

# This Week's Citation Classic

CC/NUMBER 26  
JUNE 27, 1983

**Barlow J B, Bosman C K, Pocock W A & Marchand P. Late systolic murmurs and non-ejection ("mid-late") systolic clicks: an analysis of 90 patients. *Brit. Heart J.* 30:203-18, 1968. [CSIR Cardio-Pulmonary Res. Unit and Cardiovasc. Res. Unit, Depts. Med. and Thoracic Surg., Univ. Witwatersrand, and Cardiac Clinic, Gen. Hosp., Johannesburg, South Africa]**

This paper reaffirmed that late systolic murmurs and mid-systolic clicks are intracardiac in origin. These auscultatory features, a characteristic electrocardiographic pattern, and billowing of the posterior mitral leaflet constitute a specific and common syndrome. Diverse etiological factors can result in mitral valve prolapse. [The *SCJ*<sup>®</sup> indicates that this paper has been cited over 295 times—the second most-cited paper ever published in *Brit. Heart J.*]

J. B. Barlow  
Department of Cardiology  
University of the Witwatersrand  
and  
Johannesburg Hospital  
Johannesburg 2001  
South Africa

May 4, 1983

"My interest in auscultation, phonocardiography, and the effects of vasoactive maneuvers on heart sounds and murmurs was kindled in the late-1950s when I was medical registrar to John McMichael and John Shillingford at the Postgraduate Medical School in London. During that time, I observed an abnormal mitral chorda tendinea at the necropsy of a patient who had had an isolated mid-systolic click. Completely independent of that unpublished observation, my compatriot, J.V.O. Reid, postulated<sup>1</sup> a mitral valve origin for mid-systolic clicks and suggested that mitral regurgitation may be an associated feature.

"Using left ventricular cineangiocardiography and the effects of various vasoactive maneuvers, we concluded<sup>2</sup> that late systolic murmurs denoted mitral regurgitation and that mid-systolic, which I later called 'non-ejection',<sup>3</sup> clicks also arose at the mitral valve. Nonetheless, an extracardiac origin for these auscultatory features had been widely accepted and when I had the opportunity, in April 1964, to address the staff of Johns Hopkins Hospital, and it was known that I intended to present additional evidence of an intracardiac origin, I was introduced by B. Tabatznik as an 'iconoclast'.<sup>3</sup>

The cardiologists at that famous institution accepted my conclusions but I remain indebted to one of them, J.M. Criley, for correcting a serious cineangiographic misinterpretation of mine.<sup>3</sup> It was Criley, in fact, who subsequently introduced the term 'prolapse' to describe the mitral valve anomaly. There were important aspects of mitral valve prolapse to explore at that time and my co-worker and friend, Wendy Pocock, contributed very significantly to all of the original observations.

"All research workers appreciate the frustrations which may be encountered before publication by a prestigious journal. Neither our original paper<sup>2</sup> nor a later study,<sup>4</sup> in which we recorded potentially fatal arrhythmias after exercise, were accepted by *Circulation*. The major reason for rejecting the first paper was our 'overstated conclusion that all systolic murmurs which are mainly or exclusively in late systole are due to mitral leak.' Critiques by reviewers of the second paper were so derogatory that the editor seemed apologetic when he wrote, 'I hope that you will regard them as being objective and of having some merit.' This Citation Classic was also rejected by *Circulation* because the editor could not 'assign it a sufficiently high priority.' It was published by the *British Heart Journal* only after it had been considerably abbreviated. After much encouragement from T.H. Bothwell, head of the department of medicine, I submitted the detailed data to this university for my MD thesis.

"This paper has been highly cited because it was the first to review or to describe the multiple features of mitral valve prolapse in a relatively large number of subjects. It discussed many problems which are still unresolved and thus continued to arouse much interest. Jeresaty's monograph<sup>5</sup> remains the most comprehensive review while our own current thoughts on the significance of this frequently diagnosed condition have recently been summarized.<sup>6</sup>

"Although I have received no specific awards or honors, the work has resulted in international recognition including use of the eponym for the 'specific syndrome' which I had described.<sup>3</sup> Most rewarding for me, however, has been the consequence that cardiologists from many countries now apply to work in this department."

1. Reid J V O. Mid-systolic clicks. *S. Afr. Med. J.* 35:353-5, 1961.

2. Barlow J B, Pocock W A, Marchand P & Denny M. The significance of late systolic murmurs. *Amer. Heart J.* 66:443-52, 1963.

[The *SCJ* indicates that this paper has been cited in over 225 publications since 1963.]

3. Barlow J B. Conjoint clinic on the clinical significance of late systolic murmurs and non-ejection systolic clicks. *J. Chron. Dis.* 18:665-73, 1965.

4. Pocock W A & Barlow J B. Post-exercise arrhythmias in the billowing posterior mitral leaflet syndrome. *Amer. Heart J.* 80:740-5, 1970.

[The *SCJ* indicates that this paper has been cited in over 80 publications since 1970.]

5. Jeresaty R M. *Mitral valve prolapse*. New York: Raven Press, 1979. 251 p.

6. Barlow J B, Pocock W A & Obel I W P. Mitral valve prolapse: primary, secondary, both or neither? *Amer. Heart J.* 102:140-3, 1981.