

**How to Cite:**

AlSadoun, R. T. H. (2022). A case study of using cross-linked hyaluronic acid for upper eyelid rejuvenation. *International Journal of Health Sciences*, 6(S1). 5196–5200.  
<https://doi.org/10.53730/ijhs.v6nS1.6038>

## **A case study of using cross-linked hyaluronic acid for upper eyelid rejuvenation**

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**Abstract**---Introduction: The aim of study is to rejuvenate upper eyelid by injecting cross-linked hyaluronic acid into it and correct the appearance of the eye whether it is sunken or hollowed. Method: thirty participants divided into 2 groups. Group A: a patient with sunken eye, Group B: a patient with hollowed eye and mild excess skin and. A cross-linked hyaluronic acid 20mg/ml (Hyamira/Italian brand) was injected into upper eyelid via 25gauge blunt cannula. Assessment was done by taking photos and measurements. Follow up was made on basis of 2 weeks and 3 months. Result: cross sectional study of 30 patients have left and right side upper eyelid rejuvenation, mean age of patients is (37.5 ± 8.2) years old, 19 (63.3%) patients have hollowed mild abnormality and 11 (36.67%) of them have sunken eye abnormality. There is significant difference between the mean of period of injection according to group (A&B). group A more have injection time than group A in period 2 weeks and 3 months. Conclusion: obvious upper eyelid rejuvenation, youthful appearance with no more sunken or hollowed eye with more than 1 year.

**Keywords**---cross-linked, Hyaluronic Acid, upper eyelid, rejuvenation.

### **Introduction**

Eyelids are thin, mobile layers covering the eyes. Their function are to protect the eyes from light, injury and to distribute tears throughout the eyes to keep them lubricant <sup>1</sup>. Eyelids whether upper or lower are consisting of 5 layers, these are (from the superficial to deep): 1-skin and subcutaneous tissue 2-orbicularis oculi 3-tarsal plate 4-levator apparatus 5=conjunctiva <sup>2</sup>.

Motor and sensory nerves innervate the eyelid. Motor innervation are facial nerve CN VII is the motor nerve which is responsible for eye movement and protection, temporal and zygomatic branches of facial nerve that innervate the orbicularis oculi, frontals, procures and corrugator supercilli muscle <sup>3</sup>. Ocular motor nerve CN III it mainly supplies the upper eyelid retractor and levator palpebrae

International Journal of Health Sciences ISSN 2550-6978 E-ISSN 2550-696X © 2022.

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Manuscript submitted: 27 Feb 2022, Manuscript revised: 18 March 2022, Accepted for publication: 09 April 2022  
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superiors, sympathetic fibers innervate superior and inferior tarsal muscle that leads to retraction <sup>4</sup>. While sensory nerves are ophthalmic VI and maxillary V2 division of Trigeminal nerve, ophthalmic nerve gives the terminal branches that supply the upper eyelid from lateral to medial as lacrimal nerve, supra orbital nerve and supra trochlear while medial part of upper eyelid is supplied by infra trochlear, the maxillary nerve gives zygomaticofacial and infra orbital terminal branches that supply the lower eyelid. Zygomaticofacial nerve supplies the lateral lower eyelid while infra orbital nerve supplies the lower eyelid <sup>3</sup>. The thickness of upper eyelid is less than 1mm and it is the thinnest part in the body (Pa. The average from superior eyelash to the eyebrow is 10-11mm <sup>5</sup>. The horizontal length of eyelid is 3mm between the ages of 12-25 year but 10% shortening occurs with aging, in addition, aging causes higher skin folds and increase the distance between the pupil center and the lower eyelid by about 1 mm in male and 0.5mm in female <sup>6</sup>. Simple classification to determine the upper eyelid abnormalities: 1-sunken 2-hollow with mild-moderate excess skin 3-hollow with severe excess skin (full eye). Full eye can be defined as dermatochalasis, which is dermatological condition treated by blepharoplasty surgery <sup>7</sup>. The aim of study of study obvious upper eyelid rejuvenation, youthful appearance with no more sunken or hollowed eye with more than 1 year.

## Method

Cross sectional experimental study chosen participants are 30 in number with median age 36 year “the age ranged from 30-55”. The included upper eyelid abnormalities are sunken and hollowed with mild – moderate excess skin, only patients with no previous intervention while all patients with chronic diseases, bleeding disorders , local or systemic infection, cancer , auto immune diseases or on anti-coagulant agents, chemotherapy or radiotherapy or immunological treatments or having allergy to cow milk and its derivatives or history of previous allergy to hyaluronic acid or previous intervention or fully eyes are excluded <sup>8</sup>. Assessment was done through 1-taking photos 2-measurement from the eyelash to the lateral third eyebrow and from the lateral third eyebrow to the hair lines 3-symmetry 4-feature of fullness, furrows and pretarsal skin <sup>9</sup>. The patients are divided into 3 groups: A- patients with sunken eyes B-patients with hollowed eyes and mild excess skin C-patients with hollowed eyes and moderate excess skin. All were injected with roughly 0.5 -0.6 ml cross-linked, 20mg/ml Hyamira filler via 25 gauge 50mm blunt cannula. The entrance was made at the lateral end of eyebrow, over the bone of orbicularis oculi and injected toward medial side. The injection technique was slow linear retrograde technique. Management and outcomes: Improvement in term of assessment on basis of 2 weeks follow-up visits and made retouch and final visits after 3 months. Statistical analysis done by SPSS 22, frequency and percentage used for categorical data, mean, median and SD for continuous data. T test used for evaluation differences between mean and median of continues variables. P-value less or equal to 0.05 is consider significant.

## Results

Cross sectional study of 30 patients have left and right side upper eyelid rejuvenation, mean age of patients is (37.5 ± 8.2) years old, 19 (63.3%) patients

have hallow mild abnormality and 11 (36.67%) of them have sunken eye abnormality. As show in fig 1.

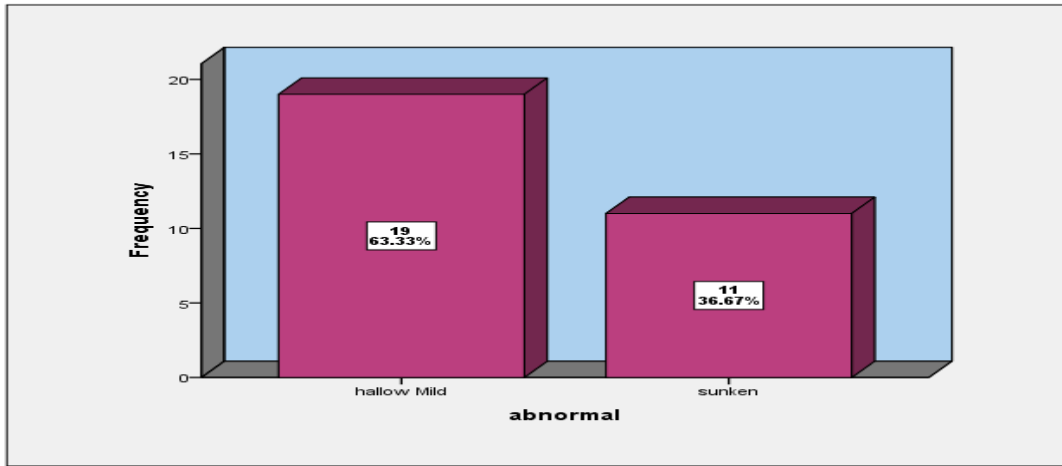


Fig (1): distribution of eye abnormalities

According to table 1; there is significant difference between the mean of period of injection according to group (A&B). group A more have injection time than group A in period 2 weeks and 3 months.

Table 1  
Difference between the mean of period of injection according to group (A&B)

period of injection	types	N	Mean	Std. Deviation	P-value
before	A	30	2.08	0.51	0.0001
	B	30	3.77	1.16	
two weeks	A	30	2.30	0.54	0.0001
	B	30	3.77	1.15	
three months	A	30	2.31	0.8	0.0001
	B	30	3.60	1.47	

P-value ≤ 0.05 (significant).

According to table 2; there is no significant difference between the mean of period of injection in group (A) in period 2 weeks and 3 months.

Table 2  
Difference between the mean of period of injection according to group (A)

type A	N	Mean	Std. Deviation	P-value
before	30	2.08	0.5	0.0001
two weeks	30	2.30	0.5	
before	30	2.08	0.5	0.06
three months	30	2.31	0.8	
two weeks	30	2.30	0.5	0.9
three months	30	2.31	0.8	

P-value  $\leq 0.05$  (significant).

According to table 3; there is no significant difference between the mean of period of injection in group (A) in period 2 weeks and 3 months.

Table 3  
Difference between the mean of period of injection according to group (B)

type B	N	Mean	Std. Deviation	P-value
before	30	3.77	1.16	0.3
two weeks	30	3.77	1.15	
before	30	3.77	1.16	0.2
three months	30	3.60	1.47	
two weeks	30	3.77	1.15	0.2
three months	30	3.60	1.47	

P-value  $\leq 0.05$  (significant).



Fig (1)

## Discussion

We got very nice results inform of upper eyelid rejuvenation, decrease folds, correct the appearance of hollow or sunken eyes and increase the distance from eyelash to eyebrow by approximately 0.25-1 cm for more youthful appearance. These results were reassessed 1-year post injection <sup>10</sup> and the same outcomes. Impressions on this study, firstly false positive outcome as false positive folds can happen and secondly long term follow up, large sample size and further studies are needed. Complications of such technique are risk of blindness, sudden edema, asymmetry, and implant filler into eyeball and over correction.

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