

Prevalence of blepharoptosis and lower lid laxity in patients with dermatochalasis

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Abstract:

Purpose: To identify prevalence of blepharoptosis and lower lid laxity in dermatochalasis patients for paying more attention to it.

Patients and Methods: A cross sectional study in which 83 patients visiting Ophthalmology Department - Almuassat University Hospital between 2020 and 2021. We take patients who have dermatochalasis despite their complaints. All patients underwent slit-lamp examination, measurement of marginal reflex distance MRD1, lid distraction and snap back test. Based on these tests we determine the presence of blepharoptosis and lower lid laxity and their degrees.

Results: A total of 83 patients were enrolled in the study. Mean age of patients was 64.4, 53.01% of participants were female. 27.7 % of patients had blepharoptosis.

65.2 % of patients had mild ptosis, 34.8 % had moderate ptosis and there was no severe ptosis in study group. 30.1% had lower lid laxity 19 of them were male, 72% were degree 1 and 28% were degree 2.

Conclusion: The incidence of blepharoptosis and lower lid laxity increases with age especially those with periocular changes.

Keywords: Blepharoptosis, Lower Lid Laxity, Prevalence, Dermatochalasis, Blepharoplasty



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دراسة انتشار الانسدال ورخاوة الجفن السفلي عند مرضى تهدل الأَجفان

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المُلخَص:

الهدف: تحديد نسبة انتشار الانسدال ورخاوة الجفن السفلي عند مرضى تهدل الأَجفان لزيادة الانتباه لها المرضى والطرائق: دراسة مقطع مستعرض ، تم فحص 83 مريضاً من مراجعي العيادة العامة في مشفى المواساة الجامعي خلال الفترة من حزيران 2020 إلى حزيران 2021 ، تم إدخال المرضى الذين لديهم تهدل جلد الأَجفان بغض النظر عن شكواهم الأساسية. تم فحص جميع المرضى بالمصباح الشقي وقياس المسافة بين حافة الجفن العلوي ومنعكس الحدقة (MRD) واختبار افتراق (سحب) الجفن السفلي و snap-back test وبناء على هذه الاختبارات تم تحديد المرضى الذين لديهم انسداد جفن أو رخاوة جفن سفلي وتحديد الدرجة .

النتائج: تم ادخال 83 مريض في الدراسة ، كان متوسط أعمار المرضى 64,4 . 53,01% من المرضى كانوا إناث.

27,7% من المرضى لديهم انسداد جفن ، 65,2% منهم كان الانسدال خفيف ، 34,8% منهم كان الانسدال متوسط الشدة ولم يكن في عينة الدراسة انسداد شديد. 30,1% من المرضى لديهم رخاوة جفن سفلي 19 مريض كانوا ذكورا ، 72% كان لديهم رخاوة جفن سفلي درجة أولى ، 28% درجة ثانية.

الخلاصة: تزداد نسبة الإصابة بانسدال الجفن ورخاوة الجفن السفلي مع ازدياد العمر وخصوصاً عند الذين لديهم تغيرات ما حول العين.

الكلمات المفتاحية: انسداد، رخاوة جفن سفلي، انتشار، تهدل جلد الأَجفان، شد الأَجفان

Introduction:

With aging peri ocular changes occur. Dermatochalasis, fat hernia, browptosis, blepharoptosis and lower lid laxity could happen separately or gathered.(Guyuron, Harvey, & surgery, 2016, p. 138)

Blepharoplasty is one of the most common plastic procedures and performed by a diversity of specialists.(Hollander *et al.*, 2019, pp. 294-309; Sniegowski, Davies, Hink, & Durairaj, 2014, pp. 9(4),341-349)

Preoperative examination is essential to successful operation and prevention complications.(Yang, Ko, Kikkawa, & Korn, 2017)

The surgeon should inquire about cardiac and thyroid disease, hypertension, diabetes, bleeding diathesis, and keloid scar formation. Allergies and a list of medications should be noted. Patients taking aspirin, anticoagulants, nonsteroidal anti-inflammatory agents, vitamin E, ginkgo, and other herbal medications should stop them, if possible, up to 3 weeks preoperatively.(Heller *et al.*, 2006, pp. 117(112), 436-445)

Being familiar with anatomy of the eyelid complex figure (1) is essential to assess the patient before surgery. Eyelid skin is the thinnest in the body and has no subcutaneous fat layer.(Bhattacharjee, Misra, & Deori, 2017, pp. 65(67), 551)

Due to the delicacy of the skin of the eyelid and the continual motion with each blink, different amount of the laxity occurs with age. The pretarsal compounds are firmly attached to the underlying tissues. Conversely, the preseptal tissues are loosely attached which lead to possible spaces for fluid accumulation.(Liu, Hsu, & surgery, 1986, pp. 2(2), 59-64)

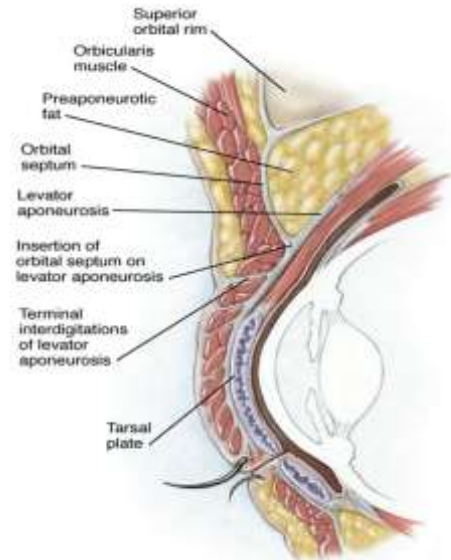
The upper eyelid can be divided into tarsal and orbital parts at the level of the supratarsal fold(Januszkiewicz, Nahai, & surgery, 1999, pp. 103(103), 1015-1018) (formed by the fusion of the levator aponeurosis, orbital septum, and orbicularis oculi fascia).The Caucasian eyelid holds this fusion approximately 3–5 mm above the upper border of the tarsal plate while, in the Asian eyelid, it lies a little lower.

The orbital septum whose function is to retain the orbital fat lies deep to the orbicularis fascia.(Siegel, 1993, pp. 20(22), 209-212)

It is continuous with the periosteum of the orbit and fuses with the levator aponeurosis 10–12 mm above

the superior tarsal border. Posterior to the orbital septum and anterior to the levator aponeurosis are the preaponeurotic fat. This layer of orbital fat can be divided into the yellow-colored central fat pad and the white nasal fat pad. It is very important to distinguish during surgery the central soft yellow orbital fat from the temporally adjacent prolapsed lacrimal gland, which is easily distinguishable by its firm nature, pinkish-gray color, and glandular structure.(Kakizaki, Malhotra, & Selva, 2009, pp. 63(63), 336-343)

Posterior to the preaponeurotic fat pads are the levator aponeurosis and levator muscle. 10 to 12 mm above the superior tarsal border, the sympathetic muscle of Muller leaves the posterior surface of the levator aponeurosis and inserts at the superior border of the tarsus.(Bosniak & Zilkha, 1999)



Figure(1): sagittal section of upper eyelid

Superior dermatochalasis is defined as excessive folds of anterior lamellar tissue in the upper eyelids. The etiology can be involutional, familial, or both. Patients suffer from heavy eyelids, difficulty in eyelid elevation, periorbital annoyance because of exaggerated use of frontal muscle and limited superior visual field.(Abell, Cowen, Baker, Porter, & surgery, 1999, pp. 15(14), 236-242; Lima, Siqueira, Cardoso, Sant'Anna, & Osaki, 2006, pp. 69(62), 227-232)

Upper and lower blepharoplasty complications:

Retrobulbar Haemorrhage

Although retrobulbar haemorrhage is rare, it is a dramatic complication usually occurs within the first day after surgery and may lead to blindness.(Hong & Kim, 2019, pp. 25(23), 124-127) figure (2)

Wound Dehiscence.

Risk factors for postoperative wound dehiscence includes infection and even minor postoperative trauma.

Scar Abnormalities.

Although eyelid skin heals very well, eyelid wounds need to be made symmetrically and sutured carefully to avoid asymmetry and scarring. Sometimes incision lines may be hypertrophied, especially in keloid-forming patients.

Upper Eyelid malposition.it could be ptosis, retraction or lagophthalmos

Ptosis (figure3) often this levator attenuation is present preoperatively but is undiagnosed.(Lowry & Bartley, 1994, pp. 38(34), 327-350)

Retraction (figure4) because of excessive skin excision or incorporation of the orbital septum in skin closure.

Lagophthalmos (figure5) presents usually in the postoperative period. Reasons involve too much skin removal or trauma to the orbicularis muscle.(Campbell & Lisman, 2000, pp. 8(3), 303-328)

Lower Eyelid Malposition

The most widespread complication after lower eyelid blepharoplasty is lower lid malposition, it may vary from mild inferior scleral show (figure 6) to severe cicatricial ectropion (figure 7 represent mild ectropion).(Baylis, Long, & Groth, 1989, pp. 96(97), 1027-1032; McGraw, Adamson, & Surgery, 1991, pp. 117(118), 852-856)

Preoperative recognition of patients at risk for lower eyelid malposition is critical. Risk factors include globe prominence, high myopia and thyroid ophthalmopathy. Horizontal eyelid laxity should be assessed preoperatively and the appropriate protocol must be chosen

Strabismus and Extraocular Muscle Disorders

Diplopia is a rare but serious problem. Injured inferior oblique muscle is the most common cause of diplopia.(Ghabrial *et al.*, 1998, pp. 102(104), 1219-1225; Hayworth, Lisman, Muchnick, & Smith, 1984, pp. 16(15), 448-451) Newly, many reports mention dysfunction of superior oblique muscle leads to acquired Brown Syndrome.(Syniuta, Goldberg, Thacker, Rosenbaum, & surgery, 2003, pp. 111(116), 2053-2059)



Figure(2): retrobulbar haemorrhage after lower eyelid blepharoplasty(Hong & Kim, 2019)



Figure(3): preoperative view with concomitant dermatochalasis and aponeurotic ptosis (left)who underwent upper blepharoplasty without addressing the underlying ptotic eyelids .Note the residual blepharoptosis postoperatively(right).(Lelli Jr, Lisman, & Surgery, 2010)



Figure (4): upper lid retraction after upper lid blepharoplasty(Oestreicher & Mehta, 2012)



Figure (5): lagophthalmos secondary to upper lid overcorrection(Oestreicher & Mehta, 2012)



Figure (6): lower lid retraction after lower lid blepharoplasty (Almouassat hospital)



Figure (7): lower lid ectropion after lower lid blepharoplasty (Almouassat hospital)

Involitional blepharoptosis is the most common type of acquired blepharoptosis. The mechanism for this condition is considered to be the degeneration of the levator aponeurosis, containing the attenuation, elongation, dehiscence, or disinsertion of the tarsus, which leads to failure of transmission between the levator muscle and tarsus.(Fujiwara, Matsuo, Kondoh, & Yuzuriha, 2001, pp. 46(41), 29-35; Older, 1978, pp. 96(10), 1857-1858) The function of the levator muscle is considered to be normal and to remain good to excellent.

A lower eyelid with a firm apposition to the globe and a smooth curve, at level of the inferior limbus, is considered esthetically pleasing.(Beigi *et al.*, 2019, pp. 72(72), 310-316)

Blepharoptosis and lower lid laxity are important factors that affect aesthetic result of blepharoplasty.

The prevalence of blepharoptosis and lower lid laxity is infrequently reported in the medical literature.(Chao, Son, & Guyuron, 2021, pp. 45(41), 193-197; Saad, Ragab, & Osman, 2020, pp. 21(22), 127)

The prevalence of senile blepharoptosis between population older than or equal to 40 years in age range from 14.8 to 16.3%, and it has been shown to be associated with increasing age, male sex, lighter skin color, and higher body mass index.(Jacobs *et al.*, 2014, pp. 150 (158), 836-643; Paik *et al.*, 2015, p. 10(17))

In this study, we aimed to study the prevalence of blepharoptosis and lower eyelid laxity in dermatochalasis patients and their relation with age and gender as risk factors.

Patients and Methods:

We performed a cross sectional study in which 83 patients visiting ophthalmology department in Almoassat University Hospital for different complaints and have upper or lower eyelid dermatochalasis over a period from June 2020 to June 2021. Patients were excluded from the study if they have a history of eyelid trauma or surgery.

All patients underwent slit-lamp examination, measurement of marginal reflex distance MRD1 , lid distraction and snap back tests.

Based on these tests we determine the presence of blepharoptosis and lower lid laxity and their degree.

Diagnostic tests:

MRD1 measurement which is the distance from the upper eyelid margin to the corneal light reflex in primary position figure (8)

Lid distraction by pulling the lower lid away from the globe and measuring the distance to which the lid is pliable figure (9). Distraction > 6 mm is considered a positive test .

Snap-back test : the lower lid was pulled away and down from the glob for several seconds then observed how long it takes to return to original position without blinking figure (10)

It was graded

Normal lid returns to position immediately on release degree (0)

Approx. 2-3 seconds degree (1)

4-5 seconds degree (2)

More than 5 seconds but does return to position with blinking degree (3)

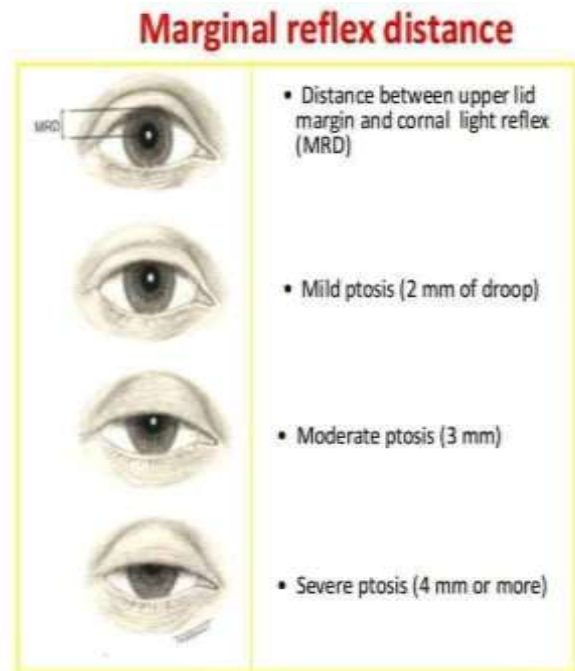


Figure (8): marginal reflex distance measurement(AAO)

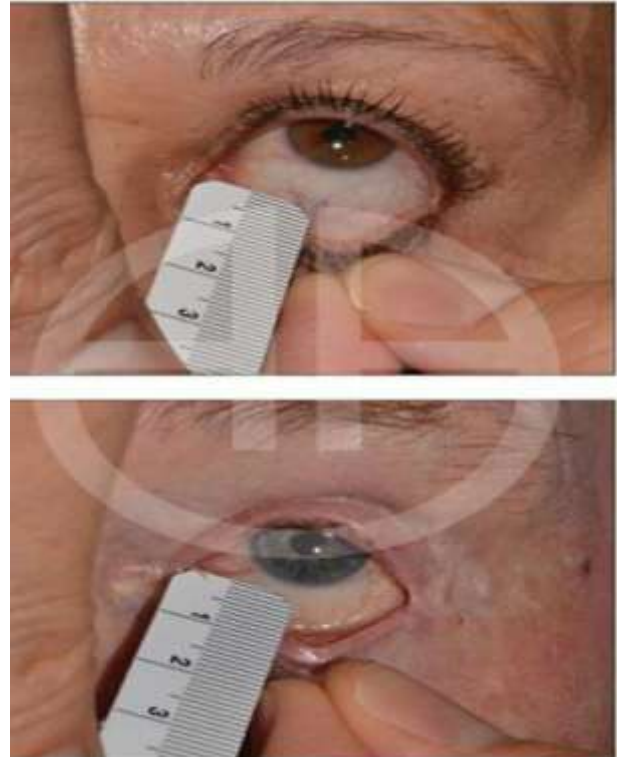


Figure (9): lid distraction(AAO)



Figure (10): snap back test (AAO)

Results:

A total of 83 patients with upper or lower eyelid dermatochalasis were enrolled in the study. Subjects ranged in age from 46 to 85 years old with a mean age of 64.4, 53.01% of participants were female.

Twenty-three out of 83 patients (27.7 %) had some degree of blepharoptosis. 15 patients (65.2 %) had mild ptosis, 8 patients (34.8%) had moderate ptosis and there was no severe ptosis in study group. 18 patients (68.3%) had bilateral blepharoptosis.

Five patients (21.7%) had unilateral blepharoptosis. Two of them had right blepharoptosis and three had left blepharoptosis. Among the patients with unilateral blepharoptosis, 3 patients had mild blepharoptosis and 2 had moderate blepharoptosis.

The age ranges were divided into ages ranging from 46-55 (0 patient), 56-65 (4 patients),

66-75 (10 patients) and older than 75 (9 patients).

As given in Table 1, the frequency of blepharoptosis increases steadily with increasing age group.

25 patients (30.1%) had lower lid laxity 19 of them were male. 18 patients (72%) were degree 1 and 7 patients (28%) were degree 2.

As given in figure 1 the incidence of lower lid laxity increases with age.

There was (0 patient) in 46-55, (5 patients) in 56-65, (10 patients) in 66-75 and (10 patients) in 76-85.

table (1): distribution of ptosis patients with age

العمر (Binned) * وجود انسدال Crosstabulation					
		وجود انسدال		Total	
		no_Ptosis	Ptosis		
العمر (Binned)	46 – 55	Count	12	0	12
		% within العمر (Binned)	100.0%	.0%	100.0%
	56 – 65	Count	29	4	33
		% within العمر (Binned)	87.9%	12.1%	100.0%
	66 – 75	Count	17	10	27
		% within العمر (Binned)	63.0%	37.0%	100.0%
	76 – 85	Count	2	9	11
		% within العمر (Binned)	18.2%	81.8%	100.0%
Total		Count	60	23	83
		% within العمر (Binned)	72.3%	27.7%	100.0%

Table (2): distribution of lower lid laxity with age

العمر (Binned) * رخاوة الجفن السفلي Crosstabulation					
		رخاوة الجفن السفلي		Total	
		No Lower lid laxity	Lower lid laxity		
العمر (Binned)	46 - 55	Count	12	0	12
		% within العمر (Binned)	100.0%	.0%	100.0%
	56 - 65	Count	28	5	33
		% within العمر (Binned)	84.8%	15.2%	100.0%
	66 - 75	Count	17	10	27
		% within العمر (Binned)	63.0%	37.0%	100.0%
	76 - 85	Count	1	10	11
		% within العمر (Binned)	9.1%	90.9%	100.0%
Total		Count	58	25	83
		% within العمر (Binned)	69.9%	30.1%	100.0%

Discussion:

Prevalence of blepharoptosis and lower lid laxity in dermatochalasis patient population has not been studied well in the literature. In few studies, gender, age and ethnicity have been identified to affect eyelid topography. (Berger & Kahn, 2012, pp. 24(24), 545-555)

Marginal reflex distance is an important anthropometric landmark in detecting blepharoptosis. In our study we defined ptosis at MRD <4 mm. Involution ptosis was the main cause in our group study. Jacobs *et al.* found an overall blepharoptosis prevalence of 16% among individuals aged greater than or equal to 45 years. (Jacobs *et al.*, 2014, pp. 150(158), 836-843)

Awareness of the higher prevalence of blepharoptosis in these patients is important for the plastic surgeon and the patient. This knowledge-enhanced preoperative evaluation helps optimize the treatment plan, improve patient expectation.

Male gender was high risk factor for lower lid laxity but not for blepharoptosis.

As expected there was a positive correlation between advanced age and the incidence of blepharoptosis and lower eyelid laxity. Findings for lower lid laxity were similar to those of Chhadva *et al.* who found that individuals with eyelid laxity were older (67 ± 10 vs. 55 ± 8 years in individuals without lid laxity, $P < 0.005$). (Chhadva *et al.*, 2016, pp. 35(34), 531)

Conclusion:

The incidence of blepharoptosis and lower lid laxity increases with age especially those with periocular changes.

The vast majority of cases was mild and easy to be overlooked without careful examination so care must be taken before blepharoplasty to avoid complication.

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