

minutes, the patient showed definite signs of improvement. He became much less restless and roentgenograms taken at this time revealed a distinct improvement in aeration. Blood gases were maintained within normal limits, first with the addition of oxygen and on the second day with room air only.

The patient's temperature at the time of changing respirators was 99.3° F. rectally. Over the next few hours the rectal temperature rose to 102° F. The patient was restless and appeared flushed. The hyperthermia responded to aspirin but within a few hours returned to increasingly higher levels and on the third day, a peak temperature of 103° F. was reached. During this time the child was extremely restless and became a serious management problem. The pediatricians found no cause for this hyperthermia but believed that antibiotic therapy was indicated, and the patient was given large doses of procaine penicillin and methicillin (Staphicillin). On the third day, one of the nurses suggested that the air delivered by the ventilator was too hot. Measurements at the tracheostomy connector revealed that the temperature of the air delivered by the ventilator was 105° F. The ventilator was immediately replaced by a different type which does not use a heated vaporizer. Over the next 45 minutes, the patient's temperature declined to 98.8° F.

COMMENT

In view of this event, a series of measurements were performed on this Emerson Postoperative Ventilator, on the same respirator with a new heating element, and on another, newer model of the same respirator. It was found that the temperature of the delivered air depended to a very large extent upon the ambient temperature of the room in which the machine was used, and also upon whether the door of the cabinet was open or closed. In another series of measurements it was found that by changing the ambient temperature of the room and dependent upon whether the door of the cabinet was open or closed, the temperature of the air delivered by the ventilator could be varied from 85° to 105° F. Having made these observations, it was easy to recall several other patients who developed unexplained hyperthermia while ventilated with the Emerson Postoperative Ventilator.

It is evident from these findings that the Emerson Postoperative Ventilator, in spite of its many excellent qualities, must be used with great caution in all areas where the ambient temperature is high or where the respirator is located near a source of heat. Physicians using this type of equipment should be careful to measure not only the volume and the pressure of delivered air but also its temperature in order to avoid serious and potentially fatal complications.

Relief of Arterial Spasm by Epidural Block in a Sympathectomized Patient

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Following lumbar sympathectomy, vasomotor paralysis of the lower limbs is usually complete and permanent. In approximately 10 per cent of patients, however, a slight degree of

recovery appears after an interval of two or three years.¹ In the following case there is evidence of strong reflex vasomotor activity four years following lumbar sympathectomy.

A 58 year old woman was admitted to the hospital for breast biopsy and possible radical mastectomy. She had arteriosclerosis obliterans with severe vascular insufficiency of the lower extremities of several years duration.

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Received from the Department of Surgery, St. Louis University, St. Louis. Aided by Grants HE-06312 and HTS-5299 from the United States Public Health Service.

Four years prior to this admission bilateral lumbar sympathectomy was performed. Three months later endarterectomy of both iliac and femoral vessels were done. On examination, her femoral pulses were weak on both sides and there was a prominent systolic bruit over the right femoral artery. There were no other abnormal clinical findings and the laboratory data were normal. On her second hospital day a left radical mastectomy was performed uneventfully under halothane nitrous oxide endotracheal anesthesia.

Three hours after the end of the procedure she complained of severe pain in the right leg. No pulse was felt in the right femoral artery. The skin of the right leg and foot felt cold. There was marked discoloration and mottling of the skin from the mid-thigh region downwards. Epidural block was instituted using 20 ml. of 1 per cent mepivacaine (Carbo-caine). This was followed by immediate relief of pain and striking improvement in the color of the skin of the right lower extremity. The skin felt warm to touch in both legs. A right iliac thrombectomy and a vein patch graft of right common femoral artery were done. The postoperative course was satisfactory and signs of vascular insufficiency did not recur.

COMMENT

Patients with arteriosclerosis obliterans are prone to develop arterial thrombosis postoperatively.² Prevention of hypotension and maintenance of adequate blood volume are important factors in avoiding this complica-

tion. Pressure on, or obstruction of diseased arteries can cause thrombosis. In this case, no hypotension occurred during the operative or postoperative periods. A combination of hypovolemia and peripheral vasoconstriction may have contributed to production of thrombosis in the absence of hypotension. Although lumbar sympathectomy was performed four years prior, the response to epidural blockade was dramatic. The significant improvement of skin color and temperature were obviously due to relief of vasoconstriction of the collateral circulation. Presence of such vasoconstriction in a previously sympathectomized patient could have been due to incomplete denervation or regeneration of an active sympathetic supply to the lower limbs. Incomplete denervation is not uncommon following lumbar sympathectomy.³ Regeneration occurs in about 10 per cent of the cases, resulting in a slight degree of recovery of vasomotor tone two or three years post sympathectomy.^{1,2} In this patient it may be assumed that enough time has elapsed to account for the return of vasomotor control of the lower extremities.

REFERENCES

1. Monro, P. A. G.: Sympathectomy: An Anatomical and Physiological Study with Clinical Applications. Oxford University Press, 1959.
2. Key, J. A.: Silent thrombosis in major limb arteries: A post-operative hazard, *Surgery* 47: 734, 1960.
3. White, J. C., Smithwich, R. H., and Simeone, F. A.: *The Autonomic Nervous System*. New York, The Macmillan Company, 1952.

Anesthesia

PRILOCAINE HYDROCHLORIDE Prilocaine hydrochloride is a local anesthetic that is similar chemically and in effectiveness to lidocaine and mepivacaine. It is useful for infiltration and block anesthesia in obstetrics and surgical procedures. The systemic toxicity of prilocaine hydrochloride is qualitatively similar to that of lidocaine and other local anesthetics, but excessive doses of prilocaine will produce methemoglobinemia due to the metabolite, o-toluidine. If clinically significant symptoms of methemoglobinemia occur, they can be effectively reversed by the intravenous injection of methylene blue. Prilocaine should not be used in patients with anemia or congenital or idiopathic methemoglobinemia. (*Council on Drugs: Evaluation of a Local Anesthetic Agent, Prilocaine Hydrochloride (Citanest)*, J.A.M.A. 199: 173 (March) 1967.)