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Clinical evaluation of the efficacy and safety of double needle thread lift for facial rejuvenation

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Abstract

Background: The double needle thread lift is a minimally invasive cosmetic procedure designed to enhance facial contours and promote skin tightening. Despite its increasing popularity, comprehensive clinical data evaluating its efficacy and safety are limited.

Objective: To assess the clinical outcomes and safety profile of the double needle thread lift in patients seeking non-surgical facial rejuvenation.

Methods: This study involved 50 participants aged 30-50 years with mild to moderate skin laxity. Each participant underwent a double needle thread lift procedure. Outcomes were evaluated at baseline, and at 1, 3, and 6 months post-procedure. Primary endpoints included patient satisfaction, physician-assessed improvement using the Global Aesthetic Improvement Scale (GAIS), and objective skin tightening measured via digital imaging. Secondary endpoints included adverse events and pain assessment using a Visual Analog Scale (VAS).

Results: At 6 months post-procedure, 85% of participants reported high satisfaction with the aesthetic outcomes. GAIS scores indicated significant improvement in facial contours and skin tightness in 78% of cases. Digital imaging showed a mean reduction in skin laxity of 25%. Adverse events were mild and transient, including swelling (60%), bruising (50%), and mild discomfort (30%). No severe complications were reported.

Conclusion: The double needle thread lift is an effective and safe option for patients seeking non-surgical facial rejuvenation, with high satisfaction rates and a favorable safety profile. Further long-term studies are warranted to confirm these findings and optimize procedural techniques.

Keyword: Double needle thread lift; Facial rejuvenation; Invasive.

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Introduction

Structural rejuvenation of the face involves replacing the scaffolding of the face in which we look for bone and soft tissue, so that the skin can drape without excess areas.[1] Facial rejuvenation encompasses both surgical and non-surgical procedures aimed at reducing the visible signs of aging and restoring a youthful appearance.[2]

Facial aging is characterized by a progressive increase in skin and soft tissue laxity.[3] The rate at which these changes affect the face varies and depends on both internal and external factors such as genetic predisposition, ethnicity, sun exposure, smoking,

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systemic disease and air pollution.[3] Skin quality is an important element of human attractiveness. The age-related decline in viscoelastic properties of skin is most pronounced after the age of 50, while skin dehydration is more common in younger age groups especially between the ages of 40 and 50.[5] Five point photo numeric scale is used to assess the skin quality which includes radiance, texture and color evenness.[6]

Now a day the use of ultrasound has facilitated a more convenient means of verifying the results of the procedure. This development has had a major impact on the enhancement of treatment methods by eliminating the need for direct examination of cadaveric specimens and allowing a more objective evaluation of results. This includes determining the appropriate plane for thread insertion taking advantage of elastic tissues and identifying lax tissues to effectively address facial aging mechanisms such as sagging tissues.[7]

The main purpose of a thread lift can be described as making extensive use of threads to pull and secure these sagging tissues in the opposite direction of gravity, preventing them from re-sagging.[8] Commonly used straight or moderately long floating type threads (also called floating threads) play a vital role in this task.[9] The action of the thread protrusions grasping the tissue is called "fixation". Due to this fixation action, the underlying loose tissue is captured by thread protrusions called "hanging points". Conversely, the part where the protrusion of the thread gets caught in hard tissue is generally called the "fixing point."[10] Therefore, in a thread lift using this protruding thread, the most important factor is the "anchoring strength" that firmly grips the tissue. The force that causes tissue to return to its original state while being held by thread protrusions is called "stress".[11]

Another term Anchoring strength is described as the force with which the teeth of the thread are firmly attached to the tissue and facilitate its ability to pull and gather the tissue.[12] This involves the teeth effectively capturing the tissue and fixing it in place.[13]

Non-absorbable polypropylene (Prolene™) threads were once common, but now absorbable polydioxanone (PDO) threads are more common. Absorbable threads such as poly-L-lactic acid (PLLA) and polycaprolactone (PCL) are also now available. Absorbable threads are a blend of different materials to take advantage of unique tissue reactions, strength, and dissolution rates in the body.[14] Silhouette Soft threads which are primarily composed of PLLA (poly-L-lactic acid) exhibits a high elastic limit compared to other threads. Its flexibility allows it to respond effectively to facial movements and expressions minimizing potential stress and discomfort after procedure.[15]

Commonly used types of cog threads include long cannula-guided or two-needle bidirectional cog threads. Usually used in a U or V shape, with a length of 40 cm or more.[16] Thread lifting results are affected by various factors such as thread material, thread thickness, shape, number of cogs thread, direction and depth of thread placement.[17]

Over the past decade minimally invasive facial rejuvenation techniques have become mainstream treatments. Its advantages include short surgical time, the possibility of an office based cosmetic procedure and a low incidence of postoperative complications. Therefore facial rejuvenation techniques using threads to lift the eyebrows, mid face, chin, and neck are frequently performed and the treatment results are good.[18] Their advantages include strength, lack of premature breakage, and minimal risk of inflammatory reactions.[19]

The popularity of thread lifting materials expands beyond polydioxanone (PDO) poly-L-lactic acid (PLLA). This highlights the importance of comprehensive evaluation when selecting the appropriate thread lifting material. The need to ensure comfort in relation to facial expressions is of paramount importance and procedures are warranted to minimize discomfort.[20]

Methods

This Quasi experimental study was conducted in a private clinic at Lahore with 50 participants aged 30-50 years with mild to moderate skin laxity.

Inclusion criteria: Those participants were included in the study who are eligible for the double needle thread lift based on age, skin laxity, and absence of contraindications with absence of any chronic medical condition.

Exclusion criteria: Pregnant or lactating women; Patients with A bleeding tendency or coagulation disorders; Patients with skin or any other organ cancer; Patients with photosensitization or immunosuppressive disease; Patients with scarring or any metabolic connective tissue disease; Patients with immunosuppression.

The sample size of 50 participants was calculated using G*Power software, with the intent to achieve statistically significant results. This sample size is expected to generalize well to similar populations seeking non-surgical facial rejuvenation.

Data collection was done by using Global Aesthetic Improvement Scale (GAIS) and objective skin tightening measured via digital imaging. Visual Analog Scale (VAS) was used for pain.

Ethical approval was obtained from the relevant institutional review board. All participants were fully informed of the risks and benefits of the procedure and provided written informed consent. Data confidentiality was ensured, and participants were anonymized during data collection and analysis. Additionally, the study strictly adhered to the Declaration of Helsinki for medical research.

Results

The demographic data include of 50 participants with 45 female and 5 male participants. The mean age of the participants is 40 years with a standard deviation of 8.758 years. The sample size is moderate with 50 participants.

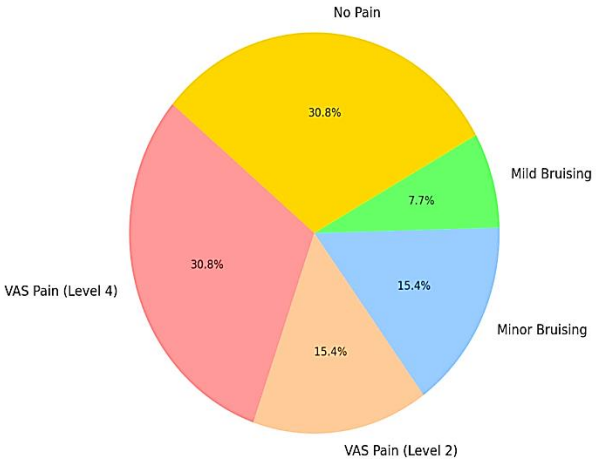

Figure 1 Adverse effects and pain assessment (VAS).

The study reported minimal adverse events associated with the double needle thread lift procedure. Most patients experienced mild side effects, including redness, swelling, and minor bruising, which resolved quickly. Moderate complications, such as persistent pain, delayed wound healing, or nodules, were infrequent. Severe adverse events, such as infections, asymmetry, prolonged scarring, or nerve injuries, were extremely rare, indicating the safety of this minimally invasive technique.

Significant improvements in facial appearance and skin laxity were observed in the participants. Baseline and follow-up assessments conducted at intervals-immediately after the procedure, 1 month, 3 months, and 6 months post-procedure-highlighted consistent enhancement in skin tightness and facial rejuvenation. Digital imaging analysis supported these findings, showcasing noticeable and lasting improvements in facial contours and texture.

Improvement Parameters

Both qualitative and quantitative metrics confirmed the procedure's effectiveness. Digital imaging analysis provided objective evidence of improvement, while

patient satisfaction scores indicated a high level of acceptance. These assessments validated the efficacy of the double needle thread lift as a reliable non-surgical option for treating mild to moderate skin laxity.

The paired t-test applied to skin laxity scores and satisfaction metrics revealed statistically significant improvements post-procedure. Descriptive statistics were used to evaluate adverse events, further confirming that the incidence of moderate or severe complications was minimal. The comprehensive analysis substantiated the safety and effectiveness of the procedure.

In this table we have applied One Sample T Test and it shows the p value 0.000 which is less than rational p value 0.05 it means that our study is significant. Each result shows a mean difference that is significantly different from the test value of 50, with the actual mean difference ranging from approximately -45.260 to -49.040. The mean differences and t-values differ significantly between the various measurements. This suggests that different aspects of the procedure or measurement may have different effects. There are different t values that we compare VAS after procedure and VAS after 1st visit shows t value of -178.440 and -205.227. There are different t values that we compare Swelling immediate post procedure and swelling after 1st visit which indicate t value -458.862 and -694.430.This study also compare between Bruising immediate post procedure and bruising after 1st visit which shows t value as -650.600 and -586.472. In this study we compare the most important variable as patient satisfaction follow up visit and patient satisfaction after 3 months and patient satisfaction after 6th month which indicates the t value as -674.426 and -1199.000 and -679.264 significantly.

Discussion

A study conducted by Hong GW *et al.* use the advancement of thread lifting procedures that has brought about considerable enhancements in addressing facial sagging, primarily associated with aging. The recent advancements in thread quality thread lifting companies coupled with the introduction of varied designs have significantly contributed to the increased efficacy of thread lifting procedures that our study has used these threads and find out significant results. In conclusion this review delves into the core and general thread lifting procedures emphasizing the

critical role of tissue consistency, anchoring strength, and holding strength and no severe complication were reported during our study.[7]

A study was conducted by Sehyung Song *et al.* Exploring the Anatomical Perspectives and the Role of Thread-Based Interventions and they done the administration of fillers to address nasolabial folds as a common practice in cosmetic procedures. However inadvertent injection into the facial artery poses severe complications, including skin necrosis and irreversible blindness. While our study did not show any of complication regarding blindness and skin necrosis using double needle thread lift. The selection of thread thickness and quantity is contingent on various factors, including skin thickness, elasticity, laxity, and volume. Additionally, for enhancing crease lines without significant sagging in the nasal alar area, the insertion of volume threads along the crease lines is considered for achieving the desired effect as these thread quality and insertion of threads technique were used in our study and get 85% of the participants satisfaction results using Global Aesthetic Improvement Scale (GAIS).[9]

A study reveiw was conducted by Gi Woong Hoong *et al.* investigates the use of thread-lifting materials different from traditional sutures in aesthetic procedures. Observations regarding the effectiveness and longevity of absorbable and non-absorbable threads are discussed with special emphasis on the efficiency of high-quality absorbable cog threads as in our research absorbable threads are being used for facial rejuvenation procedures. This type of thread were used in our study and showed a maximum of patient satisfaction and less ratio of patient in pain or discomfort.[14]

An experimental study was conducted by Hyoung-Jin MD *et al.* took a total of 21 participants and their treatment outcomes were described based on a comparison between preoperative and postoperative findings and Global Aesthetic Improvement Scale (GAIS) scores were assessed at 6 months same as our study took 50 participants and assessed on GAIS. There were 3 “Excellent” cases, 9 “Marked Improvement,” 7 “Moderate” cases, and 2 “No change” cases as compare to our study 85% of participants reported high satisfaction with the aesthetic outcomes. GAIS scores indicated significant improvement in facial contours and skin tightness in 78% of cases. Digital imaging showed a mean reduction in skin laxity of 25%. Its treatment goals are to reduce winkles and to tighten the aging skin as in our study we report no severe complications.[21]

A study conducted by Samira Yarak and Juliano Augusto Ribeiro de Carvalho use of bidirectional barbed threads is a minimally invasive technique for facial rejuvenation. Four female and two male patients with an average age of 42.5 years (ranging from 55 to 35 years old). The patients were instructed not to practice physical exercises for two weeks and to apply cold compresses for 72 h in the temporal lobe region as in our study patient with few reported pain complaints were settled by applying cold compresses and symptoms were settled in less than 72 hours. The patients were satisfied with the post-procedure result and finally an important factor that must be observed when analyzing the results obtained with this technique is the correct selection of patients treated.[20]

A review of 100 face-lift patients was performed by Rohrich *et al.* in 2014 by using Photographic analysis using a computer program as in same manner we use photographic program to entertain our results post operatively and after 6 months. The lift-and-fill face lift merges effective tissue manipulation by means of lifting and tightening in differential vectors according to original facial asymmetry and shape.[22]

Aptos threads (Chiramax; Prague, Czech Republic) are made of No. 2-0 polypropylene line with dents that create sharp edges was used by Steven Halepas DMD in 2020 while thread in our study used was absorbable polydioxanone (PDO). Minimally invasive thread-lift procedures can be performed with the patient under local anesthesia, intravenous sedation, or general

anesthesia. The most common complication is consistent with most surgical procedures including skin dimpling and buttoning are also potential adverse events as there are no such effects shown by the threads we use in our study.[23]

A study was conducted by Li, Yi-Lin MD in 2021 that in 2014 China approved polydioxanone thread (an absorbable barbed thread) for large-scale nonsurgical facial lifting. From April 2014 to January 2020 a total of 190 patients with postoperative complications of facelifts were treated after they underwent thread lifting in other hospitals. The most common complications of facial thread lifting are in the following order skin dimpling, contour irregularity, visible threads, and thread extrusion. The reasons for complications are mainly unfamiliarity with facial anatomy, unskilled surgical operation, and misunderstanding of the facial aesthetics while in our study we use the same thread but followed mild discomfort by 30% of patients because of the improved knowledge of the surgeons and their skills.[24]

A prospective chart review study with APTOS thread lift was conducted by Samad Rezaee Khiabanloo MD *et al.* in 2020 same as Reference 23 study was conducted with APTOS thread lift. A total of 58 patients were included (from July 2018 to July 2019). The patients were followed up first week, third, and sixth month after lifting surgery same in our study taken feedback. Outcomes were assessed by two surgeons and patients based on the GAIS score same as assessment was done in our study. The results showed that satisfaction in patients and surgeons increased over time after 6 months. Postoperative minor complications were also assessed and ecchymosis was found to be the most common complication as in our study we did not find any complain regarding ecchymosis.[25]

Dr Won Lee MD used doppler ultrasound guided thread lifting in January 2019 which include 50 participant to locate the frontal branch of the superficial temporal artery (FBrSTA) in the temple area and a detour pathway should be created for thread insertion to avoid vascular complications. No vascular complications were noted in all patients. As this is the safest technique to do the thread lifting procedure as we were lack of resources and our study should aim to use this technique in our upcoming research regardless to do the more safe procedures with less or no complications.[26]

A meta-analysis and system review of facial thread lifting was conducted in 2021 by Zehao Niu in which total of 26 studies were included in this meta-analysis. Swelling was the most commonly reported complication with a pooled incidence of 35% as in our study it is 30%, followed by skin dimpling (10%), paresthesia (6%) and these other complications were not reported in our study were shown in our study. Non-absorbable threads and older age of patients are associated with higher risks of complications so we use absorbable threads for better results and less complications.[27]

A study was conducted in January 2016 and Febuary 2018 for maximizing threads usage for facial rejuvenation 4 M (Multi-target, Multi-vector, Multi-layer, and Multi-material) thread lift technique for long-lasting results. Two plastic surgeons compared photographs using a 5-point Global Aesthetic Improvement Scale (GAIS) at 1, 3, 6, 12, 18, and 24 months of follow-up. On the GAIS objective assessment in most patients (85%) experienced better than 3 score (“improved”) changes as same in our study but after 6 months. Approximately 42.5% of the patients experienced better than 4 score (“much improved”) changes. The mean GAIS grade improved significantly without decline throughout a period of 12 months. The 4 M thread lifting technique presented modest to significant improvement maintaining good results at 12 months after procedure as we need some more resources to follow up the patients for more than 12 months as we have achieve better results with our technique in 6 months.[28]

Between January 2017 and July 2018 eight participants were enrolled in study of Thread lifting of

the jawline conducted by Diaspro *et al.* in which six women and two men. Only six patients complete the study and results showed that it is possible to achieve tissue repositioning which may last up to 8 months as per the recorded follow-up period. Poli-lactic/poli-caprolactone were used and this threads are safe and effective in treating skin flaws that affect mild-to-moderate ptosis of the jawline up to 8 months.As in our study we used absorbable polydioxanone (PDO) thread which have the capability to absorb in 6 months within the tissue while poli-lactic/poli-caprolactone took 12 to 15 months to absorb in tissues.[29]

Conclusion

The double needle thread lift is an effective and safe option for patients seeking non-surgical facial rejuvenation with high satisfaction rates and a favorable safety profile. Absorbable polydioxanone (PDO) threads are more common PDO threads provide strong tensile strength and dissolve gradually over 6 months or more. The facial artery which courses along the nasolabial fold both laterally and medially and intersects the fold must be preserved as a critical consideration in thread-based correction procedures. Further long-term studies are warranted to confirm these findings and optimize procedural techniques.

Declaration of patient consent The author certifies that he had obtained all appropriate patient consent.

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Conflict of interest The author affirms that he has no conflicts of interest to disclose.

Author's contribution

TK: Have made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data. Have been involved in drafting the manuscript and revising it critically for important intellectual content.

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