018, initial C-section, 12 months post-surgery). B) Post-treatment image (2025, 2nd C-section, 12 months post-surgery).

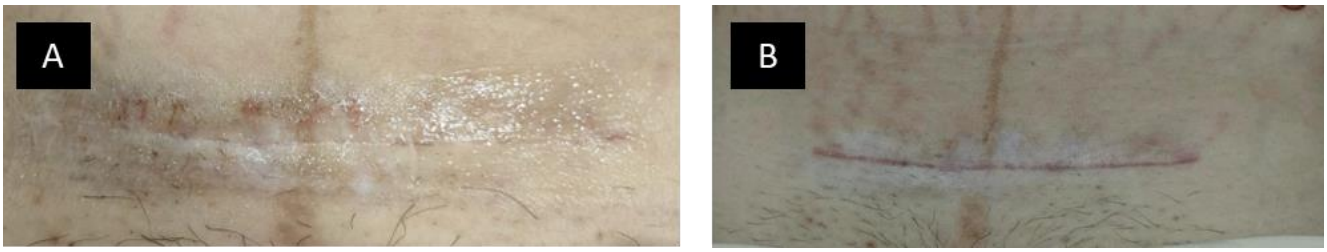

Figure S9: Case 9: 28-year-old Chinese, G1P0. C-section scar appearance at A) 1-month post-surgery. B) At 3 months post-surgery, redness was still observed on the flat scar without any swelling. C-section, cesarean section.

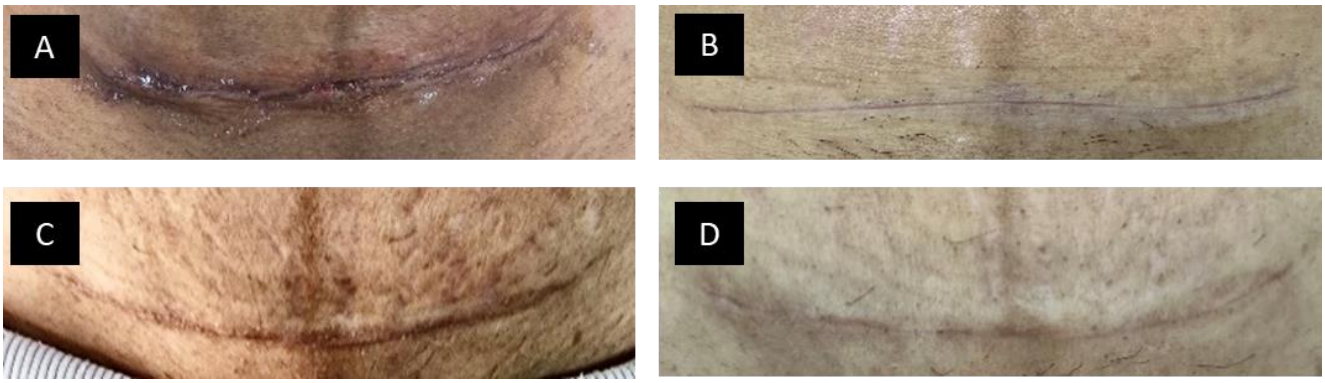

Figure S10: Case 10: 41-year-old Thai, G3P1011. C-section scar appearance at A) immediately, B) 10 days, C) 1 month, and D) 3 months post-surgery. At 3 months post-surgery, the scar remained flat, with no hypertrophy or keloid formation observed. Reduced scar pigmentation was observed. C-section, cesarean section.

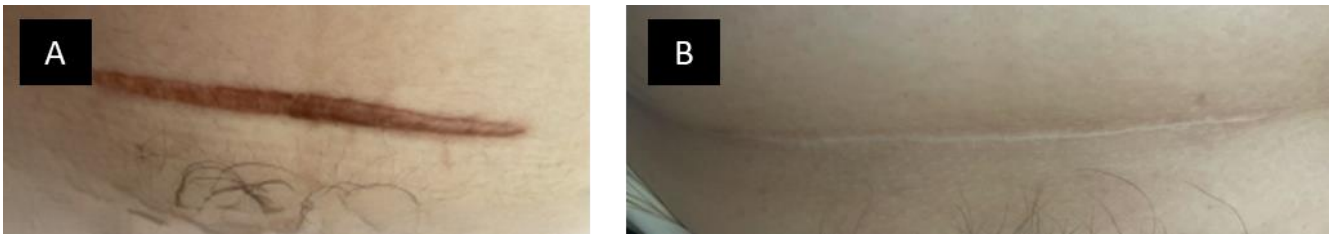

Figure S11: Case 11: 36-year-old Chinese, G3P2. C-section scar appearance A) Pre-treatment; B) Post-treatment.

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Figure S12: Case 12: 28-year-old Thai, G2P1. C-section scar appearance A) Immediately after treatment (17 days post-surgery), some scabbing and mild inflammation were visible, and the scar appeared thicker, raised, and inflamed; B) At 17 days post-treatment, the scar appeared considerably flatter and paler, showing early signs of maturation. C) At 32 days post-treatment, the scar was visibly flatter, with a significant reduction in redness compared to that observed in the initial stages. D) At 57 days post-treatment, the scar was soft, hypopigmented, and flat. C-section, cesarean section.