



2023

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How to Cite This Article

Tawfik, Ahmed Mohamed Raafat (2023) "Removal of Benign Conjunctival Naevus by Argon Laser Photocoagulation compared to Surgical Excision," *Al-Azhar International Medical Journal*: Vol. 4: Iss. 3, Article 13.

DOI: <https://doi.org/10.58675/2682-339X.1722>

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Removal of Benign Conjunctival Naevus by Argon Laser Photocoagulation Compared to Surgical Excision

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Abstract

Background: Conjunctival naevus is a widespread benign eye tumor. Surgical excision or argon laser photocoagulation are the choice of treatment for superficial and deep conjunctival naevi.

Purpose: The purpose of this study is to compare between surgical excision and argon laser photoablation of conjunctival naevus concerning safety, efficacy and postremoval complications.

Patients and methods: A randomized controlled trial was conducted in Ophthalmology Department, Al-Azhar University Hospitals, Egypt in the period from January 2022 to January 2023. 40 patients with benign pigmented conjunctival naevi were included and formed two groups; group (1) included 20 patients and used argon laser photocoagulation for removal of conjunctival naevi, while group (2) included 20 patients and surgical excision of conjunctival naevi was done.

Results: As regard to postremoval complications, recurrence of naevi occurred in group (1) only, dry eye was higher in argon laser ablation than surgical excision (15% vs. 5%), conjunctival inflammation was higher in excision than argon laser (20% vs. 10%), and scarring occurred in surgical excision group only. Unsatisfaction was higher in surgical excision than laser ablation. Also, there were statistically significant difference between both groups as regard to complications.

Conclusion: Argon laser ablation is a simple and efficient treatment of benign conjunctival naevi and may be used in chosen patients instead of a traditional surgical technique.

Keywords: Argon laser photocoagulation, Conjunctival naevi, Surgical excision

1. Introduction

A common benign eye tumor called a conjunctival naevus, can exhibit a wide range of clinical traits.¹ It has different locations and characters. It might appear on the cornea, caruncle, plica, fornix, tarsal region, or bulbar conjunctiva. Naevi in the conjunctiva may vary in color (tan, amelanotic, or brown). Instances may be cystic or noncystic and described with or without feeder or intrinsic vessels.²

Acquired superficial conjunctival naevi become clinically evident in the early periods of life and seldom develop into malignant melanomas but may develop in the presence of nodularity,

hyperpigmentation, or vascularized development. Excision or argon laser photocoagulation are treatment choices for superficial and deep conjunctival naevi.³

Naevus surgery has a further factor in tissue dragging and neovascularization. So, a big, pigmented naevi is not surgically removed. A different form of treatment for removing conjunctival naevi is an argon laser photoablation. Some claim that it is a risk-free, straightforward, and affordable operation. Argon laser ablation procedures are not requiring sutures, less painful, not causing cicatrization, and taking shorter time to recover.⁴

The purpose of this research was to compare between surgical excision and Argon laser

photoablation of conjunctival nevus concerning safety, efficacy and post removal complications.

2. Patients and methods

A randomized controlled trial was conducted in Ophthalmology Department, Al-Azhar University Hospitals, Egypt in the period from January 2022 to January 2023 included 40 patients presenting with benign pigmented conjunctival naevi classified by simple randomization into two groups:

Group (1): included 20 subjects and removal of conjunctival naevi by argon laser photocoagulation was done.

Group (2): included 20 subjects and surgical excision of conjunctival naevi was done.

2.1. Inclusion criteria

Patients (males and females) with benign pigmented naevi.

2.2. Exclusion criteria

Changes in size or color in the last 6 months.

2.3. Corneal involvement

Each patient had a complete ocular examination. The anterior segment of the eyes were examined using slit-lamp bio-microscopy. Using a slit lamp and +78 D Volk lens, the posterior portion and peripheral retina were evaluated (Volk). Clinical signs of conjunctival naevi, such as intrinsic vessels, colour, position, height, cystic alterations, and feeder vessels, were documented.

2.3.1. Techniques

After applying local anaesthetic using eye drops (Benoxinate hydrochloride 0.4%µ), laser ablations were performed with an argon green laser (532 nm) by ZEISS VISUALS 532 s Green Laser System. With a spot size of 100 µ and no overlap, the laser was focused on the nevus. The laser pulse lasted for 0.1 s and delivered 100–300 mW of energy. After a bursting sound and visual evidence of a reaction over the pigmented lesion, such as shrinking, darkening, elevation, and bubble formation, the laser treatment was completed. The nevus was removed with a cotton-tipped swab following photoablation (Fig. 1). The procedure for surgical excision started with the injection of 5 ml of a solution containing 2% bupivacaine and 0.75% mepivacaine with hyaluronidase into the retrobulbar space to provide local anaesthetic. After

administering the injection with a 1.25 inch 27 G needle connected to a 5 ml syringe, the conjunctival nevus is surgically removed with a 1–2 mm surgical margin (Fig. 2). After surgery, dexamethasone topical steroid, antibiotic eye drops (0.5% moxifloxacin hydrochloride ophthalmic solution), and artificial tears were given to all patients in both groups. This treatment lasted for two weeks. After that, the corticosteroid dosage was decreased by one drop every week while the artificial tears dosage was maintained at four times/day for 8 weeks.

2.3.2. Follow-up

Anterior segment photography and slit-lamp exams were used to show the occurrence and time of conjunctival injection, subconjunctival hemorrhage, scarring, and tissue dragging. The patient's satisfaction level was assessed 3 months after the operation. The answers were classified as 'satisfactory' or 'unsatisfactory'.

2.3.3. Ethical committee approval

Each participant in the study provided their informed written agreement, which was obtained after the research was approved by Al-Azhar University's ethics board.

2.4. Statistical analysis

Statistical Program for Social Sciences (SPSS) version 21 for Windows was used to code, process, and analyze the obtained data (SPSS Inc., Chicago, IL, USA). χ^2 analysis was used to compare the groups. Quantitative information like mean, SD, and range. Numbers and percentages were used to present qualitative data. For comparison between the two groups, a student *t*-test was utilized. It was deemed statistically significant at $P < 0.05$.

3. Results

The study included 46 eyes of 40 patients (22 males and 18 females). The mean of age in group 1 and 2 was 29.37 and 33.75, respectively. There was no significant difference between both methods regarding sex and age (Table 1).

As regard intensity of pigmentation, there were 80% of patients in group (1) compared with 90% in group (2) have faint naevi while 20% in group (1) compared with 10% in group (2) have dark naevi. Also, regarding location of naevi in group 1 and 2, there were (60% vs. 75%) naevi at nasal bulbar conjunctiva, (25% vs. 15%) naevi at the temporal bulbar conjunctiva, (10% vs. 5%) at the superior bulbar conjunctiva and (5% vs. 5%) at the inferior

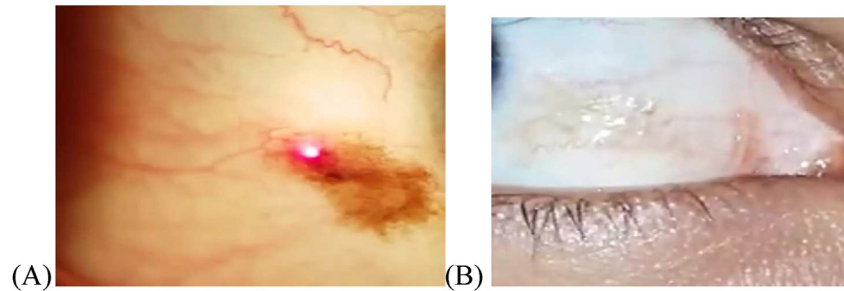


Fig. 1. Argon laser photocoagulation of conjunctival nevus. A; during ablation and B; after ablation.

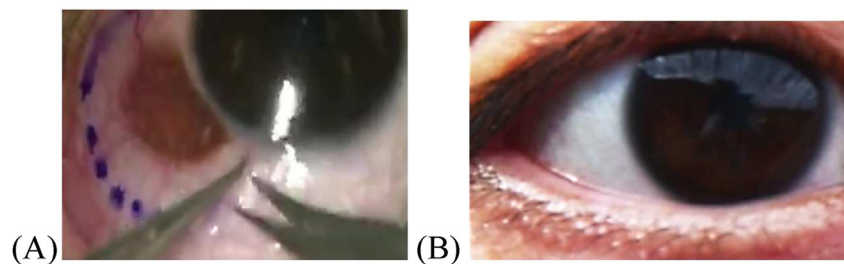


Fig. 2. Surgical excision of conjunctival nevus. A; before excision and B; after excision.

Table 1. Demographic data of studied patients.

	Group (1) (n = 20)	Group (2) (n = 20)	t/ χ^2 test	P value
Intensity of pigmentation			3.725	0.635
Faint No (%)	16 (80%)	18 (90%)		
Dark No (%)	4 (20%)	2 (10%)		
Location No (%)			1.383	0.351
Nasal bulbar	12 (60%)	15 (75%)		
Temporal bulbar	5 (25%)	3 (15%)		
Superior bulbar	2 (10%)	1 (5%)		
Inferior bulbar	1 (5%)	1 (5%)		
Size (mm) mean \pm SD				
Horizontal diameter	4.53 \pm 1.85	4.53 \pm 1.85	0.528	0.148
Vertical diameter	3.41 \pm 1.62	3.41 \pm 1.62	1.614	0.242
Size; horizontal and vertical diameter			5.261	0.152
<4 mm No (%)	16 (80%)	14 (70%)		
>4 mm and <8 mm No (%)	3 (15%)	5 (25%)		
>8 mm No (%)	1 (5%)	1 (5%)		

P value more than 0.05, non significant.

χ^2 : Chi-square test.

bulbar conjunctiva. Horizontal diameters mean of naevi in group 1 and 2 were the same (4.53 mm), also, vertical diameters were the same (3.41 mm). There was no significant difference between both methods regarding intensity of pigmentation, location, and size of naevi (Table 2).

In group (1), one session was sufficient to eliminate the nevus completely in 70.8% of eyes, two sessions in 20.8%, and three sessions in 8.4% of eyes. Laser power average used was 318.50 mW. The cumulative number of laser spots to remove nevus was 105.63 for cases in which the horizontal and

vertical diameters were less than 4 mm, 249.82 for naevi greater than or equal to 4 mm and less than 8 mm and 438.44 for naevi greater than or equal to 8 (Table 3).

As regard to post removal complications, recurrence of naevi occurred in group (1) only, dry eye was higher in group (1) than group (2) (15% vs. 5%), conjunctival inflammation was higher in group (2) than group (1) (20% vs. 10%) and scarring occurred in excision group only. Also, there was significant difference between both methods regarding complications ($P < 0.05$) (Table 4, Fig. 3).

Table 2. Clinical characters of Conjunctival Naevus.

	Group (1) (No of eyes = 24)
Number of sessions No (%)	
1 treatment No (%)	17 (70.8%)
2 treatments No (%)	5 (20.8%)
3 treatments No (%)	2 (8.4%)
Power (mW) mean + SD	318.50 ± 112.23
Spot size (µm) mean + SD	200.33 ± 104.75
Duration (sec) mean + SD	0.12 ± 0.07
Total number of spots according to size 1; Horizontal and vertical diameter	
<4 mm No (%)	105.63 ± 33.42
≥4 mm and <8 mm No (%)	249.82 ± 51.71
≥8 mm No (%)	438.44 ± 41.37

may done for naevi of any size. In contrast, surgery also eliminates natural conjunctival tissue, that can lead to neovascularization and tissue dragging Shin and colleagues.³

Our study conducted to compare between the both methods of removal (surgical excision and argon laser) of conjunctival nevus according to the safety, efficacy and complications. It included 46 eyes of 40 patients (22 males and 18 females).

The study in our hand showed that 80% of patients in group (1) compared with 90% in group (2) have faint naevi while 20% in group (1) compared with 10% in group (2) have dark naevi. Also, regarding location of naevi in group 1 and 2, there were (60% vs. 75%) naevi

Table 3. Parameters of argon laser photoablation.

	Group (1) (n = 20)	Group (2) (n = 20)	χ ² test	P value
Recurrence	1 (5%)	0 (0%)	11.284	<0.001 ^a
Dry eye	3 (15%)	1 (5%)	6.241	<0.001 ^a
Conjunctival inflammation	2 (10%)	4 (20%)	4.193	<0.001 ^a
Scarring	0 (0%)	3 (15%)	9.527	<0.001 ^a
Unsatisfaction	1 (5%)	2 (10%)	21.372	<0.001 ^a

χ²: Chi-square test.

^a P value less than 0.05, significant.

Table 4. Comparison between both groups as regard to post removal complications.

	Group (1) (n = 20)	Group (2) (n = 20)	t/χ ² test	P value
Sex				
Male No (%)	9 (45%)	13 (65%)	1.559	0.418
Female No (%)	11 (55%)	7 (35%)		
Age (year)				
Mean ± SD	29.37 ± 10.52	33.75 ± 13.09	1.645	0.253
Range	11–72	7–64		
Number of eyes				
Both No (%)	24 4 (20%)	22 2 (10%)	2.185	0.174
Right eyes No (%)	10 (50%)	9 (45%)		
Left eyes No (%)	6 (30%)	9 (45%)		

P value more than 0.05, non significant.

χ²: Chi-square test.

4. Discussion

Conjunctival nevus is the most common melanocytic conjunctival tumor. It is not necessary to eliminate a conjunctival nevus. However, it can lead to a cosmetic issue and an unnecessary psychological problem particularly if the location makes it huge and visible. Surgical excision or argon laser photoablation were used for removing a conjunctival nevus Levecq and colleagues.⁵

The benefits of argon laser photoablation in surface conjunctival naevi removal are: (1) the technique is simple to done in outpatient clinic, (2) it needs a short time and sometimes takes less than five minutes, (3) nevus is removed at the end of operation, and (4) it

at nasal bulbar conjunctiva, (25% vs. 15%) naevi at the temporal bulbar conjunctiva, (10% vs. 5%) at the superior bulbar conjunctiva and (5% vs. 5%) at the inferior bulbar conjunctiva. Horizontal diameters mean of naevi in group 1 and 2 were the same (4.53 mm), also, vertical diameters were the same (3.41 mm). In contrast to our study, Sarhan and colleagues study found that conjunctival naevi appeared most frequently on the bulbar conjunctiva (75% of cases), then limbus (15% of cases), the fornix, and the caruncle (5 percent of cases for each site). Four of them had cystic spaces with them. Five were amelanotic, 15 were melanocytic naevi Sarhan and colleagues,⁶ while the nevus was brown in 65% and non pigmented in 16% in the study conducted by Shields and colleagues.²

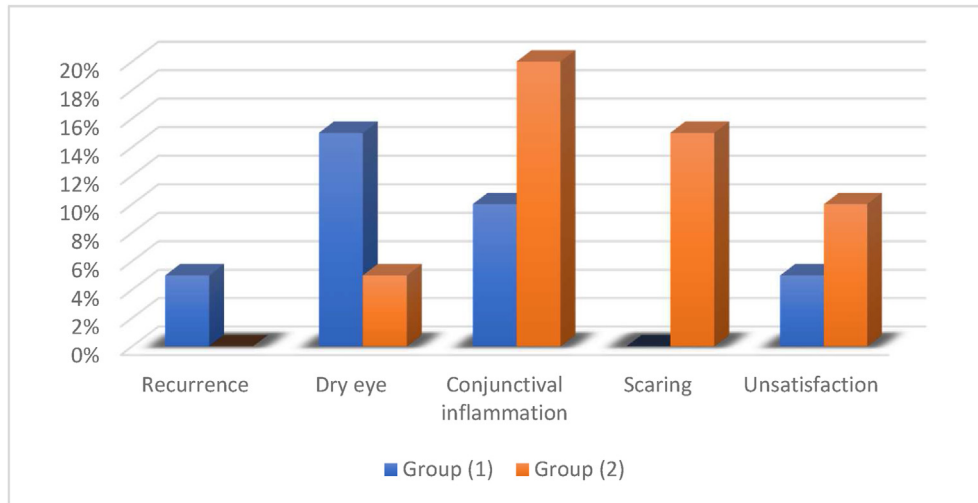


Fig. 3. Diagram for comparison between both groups as regard to postremoval complications.

Another research performed by Alsharif and his colleagues showed that naevi were found in nine cases at the temporal bulbar conjunctiva, three in the nasal bulbar conjunctiva, and two in the inferior bulbar conjunctiva. Horizontal and vertical diameters average of naevi were 5 ± 2 mm and 4 ± 2.7 mm Alsharif and colleagues.⁷

As regard to postremoval complications, our study revealed that surgical excision group has higher conjunctival inflammation and scarring while argon laser photoablation group has higher dry eye and recurrence. A 36-years-old male glass worker who underwent laser ablation only experienced one recurrence. His right eye's temporal bulbar conjunctiva was found to have a $7 \times 3 \times 8$ mm dark, brownish, superficial conjunctival nevus. Three sessions of ablation were used to get rid of this nevus. A superficial nevus measuring $2 \times 3 \times 2$ mm was discovered in the same location 18 months later. According to histopathology, it was a benign conjunctival nevus. One cause of recurrence is increased UV radiation exposure.

In comparison with our research, no scarring, tissue dragging or new development of vessels were found after surgery by Shin and his colleagues. It was only one nevus recurred. The treatment does not lead to major complications, including corneal injury, inflammation or irreversible injection Shin and colleagues.³

The photoablation by argon laser of conjunctival nevus had some drawbacks, which were that therapy does not allow histopathology and malignancy misdiagnosis. The technique has not been evaluated in terms of effectiveness on malignant melanoma and primary melanoma.

4.1. Conclusion

Argon laser photocoagulation is a simple and efficient treatment for benign conjunctival naevi and may be used in chosen patients instead of a traditional excisional technique. Laser photoablation should be made for those patients who refuse surgical options and without confirmation or suspicion of malignancy.

Conflict of interest

There is no conflict of interest, no financial issues to be declared.

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