CARDIAC ARREST IN THE CONSULTING-ROOM

BY

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One of the most alarming experiences is to be faced with a case of cardiac arrest. This emergency may arise not only in the operating-theatre but in any situation where a patient is given an injection, a general or topical anaesthetic, or undergoes any form of endoscopy. Most of the literature on cardiac arrest and its management has been written by surgeons and anaesthetists working in hospitals. Clemetson (1959) reported a successful cardiac massage in a nursing-home, but it was Beck *et al.* (1956) who predicted "that the resuscitation procedure [of cardiac massage] has application beyond the operating-room, perhaps even beyond the hospital, and, if so, this is a new medical project for development." The first cases to prove the truth of this prediction were recently reported in America (Leighninger and Hingson, 1960; Halpern and Weber, 1961). The present paper concerns the first two documented cases of intrathoracic cardiac massage in "domestic" circumstances to be reported in this country, and were performed in a general practitioner's consulting-room.

Case 1

On May 24, 1960, a 74-year-old man was brought to the evening surgery. He complained of a gripping pain across his chest that had come on suddenly earlier in the day and had been present intermittently since. He was distressed by the pain, but managed to undress and lie on the examination couch. While he was being examined he gave a sigh and became quite pallid. The heart was heard to become weak and irregular and then to stop completely. An intracardiac injection of 0.5 ml. of 1:1,000 adrenaline was made without response. While performing mouth-to-mouth artificial respiration, a thoracotomy incision was made in the fifth left intercostal space and the ribs were forced apart. The left lung was collapsed and the pleural cavity contained a large quantity of fresh blood. The heart was soft, flabby, and immobile; after squeezing, it failed to fill. Necropsy (Dr. M. L. Gladstone) revealed a ragged tear 2 cm. long in the arch of the aorta at the root of the left subclavian artery.

Case 2

On July 20, 1960, a 3-months-old baby was being circumcised in the surgery. Anaesthesia was started with chloroform administered from a dropper bottle on to an open mask. The induction was smooth and the anaesthetic was changed to 50:50 chloroform/ether. Just after the start of the operation and approximately four minutes after the onset of the anaesthetic, the infant stopped breathing. The mask was removed, and examination showed the baby to have deeply cyanosed lips and cadaveric facies. The district nurse, who was assisting, was instructed how to perform mouth-to-mouth artificial respiration while a thoracotomy was carried out through the left fourth intercostal space. The index and middle fingers of the right hand were introduced through the incision, which did not bleed, and the heart was found to be still and firm. It was pressed firmly against the chest wall two or three times, whereupon it started spontaneous rhythmical contractions, weak at first but rapidly increasing in force. The lapse between the cessation of respiration and cardiac massage was about one and a half minutes. Artificial respiration was carried on for a further minute, when the infant began to breathe and his whole colour and tone underwent a

striking transformation. He became pink and started to move his limbs. His chest was rapidly closed with Michel's clips, and, while these were being inserted, he began to cry lustily.

He was transported to hospital by ambulance, and on admission was given intravenous "nepenthe" $\frac{1}{2}$ min. (0.025 ml.). Attempts to intubate him were unsuccessful until 20 mg. of suxamethonium chloride ("scoline") was given, when an endotracheal tube was passed; but shortly this became dislodged and anaesthesia was maintained by mask and Guedel airway only. The chest wound was opened and the incision was closed in layers without connexion to an underwater seal. Chloramphenicol, 250 mg. six-hourly, was administered intramuscularly. Next day the infant seemed dazed and his reactions to auditory and visual stimuli were depressed, but he took to breast-feeding readily. His temperature rose to 100° F. (37.8° C.), and an x-ray film of his chest showed a small pleural effusion. An E.C.G. was normal. The next day the baby's mental and physical condition had improved considerably, and on the fourth day he was discharged home apparently unaffected by this remarkable ordeal. The skin sutures were removed on the seventh day with the chest wound healed. Six months later there was no evidence of neurological damage.

Discussion

Any doctor, regardless of his specialty, may quite suddenly be faced with a patient in whom cardiac arrest has occurred, and he should have in his mind a plan of action to deal with this emergency, for with prompt action nearly all these lives could be saved (Milstein, 1956).

In Case 1 a diagnosis of cardiac arrest due to coronary occlusion was made; there are a number of reports of successful resuscitation in hospital of such cases (Beck *et al.*, 1956; Reagan *et al.*, 1956; Hannon *et al.*, 1957; Walton, 1960). Safar and McMahon (1958) described a method of mouth-to-mouth artificial respiration utilizing two Guedel airways permanently fixed together at their flange ends. This simple piece of equipment was used in this case and was found to be an effective means of inflating the lungs. The technique of cardiac massage has often been described (Palomera, 1952; Milstein, 1956; Wylie, 1956). Combined artificial respiration and intrathoracic cardiac massage was attempted in this case single-handed without previous experience in thoracic surgery. It was found to require a "one-man-band" type of technique. It is doubtful if this is feasible for any length of time, and had resuscitation been successful at least one assistant would have been required.

Case 2 arose in circumstances where the likelihood of a doctor being present or available is greater—that is, after the administration of a drug, in this case chloroform. It is interesting to note that ventricular asystole was found at thoracotomy, whereas it is generally believed that chloroform induces ventricular fibrillation (Goodman and Gilman, 1955; Lee, 1959).

More recently, a method of performing "closed chest" or "extrathoracic" cardiac massage has been described (Kouwenhoven *et al.*, 1960), and from the initial encouraging reports it would seem to be the method of choice, especially in those cases occurring beyond the confines of the hospital.

Summary

Two cases of cardiac arrest occurring in a general practitioner's surgery are described. The first case was thought to be due to a coronary occlusion, and unsuccessful combined mouth-to-mouth artificial respiration and cardiac massage was attempted single-handed.

Necropsy revealed a ruptured dissecting aneurysm of the aorta. The second case was that of an infant who developed cardiac arrest during circumcision under chloroform anaesthesia. Cardiac resuscitation was successfully performed. The factors concerned in the treatment of cardiac arrest occurring beyond the hospital are discussed and emphasis is placed on active resuscitation being attempted in all cases.

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Medical Memoranda

Case of Ovarian Fibroma and Meigs's Syndrome

Ovarian fibromata represent 2 to 5% of all ovarian tumours (Dockerty and Masson, 1944); less than 20% are associated with ascites, and of these less than 1% with hydrothorax. The cause of the ascites and the mechanism of transfer of fluid to the pleural cavity (right more often than left) are still in dispute (Meigs *et al.*, 1943; Rubin *et al.*, 1944; Meigs, 1954a; Cowan *et al.*, 1954; Reiss, 1960). Meigs (1957) reviewed the problem in some detail.

The following case of ovarian fibroma is reported as illustrating some of the less commonly emphasized features in the natural history of Meigs's syndrome.

CASE REPORT

A married woman aged 71 was admitted to Hackney Hospital, under the care of Dr. J. A. Cardno, on August 21, 1959, after a febrile illness for one week, associated with dry cough, breathlessness, and pain in the right side of the chest. She also complained of abdominal pain and alternating constipation and diarrhoea for six months, with faecal incontinence in recent weeks.

Twenty years ago she had first noted a mass in the abdomen. In 1943 she had an abdominal operation in another hospital, and was told she had an inoperable ovarian cyst. She was transferred to a home for terminal care, but discharged herself after some months, and had

been fairly well and active until the onset of the present symptoms. She had had four normal deliveries, the last one 41 years ago, followed one year later by a prolapse repair. The menopause had occurred at the age of 53, with no vaginal bleeding or discharge since.

On examination she was quite well nourished and not anaemic or cyanosed. The temperature was 99.4° F. (37.4° C.), the pulse 112, and respirations 22. In the chest the right lower zone was dull to percussion, with reduced air entry and crepitations. Apart from a blood-pressure of 220/110 mm. Hg, the cardiovascular system was normal. The abdomen was occupied by a hard craggy mass which extended to the umbilicus. A diagnosis of bronchitis and right-lower-lobe collapse was made, and after treatment with penicillin, analgesics, and expectorants her respiratory symptoms resolved. X-ray examination of the chest showed only thickening of the pleura at the right base.

At this stage a gynaecological opinion was requested. On examination there appeared to be two distinct masses in the lower abdomen, though a possible midline union could not be excluded. The left tumour, larger than a full-term foetal head, arose from the pelvis and extended to the umbilicus and out into the left flank. The right tumour was smaller, but extended to above the iliac crest. Both were stony hard, irregular, and immobile. The liver, spleen, and kidneys were not palpable; there was no ascites or oedema of the legs. Vaginal examination showed that the whole pelvis was occupied by the lower pole of the left-sided mass; it was inseparable from the cervix, which was atrophic and displaced anteriorly and to the left. On rectal examination the mass was outside the rectum, the lumen of which was almost entirely occluded.

A provisional diagnosis of calcified uterine fibroids and right-sided ovarian fibroma was made, but x-ray examination showed only a soft-tissue mass without calcification.

The following summary was obtained from the hospital where treatment had been given in 1943. "Admitted May 4, 1943, with four years' history of abdominal pain and swelling, shortness of breath, and loss of weight. On examination, right-sided pleural effusion; ascites; hard nodular masses palpable in both iliac fossae, continuous with a hard tumour in the pouch of Douglas. Three pints of blood-stained fluid aspirated from abdomen, and two pints from right pleural cavity. At laparotomy a further large amount of ascitic fluid drained. Bilateral ovarian carcinoma invading both pelvic walls was diagnosed and the abdomen closed without biopsy. Further abdominal paracentesis necessary three weeks later; the fluid soon returned, oedema of the legs and vulva appeared, and she was discharged to a home for terminal care seven weeks after admission."

In view of the lapse of 16 years and the symptoms of rectal obstruction, it was decided to re-explore the abdomen. On September 11, 1959, the abdomen was opened by a midline subumbilical incision. There was half a pint (285 ml.) of clear ascitic fluid. A large single irregular lobulated mass arose from the left ovary, with a further extension impacted in and entirely filling the pouch of Douglas. It was firmly adherent to the peritoneum of the pelvic floor and lateral walls, descending colon, back of uterus, and left broad ligament. The uterus and right ovary were atrophic and normal; the rest of the abdominal cavity was free from adhesions or secondary deposits.

With some difficulty the mass was mobilized and excised intact. Both ureters were intimately related to the tumour bed, and were dissected free. A small hole in the anterior wall of the descending colon was repaired. Bleeding was heavy, being finally checked by ligating the left internal iliac artery. A right salpingo-oophorectomy was also performed and 2 pints (1,140 ml.) of blood transfused.

The post-operative course was uneventful, and when she was discharged on October 5 normal bowel habits had been re-established. The patient has been well at subsequent visits.