

## Giant Ovarian Cyst and the Supine Hypotensive Syndrome

RALPH A. EPSTEIN, M.D., AND GIDEON G. PANTER, M.D.\*

The occurrence of hypotension in the supine full-term female patient has been documented and studied. Howard *et al.*<sup>1</sup> have shown that the hypotension is due to diminished venous return from an obstructed inferior vena cava. We wish to report a similar situation in a non-pregnant patient in whom the blood pressure rose rather than fell following removal of a large intra-abdominal mass.

### CASE REPORT

A 42 year old gravida 0 presented with a five month history of 40 pound weight loss and expanding abdominal girth. There was associated progressive edema of the legs and thighs. She was unable to lace a size 10½ E man's shoe. Past history was normal except for allergies to adhesive tape and to penicillin.

Physical examination revealed a 153 pound white woman in no distress. Blood pressure was 130/72 mm. of mercury, pulse rate 86, temperature 98.6° F. The abdomen was grossly distended anteriorly but there was no flank dullness on percussion. The pulsations of the abdominal aorta were well transmitted to the anterior abdominal wall. The abdominal circumference was 123 cm. Dilated abdominal veins were present. Pelvic examination revealed an intact hymen and a huge abdomino-pelvic cystic mass. There was plus 3 pitting edema of the thighs, plus 4 pitting edema of the ankles and an 8 cm. stasis ulcer was present on the medial aspect of the left lower leg.

Hemoglobin was 13.7 g./100 ml., the white blood cell count,  $5.4 \times 10^3$ , and the differential was normal. Urinalysis revealed microscopic pyuria and urine culture showed *E. coli* growth. Nonprotein nitrogen, FBS, alkaline phos-

phatase and electrolytes were normal. ECG was interpreted as showing right bundle branch block and right ventricular hypertrophy. Chest roentgenogram showed elevated diaphragms and an IVP showed evidence of partial ureteral obstruction bilaterally.

After preoperative preparation with 50 mg. of meperidine and 0.75 mg. of atropine, her initial blood pressure was 140/80 mm. of mercury and her pulse rate was 85. Anesthesia was induced with 125 mg. thiamylal sodium and 60 mg. of succinylcholine were used for endotracheal intubation. Respirations were controlled and she was anesthetized with nitrous oxide along with small doses of curare and meperidine by intermittent intravenous injection.

The abdomen was filled with a left ovarian cyst. A trocar was placed in the cyst and 13.5 liters of serous fluid were aspirated during a 20-minute interval. Vital signs were stable until evacuation of the cyst was well under way. The blood pressure then rose to 180/120 mm. of mercury without a change in the pulse rate. There was a concomitant rise of 4 cm. of water in the superior vena caval pressure. A total abdominal hysterectomy and bilateral salpingo-oophorectomy was performed and a Meckel's diverticulum excised. Toward the termination of the procedure the blood pressure returned to its original level.

The postoperative course was uneventful. Her postoperative weight was 120 pounds and her blood pressure remained at 140/80 mm. of mercury. The pathological diagnosis was well differentiated serous cystadenocarcinoma.

### DISCUSSION

Crossen warns that splanchnic dilatation and venous pooling may follow sudden removal of large intra-abdominal masses.<sup>2</sup> In addition to sudden hypotension at operation, Ferguson has described a chronic postural hypotension which may persist in these patients.<sup>3</sup>

\* Departments of Anesthesiology and Obstetrics and Gynecology, Columbia University College of Physicians and Surgeons, New York, New York, and the Anesthesiology and Gynecology Services of the Francis Delafield Hospital, New York, New York.

Opposing this effect is the greater venous return that occurs when a mass compressing the vena cava is removed. Our patient's lower extremity and dilated abdominal veins evidenced the partial obstruction of her inferior vena cava. The rise in superior vena caval pressure during the evacuation of the cyst reflected the sudden increase in venous return. This is entirely analogous to the relieving of the supine hypotension syndrome of late pregnancy by manual displacement of the uterus off the inferior vena cava. We believe that in this case the increased venous

return outweighed any splanchnic pooling, and thus the expected fall in blood pressure was not seen.

## REFERENCES

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3. Ferguson, W. H.: Technical control of intra-abdominal pressure following large ovarian cystectomies, *South. Med. J.* 59: 207, 1961.

## Cardiac Arrest in the Burned Patient Following Succinylcholine Administration

ROBERT P. BELIN, M.D., AND CONRAD I. KARLEEN, M.D.\*

## CASE REPORT

The risk of anesthesia is reported to be considerably increased when large areas of skin are burned and infection, toxemia, anemia, inanition, and metabolic disturbances are present. The incidence of cardiac arrest in the burned patient during anesthesia is one in 250 in the United States<sup>1</sup> while in all other plastic surgery patients it is one in 2,744.<sup>2</sup> Since 70,000 serious burns occur in the United States each year, there are several hundred anesthetic burn deaths yearly.<sup>3</sup> Despite these hazards, anesthesia must be provided on frequent occasions for the burned patient during his rehabilitation.

Although succinylcholine, is a frequently employed and safe agent in the nondebilitated surgical patient, it has been implicated in 18 previously reported cases of cardiac arrest following its use in burned patients. In addition, there have been five reports of patients with severe burns each of whom experienced cardiac arrest on two different occasions following the administration of this drug.<sup>4</sup> The purpose of this report is to alert further those associated with the care and treatment of burns to the possibility of cardiac arrest following the administration of succinylcholine.

An 11 year old white boy sustained a 47 per cent third degree electrical and flame burn involving the trunk, arms, and hands when he fell into a power transformer. The patient was admitted here during the third postburn week and was treated by conventional open techniques. Although his food intake was satisfactory, his course, not unusual for a patient with a burn, was accompanied by marked debilitation, inanition, and fever. On the forty-sixth postburn day, the patient was taken to the operating room for skin grafting, at which time he was to receive his fifth anesthetic. The hemoglobin, blood urea nitrogen and a serum electrolyte values were normal and the patient was well hydrated. His previous anesthetics had been nitrous oxide, halothane, and oxygen. On this occasion, because a prone position was required to permit skin grafting the patient's back, endotracheal intubation was indicated and 20 mg. of succinylcholine was administered intravenously immediately preceded by 0.4 mg. of intravenous atropine. As intubation was attempted, the patient promptly had a cardiac arrest. He was resuscitated by employing closed chest cardiac massage and the procedure was cancelled. On the fifty-first postburn day, five days after the cardiac arrest, the etiology of which was not recognized, the patient was again anesthetized by employing the same agents, dosages, and techniques. He promptly experienced a second cardiac arrest following the intravenous injection of succinylcholine. At this time, the etiology of both cardiac arrests became apparent, and following resuscitation the procedure was continued uneventfully.

\* Department of Surgery, University of Minnesota Medical School Minneapolis, Minnesota.

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