CASE REPORTS

The phonocardiogram in a partially detached mitral (Starr-Edwards) prosthesis

M. V. JEEVA RAJ
M.B.B.S., M.R.C.P.

C. R. A. CLARKE
M.B., M.R.C.P.

H. A. FLEMING
M.D., M.A., F.R.C.P.

Cardiac Unit, Papworth Hospital, Cambridge CB3 8PZ

Summary

Phonocardiographic evidence of extreme variability of the time interval between the aortic sound (A_2) and the opening click (OC) with intermittent absence of the OC of a partially detached mitral prosthesis of the Starr-Edwards type has not hitherto been reported. This case illustrates the diagnostic use of phonocardiography in a malfunctioning mitral Starr-Edwards prosthesis.

Case report

A 38-year-old man having had two mitral valvotomies when aged 21 and 35 years, had his mitral valve replaced with a Starr-Edwards prosthesis (size 4M; series 6320) a year later in 1970. In May 1972 he developed β -haemolytic streptococcal endocarditis, an infected gum being the probable source of infection. During the fifth week of penicillin treatment he suddenly became ill with pulmonary oedema from clinically significant mitral reflux. Relentless progression of pulmonary oedema despite medical treatment coupled with significant mitral reflux and his deteriorating general health prompted the need for further open heart surgery.

A pre-operative phonocardiogram showed extreme variability of the A_2 -OC interval (0.04-0.20 sec) with intermittent absence of the OC (Fig. 1).

Replacement of the mitral valve prosthesis was carried out on cardio-pulmonary by-pass on the same day. At operation the prosthesis was found to be about 50% detached around the circumference and with gentle traction most of the remaining fixation gave way.

There was no active granulation tissue visible, either on the valve or in the valve ring and there was no evidence of clot on the prosthesis. The prosthetic bed was oedematous and contained fibrous tissue. A new Starr-Edwards (6320) mitral prosthesis was inserted.

The patient made satisfactory progress and a post-operative phonocardiogram showed a normal A_2 -OC interval (0.08 sec) (Fig. 2).

Histopathology

Starr-Edwards prosthesis 39 mm external diameter, lumen 19 mm, partial endothelialisation of atrial surface with a few flecks of thrombus adherent to the rim of orifice with slightly fluffy thrombotic projections into the orifice. Circumferential fraying of dacron noted.

Discussion

The ball in the Starr-Edwards mitral prosthesis produces a sound on closure (closing click) which is analogous to the mitral component of the first heart sound and, on opening, another sound (opening click) which corresponds to the opening snap in mitral stenosis.

A phonocardiographic study of patients with the Starr-Edwards mitral prosthesis by Hultgren and Hubis (1965) has shown that the normal A_2 -OC interval is 0.07-0.15 sec, with a mean of 0.11 sec.

The absence of the OC in dehiscent mitral (Starr-Edwards) prosthesis has been reported by Leachman and Cokkinos (1969) and a similar finding in massive thrombus of the mitral (Starr-Edwards) prosthesis reported by Spencer, Trimble and Reeves (1965). Lee *et al.* (1970) have reported phonocardiographic evidence of variability of the A_2 -OC interval with intermittent absence of the OC in three cases of a malfunctioning Cutter-Smeloff mitral prosthesis. At operation, the balls showed yellowish discoloration, but no disruption of sutures or thrombosis of the prosthesis. 'Ball variance' was found to be the cause.

Dehiscence and ball impingement in the cage, partly contributed to by the malpositioned mitral prosthesis secondary to paravalvar reflux, would

FIG. 1. Pre-operative phonocardiogram showing extreme variability of A_2 -OC, interval (0.04-0.20 sec) with an absent opening click (OC).

FIG. 2. Postoperative phonocardiogram showing normal A_2 -OC, interval (0.08 sec). CC represents the closing click.

well account for the phonocardiographic features of extreme variability of the A₂-OC interval and the intermittent absence of the OC. The systolic murmur was in keeping with mitral reflux with its rate related variability.

In a very ill patient with a malfunctioning mitral Starr-Edwards prosthesis we feel that the phonocardiographic findings can be a useful bedside adjunct to the physician and the cardiac surgeon in the assessment of prosthetic function when other methods may not be practicable.

Acknowledgment

We wish to thank Mr B. B. Milstein for his help and permission to publish this case.

Postgraduate Medical Journal (October 1975) **51**, 733-734.

Peripheral gangrene in polycythaemia vera

PAUL GÉTAZ
M.B., M.R.C.P.

PETER JACOBS
M.D., Ph.D., F.C.P., M.R.C.Path.

JANNIE H. LOUW
Ch.M., F.R.C.S., F.A.C.S.

Departments of Haematology and Surgery, University of Cape Town Medical School and Groote Schuur Hospital, Observatory, Cape Town, South Africa

Summary

A case of peripheral vascular disease which became gangrenous and led to a diagnosis of polycythaemia vera is described. Chemotherapy has been successful and surgical intervention avoided. The authors stress the importance of full haematological examination of any patient presenting with peripheral digital gangrene.

Introduction

Vascular complications in patients with the myeloproliferative syndrome are common, but it is rare for digital ischaemia to be the presenting feature. It is the purpose of the authors to report such a case, to draw attention to the response to therapy, and to emphasize some of the surgical hazards in patients with this condition.

Case report

A 45-year-old Caucasian female first presented at the age of 36 with peripheral vascular disease. Her haemoglobin was 16 g/100 ml, WBC 15,100/mm³ and platelets 430,000/mm³. Bilateral lumbar sym-

References

- HULTGREN, H.N. & HUBIS, H. (1965) A phonocardiographic study of patients with Starr-Edwards mitral prosthesis. *American Heart Journal*, **69**, 306.
- LEACHMAN, R.D. & COKKINOS, D.V.P. (1969) Absence of the opening click in dehiscence of mitral valve prosthesis. *New England Journal of Medicine*, **281**, 461.
- LEE, S.J.K., ZARAGOZA, A.J., CALLAGHAN, J.C., COUVES, C.M. & STERNS, L.P. (1970) Malfunctioning of the mitral prosthesis (Cutter-Smeloff); clinical and hemodynamic changes in three cases. *Circulation*, **91**, 479.
- SPENCER, F.C., TRIMBLE, J.K. & REEVES, R.T. (1965) Successful replacement of a thrombosed mitral ball-valve prosthesis. *Journal of the American Medical Association*, **194**, 11.

pathectomy provided symptomatic relief until the age of 43 when she presented with a similar 8-month history of pain and colour changes aggravated by the cold. Haemoglobin was 17.7 g/100 ml, PCV 53.8% and WBC 14,900/mm³. Response to Rheomacrodex was complete.

Two years later she was admitted with early gangrene of the right little toe, and both liver and spleen were palpable 4 cm below the costal margins. Haematology was essentially unchanged. Rheomacrodex led to improvement, but 2 months later she was re-admitted with extensive dry gangrene of the toe. Haemoglobin was 16.6 g/100 ml, PCV 48.4%, WBC 23,900/mm³, and platelets 625,000/mm³. Bone marrow aspiration and trephine biopsy confirmed the presence of myelofibrosis. She was started on chlorambucil 8 mg and aspirin 300 mg daily with venesection as required to maintain her PCV at 40-45%. On this regime her haemoglobin and platelets have fallen, and the white count decreased to just above the upper limit of normal. Surgical intervention has been avoided, and her toe has healed progressively.