

Dermographism: A Rare Cause of Intraoperative Hypotension and Urticaria

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A 54-year-old man with dermatographism presented for spine surgery, and shortly after induction of anesthesia, he experienced severe hypotension and urticaria, resulting in cancellation of the case on suspicion of allergic reaction. For subsequent ventral hernia repair, a perioperative management strategy was devised, which resulted in an uneventful perioperative course. This case report is the first to demonstrate severe intraoperative hypotension and urticaria from dermatographism. We discuss the strategy that made the subsequent surgery a success and provide guidance for practitioners who face a patient with a severe form of this chronic disease. (A&A Case Reports. 2016;7:41–3.)

Dermographism is the most common form of physical urticaria with a prevalence of up to 5% of the general population.¹ Although benign in most patients, there is a small minority who have severe debilitating symptoms. The name is derived from the hallmark symptom of skin wheals as a result of rubbing or scratching, which can give the appearance of being able to write on the skin. These lesions appear within seconds and can persist up to 1 hour.² The exact cause is unknown.³ Diagnosis is based on history and a positive provocation test. The most common triggers are scratching, combing or brushing hair, drying oneself with a towel after a shower or bath, and/or wearing tight clothing. Stress is a less common trigger. Any part of the body can produce symptoms, but the arms, back, and legs are most commonly affected. Sensation accompanying wheals can include any combination of pruritus, warmth, burning, pain, or nothing. A significant number of patients report symptoms of angioedema accompanying skin wheals with the lips, tongue, eyelids, hands, legs, and genital regions most affected.⁴ A relationship with bronchial hyperactivity has also been supported.⁵ Such patients are recommended to carry an emergency medical kit containing epinephrine.¹ The average duration of symptoms is approximately 6 years and may have a constant or relapsing and remitting course. The most common outpatient treatment is with H1 antihistamines, which gives >80% of patients significant symptom relief. One-fifth of patients experience from another form of inducible urticaria (Table 1). Allergic diseases are present in up to half of patients and include asthma, hay fever, and food allergy. Thyroid disease and rheumatism are also common comorbidities.¹

We present the case of a 54-year-old man with severe dermatographism who presented for surgery after having severe intraoperative hypotension and urticaria 1 year previously. The patient provided verbal and written consent before his

second surgery and gave permission to the author for publishing this case report.

CASE DESCRIPTION

This 54-year-old man (91 kg, 1.67 cm, body mass index 32.4 kg/m²) first presented for a posterior lumbar laminectomy and redo L4–S1 fusion with instrumentation. His medical history was positive for dermatographism since age 24 years. Symptoms were triggered by drying himself with a towel after bathing. He denied any asthma, shortness of breath, or angioedema accompanying the urticaria. Symptoms followed a stable course, except for the preceding several weeks before surgery in which he reported that his urticarial lesions were much larger and itchier. He was followed regularly by an allergist. For symptomatic relief, he was on 10 mg cetirizine per os once daily and 25 mg hydroxyzine per os once daily. His remaining medical history was noncontributory. Physical and airway examinations were unremarkable. He had no known allergies. No complications with previous operations were noted by the patient or medical record.

The patient was premedicated with 2 mg midazolam IV in the preoperative area. Anesthesia was induced with 250 µg fentanyl, 100 mg propofol, 50 mg rocuronium, and 50 mg ketamine. Approximately 10 minutes later, before turning the patient prone, urticarial wheals abruptly emerged on the patient's upper neck, abdomen, chest, and back. His airway pressures remained stable. Noninvasive arterial blood pressure (BP) decreased from a mean arterial blood pressure (MAP) of 81 to 52 mm Hg, and his heart rate increased to 114 beats/min from 60 to 70 beats/min previously. A bolus of 100 µg phenylephrine did not increase his BP, so a second dose of 100 µg phenylephrine was given 2 minutes later with 10 mg ephedrine, and the MAP increased to 70 mm Hg. Benadryl at 50 mg IV and 100 mg hydrocortisone IV were then administered. It was mutually decided by the anesthesiologist and surgeon that surgery should be terminated because of suspicion of an allergic reaction. Anesthesia was reversed with 3 mg neostigmine and 0.6 mg glycopyrrolate. He was observed in the postanesthesia care unit where the rash subsided over the next hour. The patient was discharged the next day with no further complications.

The second operation was for repair of a ventral hernia with mesh 1 year later. The patient was seen in the preoperative clinic 1 week before surgery. At that time, his

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Table 1. Inducible Urticarias and Potential Triggers in the Perioperative Environment

Subtype of inducible urticaria	Provoking stimuli	Possible intraoperative precipitants
Dermographism	Shear forces on skin	Surgical drapes, blood pressure cuff, tourniquet, pneumatic compression device
Delayed pressure urticaria	Pressure applied to skin	Blood pressure cuff, tourniquet, pneumatic compression device
Cold urticaria	Cold objects applied to skin (water, ice, cold air)	Cold irrigation fluid, hypothermia (i.e., cardiopulmonary bypass)
Heat urticaria	Hot objects applied to skin (usually >40°C)	Forced-air warmers, intraoperative warming devices
Solar urticaria	Ultraviolet and/or visible light applied to skin	Operating room lights, pulse oximeter, surgical lasers
Vibratory angioedema	Vibration applied to skin	Oscillometric blood pressure cuff
Aquagenic urticaria	Water applied to skin	Irrigation fluid, any fluid spilled on patient
Cholinergic urticaria	Sweating	Sweating from hyperthermia
Contact dermatitis	Many causes	Many causes depending on nature of allergy

Adapted from Zuberbier et al. 2014.⁶

allergist was consulted who recommended continuing his cetirizine and hydroxyzine at the current dose plus a prophylactic regimen of 60mg prednisone per os 12 hours before surgery and again 1 hour before surgery in addition to 50mg Benadryl per os 6 hours and 1 hour before surgery. Prednisone was to be continued for 3 days postoperatively. Avoidance of histamine-releasing drugs intraoperatively was advised.

In the preoperative area, placement of the tourniquet to obtain IV access produced red skin wheals in a 4-inch band around the tourniquet, and the site of the IV soon showed skin wheals in a 1-inch circular pattern. The skin wheals felt itchy to the patient. He was premedicated with 2mg midazolam IV to attenuate any stress-induced exacerbation of his dermatographism. In the operating room, standard American Society of Anesthesiologists monitoring was applied including a BP cuff, which after the first cycle produced red skin wheals on all skin underneath the cuff and 1 to 2 inches adjacent to the cuff. Pneumatic compression devices were applied to both lower legs, and a safety strap was placed across the patient's upper legs and hips. Induction of anesthesia proceeded with 200 µg fentanyl, 200mg propofol, and 20mg cisatracurium. Anesthesia was maintained with sevoflurane at 1 minimum alveolar concentration. At the conclusion of surgery, he received 4mg ondansetron, 1.2mg hydromorphone, and 1g Tylenol IV, and anesthesia was reversed with 2mg neostigmine and 0.4mg glycopyrrolate. Removal of the surgical drapes revealed extensive skin wheals underneath the pneumatic compression stockings, BP cuff, and operating table safety straps, and there was a bright red band of wheals underneath the adhesive from the surgical drapes. During the operation, an MAP of 60 to 80mm Hg was maintained at all times without the use of any vasoactive medications. His airway pressures remained stable during the entire case as well. The patient was tracheally extubated and transferred to the postanesthesia care unit. The patient had an uneventful stay in the hospital over the next 36 hours.

DISCUSSION

Dermographism is a subtype of inducible chronic urticaria. Other subtypes include cold, delayed pressure, solar, heat, vibratory, cholinergic, contact, and aquagenic urticarias. The clinical presentation includes urticarial lesions, but patients may also experience angioedema, bronchospasm, and rarely hypotension. Importantly, >1 subtype can occur in any patient. Treatment consists of avoiding or eliminating

the offending stimulus and managing symptoms with oral medications. First-line outpatient pharmacologic treatment consists of modern second-generation antihistamines, but for cases refractory to these, a number of other medications may be used, including the monoclonal antibody omalizumab, the immunosuppressant cyclosporine A, and the leukotriene receptor antagonist montelukast. Third-line treatment includes a short course of corticosteroids.⁶ These medications should be continued throughout the perioperative period. Epinephrine is rarely needed but is reserved for patients who experience systemic symptoms such as hypotension and bronchospasm.⁴

The anesthesia literature does not contain any case reports relating to intraoperative exacerbations of dermatographism or any of the other chronic inducible urticarias. For the practitioner encountering such a patient, a focused preoperative history should include the subtype of inducible urticaria, duration of symptoms, history of exacerbations, current and past treatments, and symptoms of comorbid conditions such as asthma, food allergy, thyroid disease, and rheumatism. Intraoperatively, a number of perioperative devices may induce urticarial wheals in a patient with dermatographism, including BP cuffs, restrictive clothing, restraints, operating table belts, surgical drapes as well as any trauma to the skin including the surgical wound and those for venous access and invasive hemodynamic measurement (Table 1). In the event that hypotension from a vigorous exacerbation is encountered, it was shown in this case to be quickly responsive to routinely used vasoactive medications such as phenylephrine and ephedrine. A low dose of epinephrine titrated to effect and a fluid bolus would be a reasonable fourth-line treatment. Urticarial lesions should resolve in approximately 1 hour.

In conclusion, dermatographism is a common subtype of inducible urticaria that has until now not been described in the anesthesia literature. The practitioner should be aware of this condition and be prepared to manage such patients in the perioperative setting. ■■

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