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EDITOR'S INVITED COMMENTARY

Invited Discussion on: Transconjunctival Müller's Muscle Tucking Method for Non-incisional Correction of Mild Ptosis

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The authors present an interesting duo of surgeries for the correction of ptosis during double-eyelid blepharoplasty. They are to be commended for their innovative technique and terrific results. The minimally invasive nature of these combined surgeries certainly offers many benefits, and the TMMT in particular deserves further consideration.

Interestingly, we don't even understand exactly how Müller's muscle surgery improves ptosis. Eyelid elevation may occur from strengthening Müller's muscle, but it may also result from posterior lamellar shortening or advancement of the levator muscle. Just as levator muscle may be excised and/or advanced during Müllerectomy [1], the 'TMMT' method may incorporate the levator muscle into the sutured tissue. The TMMT suture also passes through conjunctiva, so conjunctiva is also at least temporarily advanced along with the deeper tissues. For these reasons, I term the technique 'posterior lamellar plication.'

One cannot help but wonder what happens to the plicated conjunctiva. The high percentage of patients noting temporary foreign body sensation suggests either folded conjunctiva and/or a small amount of early suture irritation. Given the absence of symptoms after a few days, it seems likely that any folding of the conjunctiva resolves, possibly by the suture gradually eroding through the conjunctiva to relax the folded conjunctiva.

Could the suture also eventually erode through the deeper tissues that are providing the eyelid lift? This type of cheese-wiring certainly occurs with many other sutures under tension, including levator plication sutures after anterior approach ptosis repair. Nylon suture also loses tensile strength over time due to degradation and hydrolysis. However, the tissues incorporated within the 7-0 nylon sutures may not be under significant tension, and the suturing may create some permanent scarring effect. The authors provide only 6 months of follow-up, so longer term data are definitely required to answer these questions.

Indeed, about 10% of patients required repeat TMMT during the short follow-up period in this study. While repeat surgery appears quite straightforward, it adds to the already high suture burden: The combined DEB and TMMT places at about 5 cm of (admittedly low caliber) suture throughout the eyelid. Problems from the suture load within the eyelid may be challenging to treat and may increase in likelihood if several reoperations are required over decades. This is especially important given the low average patient age of only 25 years.

The young patient ages bring up a couple other points for consideration. It seems doubtful these young patients suffered from either congenital ptosis or significant aponeurotic dehiscence ptosis, as the former typically doesn't respond to Müllerectomy and the latter generally produces an elevated eyelid crease, which was not the case

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in these patients. If the surgery does result in long-term elevation, some of these patients will not tolerate the evaporative effects of surgery when their tear film transitions from the robust tear film of youth to the inflamed, thin tear film of age. Last, the results may not translate to older age-groups with more aponeurotic dehiscence ptosis.

Other complications that were not recorded but remain theoretical include symptomatic persistent plication of the conjunctiva, pyogenic granuloma, suture granuloma within the eyelid, persistent keratopathy, and contour abnormalities. Some of these complications are easily remedied, and contour issues occur with all types of ptosis repair, but these possibilities should be kept in mind.

Our incomplete understanding of Müller's muscle ptosis repair relates to this study in other ways. The authors describe 1. avoiding epinephrine in the posterior block, 2. checking the eyelid position intraoperatively, and 3. an algorithm of tucking 7–8 mm of tissue for 1 mm of ptosis correction without stating any algorithm for ptosis correction beyond that amount. Each of these factors may not have much relevance regarding the success of the procedure. Multiple successful algorithms exist to determine the tissue resection amount [2], and some authors simply advocate a standard 7-mm resection for all patients [3]. The paper cited by the authors regarding epinephrine [4] relates more to graded levator surgery. In fact, the lidocaine in the posterior lamellar block could cause ptosis, but again this is probably irrelevant. A 7-mm posterior plication may successfully treat mild ptosis in younger patients regardless of these maneuvers. Finally, while phenylephrine testing may not be required to ensure success, it certainly provides the patient with a better idea of what lifting their eyelid may look like cosmetically.

I will consider adding this combined technique to my armamentarium in selected patients, i.e., young patients desiring double-eyelid blepharoplasty who are highly motivated to improve eyelid position. I would warn them of the possibility of recurrence, and that with our current knowledge, multiple reoperations may not be warranted. It may make sense to negotiate with some patients that if the initial plication surgery fails, to leave the recurrent ptosis untreated until/if it begins to affect vision, rather than to risk a spiral into complications after multiple cosmetic ptosis corrections. The authors have piqued my interest in this combination of surgeries, and I appreciate the opportunity to share my thoughts on their excellent contribution.

Compliance with Ethical Standards

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

Statement of Human and Animal Rights, or Ethical Approval This article does not contain any studies with human participants or animals performed by the author.

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