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CONJUNCTIVOCHALASIS - A REVIEW

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ABSTRACT

Conjunctivochalasis is an ocular condition that is usually missed, unless specifically looked for. It is defined as a redundant loose non edematous inferior bulbar conjunctiva. Though generally asymptomatic, It may also present as dryness and foreign body sensation. Various grading systems like Mirmura ((based on Lid-parallel conjunctival folds), Mellers (based on lid-parallel conjunctival folds, punctual occlusion and conjunctival fold changes during down gaze and digital pressure) and Zhang's based on conjunctival folds, dryness, foreign body sensations, epiphora symptoms, punctual occlusion, tear meniscus height, tear film break-up time (BUT), and conjunctival fold changes during down gaze) system has been outlined. Various etiological aspects like dissolution of the Tenon's Capsule and role of expression of matrix metalloproteinase-1 (MMP-1) and matrix metalloproteinase-3 (MMP-3) has been dealt in detail. Different surgical approaches like paste-pinch-cut conjunctivoplasty and their steps are specified. Conjunctivochalasis has to be understood in a wider depth and more research work is required to understand CCh in better detail so that preventive steps can be implemented with regard to secondary causes.

Key words: Conjunctivochalasis, LIPCOF, Mimura System, Mellers System, Zhang's system, paste-pinch-cut conjunctivoplasty

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INTRODUCTION

Conjunctivochalasis (CCh) is an ocular surface condition defined as a redundant loose nonedematous inferior bulbar conjunctiva. CCh is usually bilateral and most often located between the globe and the lower eyelid. CCh, also known as lip-like folds, conjunctival pleating, and lid-parallel conjunctival folds (LIPCOF)¹.

Etiological factors²

- Aging
- Ocular movement
- Ocular surface inflammation
- Delayed tear clearance

Symptoms³

- Generally Asymptomatic
- Dryness - tear film instability caused by the relaxed conjunctiva. More prominent in the morning on awakening
- Tearing - secondary to interference with lower tear meniscus formation and occlusion of the inferior puncta by conjunctival folds on the margin of the lower eyelid.
- Foreign body sensation - Compression of the redundant conjunctiva during eyelid blinking or closure.

- Redness
- Subconjunctival haemorrhage - destruction of bent vessels in the conjunctival folds.
- Eye pain and Blurriness, especially in down gaze

Aggravating factors

- Previous eye surgery
- Age more than 60 years
- Eyelid issues (blepharitis and MGD)
- Contact lens wear - RGP more so than SCL
- Hyperopia
- Short axial length
- Pinguecula
- Autoimmune thyroid disease
- Superior limbic keratitis
- Ehler Danlos disease

Signs

- Altered tear meniscus
- Tear Break Up Time decreased
- Conjunctival staining with fluorescein in non-exposure zone
- Corneal staining at the non-exposure zone
- Schirmer’s test decreased
- Lid margin inflammation
- Subconjunctival haemorrhage
- Pinguecula

Grading Systems

Mimura System (based on Lid-parallel conjunctival folds- Table 1)⁴

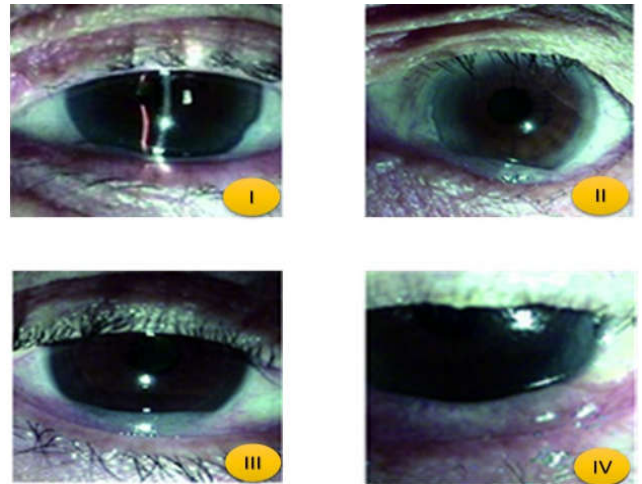
Grade	Number of folds and relationship to the tear meniscus height
0	No persistent fold
1	Single small fold
2	More than two folds and not higher than tear meniscus
3	Multiple folds and higher than tear meniscus

Table 1

Mellers System (based on lid-parallel conjunctival folds, punctual occlusion and conjunctival fold changes during down gaze and digital pressure-Table 2.)⁵

Grades	Basic Grading Criteria
0	No persistent fold
I	Single, small fold
II	Two or more folds and not higher than the tear meniscus
III	Multiple folds and higher than the tear meniscus
V	Multiple folds, higher than the tear meniscus and causing exposure problems

Table 2



Zhang’s system(based on conjunctival folds, dryness, foreign body sensations, epiphora symptoms, punctual occlusion, tear meniscus height, tear film break-up time (BUT), and conjunctival fold changes during down gaze-Table 3)⁶

Grades	Basic Grading Criteria	Supplement grading criteria
0	No persistent fold	No Symptoms
I	Single, small fold	No Symptoms
II	Two or more folds and not higher than the tear meniscus	Mild symptoms, nasal location, partial occlusion, irregular tear meniscus
III	Multiple folds and higher than the tear meniscus	Medium symptoms, nasal location, complete occlusion, discontinuous tear meniscus
V	Multiple folds, higher than the tear meniscus and causing exposure problems	Severe symptoms, nasal location, complete occlusion, no tear meniscus

Table 3

Grades II, III, and IV Conjunctivochalasis are also defined as “clinically significant Conjunctivochalasis”.

Etiopathogenesis

- Conjunctival laxity
- Gradual dissolution of the Tenon’s capsule leads to an adhesion loss between the conjunctiva and the underlying sclera that combines with an age-related conjunctival thinning and stretching
- Abnormalities in lid position
- Pressure from the eyelids may lead to impaired lymphatic drainage of the conjunctiva

Histopathogenesis⁷

- These etiological factors resulted in elastosis, chronic nongranulomatous inflammation, fragmentation of the elastic fibres, and loss of collagen resulting in hyperplasia of conjunctival epithelium, decrease of elastic fibre, and chronic inflammation⁸
- Pentraxin 3 immunostaining was strongly positive in the Subconjunctival stroma of CCh specimens which up regulates expression of matrix metalloproteinase-1 (MMP-1) and matrix metalloproteinase-3 (MMP-3)⁹
- Pro-MMP-9 levels are significantly higher in CCh
- IL-1beta and IL-6 were only found to be over expressed in CCh

Comparison between Conjunctivochalasis and Aqueous Tear Deficiency

Comparison	Conjunctivochalasis	Aqueous Tear Deficiency
Diurnal Variation	More symptomatic in the morning	More symptomatic as the day progresses
Gaze position	More symptomatic on down gaze	More symptomatic on up gaze
Frequent Blinking	Worsens symptoms	Relieves symptoms
Schirmer’s	May be normal	Decreased
TBUT	Decreased	Decreased
Conjunctival staining with fluorescein	non-exposure zone	Inter Palpebral Aperture
Corneal staining	non-exposure zone	Inter Palpebral Aperture

Table 4

Management

Treatment is not recommended if the patient is asymptomatic.

For severe disease, medical therapy with surface lubricants, antihistamines, and topical corticosteroids. In cases where medical management remains unsuccessful, surgical treatment becomes necessary.

Surgical management involves the resection of the redundant tissue. Several methods have been described

- Crescent resection with or without suture
- Suture fixation of the redundant conjunctiva to the globe
- Pinching the excess conjunctiva and performing bipolar cauterization
- conjunctivoplasty using a simple medial conjunctival resection
- conjunctivoplasty with argon green laser
- paste-pinch-cut conjunctivoplasty
- conjunctival semiperitomy combined with gentle Subconjunctival cauterization
- Conjunctivoplasty with amniotic membrane transplantation with or without the use of fibrin tissue glue.

The major concept of conjunctival surgery for dry eye is to smoothen the surface by

- (1) Reducing blink-associated micro trauma.
- (2) Reconstructing the tear meniscus and conjunctival fornix and their respective functions as reservoirs for tears.

Crescent resection with or without suture (Hughes)

Conjunctiva was anesthetized by using 0.5% Proparacaine eye drops. The eye was then exposed with a speculum and the loose conjunctiva was pushed downward and the folded conjunctiva was kept 5 mm posterior from the limbus. Redundant conjunctiva was gathered without influencing eye movement and then was excised like a crescent. The incision was approximated with a 10-0 nylon suture. Sutures remained in place for 10 to 14 days, during which 0.5% Gatifloxacin and Artificial eye drops were administered 4 times per day¹².

Pinching the excess conjunctiva and performing bipolar cauterization

For the electrocoagulation procedure, the conjunctiva was anesthetized by using 0.5% Proparacaine eye drops. Eyes were exposed,

and patients were told to look straight ahead. The loose conjunctiva was pushed downward, and the folded conjunctiva was kept 5 mm posterior from the limbus. Redundant conjunctiva was gathered together without influencing eye movement and was coagulated at its root by an electric coagulator at 3 to 6 points. Electrocoagulation parameter settings were as follows: energy 20% to 40%; duration, 0.1 to 2 seconds.

Electrocoagulation allows local inflammation to occur, and the conjunctiva attaches to the subconjunctival Tenon's capsule. Because the coagulation point is located 5 mm posterior to the limbus, and because the anatomic depth of the lower fornix from the limbus is no deeper than 8 mm, no restriction of lower gaze occurs.

Paste-Pinch-Cut Conjunctivoplasty

The procedure consists of 3 primary steps—**paste**: brin sealant is injected Subconjunctival in a line inferior to the limbus; **pinch**: the conjunctiva is grasped with curved ptosis forceps, gathering the excess conjunctiva into a ridge, which is held, allowing the sealant to polymerize; and **cut**: the ridge of excess conjunctiva and sealant is resected¹³.

After inserting a lid speculum, a Subconjunctival 2% lignocaine with epinephrine injection was administered in the inferior conjunctiva. An arc-like guideline was demarcated with a methylene blue pen; 5 to 6 mm inferior to the limbus. A small buttonhole was made in the temporal bulbar conjunctiva at the edge of the marking line with Westcott scissors after light cautery of the site. Approximately 0.3 mL of the brinogen component of brin sealant (Tisseel; Baxter AG Industries, Vienna, Austria) was injected through the button-hole subconjunctival along the demarcated line through a 19 gauge cannula, followed by 0.3 mL of the thrombin component injected in a similar fashion. Immediately after injection of the sealant, modified (curved) ptosis forceps were used to pinch the conjunctiva, thus gathering the excess conjunctiva and Subconjunctival sealant into a ridge peaked by the marking line. This ridge was held for 20 seconds allowing the sealant to polymerize. The ridge was then excised using Westcott scissors,

leaving a sealed wound 2 to 3 mm inferior to the limbus. Patients were discharged home with antibiotic and steroid drops and instructions to apply 3 times per day for 1 week and 3 weeks, respectively. All patients were seen for postoperative follow-up at day 1, month 1, and month 3.

The brin sealant is nearly completely absorbed by 2 weeks after application. Thus, the adhesion between the sclera and the conjunctiva indicates the presence of a Subconjunctival scar, rather than residual brin sealant. , the dual applicator is not well suited for use in the PPC procedure because of the larger bore of the needle and tendency of the sealant to clump at the tip of the applicator.

Thermocautery

After 0.4% oxybuprocaine hydrochloride anaesthesia, an assistant fixed the head in the slit-lamp head holder and another assistant held the eye open with her fingers without a blepharostat. The redundant bulbar conjunctival tissue was grasped 3–4 mm inferior to the limbus with a smooth forceps. The conjunctival tissue was lifted up and cauterized with an OPTEMP variable low temperature cauterizer until the redundant bulbar conjunctival tissue was ablated. Betamethasone sodium phosphate was used for 2 weeks after the cauterization, and then 0.1% fluorometholone was used for the following 2 weeks¹¹.

CONCLUSION

More research publications are required to get a better insight on Conjunctivochalasis. In patients treated for ocular surface complaints with no symptomatic relief, CCh evaluation may seem fruitful. With regard to management quite affordable and effective surgical measures are already in place.

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