Mitral paraprosthetic leak diagnosed by transesophageal echocardiography through nasal way

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Abstract
Paraprosthetic leaks are a postoperatively complication recurring with a frequency from 15 to 30%, and mostly in the mitral than in the aortic position. Transthoracic echocardiography can suspect prosthesis valve dysfunction, but for both diagnosis and evaluation of the paraprosthetic dysfunction severity, transesophageal study is required. In this report a mitral paraprosthetic dehiscence was diagnosed using a miniaturized, 10 F, monoplane probe inserted through nasal way. This technique, that do not require topical and general anestesia, appears to be well tolerated providing an accurate and more comfortable examination.

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Introduction
Paraprosthetic leaks are the major complication of prosthetic valves,\textsuperscript{1} remaining a substantial source of morbidity and mortality. Their prevalence is about 15%, with higher frequency in mitral (31%) than in aortic position (14%),\textsuperscript{2,4} and the average time of presentation is nine months after surgery.\textsuperscript{4} They can be due to a suture’s rupture or to an endocarditis infection. Although transthoracic echocardiography (TTE) is the method of choice for the non-invasive assessment of prosthetic valves, for diagnosis of paraprosthetic jet transesophageal echocardiography (TEE) is required.\textsuperscript{5–9} We report a mitral bioprosthesis

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dehiscence diagnosed by a TEE through nasal way (TEENW).

Case report

A 73-year-old man, with a porcine mitral valve implanted three months before, referred for congestive heart failure. On presentation, heart rate was 64 b/m, arterial blood pressure 120/70 mmHg and a severe dyspnea as well as a massive pansystolic murmur were present. ECG showed atrial fibrillation and a strain pattern. TTE demonstrated bi-atrial and left ventricular dilatation with a normal systolic function. Also, it suspected a para-prosthetic leak. Clinical condition prompted us to avoid standard TEE and to perform a TEENW, using a miniaturized, 10F, multifrequency (5.5–10 MHz), monoplane probe (AcuNav, Acuson/Siemens), developed for intracardiac ultrasounds. With the patient supine, without topical and general anesthesia, the transducer has been inserted, with a lubricant jelly, through a nostril. Two-dimensional image of TEENW, corresponding to a 60–90° view of a standard TEE, demonstrated a normal bioprosthetic valve, and a large area of postero-medial dehiscence (Fig. 1). Color-flow imaging showed a severe eccentric paraprosthetic jet deforming the atrial septum (Fig. 2). Pulsed-Doppler interrogation of the left upper pulmonary vein revealed a prominent systolic backflow confirming the severe paraprosthetic regurgitation (Fig. 3). No variation of both blood pressure and O2-saturation were registered. Also, no complication occurred during and after the procedure. Patient underwent to a re-surgery, but he died for disseminated intravascular coagulation.

Discussion

Bioprostheses or mechanical valve dysfunction is a postoperatively complication that recurs with a prevalence of 15–30%. Besides, mitral paraprosthetic leaks are more frequent than these in the aortic position, and haemodynamically significant jets are treated by re-surgery. Although TTE can suspect a paraprosthetic dehiscence, TEE is generally required for diagnosis. In a recent study the AcuNav probe, was used for transesophageal examination with a good results. Moreover, previous reports, using a transesophageal prototype probe, demonstrated the nose to be a good
alternative approach for TEE. We used the AcuNav catheter and the nasal approach to evaluate this clinical question. The nasal way, that avoids attempt at vomiting and choking sensation, provided a comfortable and short examination. Also, it did not require topical and general anesthesia, removing possible complications as hypotension, mental changes, and allergic reactions.

Conclusion

This report suggests the feasibility of the emerging nasal approach, using the AcuNav transducer, to reach the esophagus. Moreover, this technique showed a good accuracy in this clinical investigation.

TEENW might offer a feasible and equivalent echocardiographic alternative to standard TEE, especially in elderly patients, for target investigations.

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