

## ALLOPATHIC TREATMENT OPTIONS FOR INFRAORBITAL DARK CIRCLES

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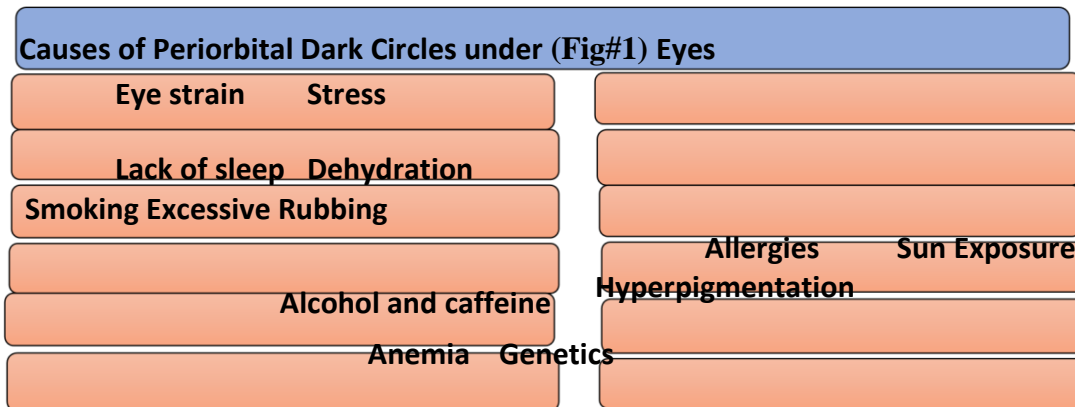
**Abstract:** Dark circles are a sign of darkness under the eyes. Due to progress in personal satisfaction, dark circles are considered a significant cosmetic concern. That's why it's so difficult to classify the Dark circles as there are so many reasons. Dark circles allude to the apparent darkness of the infra-orbital regions. Based on the experience of the writer and clinical writing this review audits the potential factors and therapy for dark circles. This condition (dark circle) is moderately normal, influencing people of any age group and sex. Treatment of infraorbital dark circles depends upon the underlying cause. Some treatments available for dark circles include topical treatment, hyaluronic acid filler, laser therapy, chemical peel, and blepharoplasty. These allopathic treatments permanently remove the dark circles under the eyes. By the utilization of different technologies, treatment can be separately customized.

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**Keywords:** Tear troughs, treatment, laser therapy, hyper pigmentation, hyaluronic acid fillers

### Introduction

The appearance of circular, uniform stain macule under the periorbital area is known as an infraorbital Dark circle (**Fig#2**). Dark circles are caused by blood leakage in the capillaries under the eyes. Because the skin of the eye is very soft and thin, leakage blood from the capillaries forms a clot under the eye and becomes prominent. But our body has a protective mechanism to get rid of this fragment. Occasionally this condition is very difficult to treat because many factors make this condition worse. With the increasing age, this condition becomes aggravated. Due to dark circles patients looks so sad and tired which will affect their personality. Many possible factors can cause infraorbital dark circles, including infections, allergies, hyper pigmentation, inflammation, lifestyle elements, shadowing due to tear troughs, shadowing due to infraorbital laxity and wrinkles, congestion of the eyelid, excessive sunlight exposure, poor diet, lack of sleep, mental stress, excessive rubbing, due to deficiency of blood, dermal melanin deposition



**Figure#1 Causes of dark circles**

Any assessment of lower eyelid DC should start including suitable comprehension of the fundamental periorbital life structures. The laryngeal canal is an anatomical depression that is encountered in people of all age groups. Dark circles under eyes are of many types and classification mainly depends upon the cause of dark circles.

**Figure#2: Appearance of Dark Circles under Eye**



**Treatment options for infraorbital Dark Circles.**

Despite the incredible number of accessible drugs and treatments to treat infraorbital dark circles, no proof-based investigations to help their utilization. For the treatment to be effective one should know the actual cause of the dark circle. Treatment includes topical treatment, surgical treatment, and laser therapy.

**Topical Treatment for infraorbital Dark Circles.**

Now a day many topical agents are used for the treatment of dark circles. These topical agents are applied locally to the area being treated. Topical agents involve bleaching agents (hydroquinone & tretinoin), depigmenting agents (albutin), a concentrate of the bearberry plant. Other agents include topical corticosteroids, antioxidants (Vit-C & Vit-E, kojic acid, and azelaic acid).[4][5]Long-term use of these agents makes the treatment effective and will gradually remove the dark circles. But some side effects including irritation and pruritis are associated with the long-term use of these topical agents for people having sensitive skin. A new system is known as a novel

hyaluronic acid microneedle system increases the penetration rate of these agents and prevents sensitive skin people from these side effects.[1].[2]

### **Treatment of infraorbital dark circles with the help of Hyaluronic acid filler.**

At present, one can use this filler method to enhance the quality of life. Hyaluronic acid is naturally present in our bodies. The concentration of HA is high in our joints, eye, and skin. Hyaluronic acid has the ability that it attracts water and make our skin hydrated. But with the age, the concentration of hyaluronic acid decreases, and skin becomes thin so a deficiency of hyaluronic acid leads to dark circles, thin skin, and wrinkles.[10] This hyaluronic acid filler is the most convenient treatment for removing dark circles which helps in delicate tissue enhancement. This hyaluronic acid helps in correcting the dark circles, tear troughs, delicate skin, and wrinkles. Shadowing due to tear troughs is the most important factor of dark circles. But these tear troughs along with fat herniation are also an ordinary type of dark circles. By using hyaluronic acid fillers we can cure the dark circle's problem.

[7][8][9]

### **Filler technique for tear troughs**

This filler technique is used to fill the tear troughs. But in this technique, a linear thread method is used and by using this method filler injection is injected to fill the tear troughs. Three injections are injected, 0.07ml per injection.[13] A variety of HA fillers injections are available to fill tear troughs which include Belotero Balane injection, Juvederm Ultra injection, Juvederm Ultra Plus injection, Restylane injection, Restylane Silk injection, Restylane Lyft injection, and Voluma injection. but some side effects are associated with these injections include swelling, bleeding, redness, lumps, and bumps. But these side effects are gone with time.[17]

### **Filler techniques for infraorbital and wrinkles thin skin, and laxity**

HA filler technique is also used for treating infraorbital area, wrinkles, and thin skin. In this technique, HA filler is not injected directly into eye bags by physicians because it can cause swelling or eyes looks swollen. So this HA filler technique despite treating tear troughs is also used as a rejuvenation purpose of eye bag areas. As hyaluronic acid provides hydration so these HA fillers not only provide hydration to under-eye skin but also improve collagen production and collectively all these improve wrinkles, thin skin, and dyschromia of the eye bag area. Products that are used for treating these problems include Belotero soft, Restylane vital, and Juvederm velbella.[21][22]

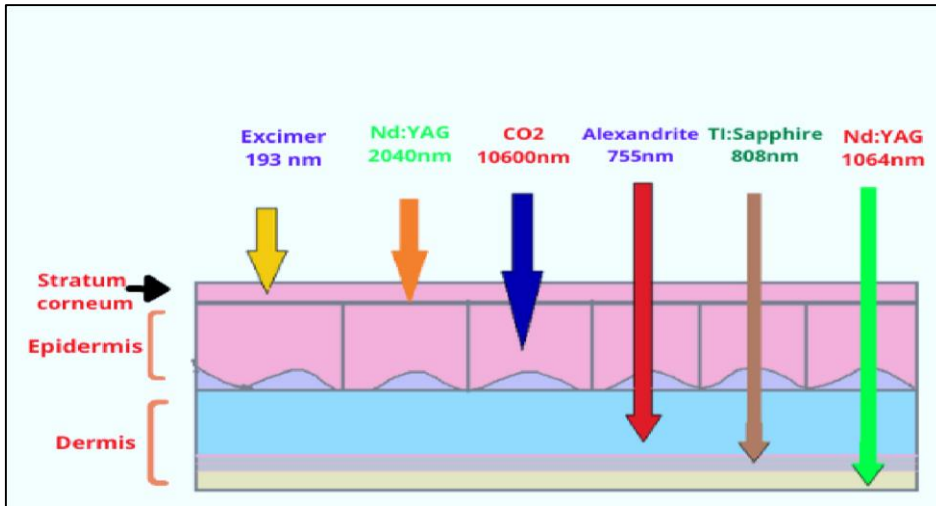
### **Chemical peeling**

The most well-known and viable method for the treatment of dark circles under the eye is the chemical peeling method. Most chemical agents that are used in this method are alpha hydroxyacid, trichloroacetic acid, and glycolic acid that help in reducing hyperpigmentation under the eyes. But appropriate utilization of these chemicals is required to stay away from any complexities.[18]

### **CO2 Laser**

Carbon dioxide laser is one of the most commonly used methods for the treatment of dark circles under the eyes. This method first appeared in 1964. Due to the rapid assimilation of water, this CO2 laser method was considered an ideal method for the treatment of dark circles. There are many lasers used in photo surgery and the wavelength of the lasers are different as indicated by their expected use but the important one is the CO2 laser.[19] The wavelength of the laser that is being used in this treatment lies in the mid-infrared region i.e. 10,600nm and this wavelength is rapidly absorbed in the water. As our skin contains a high amount (percentage) of water so the

energy of the laser is well assimilated in water and making this laser method an ideal treatment for dark circles. Carbon dioxide gas acts as a medium in this laser treatment and releases energy at a wavelength of 10,600 nm.[20]



**Figure# 3** Systematic diagram of Penetration depth of different Lasers.

**Laser technique for removing infraorbital dark circle**

Laser treatment is the most effective treatment for removing dark circles. The overall problem of dark circles, hyperpigmentation, wrinkles, and fine lines can be treated by using this technique. The most physician uses this technique of removing dark circles. There are different types of laser available for ministrations of dark circles which include a Q switched laser, fractional laser, radiofrequency devices, and pulse-dye lasers.[26][27] There are multiple Q switched lasers available such as Q-switched ruby laser, Q-switched ND: YAG laser, Q-switched alexandrite laser. Pulse-Dye laser such as Long-Pulsed Nd: YAG laser is also effective for dark circles.

**Conclusion**

There are so many causes of infraorbital dark circles and it is difficult to classify dark circles based on the cause. For treatment to be effective one should know the exact cause of dark circles before starting the treatment. As so many treatments available for the treatment of infraorbital dark circles. Topical agents reduce the dark circle but long-term use of these agent cause side effects. Hyaluronic acid fillers available are a good option for treating dark circles, filling tear troughs, also remove wrinkles. Chemical peeling agents also help in reducing hyper pigmentation. Recent approaches towards laser therapy prove a very effective result.

**Conflict of interest**

None

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