Decortication of the heart for staphylococcal pericarditis

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A case of acute staphylococcal pericarditis with constriction of the heart is reported. The response to antibiotics and simple pericardial drainage was poor. Pericardietomy and decortication of the heart was performed on a moribund patient. Marked improvement followed surgery combined with intensive antibiotic therapy. At follow-up eight months later, the patient was a normal active 6-year-old boy.

CASE REPORT

A 51-year-old boy was admitted to Alder Hey Children's Hospital, Liverpool, in January 1969, complaining of dyspnoea and dull abdominal pain referred to the left shoulder. At the onset of the illness, two weeks earlier, he had had influenza-like symptoms, and had been treated by his doctor with salicylates and tetracycline. The day before admission his general condition had deteriorated, he had vomited several times, and he had loose stools. The abdominal pain, shoulder pain and dyspnoea came on at the same time. There was no evidence of sepsis detectable as an antecedent to this illness.

On examination in hospital the boy was irritable and looked ill but was not cyanosed. The pulse rate was 114 beats/minute, regular but of small volume. The jugular veins were dilated as high as the angle of the jaw. The blood pressure was 100/50 mmHg and respiratory rate 24/minute. The heart sounds were distant with no murmurs and no pericardial rub. The percussion note was impaired and air entry was diminished in the left lower chest posteriorly. The abdomen was distended due to a smooth, tender, enlarged liver palpable five fingerbreadths below the costal margin. There was no oedema of the feet or sacrum.

The ECG showed low voltage complexes with flattened T waves. A radiograph of the chest showed a large pericardial effusion, and a small pleural effusion on the left side. The WBC was 16,000 cells/mm³ and the haemoglobin was 11·3 g/100 ml of blood.

A diagnosis of acute pericarditis with tamponade was made, and urgent pericardiocentesis was done under local anaesthesia. Pus, 300 ml, was aspirated, and 600,000 units of penicillin and 0·5 g of streptomycin were instilled into the pericardium. Digoxin, 0·25 mg eight-hourly for three doses and then twice daily, and frusemide (Lasix), 10 mg daily, were given.

Culture of the pus from the pericardium was reported next day as being positive for Staphylococcus pyogenes. The antibiotics were changed to ampicillin, 250 mg, and cloxacillin, 250 mg, by injection every six hours. On the third day, as the cardiac shadow was still large and as evidence of tamponade persisted, the pericardium was drained through an epicardiac incision. The tamponade was relieved.

On the fifth day a left pleural effusion was drained through an intercostal tube and 600 ml of serosanguinous fluid was obtained. By the fourteenth day, the condition of the patient was deteriorating in spite of treatment; the cardiac shadow had increased in size with further evidence of cardiac tamponade; the haemoglobin was 9·6 g/100 ml of blood, and the WBC 13,000 cells/mm³. Pus from the pericardium still grew Staph. pyogenes on culture. The radiograph and ECG are shown (Figs 1 and 2). No blood culture was done in view of the positive culture from the pericardium.

The patient was transferred to the Cardio-thoracic Surgical Unit at the Royal Liverpool Children's Hospital. That evening a left anterior thoracotomy at the upper border of the sixth rib was done. Further exposure was obtained by dividing the costal cartilages at the costal margin on the right and left sides. The sternum was retracted upwards. At operation there was a 1 cm thick pericardium, with thick pus and granulation tissue on the epicardium. The cardiac action appeared very sluggish. An extensive pericardiectomy and decortication was done to free the ventricles. The activity of the heart increased dramatically. The anaesthetist commented on the improvement of perfusion of the extremities. An attempt at freeing the right atrium was abandoned as the myocardium was very friable. A small tear of the atrium was sutured. Both pleural cavities were opened during pericardiectomy. They were macroscopically normal except for seropurulent fluid on both sides. Bilateral pleural drains were inserted. The patient was given parenteral antibiotics, erythromycin, 200 mg, chloramphenicol, 150 mg, and methicillin, 500 mg, all six-hourly, together with digoxin, 0·0625 mg eight-hourly, and chlorothiazide, 250 mg daily.

The patient was very unwell during the first postoperative week. The left pleural drain was removed.
FIG. 1. Preoperative radiograph showing bilateral pleural effusion and large cardiac shadow.

FIG. 2. Preoperative ECG showing low-voltage complexes and flattened T waves.
FIG. 3. Radiograph eight months after pericardiectomy.

FIG. 4. ECG eight months after pericardiectomy.
after 36 hours. The right pleural drain continued to
discharge serous fluid amounting to approximately
200 ml per day which gradually tailed off. The tube
was removed at the end of seven days. He was
anaemic and hypoproteinaemic. The serum bilirubin
was 6-3 mg/100 ml. The left hemidiaphragm was
raised, probably due to injury to the phrenic nerve
during pericardiectomy.

During the second postoperative week he gradually
improved; there was a fall in jugular venous pres-
sure; the pulse volume improved; the hepatomegaly
decreased; the icterus receded and the anaemia was
corrected. There was no evidence of recurrence of
infection. He was sent home in April 1969 after a
total of two and a half months in hospital.

When last seen eight months after his illness, he
was attending school and had a normal jugular venous
pressure and a liver palpable 2-5 cm below the
costal margin. The chest was clear. The chest radi-
graph and ECG were normal, as shown in Figs 3 and
4.

COMMENT

Staphylococcal pericarditis is an uncommon
disease. Cases reported in the literature appear
to be only among children. Many of the cases
were associated with sepsis elsewhere, e.g., osteo-
myelitis and pneumonia. Reports of a surgical
approach to treatment of staphylococcal peri-
carditis are few.

Keith, Rowe, and Vlad (1958) consider that
pyogenic pericarditis should be treated by suitable
antibiotics combined with repeated pericardial
aspiration or, if necessary, pericardiostomy. Horan (1957) agrees with this view. Benzing and
Kaplan (1963), supporting this line of treatment,
quote eight cases so treated with 100% survival.
One of their cases subsequently had a pulmonary
valvotomy and no abnormality of the pericardium
was seen. More recently, Sanyal, Kaur, Hooja,
Thapar, and Vaishnava (1970), reporting six cases
from India, have similar views, though there was a
fatal termination in four of the six patients.

The need for surgery is suggested by a case
seen in 1944 and reported by Farber and Vawter
(1965). This 12-year-old boy had staphylococcal
pyaemia with pericardial constriction due to
staphylococcal pericarditis. He died during induc-
tion of anaesthesia for pericardiectomy. Ranti,
Irwan, and Gan Yong Bing (1965) describe two
10-year-old boys treated successfully by peri-
cardiectomy for staphylococcal pericarditis. They
mention the value of the instillation of strepto-
kinase in helping to resolve the fibrinous exudate.
Gomez, Nakpil-Miranda, Aguayo, and Bote-
Martinez (1964) report a successful pericardi-
ectomy and stress the value of using streptokinase-
streptodornase (Varidase) locally on the heart,
as well as systemically, to help fibrinolysis.

In a report of three cases of staphylococcal peri-
carditis, Morgan (1964) describes one patient
who had been treated with antibiotics alone, one with antibiotics and pericardiostomy, and the other with pericardi-
ectomy; in addition, Folger (1966) reports one
case, seen at necropsy, that had a thick layer of
constricting granulation tissue. Subsequently, he
successfully excised a 3-4 mm thickened peri-
cardium in a girl of 9 months on the fourth day
of illness from staphylococcal pericarditis.

A patient with pyogenic pericarditis poses two
therapeutic problems—one a generalized septic,
aemia and toxicity, the other the mechanical
embarrassment of the heart. Our patient was in
great danger of death from the second cause.

Though he had been treated for 14 days, probably
due to inadequate drainage and inadequate an-
tibiotics, the sepsis was also uncontrolled. The
recognition of the mechanical element in this
patient’s disease led to surgical decortication. The
slow recovery from the infection with Staph.
pyogenes was then possible.

It was gratifying to see that a moribund child
could be returned to good health.

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to report this case, and to Dr. P. P. Rickham and Dr. R. S. Jones, who also treated
this patient.

REFERENCES


Conference, Children’s Hospital Medical Center,

Folger, G. M. Jr. (1966). Suppurative pericarditis—review
of the problem plus observations on two patients.

Gomez, R. A., Nakpil-Miranda, R., Aguayo, L., and Bote-
Martinez, R. (1964). Massive staphylococcal pyo-
cardium with acute cardiac tamponade: the role of
early pericardiectomy and cardiac decortication with
Pediatics, 19, 36.

Keith, J. D., Rowe, R. D., and Vlad, P. (1958). Heart
Disease in Infancy and Childhood. Pp. 679–700. Mac-
millan, New York.

Morgan, J. (1964). Case reports. Pericardial tamponade as
a complication of staphylococcal pericarditis. Canad. med.
Ass. J., 90, 1082.

Ranti, I. S. F., Irwan, S. S., and Gan Yong Bing (1965). Rapid
radial pericardial resection in purulent pericarditis: a
report of two cases. Paediat. indones., 5, (suppl.), 390.
Sanyal, S. K., Kaur, I., Hooja, V., Thapar, M. K., and
45, 198.