of respiratory rate depression, the effect lasting 2 to 4 hours after the dose given. No narcotic or respiratory depressant was given postoperatively. The depression of respiratory rate, miosis, and lethargy gradually resolved over the next nine days (fig. 1). There was no evidence of hepatic or renal dysfunction postoperatively. The patient was discharged two weeks after her operation, alert, with normal respirations, and with residual left hemiparesis.

Discussion

Only narcotic-induced depression of respiratory rate will be reversed with naloxone.[3] As naloxone does not stimulate respiration in the absence of previously administered narcotic, we believe this case represents a prolonged effect of methadone.

Narcotic-induced respiratory depression may be prolonged with: 1) hepatic insufficiency leading to decreased drug metabolism[4]; 2) renal insufficiency leading to decreased excretion of active drug or its metabolites[2]; 3) interactions with phenothiazines, monoamine oxidase inhibitors and imipramine-like drugs[5]; 4) drug overdose resulting in prolonged effective blood levels; 5) continued metabolism, release of the drug and metabolites from tissues, or enterohepatic recirculation[2]; 6) abnormal plasma protein-binding kinetics.[6]

There was no history or clinical finding to support any of these causes in our patient. Intravenously administered methadone and morphine are equipotent analgesics and respiratory depressants, with similar durations of action. The dose of 0.69 mg/kg methadone given to our patient is less than the 1–2 mg/kg morphine given in a recent study to patients undergoing cardiac surgery, where postoperative respiratory depression was found for only 24–48 hours.[1] We are, therefore, unable to explain this patient's prolonged response on the basis of previously reported findings or by any measurable metabolic abnormality.

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Diagonal Ear-lobe Crease as an Indicator of Operative Risk

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Preliminary data reported by Frank suggested that the presence of a prominent crease in the lobule portion of the auricle was associated with premature cardiovascular disease.[1] This presumptive relationship has been tested by others, and a positive association has been found between the diagonal ear-lobe crease and coronary-artery disease.[2,3] In view of this finding, it would appear reasonable to assume that the crease could be used as an indicator of operative risk. This hypothesis was tested.

Methods

Two hundred and twenty-two consecutive patients scheduled for elective surgery were followed from the day of operation to the day of discharge. The following information was recorded for each patient: presence or absence of the diagonal ear-lobe crease, clinical evidence of coronary heart disease, intraoperative cardiovascular complications, and postoperative cardiovascular complications. For the purposes of this study, the ear-lobe crease was

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deemed present when a prominent crease existed in the lobule portion of either auricle and resembled that shown in figure 1.

Results

The prevalence of the ear-lobe crease was found to increase with each decade above the third; it occurred in only three of 120 patients less than 40 years old but in 61 out of 102 patients more than 40 years old. The prevalence of the crease in patients who had coronary heart disease was greater than that in patients without clinical evidence of coronary heart disease for each decade above the third. For decades above the third, 82 per cent or 41 of 50 patients who had coronary heart disease were found to have the crease, compared with only 38.5 per cent or 20 of 52 patients without coronary heart disease (table 1).

For each decade beyond the third, intraoperative cardiovascular complications occurred more frequently in patients who had the diagonal ear-lobe crease than in patients without the crease. Forty-two per cent or 26 of 61 patients who had the crease developed intraoperative cardiovascular complications, compared with only 4.9 per cent or 2 of 41 patients without the crease (table 1). These complications included hypotension (11 cases), cardiac dysrhythmias (9 cases), and hypertension (8 cases).

The prevalence of postoperative cardiovascular complications in patients who had the diagonal ear-lobe crease was greater than that in patients without the crease for each decade above the third. Twenty-four per cent or 15 of 61 patients with the crease had postoperative cardiovascular complications, compared with only 4.9 per cent or 2 of 41 patients without the crease (table 1). These complications included cardiac dysrhythmias (7 cases), cardiac failure (4 cases), angina (3 cases), and hypertension (3 cases).

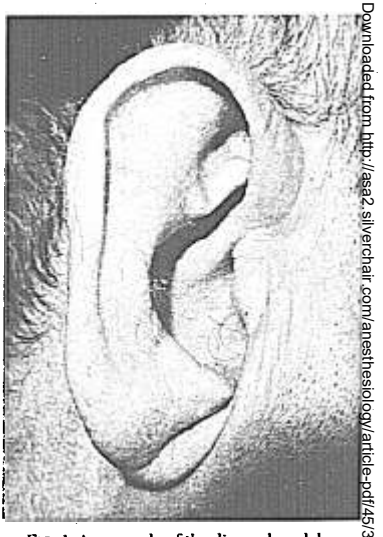

FIG. 1. An example of the diagonal ear-lobe crease in the lobule portion of the auricle.

Discussion

These data support the conclusions of others who have found that the presence of the di-

TABLE 1. Coronary Heart Disease, Intraoperative Cardiovascular Complications, and Postoperative Cardiovascular Complications in Patients more than 40 Years Old with and without the Diagonal Ear-lobe Crease

	Coronary Heart Disease				Intraoperative Cardiovascular Complications				Postoperative Cardiovascular Complications			
	Present		Absent		Present		Absent		Present		Absent	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Crease present	41	67.2	20	32.8	26	42.6	35	57.4	15	24.5	46	75.5
Crease absent	9	21.9	32	78.1	2	4.9	39	95.1	2	4.9	39	95.1

agonal ear-lobe crease is positively related to coronary heart disease[2,3] and not related solely to advancing age, as has been suggested.[4] Also, the data suggest that the crease can be used as an indicator of operative risk, since intraoperative and postoperative cardiovascular complications occurred more frequently in patients with the crease than in age-matched controls without the crease. The latter finding also was observed when patients with and without the crease were matched for type of surgical procedure and anesthetic technique.

Although the time of origin and the mechanism of formation of the ear-lobe crease have not been investigated, it has been assumed that the crease is not present at birth but develops later in life, either as a result of late penetrance of a genetically-determined characteristic or as a result of localized vascular disease with atrophy of the skin.[2] That only three of 120 patients less than 40 years old had the crease supports the assumption that the crease develops in later life. However, since the ages of these three patients were 3, 14, and 17 years, it would appear that the crease occasionally may be present at birth or may develop shortly thereafter. The significance of the crease at such an early age remains to be determined.

In summary, it appears that, for the patient not already identified to be at risk, the ear-lobe crease may be a useful indicator of the likelihood of development of intraoperative and postoperative cardiovascular problems.

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Pulmonary Interstitial Edema after Multiple Venous Air Emboli

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Venous air embolism is a well-recognized complication in patients undergoing neurosurgical procedure in the sitting position. Although cardiopulmonary changes associated with air embolism during the operative course have been described, little attention has been focused on pulmonary changes in the postoperative period. The following report describes the occurrence of postoperative pulmonary interstitial edema in a healthy patient in whom eight separate episodes of venous air embolism and systemic arterial hypotension were documented during intracranial operation in the sitting position.

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Report of a Case

A 25-year-old, 100-kg man had occasional frontal headaches and decreasing hearing in the left ear associated with low-pitched tinnitus. Past medical history was not contributory, and laboratory studies, physical examination, roentgenogram of the chest, and ECG disclosed no abnormality. Audiograms and tomograms were consistent with a diagnosis of a 1.5-cm acoustic neuroma. The patient was classified ASA physical status 1.

The patient received 50 mg hydroxyzine, 100 mg meperidine, and 0.4 mg atropine, im. An hour later, anesthesia was induced with thiopental. Tracheal intubation was facilitated with 100 mg succinylcholine, iv. Anesthesia was maintained with 50 per cent nitrous oxide and 1 per cent halothane in oxygen and pancuronium. Ventilation was controlled with a volume-limited ventilator attached to a circle absorber system. The ECG recorded cardiac rate and rhythm, and a stethoscope and a thermistor probe were inserted into the esophagus. A catheter was placed in the right radial artery, and the tip of a #7 Swan-Ganz catheter[1] was positioned in the pulmonary artery, as confirmed by a transduced pressure-wave pattern. End-tidal CO_2 concentration