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Original Article

The Efficacy of the Combined Procedure in Involutional Entropion Surgery: A Comparative Study

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Purpose: To evaluate the efficacy of the combined procedure in the management of involutional entropion.

Methods: In this study, we reviewed 45 eyes of 36 patients who underwent the combined procedure (lateral tarsal strip, retractor tightening, and everting sutures) for the management of involutional lower eyelid entropion and compared the results with 31 eyes of 25 patients who underwent the Wies procedure. Exclusion criteria included previous lower eyelid surgery and follow-up of less than 6 months.

Results: No patients demonstrated entropion on the first postoperative day. The mean follow-up period was 18.4 months (6 to 52 months) in the Wies group and 22.6 months (6 to 59 months) in the combined procedure group. During the follow-up period, 9 of 31 eyes in the Wies group presented with recurrence and only 1 of 45 eyes in the combined procedure group presented with recurrence (p = 0.001). The average time of recurrence was 4.8 months in the Wies group. Recurrence occurred at 2 months postoperatively in the patient in the combined procedure group. Six of the 9 recurrences in the Wies group were managed by the combined procedure. None of these patients had further recurrence after correction. Three patients complained about a visible incision line after the Wies procedure.

Conclusions: The combined procedure seems to be more effective than the Wies procedure in the management of involutional entropion. The combined procedure addresses the three major causative factors in involutional entropion and makes it possible to perform the surgery using a small incision.

Key Words: Combined procedure, Entropion, Wies

Involutional entropion leads to corneal epithelial problems, ocular irritation, and blepharospasm in an elderly population. Without treatment, entropion can cause corneal ulceration, microbial keratitis, visual loss, or even eye loss. Various factors contribute to the inward rotation of the eyelid margin, including thinning of the tarsal plate, atrophy of orbital fat tissue, horizontal lid laxity, vertical lid laxity secondary to dehiscence, disinsertion or laxity of lower lid retractors, and overriding of the preseptal orbicularis onto the pretarsal orbicularis secondary to the loosening of adhesion of the orbicularis and skin to the tarsal plate [1-3].

Many surgical procedures have been described for the management of entropion, and varying success rates have

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been reported, even for the same surgical techniques performed by different authors [4-14]. Because of the multifactorial nature of the disease, no entirely satisfactory surgical technique has yet been reported [4]. Due to a lack of comparative studies, the best surgical technique remains controversial. We performed the combined procedure, comprised of a lateral tarsal strip (LTS), retractor tightening, and everting sutures (ES), on 45 eyes with involutional entropion and compared the results with those of 31 eyes which had undergone the Wies procedure.

Materials and Methods

In this retrospective study, we reviewed the records of 36 patients (45 eyes) who underwent a combined procedure, which was comprised of LTS, retractor tightening, and ES, for the management of involutional lower eyelid entropion and compared the results with those of 25 patients (31 eyes) who underwent the Wies procedure. Patients who underwent surgery between January 2005 and December 2011 were included in the study. We excluded patients who had previous lower eyelid surgery or follow-up of less than 6 months.

Surgical technique

All operations were performed under local anesthesia. For the Wies procedure, a full thickness transverse skin incision 4 mm inferior to the lashes was made. Three double-armed 6.0 polyglactin sutures were placed through the conjunctiva and lower lid retractors 2 mm below the incision. The sutures were passed into the orbicularis muscle anterior to the tarsal plate in the upper wound edge, and the sutures were emerged in the skin 2 mm inferior to the lashes. The sutures were tied and the skin incision was closed with a 6.0 polyglactin suture.

For the combined procedure, an approximately 1 cm long skin incision from the lateral canthus to the orbital rim was made. A lateral canthotomy and cantholysis to the lower limb of the lateral canthal tendon were performed. Orbicularis fibers over the lateral orbital rim were dissected, and the lateral rim was identified. The periosteum was incised vertically and dissected medially to form a periosteal flap. Blunt-pointed scissors were spread anterior to the retractor layer, and the conjunctiva-retractor layer was cut at the level of the inferior border of the tarsal plate transversely from the lateral canthal region to the lower punctum. The orbicularis muscle was also cut in the same fashion to separate the pretarsal orbicularis from the preseptal part after spreading scissors between the orbicularis and the skin. The skin was left intact. The lower lid was pulled laterally under moderate tension to assess the amount of horizontal shortening. Then a tarsal strip was prepared by excising the superior mucocutaneous junctional tissue and the anterior lamella and debriding the conjunctival epithelium. The strip was shortened to achieve a slightly tight lower lid. The retractor layer was dissected posteriorly from the conjunctiva and then shortened. Three 6.0 polyglactin sutures were passed in the following order: preseptal orbicularis, retractor layer and the conjunctiva in the lower wound edge, inferior border of the tarsal plate, and pretarsal orbicularis. The sutures were tied to achieve a slight ectropion of the lid. Two 5.0 polyglactin sutures were passed through the tarsal strip and sutured to the periosteal flap. The new canthus was formed. The orbicularis over the rim and the skin was closed with 6.0 polyglactin sutures.

Patients were examined on the first and seventh postoperative days. Follow-up visits were scheduled at 1, 3, and 6 months, and every 6 months thereafter. At each visit, eyelids were assessed in the primary and downgaze positions. The patients were also asked to squeeze their eyelids closed to detect any latent recurrence. Surgical success was defined as complete resolution of the inward rotation of the eyelid margin and symptoms.

Tenets of Helsinki were followed in the study, and all patients gave informed consent. The categorized data were analyzed with Fisher's exact test. A probability level of <0.05 was considered statistically significant.

Results

There was no statistically significant difference between the two groups with regard to sex and age ($p > 0.05$). No intraoperative complication was observed in either group. In all patients, entropion was corrected successfully on day 1 postoperatively. Mean follow-up period was 18.4 months (6 to 52 months) in the Wies group and 22.6 months (6 to 59 months) in the combined procedure group. During the follow-up period, 9 of 31 (29.0%) eyes which had undergone the Wies procedure presented with recurrence, whereas

1 of 45 (2.2%) eyes treated with the combined technique presented with recurrence. The difference was statistically significant ($p = 0.001$). The average time of recurrence was 4.8 months in the Wies group, and the patient with recurrence presented at 2 months postoperatively in the combined procedure group. Six of 9 recurrences in patients who had previously undergone the Wies procedure were treated with the combined procedure. Two patients declined a second surgery, and one patient was lost to follow-up. For the patient with recurrence after the combined procedure, additional ES were placed to enhance the existing barrier between the two parts of the orbicularis muscle. None of the patients had further recurrence after correction. Three patients complained about a visible incision line after the Wies procedure.

Discussion

Senility leads to some anatomical changes in the lower lid [15,16]. Three major factors are well known to play a role in the etiopathogenesis of involutional entropion: horizontal laxity, vertical laxity, and overriding of the preseptal orbicularis onto the pretarsal orbicularis muscle. Horizontal laxity is due to laxity of the canthal tendons and the tarsal plate. Vertical laxity is due to attenuation, dehiscence, or disinsertion of retractors [1,2]. Overriding of the preseptal orbicularis onto the pretarsal orbicularis is caused by orbicularis dysfunction and loosening of the attachments of the orbicularis to the skin and tarsal plate [1,2].

Different surgical techniques have been described to correct the anatomical changes with various success rates [4-14]. Horizontal laxity can be corrected with lid shortening procedures such as LTS or full-thickness wedge resection. In order to correct vertical laxity, surgical approaches such as retractor plication, shortening and reinsertion, or placing fornix sutures which also pass from retractors have been used. Transverse blepharotomy and ES have been used to prevent overriding. The sutures create scarring and adhesions between inferior retractors and the tarsal plate as they dissolve and prevent further inward rotation and recurrence [6].

Surgical techniques that address only one or two pathogenetic factors have been reported to have higher recurrence rates. Dryden et al. [7] reported a recurrence rate of 16% after retractor attenuation repair. Iliff [8] reported that 9% of his patients presented with recurrence after placing fornix sutures. Boboridis et al. [11] reported a recurrence rate of 5% after the Jones retractor plication technique. Wright et al. [13] reported a long-term recurrence rate of 15% with ES. The combination of these procedures to address all etiopathogenetic factors can maximize surgical success [14]. Scheepers et al. [6] reported a recurrence rate of 21% after placing ET and no recurrence after the ET + LTS procedure during 18 months of follow-up. Hedin [9] reported no recurrence after retractor reinsertion combined with wedge resection, and Wesley and Collins [10] reported no recurrence after retractor reinsertion and LTS. However, there are only a few comparative studies. Due to the lack of comparative studies, the best surgical technique remains controversial.

The present study compared two different surgical techniques for the management of involutional entropion. The Wies procedure mainly corrects two pathologies: vertical laxity and orbicularis dysfunction. The Wies procedure is a combination of transverse full-thickness blepharotomy and ES. Vertical laxity is corrected by placing ES, which passes from the retractor layer and tightens the retractor layer. Blepharotomy induces scar formation between the skin, conjunctiva, and the preseptal and pretarsal orbicularis. Scar formation and ES are intended to prevent overriding of the preseptal orbicularis onto the pretarsal orbicularis. On the other hand, the combined procedure is comprised of LTS, retractor shortening and reinsertion, and ES. The orbicularis muscle was also cut to separate the pretarsal orbicularis from the preseptal section and resutured to form scar tissue. The combined procedure addresses three pathologies: vertical laxity, horizontal laxity, and orbicularis dysfunction. Vertical laxity is corrected by retractor shortening and reinsertion, and horizontal laxity is corrected by the LTS procedure. Scar formation between the pretarsal and preseptal orbicularis and the ES prevents overriding of the preseptal orbicularis onto the pretarsal orbicularis. In our study group, there was no entropion on the first postoperative day in either group. However, during the follow-up period, 9 of 31 (29%) eyes presented with recurrence in the Wies group, and only 1 of 45 (2.2%) eyes presented with recurrence in the combined procedure group ($p = 0.001$). Borboradis et al. also reported a recurrence rate of 17% after the Wies procedure [11]. After the Wies procedure, scar formation and retractor tightening may not be strong enough to keep the lids in a normal po-

sition over time. In addition, horizontal laxity is not addressed in the Wies procedure. One etiopathogenetic factor may clinically seem to dominate the other factors in patients with involutional entropion. However, because the aging process as a whole more or less affects all tissues, it is possible to assume that some amount of horizontal laxity is present in all involutional entropion patients. The higher success rate of surgical procedures, which are comprised of all of the main etiological factors, also supports this assumption.

The cosmetic results of a procedure should also be taken into consideration in order to choose the most appropriate approach, and cosmetic results may be as important as surgical results in oculoplastic surgery. In the Wies procedure, an approximately 3-cm-long full thickness transverse skin incision 4 mm is made inferior to the lashes. Three patients complained about a visible incision line after the Wies procedure in our series. In the combined procedure, the only incision is an approximately 1 cm long line and is buried in skin stress lines, from the lateral canthus to the orbital rim, and no patients complained about a visible incision scar. Also, LTS, which is used to correct horizontal laxity, avoids eyelid notching and phimosis [4]. Full-thickness eyelid resections may correct horizontal laxity but may add strain on the weakened lateral canthal tendon and may cause notching. Hedin [9] and Allen [12] reported lid notching after wedge resections. The LTS procedure more physiologically corrects lateral canthal tendon laxity than eyelid resections [5]. Cosmetic results are satisfactory with our combined procedure.

In conclusion, our combined procedure is a useful technique and results in a high success and low recurrence rate. The combined procedure addresses the three major causative factors in involutional entropion and allows the surgeon to perform the surgery using a small incision which is buried in skin stress lines.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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