

Minimum Access Endoscopic Brow Lift with Deep Temporal

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ABSTRACT

Background: The goals of any brow-lifting procedure are to stabilise the brow at an aesthetically ideal height, orientation and provide reproducible and lasting results while concealing scars and avoiding the stigmata of a facial plastic surgery: hairline elevation, over-elevated brows, or a quizzical appearance.

Aim of the study: This study was designed to evaluate the efficacy and safety of using the endoscopic approach in brow lifting surgery.

Patients and Methods: This prospective interventional study involved twenty patients who underwent endoscope temporal brow lift at Al-Shaheed Ghazi Al-Hariri hospital and the burn centre at Baghdad Medical Complex between October 2020 and June 2022. Twenty patients were included, and surgical intervention for temporal brow lift was done using an endoscope. The patients were assessed before surgery and monthly until 6 months after. Evaluation of all the patients has been advocated objectively and subjectively. The distance (in mms) between the nasal ala and the lateral tail of the brow and the vertical distance between the lateral tail of the brow and the lateral canthus were used as an objective evaluation method. Visual Analogue Scale was used to evaluate the perception of the patients, the surgeon, and the third eye (another surgeon) after the post-operation.

Results: In objective evaluation, the mean gain of the distance between the nasal ala and the lateral tail of the brow is 8 mm, the mean increase in the vertical distance between the lateral tail of the brow and the lateral canthus is 6.5 mm. Regarding subjective perceptions using VAS, most patients have good perceptions, while most surgeons' perceptions are perfect. No major complications were faced in our patients, perhaps due to the lack of complexity, such as calvarial interventions, and avoidance of using biodegradable implantable devices.

Conclusion: Endoscopic temporal brow lifting is a minimally invasive option with a smooth postoperative recovery that can provide promising aesthetic results. However, larger series of patients and more extended periods are needed for more precise evaluation.

Keywords: Forehead lift, endoscopic lift, Minimum access endoscopic lift

Introduction

The face is the focal point of human beauty. Although various factors influence facial beauty, the ageing process is the most common aspect prompting surgical intervention. A forehead lift procedure results in several improvements to the ageing face. It raises the eyebrow to a more youthful level, ameliorates the transverse and vertical wrinkles, and pens up the eyes. These use to first the were Navayanan and Liang and al. et Core 1992, In].2-1[facelift the complementing in well very work changesan endoscope for facial rejuvenation. Since then, many plastic surgeons have preferred endoscopic eyebrow lift for upper face rejuvenation. Vasconez, Issei, and Chajchir were among the first surgeons to describe using the endoscope for brow lifting. Subsequently, many authors have published a variety of modifications and refinements in this approach of brow rejuvenation surgery. lifting brow in approach endoscopic the of safety and efficacy the evaluated study This .[3,4]

Patients and methods

Between October 2020 and June 2022, an interventional prospective study involved twenty patients who underwent endoscope temporal brow lift at Al-Shaheed Ghazi Al-Hariri hospital and the burn centre at Baghdad Medical Complex. Their ages ranged from 35 to 60 years, with a mean of 45 years.

Inclusion Criteria

Patients who complained of lateral brow ptosis and had normal

eyebrow position, desiring to elevate their lateral eyebrow within the aesthetic standard.

Exclusion Criteria

Patients with tattooed eyebrows, medial eyebrow ptosis, filler or botox to their eyebrow within the last 6 months, previous eyebrow or browpey procedures and unrealistic expectations. All the patients were informed about their need for eyebrow elevation, and later on, they can have blepharoplasty if needed. Physical examination was performed focusing on eyebrow mobility, symmetry, and position. the precise position(normal eyebrow is 0.5-1cm above the supraorbital rim in females, and at the level of the supraorbital rim in males) Ptotic eyebrows predispose to fullness of the upper eyelid; hence, elevation of the eyebrow manually can determine the excess skin of the upper eyelid. Finally, the presence of forehead and glabellar frown lines was determined. Measurements (in mms) were obtained preoperatively, including the distance between the nasal ala and the lateral tail of the brow and the vertical distance between the lateral tail of the brow and a horizontal line extending at the lateral canthus. All patients had routine preoperative investigations, including photographic documentation in the standard frontal and oblique (left and right) views. Evaluation of all the patients was advocated both objectively and subjectively.

The distance (in mms) between the nasal ala and the lateral tail of the brow and the vertical distance between the lateral tail of

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the brow and the lateral canthus were used as an objective evaluation method. The Visual Analogue Scale was used to evaluate the post-operation perception of the patients, surgeon, and third eye (another surgeon).

Surgical procedure

Preoperative marking is done while the patient is sitting in the operating theatre. First, the superior temporal line is marked, separating the forehead and temporal zones. Then the inferior temporal septal line was identified by drawing a line that extended from the brow to the helical root. This line will separate the superior and inferior temporal compartments. The lateral orbital rim is then marked with the sentinel vein's proposed site, which is approximately 1cm from the lateral orbital rim. The incision is done along the vector of maximal proposed eyebrow lifting, and this vector corresponds to the continuation of the line that extends from the nasal ala toward the lateral eyebrow, ending up to 2cm within the temporal hairline. The length of the incision is about 2cm. The same marking is done at the opposite site.

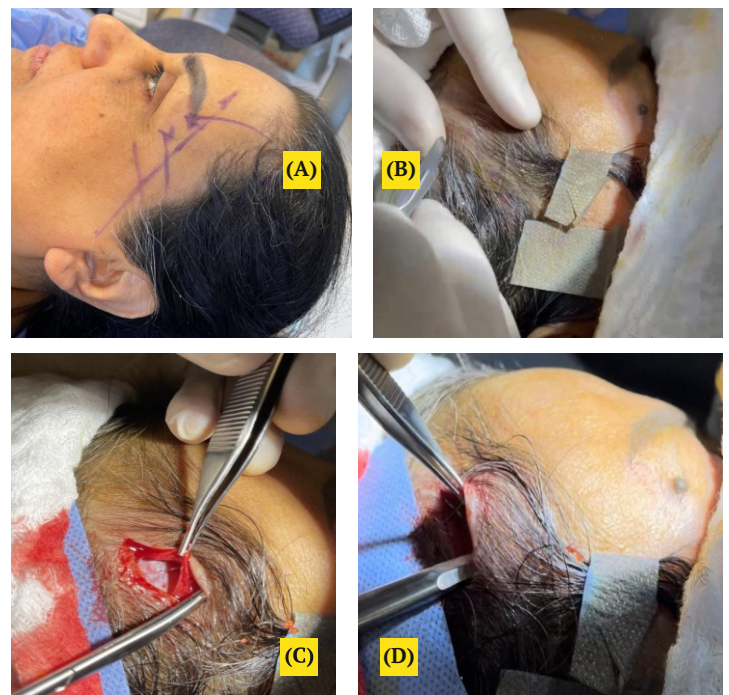
After finishing the marking, the patient is allowed to lie down in the theatre and an intravenous cannula is inserted together with monitoring. All operations were done under local anaesthesia using tumescent solution (250ml of normal saline solution with 50ml of 1%xylocaine and 1cc of 1% 100,000 adrenaline). After the standard procedure for prepping and draping, the scalp hair is covered with gel and plaited using the elastic band to avoid introducing the hair within the operative field; no hair sharing is done. Local infiltration of the incision line is done using local lidocaine injection. Then the tumescent is infiltrated in the subcutaneous plane down to the zygomatic arch, which works as anaesthesia and hydrodissection, so hemostasis will be secured. About 25 to 30 ml of tumescent is infiltrated on each side.

After waiting for the last 7 minutes, the operation begins by incising the previously marked temporal incision using a No.15 scalpel; the incision is bevelled to avoid injury to the hair follicles. The incision is made and extended through the skin, subcutaneous tissue, and temporoparietal fascia down to the deep temporal fascia which has characteristic white glistening color, sometime simple slit can be don in the deep temporal fascia where we see the temporalis muscle located beneath it to be sure that we are in the correct plane. After completing the incision, a facelift scissor was used to do blunt dissection through the temporal incision. The dissection is done above the deep temporal fascia and extended to one centimetre in front of the temporal hairline. After that, a curved Ramirez endoscopic periosteal elevator (9mm) was introduced to do blunt dissection above the deep temporal fascia that extended above the supraorbital margin and to the lateral orbital margin down to the inferior temporal septal line that was previously marked. Also, the dissection can extend posteriorly toward the occipital. All this dissection is done blindly within this bloodless field. A scissor is used to serve the temporal conjoint fascia (superior temporal septal line) that extended along the superior temporal line and represented the fusion between the forehead galea and temporoparietal fascia, and after serving this conjoint fascia, a periosteal elevator is used is sweep movement to open the connection between the forehead and temporal zones. Than 4mm rigid endoscope with 30° angle that equipped with video camera is introduced through the same temporal incision with the scope we introduce another curve Ramirez endoscopic periosteal elevator (6mm) which will complete dissection under direct endoscopic vision of temporal area below the

inferior temporal septum along the lateral orbital margin till identified the sentinel vein. After that, the elevator is exteriorised, and an endoscopic scissor is introduced through a temporal incision along the endoscope to do sharp dissection of the retaining orbital ligament along the lateral orbital margin. During the release of the orbital ligament, the sentinel vein is preserved, and the dissection is done around it in medial and inferior dissection. The lateral border of our dissection is the zygomatic temporal sensory nerve, which is located just laterally and slightly inferior to the sentinel vein. During our dissection of the lateral orbital retaining ligament, the assessment finger is placed on the interior aspect of the lateral orbital rim to prevent the release of the lateral canthal ligament. Sharp dissection is also carried out under direct endoscopic vision using endoscopic scissors along the superior orbital margin.

To divide the ligamentous adhesion above the superior orbital margin, the dissection is continuous till the retro-orbicularis fat pad (roof) is observed. After finding and releasing the retaining ligament and adhesion zones around the orbit, the hemostasis is secured using bipolar cautery under endoscopic vision in case we need. Then, the lateral elevation is done by lifting the temporoparietal fascia and fixing it to the deep temporal fascia by using 3.0 PDS that anchors the undersurface of the elevated temporoparietal to the deep temporal fascia in a horizontal mattress fashion. Usually, overcorrection is preferable. The excess skin is not trimmed, and the incision is closed using stainless steel staples or clips with an elevation of the wound edge. Simple dressing is applied to the incision, consisting of a sterile strip. The operation is repeated on the other side. A headband wraps the whole forehead and temporal region.

Patients were instructed to keep their heads elevated. All patients were discharged and kept on Oral antibiotics and analgesia. For one week, the patient was instructed to use an ice bag around the eye to reduce ecchymosis and swelling. The clips were removed on the 7th postoperative day.



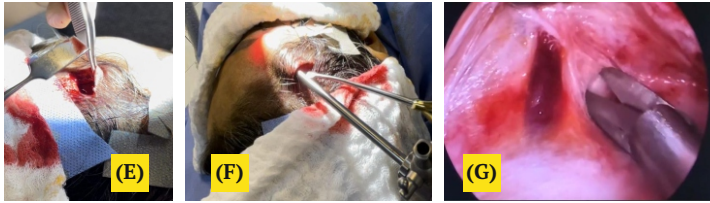


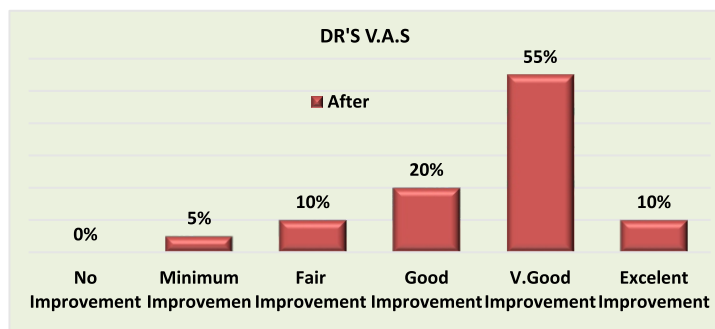
Figure (1): (A)Marking the superior temporal .then the inferior temporal septal together with the proposed site of the sentinel vein (B) Mark the incision site 2 cm behind the hair line (C) The white glisning appearance of the deep temporal fascial (D) Scissor was used to do blunt dissection through the temporal incision (E) Dissection with Ramirez endoscopic periosteal elevator (9mm) (F)The scope with the periosteal elevator are introduced to the same incision (G) The sentinel vein is identified and the dissection is done around it.

The mean gain of the distance between the nasal ala and the lateral tail of the brow is (8 mm), while the mean gain in the vertical distance between the lateral tail of the brow and the lateral canthus is (6.5 mm), as shown in Table 1.

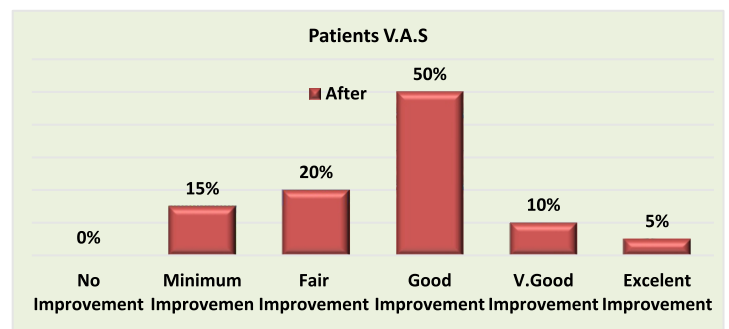
Table 1: After 6 months of surgical intervention.

Patients number	Sex	Age	Distance between the nasal ala and the lateral tail of the brow		The vertical distance between the lateral tail of the brow and the lateral canthus	
			before	After	before	After
1	♀	40 years	64	75	10	16
2	♀	35 years	63	70	9	14
3	♀	40 years	60	68	8	16
4	♀	50 years	71	78	11	15
5	♀	55 years	64	70	10	17
6	♂	42 years	70	75	11	18
7	♀	39 years	73	79	13	16
8	♀	44 years	74	80	11	18
9	♀	46 years	69	78	9	16
10	♀	40 years	67	75	11	18
11	♀	37 years	62	69	12	17
12	♀	38 years	56	66	11	22
13	♀	56 years	73	80	9	15
14	♀	59 years	69	74	11	18
15	♀	50 years	75	80	10	18
16	♀	55 years	62	70	10	16
17	♀	45 years	72	83	9	14
18	♀	45 years	69	82	10	17
19	♀	36 years	65	74	8	17
20	♀	34 years	74	80	9	18
Mean			67.6 mm	75.3 mm	10.1 mm	16.8 mm

Regarding the subjective perception using VAS, the majority of patients experienced good perceptions while the majority of surgeons' perceptions were very good (Figure 2.3).



Figure(2): The subjective perception of Surgeonsnn



Figure(3): The subjective perception of patients

All the patients who already had eyebrow ptosis reported improved visual field with lightening of lateral upper eyelid fullness. Most of the patients reported no discomfort during the operation. No major complications were observed postoperatively; only one case of hematoma resolved after 5 days without surgical intervention and one case of neuropraxia of the frontal nerve resolved after one month.



Figure(4): 38 years old female, (A)Side view before intervention. (B) Front view before intervention. (C) Side view after 6 months from intervention. (D) Front view after 6 months from intervention.



Figure(5):58 years old female, (A)Side view before intervention.(B) Front view before intervention (C) Side view after 5month from intervention.(D) front view after 5month from intervention.

Discussion

Transtemporal eyebrow lift can be performed in isolation or in combination with forehead rejuvenation depending on patient presentation and patient desire. Transtemporal brow elevation can be adopted through a subcutaneous approach or an endoscopic one. Knize was improved and popularized the endoscopic approach for temporal eyebrow elevation. This approach relay on the principle of releasing all periorbital attachments and mechanical fixation. It provided good surgical exposure with an excellent surgeon's view, together with limited incision and no distortion of the hairline. Although a transtemporal eyebrow lift can be done without an endoscope using a fiberoptic headlight and pistol grip endoscopic scissors, such an approach requires much experience; inadvertent damage and inadequate release of tissue are still possible, since the procedure is not done under a direct and magnified vision approach as with an endoscope. In the direct temporal approach (transtemporal endoscopic in our study, lateral eyebrow lift was done in 20 patients who were presented with lateral brow ptosis or desired to have more lateral eyebrow lift, with promising results [5]. Although the overall satisfaction data showed no significant difference in complication rate between open and endoscopic approaches, the endoscopic one reported less frequency in these complications. [4], Paul et al. Advocate using a three-incision approach in endoscopic brow lift, one at the midline and two at the temporal site, one opening used to introduce the scope and the other for the periosteal elevator. [6] S. Withey et al. used five incisions, one in the midline and two paramedian incision beside the two temporal incisions [7].

In our procedure, we just used a single temporal incision that hides within the temporal hairline. Through this incision, the scope is introduced together with either an endoscopic elevator or endoscopic scissors. Through such modification, we didn't need to use other incisions, like paramedian incision, which is frequently used with the traditional method of endoscopic temporal brow lift. The pocket was quite (distance) enough to introduce the endoscope with either scissor or elevator, and we faced no difficulty in their handling. By such modification, we have a temporal scar that was well hidden within the temporal hairline and barely visible later. Regarding the fixation methods, it should incorporate all the following features: aesthetic satisfaction, patient comfort, intraoperative ease of use, and uncomplicated postoperative care to obtain the desirable outcome [8].

A biodegradable endotine fixation device used for endoscopic forehead lifts by Grant Stevens . The endotine device is designed to secure the periosteum and galea in contrast to another way of fixation. Subperiosteal lift achieves more permanent fixation because the entire periosteum adheres to bone. The subgaleal elevation consists of galea and frontalis muscles, both of which are elastic and can stretch and glide back toward their original positions. However, the incomplete resorption of the device and its cost need to be considered as limiting factors [9].

Byrd et al advocate using different way of fixation by using plate and screw after indentificatoin of the point of fixation and after fixation of the screw the suture then tied to the screw,this way of fixation provides precise vector determination, but it drawback include palpable screw and permanent skull implant besides it's costly [10].

Tom Gallaher et al. developed an outer calvarial table fixation technique. which allows direct fixation of the periosteum or galea to the outer table of the frontal bone through the use of an outer table calvarial tunnel.

In this way, there was no problem associated with long-term implantable devices, and eliminates any potential problems associated with such a device as well as the expense involved but consideration should be taken of avoidance throw and throw calvarain penetration [11].

In our approach, we adopted a smaller number of incisions, and we did not use any implantable fixation devices with no interference with calvarium. Hence we consider our approach is easy to performed with less drawbacks.

Regarding the subjective perceptions according to visual analogu scale, most of the patients experienced good perceptions while the surgeons perceptions were vary good (figure) .This difference in perceptions is related to the knowledge of surgeons about the anatomical and surgical facts that most of the patients do not.

Objectively, the mean gain in the (Distance between nasal ala and lateral tail of the brow) was 8 m and (the vertical distance between the lateral tail of the brow and lateral canthus) was 6.5m (Table 3.1) ,we assume that these values that we achieved in our technique are promising. No major complications were faced in all of our patients, perhaps due to lack of the complexity like calvarial interventions, and avoidance of using biodegradable implantable devices.

Conclusion and recommendation

Endoscopic temporal brow lifting is minimally invasive option with smooth postoperative recovery that can provide promising aesthetic results, although larger series of patients and longer period of time are needed for more precise evaluation.

References

1. Marc R. Arram, Sandy Tsao, Zeina Tannous, Mathew M. Arram. Colour atlas of cosmetic dermatology. 1st.ed, McGraw-Hill Medical, 2007; pp 2.
2. Mimis N. Cihen, seth R. Thaller. The unfavorable result in plastic surgery: Avoidance and Treatment, 4th.ed., Thieme, 2018; pp. 273.
3. Robert N. Tower, Roger A. Dailey. Endoscopic pretrichial brow lift. Surgical indications, technique and outcomes. Opticalmic plastic and reconstructive surgery, 2004;20(4):268-273.
4. Darrell W. Graham, Justin Heller, T. Jonathan Kirkjian, Timonthy S. Schaub, Rod J. Rohrich. Brow lift in facial rejuvenation: A systematic literature review of open versus endoscopic technique. Plast Reconstr Surg, 2011;128:335e.
5. Knize DM. Limited incision forehead plasty. Plast Reconstr Surg, 1999;103:271-284.
6. Nassif PS. Endoscopic Brow-Lift with Deep Temporal Fixation Only (DTFO). Facial Plastic Surgery Clinics of North America. 2006 Aug;14(3):203-11.
7. Withey, S., Waterhouse, N., & Witherow, H. (2002). One hundred cases of endoscopic brow lift. British Journal of Plastic Surgery, 55(1), 20-24. doi:10.1054/bjps.2001.3707
8. Adetayo OA, Wong WW, Motakef S, Frew TG, Campwala I, Gupta SC. Endoscopic Brow Lift Fixation With Mitek Suture Anchors: A 9-Year Experience of a New "Ideal" Technique. Plast Surg (Oakv). 2019 May;27(2):100-6.
9. Stevens W. The endotine: A new biodegradable fixation device for endoscopic forehead lifts. Aesthetic Surgery Journal. 2003 Mar;23(2):103-7.
10. Rod J. Rohrich, Samnel J. Beran. Evolving fixation methods in endoscopically assisted forehead rejuvenation: controversies and rationale. plastic and reconstructive surgery, 1997, 100(6):1575-1582.
11. Gallaher T, Glover WB, Ingram, AE, DeLozier, III JB. An Outer-Table Suspension Technique for Endoscopic Browlift. Aesth Plast Surg. 1997 Jul;21(4):262-4