The Postpericardiotomy Syndrome and Other Major Complications of Open Heart Surgery

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Open-heart surgery for the correction of heart defects now appears to be a safe and generally successful procedure; however, since the complication rate is still quite high, the authors point out the continued need for careful selection of patients for this type surgery.

INTRODUCTION

ALTHOUGH THE advent of safe total cardiopulmonary by-pass and open heart surgery has allowed the correction of cardiac defects in patients previously destined to shortened and limited lives, it must be remembered that much remains to be learned about such surgery and consequently complications are still fairly common and modifications of technique are still frequent. A few of the new operative and postoperative problems thus far reported include: (1) heart block,¹ (2) "malignant" bacterial endocarditis,² (3) massive hemolysis,³ (4) air embolus,⁴ (5) blood dyscrasias,⁵ (6) alveolar collapse,⁶ (7) postperfusion digitalis hypersensitivity,⁷ (8) ruptured sinus of Valsalva,⁸ (9) postperfusion syndrome,⁹ and (10) postpericardiotomy syndrome.¹⁰ It is the purpose of this paper to present a typical case of the postpericardiotomy syndrome and to review the etiology, diagnosis, and treatment of this entity. Additionally, the incidence of the postpericardiotomy syndrome as well as other major complications associated with 109 open heart operations on infants and children at the Children's Memorial Hospital, University of Oklahoma Medical Center, during the past three years (1959-1962) will be briefly reviewed.

CASE REPORT

This 13-year-old white boy was admitted to the Children's Memorial Hospital for the third time on 1/7/62, because of fever, cough, and shoulder pain. He had had open heart correction of valvar pulmonary stenosis on 12/20/61, using normothermic total cardiac by-pass. He was on extracorporeal circulation for 17 minutes. The total operating time had been 35 minutes. Except for a low grade fever, his postoperative course was not unusual. Two days prior to the present admission (16 days postoperative) he developed fever, a non-productive cough, and arthralgia involving both shoulders.

Physical examination on admission revealed a pulse rate of 140, regular respirations at a rate of 40, temperature 103.8° F.,...

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On the second hospital day, a left thoracentesis was performed and 300 ml. of serosanguineous fluid removed. Cultures of this fluid were negative.

A diagnosis of the postpericardiotomy syndrome with both pleural and pericardial effusions was made.

The patient was placed on bed rest and continued to be febrile for the first five days of his hospitalization. Codeine was administered on three occasions for severe anterior chest pain. Chest pain was aggravated by deep breathing and coughing. After the sixth hospital day he showed gradual improvement, became afebrile and was discharged on 1/17/62, to continue limited indoor activities at home.

He was re-admitted to the hospital on 1/21/62, with a two day history of chest pain, left shoulder pain, and fever. At this time he again appeared moderately ill and had splinting of respirations. The pulse rate was 156, the respiratory rate 32, temperature 101.6°F, and blood pressure 100/70. The physical findings were unchanged from his previous examination.

Laboratory studies revealed a hemoglobin of 12.5 gm. per cent and a white blood count of 25,900 with 86 per cent polymorphonuclears. Chest x-ray showed no pleural fluid and a decrease in cardiac transverse diameter. The EKG was unchanged from the previous admission. The sedimentation rate was 43, the A.S.O. 166, C.R.P. negative, and S.G.O.T. 16 units. Three blood cultures were sterile.

He was again placed on bed rest and on the day following admission started on 3,000 mg. of aspirin daily. He continued to have chest pain and a spiking fever to 103°F. The aspirin dosage was increased to 6,000 mg. daily on the fourth day. Within 24 hours he was afebrile and symptomatically improved. The remainder of his hospital course was unremarkable. He remained afebrile and his white blood cell count dropped to 8,450. The sedimentation rate remained elevated. There was a progressive decrease in the size of his cardiac silhouette. He was discharged on 2/7/62. Until present, he has continued on aspirin and limited activities at home and has remained asymptomatic.
The case presented was the most severe of six cases of the postpericardiotomy syndrome thus far recognized at this center. Although the syndrome can be associated with marked and prolonged morbidity, in contrast to the original concept it is unlikely to represent a threat to life unless the cardiac defect has not been improved by the surgical procedure. Ito, et al., first postulated, that the postcommisurotomy syndrome following surgery for rheumatic mitral stenosis and the postpericardiotomy syndrome following surgery for congenital heart lesions are the same. Although the pathogenesis is not completely understood, most workers feel the syndrome is related to an auto-immune reaction associated with the presence of blood or serum in the pericardium. Postinfarction pericarditis and pericarditis in patients following penetrating stab wounds of the chest are probably of similar etiology.

Table 1 lists the clinical and laboratory findings and their approximate incidence in the postpericardiotomy syndrome. Pleuritic chest pain associated with rapid, shallow respiration and cough suppression is common and increases the risk of postoperative bronchopneumonia. The syndrome most commonly has its onset during the second postoperative week but may occur many months after surgery. Symptoms usually last one to two weeks but can persist for a month or more. Relapses have occurred as long as a year after surgery. The incidence of the syndrome in patients undergoing open heart surgery has varied from as low as 10 per cent to as high as 40 per cent. Blood and pericardial and pleural fluid cultures are sterile.

Differential diagnosis of the postpericardiotomy syndrome from complicating postoperative pulmonary, pleural, and cardiac bacterial infections is often difficult. Because of the potential serious consequences of delayed therapy for bacterial cardiac infections in the postoperative period, it is likely that many patients with the postpericardiotomy syndrome have been treated for four to six weeks with antimicrobials because of suspected bacterial endocarditis.

Since the etiology of the postpericardiotomy syndrome is not certain, specific treatment is not available. Adrenal steroids have been reported to be of clinical benefit. Some investigators recommend that steroids be used routinely not only for therapy but also as prophylaxis to reduce the incidence of this syndrome. Because of the usual benign nature of this disease, the lack of residual complications and the possible confusion with bacterial infections, the routine use of steroids does not appear indicated and may be hazardous. Elster has felt that prolonged aspirin therapy shortens the duration of symptoms due to the postcommisurotomy syndrome.
syndrome and may be useful in preventing the disease. Aspirin in high daily dosage was used in two of our cases of the postpericardiotomy syndrome with apparent good response. Aspirin was administered only sporadically in the other four cases of this syndrome of our experience. The others had more benign symptoms of shorter duration.

Our total experience with the postpericardiotomy syndrome as well as other major complications associated with open heart surgery is listed on table 2. The high incidence of major complications in our patients (35 per cent) is not higher than the experience of other groups. Complications have proved fatal in nine of our patients. Although our operative mortality is zero for the correction of uncomplicated intracardiac lesions (62 patients) and only seven per cent for patients with complicated and uncomplicated surgically correctable lesions (99 patients), the high incidence of complications emphasizes the seriousness of this type surgery and makes it apparent that the mere presence of a reparable intracardiac defect is not adequate indication for open heart surgery. Surgical decisions must still be made carefully for each individual patient on the basis of medical versus surgical risk and the expected surgical gain.

**SUMMARY**

A patient with the postpericardiotomy syndrome is presented and this and other complications following open heart correction of congenital heart defects in 109 infants and children are reviewed. Although open heart surgery now can be performed with a low mortality, the incidence of complications is still high. Many of the complications are poorly understood and unavoidable. Patient selection for open heart surgery therefore must continue to be very critical.

At the present time, patients with intracardiac defects causing no significant physiological abnormality probably should not be subjected to surgical correction.

**REFERENCES**


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