Advances in Plastic & Reconstructive Surgery

Applis Publishers

Research Article ISSN: 2572-6684

Transoral and Transconjunctival Routes for a Middle Third Facial Lift: An Anatomical Study

Webster Ronaldo[1*], Labbé Daniel[2], Ely Pedro Bins[3], Oxley Andrea[4], Gasperin Bruno De La Méa[5], Battisti Caroline[6]

[1, 2, 3]Department of plastic and reconstructive surgery, University Foundation of Medical Sciences of Porto Alegre, Porto Alegre.

[4, 5, 6]Department of anatomy. University Foundation of Medical Sciences of Porto Alegre, Porto Alegre.

Abstract: Despite several advances in facial plastic surgery, treatments focused on the facial middle third (FMT) lack a standard and definitive approach, often falling short in a long lasting result. A simulated surgery in a fresh frozen anatomical specimen was performed to compare the transoral (TOR) vs. transconjuntival (TCR) routes to perform FMT lifting. The same range of elevation of FMT tissue was achieved with TOR and TCR, despite a perception of a somewhat incomplete release of deeper and distal structures to the initial incision in the former route. Based on this anatomical simulated surgery study, TOR and TCR could be considered in FMT lift and appear to be safe and reproducible. Further clinical trials are warranted to access objective data on morbidity and outcome longevity.

Keywords: *Malar Lift; Midface; Facial Lifting*

Abbreviations: TOR: Transoral route; TCR: Transconjuntival route; UFCSPA: Universidade Federal de Ciências da Saúde de Porto Alegre HPSM Hospital Privé Saint Martin.

Introduction

Facial lifting (FL) is one of the most well-researched procedures in the plastic surgery field [1-3]. Recent decades have seen a shift towards more effective procedures and smaller scars [4, 5]. Despite advances in facial plastic surgery, there is no standard or definitive approach to treatment of the area known as the facial middle third (FMT), and outcomes of FMT surgeries are often suboptimal [6, 7]. In this study, we focused on two alternative methods for FMT lifting.

Materials and Methods

Surgery was performed on a frozen anatomical specimen to compare transoral (TOR) and transconjunctival (TCR) methods for FMT lifting [Figure 1]. The specimen was donated according to local regulations, and all protocols followed Geneva conventions for studies in humans. Anatomical dissection was conducted at Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSPA), Brazil as part of a multicentre study in advanced facial surgery in collaboration with the Hôpital Privé Saint Martin (HPSM), Caen, France.

A TOR procedure was performed on the right side of the face. Standard skin marks were used to support the FMT and to anchor the stitches to the osseous tunnels in the inferior orbital margin [Figure 2]. The initial cutaneous point was at the intersection of the vertical line that passes through the commissure of the mouth and a horizontal line

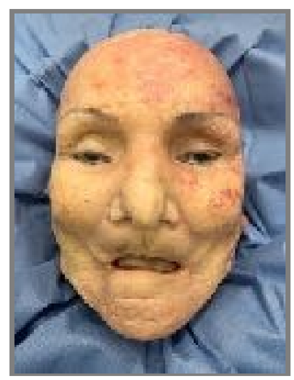

Figure 1: Anatomical specimen.

Figure 2: Cutaneous marks that reflect the anchorage points of the facial middle third (FMT).Yellow pins show the intersection point between the oral commissure and the ala nasale, and green pins show the intersection point between the lateral canthus and the ala nasale.

***Address for Correspondence:** Dr. Ronaldo Webster, PhD. Department of plastic and reconstructive surgery, University Foundation of Medical Sciences of Porto Alegre, Porto Alegre, Brazil, E-Mail: ronaldowebster1@me.com

Received Date: May 21 2018; **Date Accepted:** July 30, 2018; **Date published:** July 31, 2018.

at the level of the ala nasale . The second point was at the vertical line that intersects the same horizontal ala nasale line and the lateral canthal eyelid commissure. A third mark was made at the intersection between the vertical line passing through the inner eyelid canthus and the horizontal line at the level of the ala nasale. All incisions were made using a modified Caldwell-Luck incision. Progressive dissection was performed, identifying the pyriform aperture, infraorbitary nerve and foramina, malar body, zygoma and zygomaticomaxillary nerve, and inferior orbital edge [Figure 3].

Figure 3: Transoral (TOR) approach. Dissection through the subperiosteal plane.

Two vertically oriented osseous tunnels were made in the inferior orbital rim, laterally from the infraorbital nerve. In addition, one perforation was made in the most cranial aspect of the pyriform aperture [Figure 4]. The stitches were passed transcutaneously using a rectified needle in the vertical orbital rim tunnels [Figure 5] and posteriorly using a Casagrande needle for endoscopic surgery lifting (FMT tissues) [Figure 6].

Figure 4: TOR approach. The threads were passed through the osseous tunnels.

Figure 5: TOR approach. A Casagrande needle was inserted through the skin in the previously marked intersection points.

Figure 6: TOR approach. Facial medial third tissues were anchored using the Casagrande needle.

A TCR procedure was performed on the left side. The same cutaneous markings used in the TOR procedure were made, except for the third mark. An incision was made at the grey line of the conjunctiva in the inferior eyelid, which progressed in a pre-septal direction towards the orbital rim [Figure 9]. The incision was extended to free the FMT tissue from the maxilla. The infraorbital nerve and vessels were identified and preserved [Figure 10]. Two stitches were made laterally from the infraorbital foramina, as described for the TOR procedure [Figure 11].

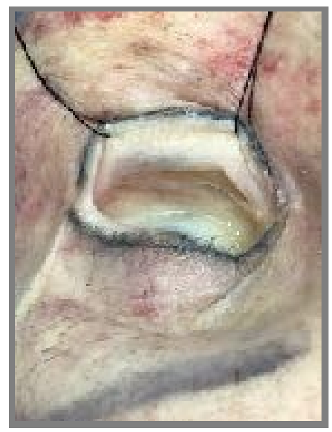

Figure 7: Transcranial (TCR) approach. Pre-septal dissection towards the inferior orbital rim.

Figure 8: TCR approach. Black pins denote the osseous tunnels that were created in the inferior orbital rim.

Figure 9: TCR approach. The threads were introduced into the osseous tunnels and then attached to the tissues of the FMT using a Casagrande needle.

Results

Both methods were successfully accomplished. The duration of the TOR procedure was approximately 45 min. It was possible to create three anchor points in the orbital rim and nasal bone without difficulty or obvious damage to facial structures. A 2-cm elevation in FMT tissues was seen and the orbit volumes were restored to an ideal position [Figure 7 and 8].

Figure 10: TCR approach. Black pins denote the osseous tunnels that were created in the inferior orbital rim.

Figure 11: TCR approach. The threads were introduced into the osseous tunnels and then attached to the tissues of the FMT using a Casagrande needle.

The mean duration of the TCR procedure was 60 min. The two anchor points were easily made lateral to the infraorbitary foramina. Creation of a more medial anchor point was avoided, being deemed risky due to the presence of the inferior oblique ocular muscle. In addition, the TCR procedure seemed to have greater potential to damage delicate structures, such as the orbital inferior septum, retaining ligaments, and orbital muscles, versus the TOR approach. The inferior part of the periosteal release also resulted in difficulty in visualising the deep FMT structures. The same elevation was achieved with TCR, despite a perception of a somewhat incomplete release of deeper and distal structures.

Discussions

Despite great advancements in rhytidoplasty and facial reconstructive surgery, achieving good and long-lasting results for FMT, especially in the eyelid-cheek junction, remains challenging. Several procedures have been used to solve these issues. It is important to consider that the main goal of FMT lift, namely, correction of tissue deflation, can be achieved with fat grafts. However, FMT results have been poor using this method. To provide a comprehensive approach with natural results, tissue repositioning should be used in more advanced cases of FMT ptosis [8-11]. In addition, every effort should be made to reduce scarring, and surgical procedures should be standardised [5].

In this study, both the TCR and TOR procedures were effective in elevating the FMT, reproducible, and amenable to being standardised.

Anatomical studies detailing the main causes of injury to key structures and proper anatomical positions have been widely used as a reference to ensure safe surgeries. In addition, historical surgical data provide a basis for the development of new surgery techniques and methods [2, 12, 13].

There are some advantages to TCR and TOR procedures over endoscopic surgery [4, 14]. First, the anchoring point is close to the tissues that need to be elevated, circumventing the long-term ineffectiveness of using distant anchoring points. Second, TCR and TOR procedures involve a straightforward method of dissection that is performed in a limited and localised fashion, which can help minimize damage to facial structures.

Schwarcz et al. (2015) emphasized the importance of preventing eyelid malposition. Using a trans-eyelid route for an FMT lift is a useful option for experienced surgeons, but leads to partial denervation of the upper portion of the orbicularis muscle, which can theoretically induce late-onset lagophthalmos [15]. The TCR procedure is a promising option that allows for safe treatment of the fat deposit bags in the eyelid area while providing a firm basis for anchoring points in the orbital rim, and thus preventing lagophthalmos. Additionally, double-plane eyelid surgery can be performed, which preserves the innervations of the orbicularis muscle [6]. Another interesting option for TOR and TCR procedures is limiting the degree of skin excision through pinch eyelid surgery and the association of skin resurfacing; however, the feasibility of this approach depends on the degree of skin laxity. The parameters of laser skin resurfacing can be adjusted to allow even muscle shrinkage if necessary. Additional eyelid support can be provided using a simple stitch canthopexy if necessary when the muscle remains innervated.

In this study, the TOR procedure seemed safe and provided even the possibility of an anchor point at the rim of the pyriform aperture. This may be useful for "heavy faces" that have a marked nasolabial fold.

In this study, the same degree of elevation was achieved using both TOR and TCR procedures, despite a perception that these methods result in a somewhat incomplete release of deeper and distal structures from the initial incision [Figure 12]. Similar findings were noted by Sales-Sanz et al. who reported techniques that can result in non-visible scars after a midface lift [5].

Figure 12: TOR approach (right side). TCR approach (left side). Elevation of the tissues of the FMT was achieved using both techniques.

One downside of TOR is potential contamination of the operative field. However, this risk could be decreased by postponing application of the technique until the end of the surgery and after following prophylactic antibiotic guidelines. One possible side effect of the TCR procedure that could jeopardise the long-term outcome is lagophthalmos due to excessive scar tissue formation. However, early mobilization of the eyelid via gentle massage in an upward direction and additional procedures for inferior eyelid support (e.g. canthopexy or muscle tightening flaps) can be applied to manage this potential hazard.

In future studies, we hope to compare these routes for FMT lift surgery, with the goal of improving FMT outcomes in cases that are judged unresponsive to conventional techniques of lifting.

Conclusions

In this study, TOR and TCR procedures were found to be viable options for FMT lift surgery, and both approaches seemed safe andreproducible. Further clinical trials are needed to determine morbi-dity and long-term outcomes.

Acknowledgments

We thank the UFCSPA anatomical techni-cians for their involvement and provision of the best standard of care to the Body Donation Program of UFCSPA.

We also thank the surgical management department of HPSM for granting us the opportunity to develop a multicentre study to share knowledge in an international setting.

References

1. Chaiet SR, Williams EF. Understanding midfacial rejuvenation in the 21st century. Facial Plast Surg. 2013; 29:40-45. [Crossref]
2. Jacono AA, Ransom ER. Anatomic predictors of unsatisfactory outcomes in surgical rejuvenation of the midface. JAMA Facial Plast Surg. 2013; 15:101-109. [Crossref]
3. Stevens HP, Willemsen JC, Durani P, Rasteiro D, Omoruyi OJ. Triple-layer midface lifting: long-term follow-up of an effective approach to aesthetic surgery of the lower eyelid and the midface. Aesthetic Plast Surg. 2014; 38:632-640. [Crossref]
4. Engle RD, Pollei TR, Williams EF. Endoscopic midfacial rejuvenation. Facial Plast Surg Clin North Am. 2015; 23:201-208. [Crossref]
5. Sales-Sanz M, Barrancos C, Won-Kim HR, Sales-Sanz A, Colmenero C. Reconstructive subperiosteal midface lift: A three nonvisible incision approach. Orbit. 2017; 36:256-263. [Crossref]
6. Schwarcz RM, Kotlus B. Complications of lower blepharoplasty and midface lifting. Clin Plast Surg. 2015; 42:63-71. [Crossref]
7. Le Louarn C. Specificity of facelift surgery, including mid facelift, in case of facial palsy. Ann Chir Plast Esthet. 2015; 60:454-461. [Crossref]
8. Volpei C, Fernandez J, Chignon-Sicard B. [The eyelid-cheek junction]. Ann Chir Plast Esthet. 2017; 62:435-448. [Crossref]
9. Botti G, Botti C. Midface lift: our current approaches. Handchir Mikrochir Plast Chir. 2014; 46:224-233. [Crossref]
10. Pascali M, Quarato D, Bocchini I, Cervelli V. Midface-lift patient satisfaction: A 5-year follow-up study. Indian J Plast Surg. 2016; 49:329-335. [Crossref]
11. Mittelman H, Hershcovitch M. Management of the midface during rhytidectomy. Facial Plast Surg Clin North Am. 2015; 23:195-200. [Crossref]
12. Doumit G, Gharb BB, Rampazzo A, McBride J, Papay F, Zins J, et al. Surgical anatomy relevant to the transpalpebral subperiosteal elevation of the midface. Aesthet Surg J. 2015; 35:353-358. [Crossref]
13. Rossell-Perry P, Paredes-Leandro P. Anatomic study of the retaining ligaments of the face and applications for facial rejuvenation. Aesthetic Plast Surg. 2013; 37: 504-512. [Crossref]
14. Quatela VC, Azzi JP, Antunes MB. Endoscopic-assisted facelifting. Facial Plast Surg. 2014; 30:413-421. [Crossref]
15. Yin VT, Chou E, Nakra T. The transeyelid midface lift. Clin Plast Surg. 2015; 42:95-101. [Crossref]