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## Quickert procedure for involutional lower eyelid entropion: a multi-centre study



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### ABSTRACT

**Background:** Involutional entropion is the inward turning of the eyelid margin and commonly happens in the inferior eyelids in elderly people. The prevalence is as high as 2.1% in people  $\geq$  60 years old and more common in women than men. This condition may cause ocular surface irritation and discomfort secondary to contact between cilia and the ocular surface. Several etiological factors are suspected to be important causes of involutional entropion. One of them was horizontal eyelid laxity. Quickert Procedure is one of the surgical interventions recommended to correct involutional lower eyelid entropion in the elderly Asian population with 0% of recurrent entropion in a recent study by Miyamoto et al.

**Methods:** This is a descriptive retrospective study of 16 involutional lower eyelid entropion patients (18 eyelids) that needed surgical correction. About ten males and six females were undergone Quickert procedure to correct the involutional entropion. Patients

were assessed postoperatively for 24 months to evaluate the recurrence entropion, cosmetic, and functional improvement. Data were analyzed by SPSS version 20 for Windows.

**Results:** This study included 16 patients, with mean age was 69.8 years old which range from 62-85 years old. They consisted of 9 (56.0%) patients were male, and the rest was female (44.0%). Eleven (61.0%) patients were with left eye laterality, and 10 (63.0%) patients found without anticoagulant consumption. All patients (100.0%) had positive snapback test and achieved  $>6$  mm in distraction test. After surgical intervention, no patients (0.0%) were found to experience recurrence of involutional entropion nor ocular discomfort due to prior surgery.

**Conclusion:** A detailed assessment of the etiology, accurate preoperative evaluation, and precision in addressing patients underlying eyelid anatomic abnormalities are needed in the selection of appropriate surgical procedures to correct entropion.

**Keywords:** Involutional Entropion, Horizontal Eyelid Laxity, Quickert Procedure

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### INTRODUCTION

Entropion is defined as a condition in which the eyelid margin rotates inward. It is in contact with the anterior globe and is caused by the aging process and involutional changes (involutional entropion) or by cicatricial changes affecting the posterior lamella of the eyelid (cicatricial entropion). The most common type of entropion in elderly people and usually involves in the lower eyelid is involutional entropion. Contact between the anterior globe and the eyelid margin or lashes causes intermittent or persistent discomfort symptoms of ocular irritation, foreign body sensation, redness, pain, and watering eye.<sup>1</sup> Several mechanisms are believed to be the cause of involutional entropion. Tissue laxity occurs especially in the lower eyelid and results from tissue collagen (age-related decrease in collagen tensile strength). Involutional entropion can come from enophthalmos due to age-related atrophy of orbital fat (horizontal eyelid laxity). The detachment of lower lid retractors and vertical movement of anterior lamella across

the posterior (preseptalorbicularis overriding) cause the involutional entropion. Involutional entropion is usually associated with eyelid laxity.<sup>2,3</sup> Despite the conservative treatment with ocular lubricants, taping, or botulinum toxin injection can minimize the symptoms of ocular irritation, surgical intervention is still required to restore anatomic positioning definitively. Corrective surgical procedure for involutional entropion is directed toward correction of the factors active in causing malposition of the eyelid. Horizontal laxity, particularly common in involutional lower eyelid entropion, is generally correctable. Quickert Procedure is one of the surgical procedures which gives not only well cosmetic for there is no longer any entropion or ectropion but also functional outcome for correcting involutional entropion mainly due to horizontal laxity.<sup>4-6</sup> Quickert Procedure can address horizontal eyelid laxity by full-thickness eyelid shortening and vertical eyelid laxity by tucking the lower lid retractor the orbicularis oculi muscle and the tarsal plate. It can prevent the preseptal

orbicularis oculi muscle overriding by creating fibrosis with the sutures.<sup>5</sup>

## METHODS

This retrospective study was conducted at Haji Adam Malik General Hospital, Universitas Sumatera Utara Hospital, and Royal Prima General Hospital from January 2015 – August 2019. About 16 patients (18 eyelids), 10 were males, and 6 were females. None of them had previous surgery for entropion correction nor another eyelid surgery. All patients underwent the Quickert procedure for involutional lower eyelid entropion correction. Surgery was performed by a single surgeon (RRL) after informed consent was carried out.

An entire procedure of ophthalmic examination was done before surgery to all patients. Visual acuity, ocular motility, external and internal segment of the eyeball were evaluated. Distraction tests and snapback tests were included to evaluate the weakening of inferior eyelid retractors muscle. The eyelid distraction test was performed by displacing the inferior eyelid anteriorly from the globe, and distance was measured. If the distraction is greater than 6 mm, it is considered eyelid laxity. The snapback test was done by pulling the lower eyelid downward away from the eyeball. A normal-tension eyelid will snapback to place immediately. The snapback test was positive if the patient blinks the eyelid to resumes eyelid into proper position. Another investigation, such as blood pressure, chest X-ray, complete blood count, liver, kidney, blood sugar test, bleeding time, clotting time, was accomplished as an essential investigation before surgery.

About ten patients (10 eyes) underwent surgery under local anesthesia. The Lower eyelid was infiltrated with 2 mL of 2% lidocaine hydrochloride and 1:100.000 adrenaline subcutaneously and subconjunctivally. Another six patients (8 eyes) underwent surgery under general anesthesia, TIVA (Total Intra Venous Anesthesia) by anesthesiologist due to the patient's condition. Quickert Procedure was conducted by several steps such as mark the skin by making a line perpendicular to the lower eyelid margin about 5 mm from the lateral canthus. It made another mark opposite the eyelid margin about 5 mm below the inferior eyelid margin. A Full-thickness incision 5 mm vertically on the previous mark. Another full-thickness incision horizontally from the inferior aspects of the prior incision was performed about 5 mm below the eyelid margin and the tarsal plate as a mark that placed earlier. Align the two eyelid strips to assess the amount of horizontal eyelid laxity and accordingly remove some excess tissue to corrected horizontal eyelid

laxity. Once excess lid tissue had been removed, placed three double-armed 4-0 absorbable suture (4-0 Vicryl) by the lower lid retractor lining (better not penetrate the conjunctiva). After that, it was passed through the lid strips to emerge about 2 mm inferior to the eyelid margin (everting suture) once the lid margin was closed.

The lid margin (tarsal plate and lash line) was then sutured (6-0 Vicryl) in a normal fashion ensuring proper alignment and ensuring no misalignment of the eyelid margin. Then, close the suture tightly to make a slight overcorrection that can be correct automatically in several weeks. Close the skin with interrupted 6-0 non-absorbable sutures (6-0 prolene). In addition, an antibiotic eye ointment was applied in the area of the surgical wound.

As postoperative management, surgical wound evaluation was conducted by providing an oral antibiotic (ciprofloxacin 500 mg two times daily), eye ointment three times daily, non-steroid anti-inflammatory drug (NSAID) as a pain reliever and swelling (Diclofenac sodium 50 mg three times daily), and omeprazole tablet 20 mg once daily. In addition, a Vitamin C 500 mg, two times daily, was administered for five days. The skin sutures were removed at 5-7 days. All patients were examined every two weeks for eight weeks after the skin sutures had been removed. Patients evaluated continuously every six months for the next 22 months to assess the recurrence entropion and other ocular symptoms like foreign body sensation, watering, and ocular irritation that may appear prior the surgery beside cosmetic and functional improvement. Data were analyzed by SPSS version 20 for Windows.

## RESULTS

This study examined 16 patients (18 eyelids), nine were males, and seven were females. The mean age was 69.8 (62-85) years old. Two patients experienced bilateral involutional entropion. The clinical characteristics of all subjects can be seen in [Table 1](#).

There were 11 (61.0%) patients with left eye laterality and 6 (37.0%) patients who were regularly taking anticoagulants due to heart disease. Snapback test and distraction tests were performed. All patients had positive snapback test (100%) and > 6 mm distraction test (100.0%). After the surgery, follow up was conducted for 24 months every two weeks for eight weeks after the skin sutures had been removed. Patients assessed continuously every six months for the next 22 months to evaluate the recurrence entropion and other ocular symptoms like foreign body sensation, watering, and ocular

**Table 1. The characteristics distribution of subjects with involitional lower eyelid entropion**

Characteristics	Quickert Procedure (Eyelids)	Percentage (%)
Sex		
Male	9	56.0%
Female	7	44.0%
Mean age (minimum-maximum)	69.8 (62-85)	
Laterality :		
Right Eye	7	39.0%
Left Eye	11	61.0%
Anticoagulant consumption		
Yes	6	37.0%
No	10	63.0%
Snapback test :		
Negative	0	0.0%
Positive	18	100.0%
Distraction test :		
≤ 6 mm	0	0.0%
> 6 mm	18	100.0%
Recurrence entropion	0	0.0%
Other ocular symptoms	0	0.0%

irritation. Along with the follow-up, there is no recurrent entropion (0.0%), and none of the patients had other ocular symptoms due to prior surgery (0.0%).

## DISCUSSION

Involitional entropion is the folding of the lower eyelid margin inward and commonly affected in elderly people. The prevalence is as high as 2.1% in people ≥ 60 years old and more common in women than men. Progressive ocular irritation, redness, watering, burning, the pain almost happens in entropion patients due to lashes rub the anterior surface of the globe and may result in epithelial defect, corneal ulcer, and even globe perforation.<sup>7</sup> The pathogenesis of involitional entropion is various. Fat atrophy with enophthalmos and pressure escalation during blinking also contribute in the occurrence of entropion other than laxity of the eyelid, disinsertion of the lower retractors muscles, and preseptal orbicularis overriding.<sup>8</sup> Management of involitional entropion is conservative and surgical. Some medications, as conservative management, were only minimized the symptoms temporarily. Otherwise, surgical management is the definitive repair for involitional entropion.

Several options of surgical intervention for involitional entropion, such as everting sutures, Quickert procedure, reinsertion of lower eyelid

retractors, lateral canthal tightening, combine everting sutures, and lateral canthal tightening. Those procedures are possible for patients who suffer from vertical laxity, horizontal laxity, and orbicularis oculi muscle overriding.<sup>9-11</sup> To decrease the recurrence rate, a combination of these procedures can correct multiple factors.<sup>12-15</sup> Quickert procedure was chosen in this study for its efficacy in treating entropion. It can address all the known causes of involitional entropion at single surgery: horizontal eyelid laxity by full-thickness eyelid shortening and vertical eyelid laxity by tucking the lower lid retractor between the orbicularis oculi muscle and the tarsal plate. Quickert procedure can prevent the preseptal orbicularis oculi muscle overriding by creating fibrosis with the sutures. Miyamoto et al. found that with Quickert Procedure there was 0% of recurrent entropion with maximum 89 months after surgery.<sup>5</sup> The study conducted by Jang et al. also showed no recurrent entropion after 24 months of follow up.<sup>16</sup> Other than that, we chose Quickert procedure because it fits our patients' condition that takes anticoagulant regularly. Quickert procedure is the right choice because it doesn't need anticoagulant treatment to be halted.<sup>1</sup>

Good functional eyelid is not the only thing to be assessed in every follow-up visit and cosmetic improvement. Some involitional entropion cases in Asia are also accompanied by other eyelid problems, baggy eyelid for an example. Lower eyelid fat removal needs to be thought through in entropion repair of the Asian lower eyelid, and Quickert procedure is a better choice in surgical management for involitional lower eyelid entropion in Asia and Western countries.<sup>5,17</sup>

## CONCLUSION

In the present study, Quickert procedure is still a better alternative procedure for lower eyelid involitional entropion correction (recurrence entropion 0%).

## AUTHOR CONTRIBUTION

All authors have contributed to all processes in this research, including preparation, data gathering, and analysis, drafting, and approval for publication of this manuscript.

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**CONFLICT OF INTEREST**

Authors have no conflict of interest related to this work

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