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Case report

# Stevens–Johnson syndrome following cataract surgery

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ABSTRACT

A case of Stevens–Johnson syndrome in a healthy 58-year-old woman who underwent cataract surgery under topical anesthesia is reported. General skin erosions developed 2 hours after surgery. The patient's family doctor diagnosed that she was allergic to seafood. One month later, she underwent phacoemulsification surgery in the other eye. After surgery, she developed Stevens–Johnson syndrome with general skin lesions, erythema nodosa, genital mucosa erosion, oral ulcers, gastritis, and conjunctiva edema. The symptoms subsided 2 weeks later after immunotherapy. Although nonpreserved anesthesia (2% lidocaine) has seldom been reported to cause allergic reactions via the intravenous or the intramuscular route, it is possible that an intracameral injection of 0.2% lidocaine during cataract surgery can induce Stevens–Johnson syndrome. Careful evaluation of the patient's history and proper treatment were recommended to prevent additional complications.



## 1. Introduction

Intracameral lidocaine, used as a local anesthetic for phacoemulsification, is now a standard procedure and widely used for cataract surgery.[1,2] Lidocaine hydrochloride, an amide-type local anesthetic, is commonly used for facial plastic procedures.[3] Although lidocaine is frequently used during these procedures, adverse drug reactions could still happen, such as hypotension, bradycardia, urticaria, tissue necrosis, and angioedema, even administered in a very small dose (Table 1).[4] Moreover, most of the reported reactions are caused by hypersensitivity. In the case of anaphylactic reaction to lidocaine, early treatment with epinephrine, oxygenation, and intravenous fluid resuscitation resulted in relief of the symptoms.[5]

Stevens–Johnson syndrome is an acute, self-limiting disorder which affects the skin and two or more mucosal membranes.[6] With the exception of certain idiopathic cases, Stevens–Johnson syndrome is usually triggered by medications or associated with infections.[6] In this report, we present one patient who developed Stevens–Johnson syndrome which was induced by intracameral administration of lidocaine during phacoemulsification.

## 2. Case report

A 58-year-old woman underwent phacoemulsification under topical anesthesia. Perioperative medications included topical eye medications: 0.5% proparacaine hydrochloride (Alcaine; S.A. Alcon-Couvreur N.V., Puurs, Belgium), 1% tropicamide (Mydiracyl 5%; Alcon-Couvreur), 10% phenylephrine hydrochloride (Wu-Fu, I-Lan County, Taiwan), and levofloxacin 0.5% (Cravit; Santen, Pharmaceutical Co., Ltd., Osaka, Japan). The patient received an intracameral injection of 0.04 mg (0.2 mL, 2% xylocaine, diluted with 0.8 mL balanced salt solution [BSS]) preservative-free lidocaine hydrochloride (2% xylocaine; AstraZeneca Taiwan, Taipei, Taiwan). Additionally, fluorometholone 1% (1 mg/mL) (FML; Sinphar Pharmaceutical Co., Dongshan Township, I-Lan County, Taiwan) and levofloxacin were both applied BID for 2 weeks. The patient developed a generalized skin rash with itching 2 hours after cataract surgery. An antihistamine (diphenhydramine (Vena, Panbiotic labortories, Kaohsiung City, Taiwan) [1 ampoule]) and a steroid (dexamethasone [8 mg], Standard Chem. & Pharm. Co., Ltd., Tainan City, Taiwan, intravenous [IV] push) were prescribed, and the symptoms resolved 5 days later. The oral mucosa, conjunctiva, and

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**Table 1**
Adverse drug reactions caused by lidocaine hydrochloride.

| System | Common | Infrequent |
|---|---|---|
| CNS | Headache, dizziness, drowsiness, confusion | Seizures, coma |
| Cardiovascular | Hypotension, bradycardia | Arrhythmias, cardiac arrest |
| Respiratory | Dyspnea | Bronchospasm, respiratory depression |
| Gastrointestinal | Nausea, vomiting | Metallic taste |
| Eyes | Visual disturbances, local burning, conjunctival hyperemia, diplopia | Corneal epithelial changes/ ulceration |
| Skin | Itching, irritation, rash, paraesthesia | Urticaria, edema, tissue necrosis, angioedema |

**Table 2**
Common etiologic drugs in Stevens–Johnson syndrome.

| Drug groups | Common drugs | |
|---|---|---|
| 1. Anticonvulsants | Phenytoin | Carbamazepine |
| | Phenobarbital | Ciazepam |
| 2. Antibiotics | Cephalosporins | Amoxicillin |
| | Ampicillin | Vancomycin |
| 3. Nonsteroidal antiinflammatory drugs | Diclofenac | Ibuprofen |
| | Ketoprofen | Sulindac |
| 4. Sulfonamides | Cotrimoxazole | Trimethoprim-sulfamethoxazole |
| | Sulfadiazine | Sulfadoxine |
| 5. Miscellaneous | Allopurinol | Metronidazole |
| | Quinine | Fluconazole |
| | Chloroquinine | |

genital mucosa were all intact. Vision in the right eye was 20/20 with minimal signs of inflammation.

One month later, the patient underwent surgery in the other eye with the same procedures and medications. Immediately after the surgery, she developed a diffuse, erythematous, pruritic full-body rash that involved the palms of her hands and the soles of her feet. She also had fever and chest tightness. The patient's eyelids were edematous and the conjunctiva were chemotic. Antihistamine (diphenhydramine HCl 30 mg/L ampoule) and steroid injections (dexamethasone [8 mg], IV push) had only a minimal effect. Two days later, the skin lesion progressed to erythema nodosa along with other symptoms, such as genital mucosa erosion, oral ulcers, and gastritis. As we suspected an adverse drug reaction related to the patient's cataract surgery, she was referred to an immunologist (Dr C.-W. Lin). Immunotherapy was arranged immediately. Venous blood (1 mL) was drawn and fully mixed with 1 mL of 2% lidocaine, which was intramuscularly injected slowly back into the patient. Ascorbic acid (200 mg/tab, TID) and prednisolone (5 mg/tab, BID) were prescribed. The itching and burning sensation subsided 2 days after the first injection. The immunotherapy was performed twice a week and continued for 3 weeks, until the skin lesions had resolved. Vision in both eyes was 20/20, and the patient's ocular examinations were uneventful during this period.

## 3. Discussion

To the best of our knowledge, this is the first published report of Stevens–Johnson syndrome after phacoemulsification. To determine the causative agent, we reviewed the patient's medical history throughout the event. The topical eye medications, which included 0.5% proparacaine hydrochloride, 1% tropicamide, and 10% phenylephrine hydrochloride had been used before surgery for the posterior chamber intraocular lens (PC-IOL) power calculation. Levofloxacin and fluorometholone 0.1% had been prescribed and administered after the first operation. As no adverse effect had occurred during these two periods, we could exclude the above-mentioned medications. Intracamerally injected lidocaine during the surgery was the only drug which could have induced this adverse reaction.

Intracameral injection of preservative-free lidocaine is widely used for local anesthesia and discomfort relief in cataract surgery with minimal inflammation and endothelial cell loss.[1,4,7] The medication normally provides persistent, stable, and satisfactory pupil dilation for a safe phacoemulsification and intraocular lens implantation in most patients.[1,2] However, it may lead to rare but serious adverse drug reactions, such as Stevens–Johnson syndrome. In this report, the patient suffered from a skin lesion which progressed to erythema nodosa along with genital mucosa erosion, oral ulcers, and gastritis.[8]

Stevens–Johnson syndrome is predominantly known as a drug-induced disease which causes severe adverse cutaneous reactions which predominantly involve the skin and mucous membranes, and is considered a medical emergency as it is potentially fatal.[9–11] The reactions, which are characterized by extensive necrosis and detachment of the epidermis, are followed by erosions of the skin and mucous membranes. The most common causative medications are sulfonamides, nonsteroidal antiinflammatory drugs, anticonvulsants, and allopurinol (Table 2).[10–12,14] The mainstays of therapy are specialized supportive care, discontinuation of the use of the suspected inducing drug, and use of intravenous steroid therapy as the main treatment regimen.[10–13] Moreover, in a small series of patients, immunomodulating agents such as high-dose intravenous immunoglobulin therapy is effective.[12]

Supportive management still remains the mainstay of the treatment for Stevens–Johnson syndrome.[8] This involves a skilled clinical assessment, an early identification of the etiology, and an immediate withdrawal of the causative drug. Close monitoring of fluids and electrolytes is also important for preventing additional complications.[9–12] In this case, we also used immunotherapy immediately. Venous blood (1 mL) from the patient was fully mixed with 1 mL of 2% lidocaine, which was slowly administered by intramuscular injection. This method was performed twice a week and continued for 3 weeks, and the cutaneous lesions and visual acuity showed obvious improvement after treatment. In this case report, we provided this safe and easy method to treat this severe adverse drug reaction.

In conclusion, an intracameral injection of lidocaine, widely used in phacoemulsification, can cause adverse drug reactions. Definitive treatment includes prompt identification and discontinuation of the possible causative medication, as well as appropriate supportive measures. Proper immunotherapy can prevent further steroid complications and treat the symptoms efficiently. Ophthalmologists who perform cataract surgery should be aware of this adverse drug reaction and be familiar with its treatment.

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