with consequent prosthesis-patient mismatch[3]; in fact, the prosthetic aortic valve index at operation, calculated retrospectively, was 1.5 cm^2/m^2. Significant transaortic systolic gradients have been reported postoperatively with small-sized Hancock xenografts.[4] In the present case stenosis was made worse by fibrous tissue overgrowth on the cusps, which is observed mainly on the mitral porcine prostheses,[1] and by central impingement of the valve prongs. The latter has recently been recognized as a cause of hemolysis[5] and thrombus formation,[6] both of which were absent in our case. Currently, concern exists that the standard orifice Hancock valve may not be a suitable substitute for the native aortic valve in the presence of a narrowed anulus if surgical enlargement of the latter is not performed.[7] The case herein reported provides evidence that the already unfavorable ratio of internal to external diameter of small-sized Hancock valves may be worsened, even in the absence of structural changes of the cusps, by fibrous tissue overgrowth and inward bending of the struts, an association previously unreported.

REFERENCES

1. Bortolotti U, Gallucci V, Casarotto D, Thiene G: Fibrous tissue overgrowth on Hancock mitral xenografts: a cause of late prosthetic stenosis. Thorac Cardiovasc Surg **27**:281, 1979.
2. Alam M, Goldstein S: Echocardiographic features of a stenotic porcine aortic valve. AM HEART J **100**:517, 1980.
3. Rahimtoola SH: The problem of valve prosthesis-patient mismatch. Circulation **58**:20, 1978.
4. Jones EL, Carver JM, Morris DC, King SB III, Douglas JS Jr, Franch RH, Hatcher CR Jr, Morgan EA: Hemodynamic and clinical evaluation of the Hancock xenograft bioprosthesis for aortic valve replacement (with emphasis on management of the small aortic root). J Thorac Cardiovasc Surg **75**:300, 1978.
5. Magilligan DJ, Fisher E, Alam M: Hemolytic anemia with porcine xenograft aortic and mitral valves. J Thorac Cardiovasc Surg **79**:628, 1980.
6. Salomon NW, Copeland JC, Goldman S, Larson SF: Unusual complication of the Hancock porcine heterograft: Strut compression in the aortic root. J Thorac Cardiovasc Surg **77**:294, 1979.
7. Lurie AJ, Miller RR, Maxwell KS, Grahl TM, Vismara LA, Hurley EJ, Mason DT: Hemodynamic assessment of the glutaraldehyde-preserved porcine heterograft in the aortic and mitral position. Circulation **56**(suppl II):104, 1977.

Radiographic pseudofracture of the Medtronic bipolar polyurethane pacing lead

Thomas E. Dunlap, M.D., Kishor D. Popat, M.B., and Richard P. Sorkin, M.D. *Westland, Mich.*

From the Division of Cardiology, Department of Internal Medicine, The University of Michigan, and Wayne County General Hospital.

Received for publication May 26, 1981; accepted July 14, 1981.

Reprint requests: Thomas E. Dunlap, M.D., 1111 Sonoma Ave., Santa Rosa, CA 95405.

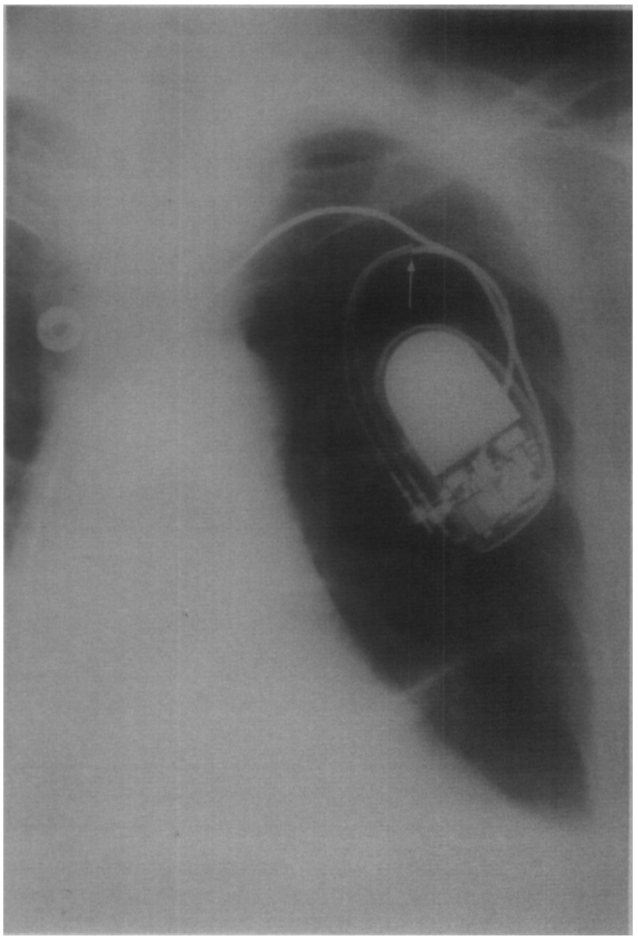

Fig. 1. Standard posteroanterior chest radiograph demonstrating the appearance of the Medtronic 6972 lead in one patient. Note areas of discontinuity *(arrows)*. The system performed normally, ruling out lead fracture.

The radiographic appearance of fractures in permanent cardiac pacemaker system leads has been well described in previous articles.[1-3] However, during the present era cardiac pacing is experiencing a plethora of technological innovations. One of these innovations has been the transvenous polyurethane endocardial lead. We present here a graphic demonstration of the normal appearance of the Medtronic 6972 bipolar polyurethane lead and how its appearance on chest x-ray examination may simulate lead fracture (Figs. 1 and 2).

The construction of the lead is of a coaxial design, and at the bifurcation of the outer coil from the inner coil the outer coil is offset from the inner coil (Figs. 3 and 4). It is at this offset area that the wire can appear discontinuous, thus simulating lead fracture on a standard radiographic view. In fact, this is the normal appearance. We present these data to familarize physicians working with pacemakers and pacemaker radiography about this "pseudofracture" appearance. It is important to recognize this feature in order to avoid an unnecessary lead explantation.

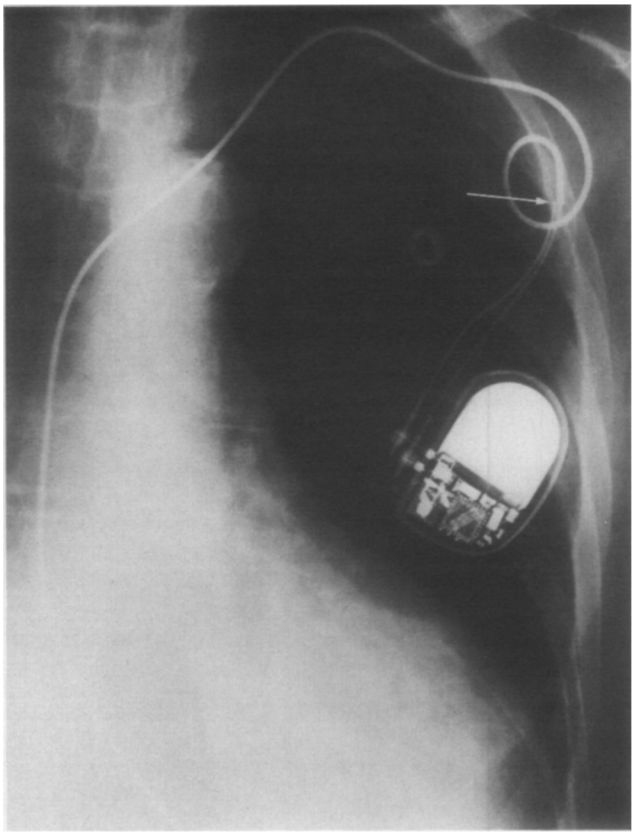

Fig. 2. Posteroanterior chest radiograph from another patient, showing the 6972 lead. The system performed normally, ruling out lead fracture. See legend to Fig. 1.

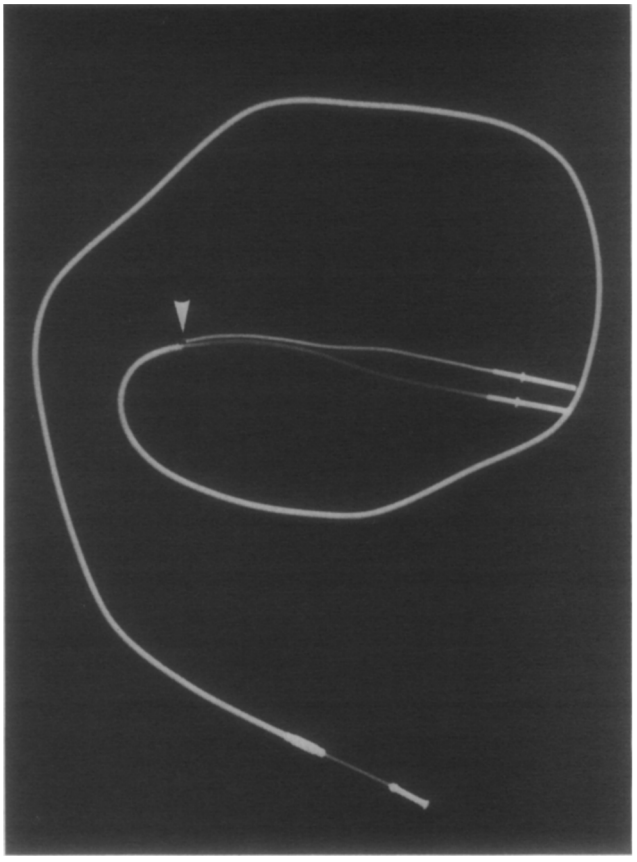

Fig. 3. Radiograph of the 6972 lead alone. Note area of discontinuity *(arrowhead)*.

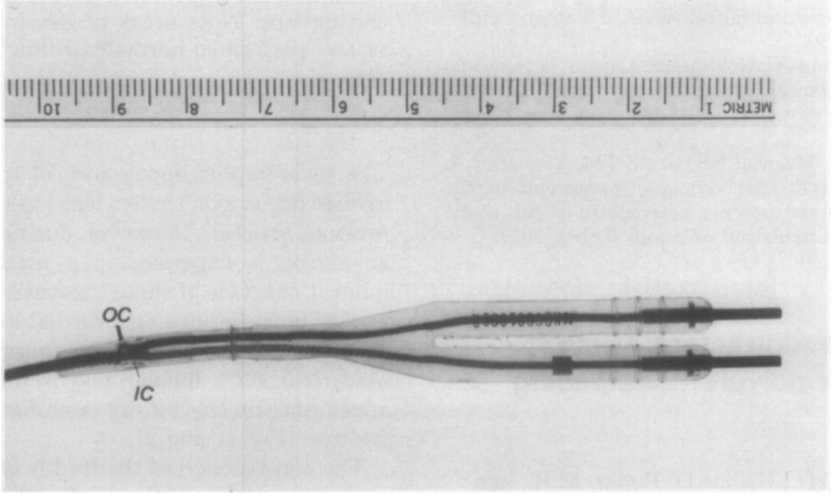

Fig. 4. Photograph of the 6972 lead. Note area where the outer coil *(OC)* crosses over to form a bifurcation. *IC* = inner coil.

REFERENCES

1. Sorkin RP, Schuurman BJ, Simon AB: Radiographic aspects of permanent cardiac pacemakers. Radiology **119**:281, 1976.
2. Hall WM, Rosenbaum HD: The radiology of cardiac pacemakers. Radiol Clin North Am **9**:343, 1971.
3. Kaul TK, Baim WH: Radiographic appearances of implanted transvenous endocardial pacing electrodes. Chest **72**:323, 1977.