

# Dermatologic surgery emergencies



## Complications caused by systemic reactions, high-energy systems, and trauma

Kira Minkis, MD, PhD,<sup>a</sup> Adam Whittington, MD,<sup>b</sup> and Murad Alam, MD, MSCI<sup>b,c,d</sup>  
*New York, New York, and Chicago, Illinois*

### Learning objectives

After completing this learning activity, participants should be able to describe management options of each specific type of emergency that can result from dermatologic surgery, lasers, and cosmetic surgery.

### Disclosures

#### Editors

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While the overall incidence of emergencies in dermatologic surgery is low, emergent situations can occasionally pose a risk to patients undergoing such procedures. The clinical importance of several types of emergencies related to systemic reactions, high energy systems, and trauma are reviewed, and relevant epidemiology, clinical manifestations, diagnosis, work-up, management, and prevention are discussed. Early detection of surgical emergencies can mitigate any associated adverse outcomes, thereby allowing the outstanding record of safety of dermatologic surgery to continue. (J Am Acad Dermatol 2016;75:265-84.)

**Key words:** anaphylaxis; arrhythmia; complication; dermatologic emergency; fire; hematoma; laser injury; lidocaine toxicity; trauma.

Despite the high level of safety and low adverse event rates associated with office-based dermatologic surgery, emergencies can arise, and it is helpful for dermatologists to be able to identify the onset of these. Prompt recognition and appropriate management can minimize detrimental patient outcomes and ensure that dermatologic surgery maintains its privileged position as an unusually safe surgical specialty.

Many of the adverse events and emergencies considered in this review are uncommon or rare.

### Abbreviations used:

ACLS:	advanced cardiovascular life support
BLS:	basic life support
CPR:	cardiopulmonary resuscitation
EMI:	electromagnetic interference
EMS:	emergency medical services
RBH:	retrobulbar hematoma or hemorrhage

Nonetheless, we include these for completeness. In addition, many of these uncommon problems are by

From the Department of Dermatology,<sup>a</sup> Weill Cornell Medical College, New York, and the Departments of Dermatology,<sup>b</sup> Otolaryngology,<sup>c</sup> and Surgery,<sup>d</sup> Feinberg School of Medicine, Northwestern University, Chicago.

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Correspondence to: Murad Alam, MD, MSCI, Department of Dermatology, Feinberg School of Medicine, Arkes Pavilion,

676 N Saint Clair, Ste 1600, Chicago, IL 60611-2941. E-mail: [m-alam@northwestern.edu](mailto:m-alam@northwestern.edu).

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nature unpredictable and idiosyncratic, often associated with few if any steps that a dermatologist can reasonably preemptively implement to avoid their occurrence. Finally, while we generally include a detailed methodology for addressing and managing each adverse event, the portion of such management that is performed by the dermatologist is limited. In many and likely most situations, the dermatologist's role is merely to identify that something is wrong, and then to make a referral to another specialist. A simplified description of what may be done by nondermatologists is included to help the dermatologist refer to the correct service and communicate with the doctor receiving the referral, and not because the dermatologist is responsible for further management.

The first part of this review addressed complications that may occur during dermatologic surgery caused by occlusion and blood pressure. This second article in the series will consider problems that are more likely to occur because of systemic reactions, high-energy systems, or trauma.

## ANAPHYLAXIS

### Key points

- **Anaphylaxis is the most dramatic and potentially catastrophic manifestation of immediate hypersensitivity**
- **Severity of reactions can vary widely from mild pruritus and urticaria to shock and death**
- **The key to anaphylaxis management is prompt recognition**
- **Intramuscular epinephrine is the first-line treatment of patients with suspected anaphylaxis**

### General/incidence

Anaphylaxis is a potentially catastrophic manifestation of immediate hypersensitivity with the release of numerous proinflammatory, vasoactive substances leading to vasodilation with increased vascular permeability, edema, bronchospasm, and bronchoconstriction.

Data regarding the incidence and prevalence of anaphylaxis are limited, with no available incidence data for dermatologic surgery. Apart from previous exposure, no known epidemiologic characteristics exist that can reliably identify those at risk for anaphylactic sensitivity. In the hospital setting, medications (especially penicillins and anesthetic agents during the perioperative period) and radiographic contrast agents are the most common causes of anaphylaxis.<sup>1,2</sup> Medications are a relatively more common cause of anaphylaxis in adults compared to

children (~10% vs ~1%), unlike foodstuffs, which are more associated with childhood anaphylaxis (~5% vs ~30%). The majority of both adult and child anaphylaxis cases are caused by insect venom (80% vs 60%).<sup>3</sup> In many cases of anaphylaxis, no cause can be determined. Overall, the lifetime risk of anaphylaxis in the United States is estimated to be  $\geq 1.6\%$ , with anaphylaxis accounting for >100 deaths annually.<sup>4</sup>

Although the specific incidence of anaphylaxis in dermatologic surgery is not known, it is conceivable that anaphylaxis can occur because of preoperative administration of a penicillin or cephalosporin for endocarditis or wound prophylaxis, local injection of an ester anesthetic or lidocaine with methylparaben, or less likely events, such as bee stings or ingestion of particular foods.<sup>5,6</sup> Muscle relaxants and latex are the most common causes of anaphylaxis during surgical procedures. Of particular concern during dermatologic surgery is latex because of the prevalent use of products containing latex (eg, gloves and instruments), which may be the causative basis for the increasing incidence of latex anaphylaxis.<sup>7</sup> Anaphylaxis has been described in several cases as being caused by the topical application of antibiotics, such as bacitracin, or chlorhexidine.<sup>8-11</sup> Reported cases typically involved patients with stasis dermatitis or ulceration, which may have rendered them susceptible to rapid systemic absorption of the topical agent. Administrations of pain-reducing medications (eg, nonsteroidal antiinflammatory drugs and narcotics, such as morphine and meperidine) have also been associated with anaphylaxis.<sup>7,12</sup> Another rare cause of anaphylaxis in dermatologic surgery is the intravascular chemical agent used in sclerotherapy. Anaphylaxis to such agents can occur in sclerosant-naïve patients, or in patients with a previous exposure or history of tolerance to subsequent retreatment. As such, patients with anaphylactic reactions should be carefully monitored to ensure that an episode that has apparently subsided does not recur, in the short-term or the more distant future.<sup>13,14</sup>

### Clinical features

The severity of reactions can vary widely from mild pruritus and urticaria to shock and death. Prodromal features include diffuse erythema, pruritus, or urticaria; these may be followed by inspiratory stridor, laryngedema, bronchospasm, hypotension, cardiac arrhythmia, and hyperperistalsis, or any combination thereof (Fig 1). The progression of symptoms can occur as outlined in Table I. Rapid onset culminates in a rapid peak of severity within 5 to 30 minutes, and potential consequences include shock and death.<sup>15</sup>

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