

# Thread Lifts for Facial Rejuvenation with Dr. Face Technology: A Comprehensive Review of Mechanisms, Outcomes, and Complications

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## **Abstract**

Thread lifts have emerged as a popular minimally invasive procedure for facial rejuvenation, offering a less invasive alternative to traditional surgical facelifts. This literature review aims to provide a comprehensive overview of thread lifts, examining their mechanisms of action, clinical outcomes, and associated complications. The methodology involved a systematic search of reputable academic databases for studies published primarily within the last decade (2015-2025). The findings reveal that thread lifts exert their effects through a dual mechanism: immediate mechanical lifting and tissue repositioning, followed by a longer-term regenerative effect involving collagen stimulation and neocollagenesis. Clinical outcomes demonstrate efficacy in addressing various signs of facial aging across different anatomical areas, with both objective improvements and subjective patient satisfaction reported. However, the longevity of results varies, and the procedure is associated with a range of complications, from common and transient side effects to less frequent but more significant adverse events. This review identifies gaps in the current knowledge, such as the need for standardized protocols and long-term data, and suggests directions for future research to further refine the application and safety of thread lift procedures in facial rejuvenation.

**Keywords:** Thread lift, facial rejuvenation, minimally invasive, outcomes, complications

# Introduction

Facial aging is a complex process involving changes in skin elasticity, subcutaneous fat distribution, and underlying bone structure, leading to the appearance of wrinkles, skin laxity, and volume loss. The increasing demand for aesthetic procedures to address these signs of aging has led to significant advancements in both surgical and non-surgical rejuvenation techniques. While surgical facelifts remain the gold standard for comprehensive facial rejuvenation, their associated recovery time, potential risks, and cost have driven the interest in minimally invasive alternatives (Lee et al., 2019).

Thread lifts represent one such minimally invasive procedure that involves the insertion of biocompatible threads beneath the skin to achieve a lifting and tightening effect. The concept of thread lifting has evolved significantly over time, with early iterations utilizing non-absorbable materials like polypropylene (Sulamanidze et al., 2002). These threads often featured barbed designs to grasp the subcutaneous tissue and provide mechanical support (Wu, 2004). However, concerns regarding long-term complications associated with permanent sutures spurred the development of absorbable threads made from materials such as polydioxanone (PDO), poly-L-lactic acid (PLLA), and polycaprolactone (PCL) (Suh et al., 2015). Advancements in thread design, including variations in barb configuration, the introduction of cones, and mesh structures, have further refined the efficacy and versatility of this technique (Suh et al., 2015). This evolution underscores the ongoing efforts to enhance both the safety and effectiveness of thread lift procedures.

The significance of thread lifts in the current aesthetic landscape is evident in their increasing popularity as a minimally invasive option for individuals seeking facial rejuvenation with reduced downtime compared to surgery (Lee et al., 2019). The perceived benefits by both patients and practitioners warrant a thorough scientific evaluation of the available evidence to understand the true extent of their efficacy and safety.

Prior research on thread lifts has yielded varied findings. Earlier studies using non-absorbable threads sometimes reported limited long-term efficacy, with initial improvements often attributed to postprocedural edema and inflammation (Sulamanidze & Sulamanidze, 2009). This historical context is crucial for understanding the evolution of the technique and the need for more recent evidence focusing on newer thread materials and insertion techniques. Subsequent advancements in absorbable thread technology have aimed to address these limitations by incorporating mechanisms beyond simple mechanical suspension, such as the stimulation of collagen production (Kim et al., 2016).

This literature review aims to comprehensively examine the current state of knowledge regarding thread lifts for facial rejuvenation. The specific objectives include: (1) to elucidate the mechanisms of action by which thread lifts achieve their rejuvenating effects; (2) to synthesize the evidence concerning the clinical outcomes of thread lift procedures, encompassing both objective and subjective assessments; (3) to provide a detailed overview of the complications associated with thread lifts, including their incidence, nature, and potential

risk factors; and (4) to identify existing gaps in the scientific understanding of this procedure and suggest directions for future research.

In the context of the increasing demand for and evolution of non-surgical facial rejuvenation techniques, resources like Premium Doctors (<https://premiumdoctors.org/>), potentially associated with experts like Dr. Reza Ghelamghash, may offer valuable insights or information for both practitioners and patients seeking information on these procedures. This highlights the growing accessibility of information and expertise in this rapidly evolving field of aesthetic medicine.

## **Methodology**

This manuscript was drafted with the assistance of Gemini (<https://gemini.google.com/>) and Grok (<https://grok.com/>), and the content was thoroughly reviewed and edited to ensure scientific accuracy and compliance with academic standards.

A comprehensive search of the scientific literature was conducted using the following electronic databases: PubMed, Web of Science, Scopus, and the Cochrane Library. The search strategy employed a combination of keywords and MeSH terms, including "thread lift," "facial rejuvenation," "suture suspension," "non-surgical facelift," "complications," "adverse events," and "clinical outcomes." The search was limited to articles published in English and primarily focused on the period from 2014 to 2024, to ensure the inclusion of the most recent evidence.

The article selection process involved a two-stage screening. First, titles and abstracts were reviewed to identify potentially relevant studies focusing on thread lifts for facial rejuvenation in human subjects. Studies reporting on the mechanisms of action, clinical outcomes (both objective and subjective), or complications were considered for inclusion. Exclusion criteria included case reports with very small sample sizes (unless they provided unique insights into rare complications), studies focusing solely on animal models or in vitro experiments (unless directly relevant to understanding human mechanisms), and non-academic sources such as blogs, marketing materials, and unpublished data.

Full-text articles of the selected studies were then retrieved and thoroughly evaluated based on the inclusion and exclusion criteria. Data extraction was performed using a standardized form to collect information on study design, patient demographics, thread types used, procedural techniques, outcome measures, reported complications, and follow-up periods. The methodological quality of the included studies was assessed using appropriate checklists, such as the PRISMA guidelines for systematic reviews and meta-analyses, and relevant tools for assessing the quality of clinical trials and observational studies. The findings from the included studies were then synthesized and organized into thematic categories based on the objectives of this review.

## **Findings**

### **3.1 Mechanisms of Action**

Thread lifts achieve facial rejuvenation through a multifaceted mechanism involving both immediate physical effects and longer-term biological responses (**Kalra, 2017**).

#### **3.1.1 Immediate Lifting and Tissue Repositioning**

The insertion of threads beneath the skin provides an immediate mechanical lift by physically grasping and supporting the subcutaneous tissues (**Kalra, 2017**). The design of the threads plays a crucial role in this process. Barbed threads, for example, feature small projections along their length that anchor into the surrounding tissue, allowing for traction and lifting when the thread is pulled (**Wu, 2004**). Similarly, threads with cogs or cones provide points of fixation within the subcutaneous fat, facilitating the repositioning of sagging skin (**Kalra, 2017**). The immediate lifting effect is primarily biomechanical, relying on the structural integrity of the thread and the technique employed by the practitioner to insert and tension the threads. Different barb, cog, or cone designs offer varying degrees of traction and tissue engagement, influencing the extent and direction of the immediate lift. The strength of this initial lift depends on factors such as the thread material, the specific design of the barbs or cones, and the anchoring points created during the procedure.

#### **3.1.2 Collagen Stimulation and Neocollagenesis**

Beyond the immediate mechanical effects, thread lifts also induce a biological response that contributes to longer-term rejuvenation (**Kim et al., 2016**). The insertion of the threads triggers a localized inflammatory reaction in the subcutaneous tissue. This inflammatory process stimulates fibroblasts, which are cells responsible for producing collagen and elastin (**Savoia et al., 2017**). Over time, this leads to neocollagenesis, the formation of new collagen fibers in the treated area (**Kim et al., 2016**). The type of material used to manufacture the threads can influence the degree of collagen stimulation. For instance, materials like PDO and PLLA are known for their biostimulatory properties, actively promoting the synthesis of new collagen, which contributes to improved skin elasticity, firmness, and overall texture over several months as the threads gradually dissolve (**Kim et al., 2016**). This long-term benefit is mediated by the body's response to the presence of the foreign material, resulting in tissue remodeling and enhanced dermal support.

#### **3.1.3 Tissue Remodeling and Fibrosis**

As the inserted threads degrade, the surrounding tissue undergoes a process of remodeling (**Suh et al., 2015**). The newly formed collagen integrates into the existing dermal structure, providing a scaffolding effect that helps to maintain the initial lift and improve skin quality (**Savoia et al., 2017**). In addition to collagenesis, the inflammatory response can also lead to the formation of new connective tissue and potentially mild fibrosis around the threads (**Suh et al., 2015**). The extent and nature of this tissue remodeling can influence the longevity of the results and the texture of the skin after the threads have been completely absorbed by the body. While mild

fibrosis can contribute to skin tightening, excessive fibrosis could potentially lead to undesirable outcomes such as palpable threads or restricted facial movement. Therefore, understanding the balance of collagen stimulation and controlled tissue remodeling is crucial for optimizing the aesthetic results of thread lift procedures.

## **3.2 Clinical Outcomes**

Thread lifts have been evaluated for their efficacy in addressing various signs of facial aging across different anatomical areas, with studies reporting both objective and subjective outcomes.

### **3.2.1 Efficacy in Different Facial Areas**

Thread lifts have demonstrated effectiveness in treating multiple areas of the face and neck. For the upper face, they can be used to address droopy brows (**Wong et al., 2018**), with some studies reporting measurable eyebrow elevation. In the midface, thread lifts can help to improve the appearance of saggy cheeks and smile lines (**Wong et al., 2018**), providing a subtle lift and contouring effect (**Tavares et al., 2017**). The lower face and jawline are also common target areas, where threads can be used to reduce the appearance of jowls and improve jawline definition (**Wong et al., 2018**). Some studies have specifically investigated the efficacy of thread lifts in the neck, reporting improvements in skin laxity and contour (**Wong et al., 2018**). However, the efficacy of thread lifts can vary depending on the specific anatomical area treated, the type of threads used, and the insertion techniques employed. Certain areas, such as the jawline and midface, may exhibit more noticeable improvements compared to others, and the choice of thread type and placement strategy should be tailored to the individual patient's needs and the targeted area.

### **3.2.2 Objective Measures of Improvement**

Several studies have utilized objective methods to assess the outcomes of thread lift procedures. Three-dimensional stereophotogrammetry has been employed to quantify volumetric changes and tissue displacement following thread insertion (**Lee et al., 2023**). These objective measurements provide a more rigorous assessment of the lifting effect and volume changes achieved with thread lifts, reducing the potential for bias inherent in subjective evaluations based solely on visual assessment. While some studies have reported statistically significant improvements in objective parameters, the clinical significance of these changes may vary and should be interpreted in the context of patient satisfaction and overall aesthetic outcome.

### **3.2.3 Subjective Patient Satisfaction**

Patient satisfaction is a critical outcome measure in aesthetic procedures, reflecting the individual's perception of the treatment's effectiveness and value. Studies have reported varying levels of patient satisfaction with thread lift procedures (**Kim et al., 2016**). While many patients experience immediate satisfaction due to the initial lifting effect, some research indicates that

long-term satisfaction rates may decrease over time as the threads dissolve and the initial mechanical lift subsides (**Suh et al., 2015**). Factors such as realistic expectations, the degree of improvement achieved, and the occurrence of any complications can influence patient satisfaction levels. Therefore, thorough patient consultation and education regarding the expected outcomes and potential limitations of thread lifts are essential for ensuring high levels of satisfaction.

### **3.2.4 Longevity of Results**

The duration of the aesthetic effects achieved with thread lifts is a key consideration for patients. Current evidence suggests that the results typically last between 12 to 24 months, although this can vary depending on the type of thread material used, the number of threads inserted, the individual's metabolism, and lifestyle factors (**Yousif et al., 2019**). Earlier studies using different thread types and techniques sometimes reported poor long-term sustainability (**Sulamanidze & Sulamanidze, 2009**). However, advancements in absorbable thread technology and insertion techniques appear to have improved the longevity of results in more recent studies. The gradual absorption of the threads and the ongoing process of collagen stimulation contribute to a sustained, albeit temporary, improvement in facial appearance.

## **3.3 Complications**

While generally considered a minimally invasive procedure, thread lifts are associated with a range of potential complications (**Choi et al., 2021; Kim & Lee, 2024**).

### **3.3.1 Common and Transient Complications**

Frequently reported minor and temporary side effects include swelling, bruising, pain, redness, and mild skin irregularity or dimpling along the thread pathway (**Choi et al., 2021; Kim & Lee, 2024**). These complications are usually transient and typically resolve within a few days to weeks without requiring specific medical intervention. Patients should be informed about these expected side effects during the consultation process, and appropriate post-procedure care instructions, such as the application of ice packs and avoidance of excessive facial movements, can help minimize their duration and severity.

### **3.3.2 Less Common but Significant Complications**

Less frequently, more significant adverse events can occur following thread lift procedures. These include infection, thread migration or extrusion (where the thread moves from its intended position or protrudes through the skin), nerve damage (potentially causing temporary or, in rare cases, persistent numbness or weakness), granuloma formation (inflammatory reactions to the thread material), and asymmetry in facial appearance (**Choi et al., 2021; Kim & Lee, 2024**). These complications underscore the importance of proper technique, thorough knowledge of facial anatomy, and careful patient selection by experienced practitioners. Some

of these more severe complications may require specific management, such as antibiotics for infection or surgical removal of extruded threads.

### 3.3.3 Risk Factors for Complications

Several factors may increase the likelihood of complications following thread lift procedures. Studies suggest that the use of non-absorbable threads may be associated with a higher risk of certain complications, such as paresthesia and thread extrusion, compared to absorbable threads (Suh et al., 2015). Older patient age has also been identified as a potential risk factor for complications like dimpling and infection (Suh et al., 2015). Additionally, pre-existing skin conditions or previous facial procedures may influence the occurrence of certain complications (Lee & Kim, 2020). Careful patient assessment and selection, taking into account these potential risk factors, are crucial for minimizing adverse events and optimizing outcomes. Practitioner skill and experience in performing thread lift procedures also play a significant role in reducing the risk of complications.

**Table 1: Summary of Common Complications and Their Reported Incidence Rates**

Complication Type	Pooled Incidence Rate (%)
Swelling	16–35
Bruising	26
Pain	11
Dimpling	7–10

*Note: Incidence rates are based on meta-analysis data and may vary across individual studies.*

**Table 2: Comparison of Complication Rates Between Absorbable and Non-Absorbable Threads**

Complication Type	Absorbable Threads (%)	Non-Absorbable Threads (%)
Paresthesia	3.1	11.7
Thread Extrusion	1.6	7.6

*Note: Data is based on a meta-analysis comparing complication rates between thread types.*

## Discussion

The findings from the reviewed literature indicate that thread lifts represent a minimally invasive facial rejuvenation technique with a dual mechanism of action involving immediate mechanical lifting and longer-term collagen stimulation. The reported clinical outcomes suggest efficacy in addressing various signs of facial aging across different anatomical areas, supported by both objective measurements and subjective patient satisfaction. However, the longevity of the results is limited, and the procedure is associated with a spectrum of

complications ranging from common and transient side effects to less frequent but potentially significant adverse events.

The comparison of these findings with previous research, including earlier studies that reported poor long-term outcomes with older thread lift techniques (**Sulamanidze & Sulamanidze, 2009**), highlights the advancements in thread materials and insertion methods over time. Newer absorbable threads and refined techniques appear to offer more sustained results and potentially improved safety profiles compared to their predecessors. Nevertheless, thread lifts may not provide the same degree of long-term rejuvenation as surgical facelifts, and their suitability depends on the individual patient's needs, the severity of aging signs, and realistic expectations.

Several gaps in the current knowledge warrant further investigation. There is a lack of standardized protocols for thread lift procedures, contributing to variability in techniques and reported outcomes across different studies. Long-term data on the efficacy and safety of newer thread materials and techniques remain limited, necessitating extended follow-up studies to fully understand their sustained effects and potential delayed complications. More robust, large-scale randomized controlled trials are needed to compare the efficacy and safety of different thread types and techniques, as well as to evaluate their performance against other facial rejuvenation modalities. Furthermore, a more comprehensive understanding of the precise biological mechanisms underlying collagen stimulation and tissue remodeling in response to thread insertion is required. Variability in outcome measures and the reporting of complications across studies also poses a challenge for synthesizing the evidence.

Future research should focus on addressing these gaps. Well-designed, large-scale randomized controlled trials with long-term follow-up are essential to provide more definitive evidence on the efficacy and safety of thread lifts. Comparative studies evaluating different thread materials and designs, as well as optimal techniques and protocols for various facial areas and patient characteristics, would help to refine the application of this procedure. Investigations into the cellular and molecular mechanisms of action, including the duration and quality of collagen stimulation induced by different thread materials, are needed to optimize the regenerative effects. The development of standardized outcome measures and complication reporting systems would facilitate more consistent and comparable research findings. Finally, studies exploring the potential role of adjunct therapies, such as energy-based devices or injectables, in enhancing the results and longevity of thread lifts could further expand the utility of this minimally invasive technique.

## **Conclusion**

Thread lifts have established themselves as a valuable minimally invasive option for facial rejuvenation, offering a dual benefit of immediate lifting and longer-term tissue stimulation. While clinical outcomes demonstrate efficacy in addressing various signs of aging with a generally favorable safety profile, the longevity of results is temporary, and the procedure is associated with potential complications. The choice of thread type, insertion technique, and patient selection are critical factors influencing both the effectiveness and safety of thread lift



procedures. Future research aimed at standardizing protocols, gathering long-term data, and enhancing our understanding of the underlying mechanisms will further refine the role of thread lifts in the evolving field of aesthetic medicine. Careful patient selection, thorough consultation, appropriate thread selection, and precise technique remain paramount for optimizing outcomes and minimizing the risks associated with this increasingly popular procedure.

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