Uncommon acquired Gerbode defect (left ventricular to right atrial communication) following a tricuspid annuloplasty without concomitant mitral surgery

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Left ventricular (LV) to right atrial (RA) communication, also known as Gerbode defect, is very rare, usually congenital but sometimes also acquired. Cases of Gerbode defect have been reported after left valve surgery, usually valve replacement. We describe the first case of LV-RA communication following a tricuspid annuloplasty not combined to a left valve surgery. The case we report concerns a 73-year-old woman who underwent a double-valve surgery (pulmonary valve replacement and tricuspid annuloplasty) for symptomatic severe right heart failure due to post-endocarditis pulmonary valve regurgitation. A LV–RA shunt was discovered 1 year after surgery. This case report confirms the responsibility of a tricuspid annuloplasty in an acquired LV–RA shunt.

KEYWORDS
Valve disease; Tricuspid valve annuloplasty; Gerbode defect

Introduction
Tricuspid annuloplasty is a valve surgery, mainly used in acquired tricuspid insufficiency. It is a safe and effective method, with few complications. We report here an uncommon complication, which appeared 1 year after surgery.

Case report
A 73-year-old woman with a long medical history is regularly checked at the cardiology consultation in our institution. Several years before, in 1999, she developed an isolated pulmonary valve endocarditis (Streptococcus mitis) treated successfully with long-term antibiotics (5 weeks of vancomycin combined during the first 2 weeks with amikacine). After 6 months, the vegetation of the pulmonary valve was reduced by half, the patient presented no signs of infection or heart failure, and repeated haemocultures showed no germs. Besides this rare valvular affection, her medical history consisted of bilateral total knee arthroplasty, bladder fixation, monoclonal gammapathy, and an allergy to penicilline. Five years later, in 2004, she was hospitalized for major right heart failure with dyspnoea (NYHA III), oedema of the legs, and atrial fibrillation. An echocardiography was performed, showing a normal left ventricular (LV) size and function but a dilatation of the right ventricle (RV), a severe tricuspid regurgitation due to the dilatation of the RV and above all, severe pulmonary valve regurgitation. A treatment based on diuretics offered poor results. An unsuccessful attempt of conversion to sinus rhythm by cordarone and then by electrical cardioversion also failed to improve the patient. Owing to persistent right heart failure that could not be controlled by medical management, surgery was proposed. In May 2005, a double-valve surgery was performed with pulmonary valve replacement (Carpentier–Edwards porcine bioprosthesis of 25 mm) and tricuspid annuloplasty (Carpentier–Edwards ring of 32 mm). The result of the surgery was impressive showing major improvement in the clinical condition: clear reduction of dyspnoea (NYHA II), regression of the oedema of the legs, the persistence of sinus rhythm, and global improvement of the patient’s quality of life. A post-operative echocardiography was carried out showing a reduction of the right ventricle volume, a persistence of a very light tricuspid regurgitation, and a functional pulmonary valve with a light regurgitation. A year later, in August 2006, the patient expressed no particular complaints but a new and high degree (Grade 3/6) holosystolic cardiac murmur was
In this report, however, it is not clearly indicated which procedure (mitral valve replacement or tricuspid annuloplasty) seems responsible for the intracardiac shunt. A second case in the literature is reporting a 71-year-old woman with a history of mitral valve replacement and tricuspid ring annuloplasty (rigid prosthetic ring), developing a heart murmur 8 months after surgery. Echocardiography revealed an LV–RA communication. According to the authors, a dehiscence of the tricuspid ring could have created a tear of the atrio-ventricular membranous septum, leading to the LV–RA shunt. However, it cannot be excluded that the mitral valve replacement could have an impact on the emergence of the shunt, for example, by weakening the atrio-ventricular septum. The case we described, to the best of our knowledge, is the first case that reports the appearance of an LV–RA communication following a tricuspid annuloplasty alone, not combined with a left-side valve surgery, showing the possibility of such a complication after the placement of a Carpentier-Edwards ring. The shunt appeared several months after surgery, excluding a per-operation complication such as described for the mitral or aortic valve replacement (mainly due to the valvular debridement). In this instance, we think either of an erosion of the atrio-ventricular membranous septum, due to the rigid prosthetic ring, or of a small tear due to the traction of the ring on the septum. There is a small portion of the membranous septum next to the line of attachment of the septal leaflet of the TVs which seems weaker. We can therefore suppose the damage to be on this portion, leading to the shunt. Concerning the choice of using a ring for the tricuspid annuloplasty, it is today recognized that TV repair with annuloplasty ring compared with TV repair without ring like a De Vega procedure is associated with a decreased recurrence of tricuspid regurgitation, and with better long-term survival and event-free survival. The use of a rigid ring, compared with a semi-rigid ring (such as Duran or Crosgrove ring), could have an impact on the generation of the shunt, but it is difficult, due to the rarity of this defect, to estimate whether the use of a semi-rigid ring could have reduced the risk of this particular complication. Concerning the treatment, if needed, surgical closure remains the treatment of choice. It seems reasonable to save the patient with a high-risk surgery as long as the shunt remains small with no evolution, and if the patient shows no symptoms. An alternative to the surgery could be a percutaneous manoeuvre with the installation of a ventricular septal occluder, as described recently by Trehan et al. It is of course too early to compare these percutaneous approaches to surgery. In conclusion, the case we reported demonstrates that a communication between the LV and the RA can be a complication of a tricuspid annuloplasty alone.

Supplementary data

Supplementary data are available at European Journal of Echocardiography online.

References


3. Sasaki N, Shimoyama M. Acquired supravalvar type of left ventricular to right atrial communication following non-penetrating cardiac trauma caused by traffic accident. Heart 2003;89:341.


