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A Five-Year Study of Cicatricial Entropion at Kirana Eye Hospital: Clinical Characteristics and Surgical Outcomes

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ABSTRACT

Purpose: Cicatricial entropion is an inward turning of eyelid margin caused by scarring tissue of the posterior lamella. The chronic damage of cicatricial entropion can irritate the ocular surface and harm the cornea. Proper reconstructive surgery techniques are needed to prevent further damage and visual impairment. This retrospective study was done to evaluate the clinical characteristics of cicatricial entropion and surgical outcomes to repair entropion at Kirana Eye Hospital, dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia.

Methods: Records of all patients with cicatricial entropion who underwent surgical repair between January 2012 and December 2017 were reviewed retrospectively. Variables include basic and clinical characteristics, and surgical outcomes were recorded and analysed.

Results: A hundred and twenty-two eyelids from 79 patients were included. Of those patients, 57% were female with mean age 51.4 years old. The laterality tendency is bilateral in 43 patients (54.4%). The most common initial complaints were foreign body sensation (35.4%). Cicatricial entropion is most commonly found on the upper eyelid (97.5%) with moderate severity. The majority of etiology is unknown but referred to chronic ocular surface inflammation in 51 eyelids (64.6%). Combined procedures were performed in most of the eyelids (79.5%).

Conclusion: It is imperative that combined procedures be carried out in a moderate-severe degree cicatricial entropion. In our current study, recurrence mostly happen in patients suffering from Stevens-Johnson syndrome.

Keywords: *cicatricial entropion, clinical characteristics, surgical outcomes, reconstructive surgery, Stevens-Johnson syndrome*

Cicatricial entropion is an inward turning of eyelid margin caused by scarring tissue of the posterior lamella that irritates the ocular surface due to trichiasis and/or conjunctivalization on the palpebral margins.[1-3]

According to the World Health Organization, cicatricial entropion affected almost 7-8 million people around the world with blindness rate 11.5 million people.[4,5] Cicatricial entropion may be caused by several conditions such as inflammation (Stevens-Johnson Syndrome/SJS), infection (trachoma, herpes zooster), trauma (thermal, chemical), autoimmune disease (cicatricial pemphigoid), or surgery (enucleation).[1-3] Various surgical procedures have been used for different

severity of cicatricial entropion including anterior lamellar reposition, posterior lamellar graft, terminal tarsus rotation, and tarsal fracture.[1,2,6,7] To our knowledge, this is the first study to evaluate the surgical outcomes of cicatricial entropion in our eye hospital. Therefore, evaluation of demographic and clinical characteristics of cicatricial entropion correction, results of surgical management regarding severity of cicatricial entropion, and recurrence following surgery are the merit of this study.

METHODS

This is a retrospective study that took place from January 2012 to December 2017 at Kirana Eye Hospital, dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia. All patients with cicatricial entropion who underwent corrective surgery performed by three oculoplastic surgeons (HS, YI, & AJ) were recruited in this study. Written informed consent were obtained from all patients. Data were collected by investigating medical records. Evaluation were noted including demographic data, general ophthalmology examination, eyelid and corneal disease examination, types of surgical technique to correct cicatricial entropion, success rate of surgical procedure, and recurrence after cicatricial entropion corrective surgery. Data were collated and tested with descriptive statistical test. Categorical variables were presented in proportion. Numerical variables were presented in mean, median and standard deviation. All statistical analyses were completed using IBM SPSS Statistics 24.0 software.

RESULTS

There were 86 patients with cicatricial entropion who underwent corrective surgery and recruited for the study over a five-year period. Seven medical records that could not be investigated further were excluded. This study included 122 eyelids of 79 patients (45 females, 34 males) with mean age 51.4±19.48 years. Thorough clinical characteristics of the subjects are summarized in Table 1. Cicatricial entropion laterality has a higher tendency to be bilateral (54.4%) than unilateral. Majority of patients' chief complaints are foreign body sensation (35.4%) and throbbing sensation (34.2%).

Table 1. Clinical Characteristics of Cicatricial Entropion Subjects

Characteristics	Total (%) n = 79 patients / 122 eyelids
Laterality (n = 79 patients)	
Unilateral	36 (45.6)
Bilateral	43 (54.4)
Chief Complaint (n = 79 patients)	
Throbbing Sensation	27 (34.2)
Foreign Body Sensation	28 (35.4)
Watery Eyes	3 (3.8)
Burning Sensation	21 (26.6)
Etiology (n = 79 patients)	
Unknown	51 (64.6)
Stevens-Johnson	18 (22.8)
Syndrome	7 (8.9)
Chemical Trauma	3 (3.8)
Mechanical Trauma	
Entropion Degree (n = 122 eyelids)	
Mild	29 (23.8)
Moderate	92 (75.4)
Severe	1 (0.8)
Entropion Location (n = 122 eyelids)	
Upper	119 (97.5)
Lower	0
Upper and Lower	3 (2.5)

Eyelid Abnormalities (n = 122 eyelids)	122 (100)
Trichiasis	122 (100)
Tarsal Conjunctiva Cicatrix	19 (15,6)
Conjunctivalization of Eyelid Margin	16 (13.1)
Symblepharon	
Corneal Abnormalities (n = 122 eyelids)	17 (13.9)
Conjunctivalization	71 (58.2)
Neovascularization	3 (2.5)
Keratitis	6 (4.9)
Epithelial Defect	7 (5.7)
Corneal Ulceration	85 (69.7)
Corneal Cicatrix	

The majority of cicatricial entropion etiology (Table 2) was unknown (67.2%) with 92 eyelids (75.4%) were classified in the moderate severity of entropion.

Table 2. Distribution of Cicatricial Entropion Etiology and Entropion Degree (n = 122 eyelids)

Etiology	**Entropion Degree**			**Total Eyelids (%)**
	Mild	**Moderate**	**Severe**	
Unknown	19	63	0	82 (67.2)
SJS	3	24	1	28 (22.9)
Chemical Trauma	5	4	0	9 (7.4)
Mechanical Trauma	2	1	0	3 (2.5)
Total Eyelids (%)	29 (23.8)	92 (75.4)	1 (0.4)	122

SJS= Steven-Johnson Syndrome

Our three operators performed several types of surgical interventions consisting of single or combined procedures for each entropion degree, summarized in Table 3.

Combined procedures were performed in most of the eyelids (97/122, 79.05%). Patients were followed-up regularly after 1 week, 2 weeks, 1 month, 3 months and >3 months postoperatively. Recurrence was observed in 10 eyelids (10/122, 8.19%) postoperatively in which six eyelids (6/122, 4.91%) had a moderate degree of entropion caused by SJS. Mean time of recurrence was 11 months.

Table 3. Distribution of Types of Surgery and Entropion Degree (n = 122 eyelids)

Surgical Procedure		**Entropion Degree**			**Total**
		Mild	**Moderate**	**Severe**	
Upper Eyelid	ALR	28	0	0	28
	ALR and TS/LD	0	75	0	75
	ALR and release Symblepharon	1	1	0	2
	ALR and TS/LD + AMT and fornixplasty	0	2	0	2
	ALR and TS/LD and release Symblepharon	0	4	0	4
	ALR and TS/LD and blepharoplasty	0	5	0	5
	ALR and release Symblepharon and BMG and AMT	0	1	0	1
	ALR and blepharoplasty	0	4	0	4
	ALR and	0	0	1	1

	release Symblepharon and posterior lamellar graft				
Upper and Lower Eyelid	Tarsal fracture	3	0	0	3

ALR = Anterior Lamellar Reposition, TS = Tarsal Split, LD = Lamellar Division, AMT = Amniotic Membrane Transplant, BMG = Buccal Mucosa Graft

DISCUSSION

Chronic irritation due to cicatricial entropion of the ocular surface could lead to epitheliopathy, keratopathy, keratitis, corneal ulcer, corneal cicatrix, and corneal neovascularization that threaten the vision.[1-3] Hence, surgical intervention of cicatricial entropion is suggested to prevent further damage to the cornea.[1,2,6]

In our study, cicatricial entropion laterality was more common in bilateral cases (54.4%). Previous studies stated that bilateral cicatricial entropion is associated with immune reaction or chronic inflammation, such as in SJS and pemphigoid.[7-9] On the other hand, unilateral cicatricial entropion generally occurs due to trachoma or chemical injuries.[7,8,10]

An interesting finding was the unknown underlying etiology as the highest cause. This could be attributed to neither expressed discomforts of the patients nor ophthalmology treatment and etiology were found in the medical records. Trachoma was reported as the highest etiology in developed countries.[5,10,11] Other causes were found to be SJS (22.8%), chemical trauma (8.9%), and mechanical trauma (3.8%). Cicatrix in SJS is preceded by bilateral formation of membrane and pseudo-membrane. When this disease becomes a chronic disorder, a sign of limbal stem cells deficiency (LSCD) in cornea appears.[1,7,9] Chemical trauma is divided into acid or base chemical reaction. A coagulation reaction to the conjunctival epithelium and cornea occurs in an acid chemical trauma whereas a saponification process between alkaline substances and fatty acid encounter in alkali chemical trauma.[1,7,8] Cicatricial entropion etiology also has a correlation with degree of entropion.[1,8] Progressive etiology (i.e. SJS and chronic inflammation) will have a tendency to be moderate-severe degree of entropion, whereas static etiology (i.e. traumatic injuries and post-surgery) tends to have minimal-moderate degree of entropion.[1,8,9]

One of the most effective methods to correct upper eyelid cicatricial entropion is the ALR procedure.[7,12] The majority of cicatricial entropion in this study was on the upper eyelid (97.5%). The most clinical symptoms found are trichiasis and scarring of tarsal conjunctiva. These conditions yielded in corneal damage from constant friction between eyelids and corneal surface.[1,7,13] Therefore, ALR procedure may be preferred alone to leave the tarsus bare for spontaneous epithelialization; or combined with amniotic membrane transplantation or mucosal graft. Kemp and Collin recommended ALR to treat minimal-moderate degree of cicatricial entropion.[7] The operators mainly chose ALR combined with tarsal split or lamellar division to repair a moderate degree. Combined method aims to broaden the distance between the eyelid and globe. Success rate of the combination widely varies.[7,12,15] We achieved a complete success (75/75, 100%) in less than 3 months and decreased to 89.29% (25/28) in more than 3 months.

In cases with mild degree entropion, majority of the procedure was ALR alone. Again, we obtained a complete success (28/28, 100%) in less than 3 months and decreased to 81% (9/11) in more than 3 months. Higher success rate (88.4%) was achieved by Sodhi et al who used ALR technique in 84 eyes with cicatricial entropion after one year follow-up.[6]

Cicatricial entropion could be complicated mechanically with other eyelid disorders such as dermatochalasis

and brow ptosis, hence, the other abnormalities should also be corrected.[12,15] Three operators chose to add blepharoplasty with ALR for nine eyelids with cicatricial entropion and dermatochalasis in our series of moderate upper cicatricial entropion in order to maximize the goal of surgery and patient satisfaction.

There were six eyelids (6/122, 4.91%) who experienced recurrence with SJS as the main etiology, followed by chemical trauma in four eyelids (4/122, 3.28%). Ross et al described recurrence rate of cicatricial entropion with progressive etiology (such as SJS and pemphigoid) as high as 17% while cicatricial entropion with static etiology (such as trachoma and chemical trauma) have 14.9% in a 6-month follow-up.[8]

Although there were good enough results for drawing the conclusion, this study has several limitations that are likely to have been influenced by the incomplete data in the medical records and minimum follow-up time. Some of the patients were also loss to follow-up as a consequence of patients' lack of compliance despite the surgeons' requirements postoperatively. Further studies with longer follow-up periods, however, are recommended to evaluate the long-lasting effect of surgical procedures. In conclusion, we believe that combined procedure with anterior lamellar recession is a good option for treating a moderate dan severe degree cicatricial entropion. Type of surgery might be adjusted based on each entropion degree.

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