Induced Hypotension for Extensive Surgery in an Infant

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A vigorous 9 month old, 6.3 kg. infant presented a huge capillary hemangioma arising from the left side of the face and neck, approximately half the size of the head (fig. 1). A small hemangioma was first noted at birth. Due to rapid growth of the tumor, it was treated with radiotherapy on two occasions without appreciable slowing of the growth. No other physical abnormalities were observed. Laboratory data: hemoglobin, 12.1 g.; hematocrit, 37; urinalysis, normal.

ANESTHETIC MANAGEMENT

A stethoscope was taped over the precordium, and the patient placed on a thermo-controlled blanket with a rectal thermometer in place. Anesthesia was managed with N₂O, O₂ (3:3) and halothane; concentration ranging to 2 per cent. Following saphenous cutdown an infusion of Ringers lactate was started. Succinylcholine 20 mg. and atropine 0.1 mg. were given intravenously, a no. 18 F. plastic endotracheal catheter inserted and controlled ventilation instituted via a modified Ayre's T-piece. Minute to minute arterial blood pressure determinations were made using a Collens oscillometer. Fifteen minutes after induction, 4 mg. of pentolinium (Ansloyn) were given intravenously and the operating table was adjusted to a 15 degree head-up position.

The preinduction brachial artery pressure was 80/45. After the administration of pentolinium, blood pressure progressively fell to 40/20 and was maintained at approximately this level for two hours and a half. Slight variations of the arterial pressure were easily controlled by adjusting the halothane concentration.

The excision of the hemangioma required a meticulous dissection of the facial nerve, as the main trunk and all its terminal branches were completely surrounded by the tumor mass. By the operating surgeon's enthusiastic testimony, only the remarkably dry operating field secured by ganglionic blockade in this highly vascular hemangioma made possible the preservation of the entire seventh cranial nerve. Blood loss of 200 ml., as estimated by weighing sponges, was replaced. Suction was not used and the drapes were not blood stained. Before the skin closure, the operating

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table was levelled and halothane discontinued. Within ten minutes the arterial blood pressure rose to induction level. By the end of the procedure, the patient was fully responsive. Vital signs remained stable in the recovery room. The postoperative period was uneventful. Facial nerve function was completely restored within three months.

Discussion

During pediatric surgery, controlled hypotension employing autonomic blocking agents, has been used with no greater risk than in adult surgery by Anderson, who advocates trimethaphan (Arfonad) because of its flexibility of action. We have noted, however, as recorded by Kilduff that in children tachyphylaxis develops rapidly with trimethaphan, and often proves resistant to further doses of Arfonad. Pentolinium was employed in this case to avoid these problems. Pentolinium is metabolized rather slowly, having an effective autonomic blocking action for about 45 minutes. Additional increments are rarely required, and tachyphylaxis is uncommon.

Summary

When the type of autonomic blockade produced by pentolinium was combined with adjuncts of posture, halothane, and manual ventilation, the arterial pressure of a 9 month old infant could be precisely maintained at desired levels during the surgical procedure. Arterial pressure was easily returned to preinduction level two hours and a half after the administration of the blocking agent. A dry operative field contributed materially to the preservation of the seventh cranial nerve. A technically formidable operation was greatly simplified by anaesthetic management.

References