

thorax occurring during anesthesia is reviewed. Additionally, it has been found that a wheeze may occur as a diagnostic clue during the initiation of tension pneumothorax. However, since this wheeze may lead to a misdiagnosis of bronchospasm, the treatment of which may include raising the airway pressure, it may be dangerously misinterpreted.

The authors express their gratitude to Drs. T. C. McAslan, C. T. Seebert, and J. J. Conroy, for participation and consultation in the preparation of the manuscript.

REFERENCES

- Gold MI, Helrich M: Pulmonary mechanics during anesthesia. V: Status asthmaticus. *ANESTHESIOLOGY* 32:422-428, 1970
- Macklin CC: Pneumothorax with massive collapse from experimental local overinflation of the lung substance. *Can Med Assoc J* 36: 414-420, 1937
- Dundee JW: Tension pneumothorax during the induction of anaesthesia. *Anaesthesia* 10:74-75, 1955
- Martin JT, Patrick RT: Pneumothorax: Its significance to the anesthesiologist. *Anesth Analg (Cleve)* 39:420-429, 1960
- Nicholas JN: Mediastinal emphysema. *Br J Anaesth* 30:63-76, 1958
- Schweizer O: Complications of anesthesia during radical surgery about the head and the neck. *ANESTHESIOLOGY* 16:927-938, 1955
- Gravenstein J: Pneumothorax and extensive emphysema after high intratracheal pressure in anesthetization. *JAMA* 171:158-160, 1959
- Christian MS, Munson CS, Hamilton WK: Pneumothorax following induction of anesthesia. *JAMA* 209:1710-1711, 1969
- Rastogi PN, Wright JE: Bilateral tension pneumothorax under anaesthesia. *Anaesthesia* 24:249-252, 1969
- Hamilton WK, Moyers J: Pneumothorax during surgery. *JAMA* 198:187-188, 1966
- MacKenzie AI, Patterson WD: Bilateral tension pneumothorax occurring during operation. *Br J Anaesth* 43:987-990, 1971
- Eger EI II, Saidman LJ: Hazards of nitrous oxide anesthesia in bowel obstruction and pneumothorax. *ANESTHESIOLOGY* 26:61-66, 1965
- Northfield TC: Oxygen therapy for spontaneous pneumothorax. *Br Med J* 4:86-88, 1971

Anesthetic Hazards of Cold Urticaria

CHARLES H. LOCKHART, LCDR MC USNR, AND JOHN C. BROWNIGG, LCDR MC USNR

Cold urticaria is an unusual disease characteristically manifested by relatively innocuous cutaneous lesions which develop on exposure to cold. Its recognition is essential, however, as it may be lethal under certain conditions.¹

REPORT OF A CASE

A 25-year-old woman was admitted to Portsmouth Naval Hospital with symptoms of abdominal pain which had begun upon insertion of an intrauterine contraceptive device several days earlier. Roentgenograms of the abdomen showed the device to be intraperitoneal. A celiotomy was scheduled on an urgent basis.

Preanesthetic history and physical examination by both gynecologist and anesthesiologist disclosed no abnormalities except mild pain elicited by lower abdominal palpation. The patient specifically denied having any allergies.

Preoperative medication consisted of meperidine, 75 mg, diazepam, 5 mg, and atropine, 0.4

mg, administered intramuscularly an hour prior to induction of anesthesia.

Upon arrival in the surgical suite, an intravenous drip was begun, utilizing a 16-gauge polypropylene cannula, and 5 per cent dextrose in Ringer's lactate solution was administered briskly. Soon a painful erythematous wheal was noticed along the course of the cephalic vein and its tributary in which the cannula was placed. The solution, its container, and administration equipment were examined, but no gross abnormality was found. Similar equipment and solutions had been used for other patients that day without incident.

The entire iv set-up was immediately removed. The patient was requested and again denied having any allergies, including cutaneous reactions to contact with foreign materials. Using a 19-gauge metal needle and a 5 per cent dextrose solution from a different manufacturer, another infusion was begun in the other arm. While this was being done, the patient related that as long as she could remember, when exposed to cold, she would develop "hives," over the exposed area only. Meanwhile, a similar urticarial streak was developing along the course of the vein being used

Received from the Department of Anesthesiology, Naval Hospital, Portsmouth, Virginia.

for infusion. Remarkably, warming the intravenous fluid to 37 C prior to administration resulted in rapid disappearance of the painful swelling and erythema. The operative procedure was performed without further anesthetic or gynecologic incident.

Postoperatively, after gaining consent from both the patient and her husband, the procedure of infusion of cold solution followed by infusion of body-temperature solution was repeated and the prior findings were reconfirmed. Additional history was characteristic of familial cold urticaria, the patient's mother being similarly afflicted. Appropriate tests for cold hemolysins and agglutinins and for cryoglobulins were negative.

DISCUSSION

This case is brought to the attention of the anesthesiologist for several reasons.

First, an unusual disease first presented itself for definitive diagnosis to the anesthesiologist, who was obliged to determine the cause(s) of the lesion before continuing the procedure. The possible causes included ectopic placement of the infusion cannula, contact hypersensitivity to the cannula, reaction to the intravenous fluid or possible contaminants in the fluid, arterial injection, and drug- or trauma-induced local tissue reaction.

Second, the necessity to diagnose this chronic disease in this unusual situation led to a brief review of the literature,¹⁻⁵ which disclosed several interesting facts.

Cold urticaria may occur in four classes of patients: 1) Patients with paroxysmal cold hemoglobinuria who have cold agglutinin and hemolysin antibodies present, as demonstrated by the Donath-Landsteiner test. 2) In cryoglobulinemia, an abnormal quantity and type of globulin precipitates on cooling, thus forming a diagnostic test. This condition may be associated with the "connective-tissue" diseases, macroglobulinemia, or multiple myeloma. 3) In idiopathic acquired cold urticaria,

a disease which may appear at any time of life and has no known etiology. 4) In congenital cold urticaria which is inherited as an autosomal dominant but with variable expressiveness. Our patient appears to fit in the last category. The more serious other associated diseases were ruled out.

The pathophysiology of the condition appears to result from histamine release from granules in basophils in blood and tissue mast cells, as shown by Juhlin and Shelley.² Symptoms are usually limited to local erythematous pruritic urticarial cutaneous lesions. Of special interest to the anesthesiologist is a potentially life-threatening syndrome reported to occur in particularly sensitive individuals and in cases of extreme exposure to cold.¹ The syndrome includes laryngeal edema, bronchospasm, tachycardia, hypotension, and ventricular arrhythmias terminating in fibrillation. Rapid infusion of cold blood or fluids can precipitate it, as can irrigation of pleural or peritoneal cavities with cold fluid. Use of a hypothermia blanket and other surface-cooling techniques is also contraindicated.

REFERENCES

1. Horton BT, Brown GE, Roth GM: Hypersensitivity to cold with local and systemic manifestations of histamine-like character: Its amenability to treatment. *JAMA* 107:1263, 1936
2. Juhlin L, Shelley WB: Role of mast cell and basophil in cold urticaria with associated systemic reactions. *JAMA* 177:371-377, 1961
3. Houser DD, Arbesman CE, Ito K, et al: Cold urticaria: Immunologic studies. *Am J Med* 49:23-33, 1970
4. Rawnsley HM, Shelley WB: Cold urticaria with cryoglobulinemia. *Arch Dermatol* 98: 12-17, 1968
5. Marks MB: Physical and climatic factors in allergy, *The Allergic Child*. Edited by F Speer. New York, Harper and Row, 1963, pp 148-149