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Case Presentation

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# Embolic Retinal Following Triamcinolone Injection in the Forehead for Treating Hyperplastic Scarring: A Case Report

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## Abstract

**Background**: A potentially blind-threatening side effect of facial therapeutic injections is embolic retinal. Finding out the causes of this adverse effect and ways to prevent it was the aim of this report.

**Case summary**: A 55-year-old man with hyperplastic scarring on his Left frontal area, was scheduled for a solution of triamcinolone (40 mg/ml) and 4 ml of lidocaine (2%) was injected by a dermatologist. However, during the third injection in July 2017, the patient suddenly developed a loss of vision in his left eye. Three months later, the patient's vision returned to normal and there was a slight atrophic scar on his forehead. Overall, the possible causes of embolic retinal were explained as follows: first, the face veins do not have venous valves and have diffuse anastomoses, which makes it possible for medication boluses to accidentally induce embolism by entering the retinal vascular system. Second, when medications such as oils or solutions are injected into the craniofacial region, their diameter is greater than the calibre of the intraretinal vessels. Third, the patient's agony during the drug injection causes the cephalon facial vessels to violently spasm, which causes an embolism.

**Conclusion**: Embolic retinal is a potentially blinding side effect of facial therapeutic injections. To prevent such difficulties, steps must be made such as closely controlling the quantity and rate of drug injection, carefully aspirating before injecting in the facial region, or optimizing the mode of administration and drug combination.

**Keywords**: Intralesional triamcinolone injection; Embolic retinal; Hyperplastic scarring

## Introduction

After skin dermal injury, excessively proliferating connective tissue results in Hyperplastic Scarring (HS). Injections of intralesional corticosteroids, of which triamcinolone is the most common, are currently the most widely utilized therapies for HS. The majority of earlier studies advised using injectable Triamcinolone

Acetonide (TAC) at concentrations ranging from 10 to 40 mg/mL with lidocaine to lessen pain during injection. Typically, the injection is administered once or twice a month to produce the desired result **[1,2].** Side effects from intralesional triamcinolone injections may include capillary dilatation, hyperpigmentation, skin atrophy, or necrosis, among others **[3].** In this case study, we describe an extremely rare instance of embolic retinal after triamcinolone was injected into the forehead to treat HS. We also discuss the reasons behind this unfavourable impact and how to avoid it.

## Case Presentation

A 55-year-old man with hyperplastic scars on his Left frontal area, scheduled for a solution of triamcinolone (40 mg/ml) and 4 ml of lidocaine (2%) was injected by a dermatologist. However, following the third triamcinolone injection in July 2017, the patient abruptly lost vision in his left eye and pressed the brow's arch with his hand. The patient was immediately given a blood pressure check, which revealed a reading of 240/160 mm Hg. A large petechial blackness started to develop on the patient's left side of the forehead an hour after the injection along the vascularized division of the forehead skin **(Figure 1).** The patient's blood pressure dropped to 98/140 mmHg after 1.5 hours. The patient was given the proper antihypertensive medication to keep their blood pressure in the 160/120 mmHg range while also receiving salvia tablets to activate blood circulation and remove blood stasis. Besides, the patient was instructed to visit the ophthalmology department. The patient's vision had not improved after five days, he had not seen an ophthalmologist, and he still had some petechial blackness on his forehead **(Figure 2).** The patient's vision returned to normal three months later, and there was a small atrophic scar on his forehead.


**Figure 1**: One hour after an injection of tretinoin.

**Figure 2**: Five days after an injection tretinoin.

## Discussion

Although therapeutic Intralesional triamcinolone injections in the craniofacial region generally have reliable safety profiles with only minor adverse effects. There have been reports of devastating adverse effects such as retinal and ocular artery obstruction in rare instances. In this report, a 55-year-old male patient experienced an

abrupt retinal artery occlusion following a triamcinolone acetonide injection into his forehead. The mechanisms of embolic retinal were explained as follows: first, it has been reported that the cephalon face injection site itself poses a risk area due to scattered anastomoses and a lack of venous valves in the facial veins, which could result in an embolism if medication boluses accidentally enter the retinal vascular system **[4].** Second, when injections of medicines such as oils or suspensions into the craniofacial region, certain particles that are bigger in diameter than the calibre of the intraretinal arteries may also cause an embolism **[5].** Third, the pain of the injection may trigger severe facial vessel spasms in the patient, which might result in vessel thinning and smaller drug emboli entering the retinal vessels, which can result in embolization of the central retinal artery. However, only a small percentage of individuals with severe spasms experience retinal embolization; instead, the majority experience mild spasms that cause a temporary dark haze or visual loss.

## Conclusion

To identify new ways to improve efficacy or lessen adverse effects, many researchers are studying triamcinolone injection for the treatment of hyperplastic scarring. The following are two typical approaches. Combination medications make up one of the methods. According to Khan et al. **[6],** the intralesional 5-FU and TAC combination is a potential therapeutic strategy for treating hypertrophic scars. TAC dramatically reduced TGF-1 expression and cell growth, whereas 5-FU mostly promoted apoptosis. The recurrence rate of hyperplastic scars was significantly decreased as a result of the two treatments combined. Combination therapy exhibits a synergistic benefit while lowering the dosage of the drugs, hence lowering the likelihood of side effects. The other strategy is to improve drug delivery. Because of the high degree of injection required by the injectable medication method, it is challenging to keep the drug concentration consistent while injecting. Further, patients frequently experience pain and are unable to endure the treatment due to the deeper depth of drug administration required by injection. The aforementioned two flaws can be avoided with microneedle transdermal medication delivery. To illustrate, Qin Z et al**. [7]** preparation of Triamcinolone Acetonide (TAA) into Lipid Nanoparticles (LNPs) for transdermal administration can improve transdermal permeation performance and safety of this drug, as well as reduce adverse reactions and side effects brought on by an overdose of the clinical medication. This significantly enhances the therapeutic effect of the drug on HS. Future research should concentrate on potential intralesional injection optimization, multiple treatment regimens with varied dosages, and varied elimination treatment intervals.

In conclusion, embolic retinal is a potentially blinding side effect of facial therapeutic injections. Before injecting a steroid suspension into the facial area, extreme caution should be exercised and careful aspiration must be carried out. It is vital to take into account the recommendations before injection, such as active conversation with the patient to reduce patient tension and panic, in addition to having a thorough awareness of the underlying anatomy and facial danger zones. If you experience any negative reactions, cease the injections right away, actively widen your blood vessels, lower your eye pressure, and use other symptomatic therapies.

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