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Case Report

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Successful Mitral Valve Repair after Carillon® Device

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ABSTRACT

Background: The purpose of this study is to highlight the critical role of surgical repair of the mitral valve following the failure of an interventional repair attempt using a Carillon device.

Case Presentation: A 72-year-old male patient was admitted with progressing heart failure due to severe mitral regurgitation. The patient had a history of severe mitral regurgitation treated with a CARILLON® Device. The patient underwent mitral valve repair with an annuloplasty ring and artificial chordae implantation. Intraoperative and postoperative course were uneventful. Echocardiographic control 6 months after surgery showed a competent valve.

Conclusions: By presenting this case, the study seeks to underscore the importance of having surgical options available as a contingency plan and to guide clinicians in managing similar scenarios, ensuring optimal patient outcomes when interventional methods do not suffice.

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List of Abbreviations

MV: Mitral Valve
MR: Mitral Regurgitation
TOE: Transesophageal Echocardiogram
NYHA: New York Heart Association
Fig: Figure

Background

The field of interventional mitral valve repair has rapidly evolved in the last decade [1,2]. The Carillon® mitral contour device is designed for percutaneous mitral valve repair [3]. In case of mitral annular dilatation, external compression of the mitral valve annulus is supposed to re-approximate mitral valve leaflets and establish sufficient mitral valve coaptation. The device is implanted into the coronary sinus via a transjugular approach under conscious sedation using transoesophageal echocardiography and fluoroscopy guidance. Recurrent mitral valve regurgitation after Carillon® implantation has been reported however very limited information exists regarding further surgical treatment. We therefore present a case of successful mitral valve (MV) repair with an in situ Carillon® device.

Case Presentation

A 72-year-old male patient was referred to our clinic with progressive heart failure NYHA (New York Heart Association) class III due to recurrent severe mitral valve regurgitation. The patient underwent transcatheter mitral valve repair with a Carillon® device for severe mitral regurgitation nine months earlier. Preoperative transesophageal echocardiography (TOE) depicted severe eccentric mitral regurgitation jet due to a pseudo-prolapse of the anterior mitral valve leaflet (Figure 1). A multidisciplinary heart team favored mitral valve repair via a standard minimally invasive setting as previously described [4]. The in situ Carillon® device was easily identified with forceps. The device led to retraction of the posterior mitral leaflet in P1 segment in dorso-lateral direction in the arrested heart. The MV (mitral valve) was repaired with 36mm SimuFormTM Ring (Medtronic, Minneapolis, Minnesota, US) and one set of loops with four neo-chordae (28mm Seramon® etc.) originating from posteromedial papillary muscle to the prolapsing A2 segment. The left atrial appendage was directly closed with a 3.0 Prolene running suture for stroke prevention [5].

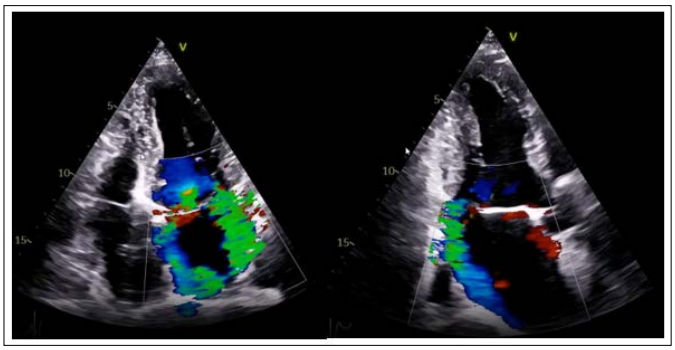

Figure 1: Preoperative Transthoracic Echocardiogram Depicting Severe Mitral Insufficiency

Intra – and postoperative course was uneventful. Intraoperative TOE (transesophageal echocardiography) as well as pre-discharge echo showed no residual mitral regurgitation (Figure 2). The Carillon® device remained in place (Figure.3). At six months follow up the patient presented in NYHA class I and echocardiography showed no evidence of MR (mitral regurgitation).

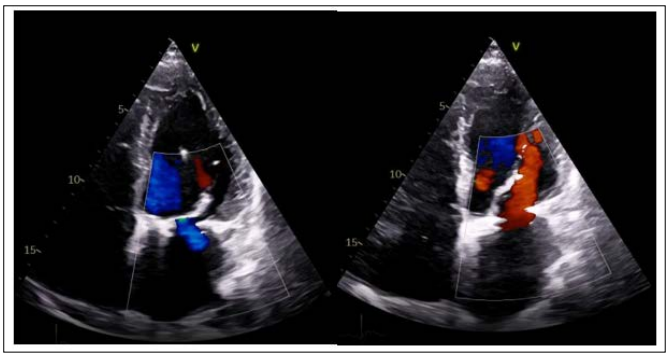

Figure 2: Postoperative Transthoracic Echocardiogram with no Residual MR (Mitral Regurgitation)

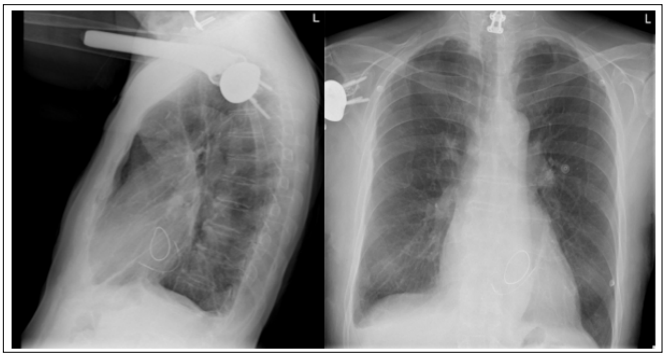

Figure 3: Chest X-Ray (AP and LL-view) Showing the Existing Carillon® Device and the surgicaly implanted Ring (Arrow)

Discussion

Failure of a percutaneous mitral valve repair represents an increasing clinical challenge. Very few information exist regarding surgical repair after Carillon® Device implantation. While a failed Edge-to-Edge therapy often leads to mitral valve replacement, Bartkowiak et al. showed that a mitral valve repair after failed Carillon® device therapy is feasible [6,7]. With this present case we confirm this finding. In addition, this present case is notable for several reasons:

- Pathomechanism of recurrent MR (mitral regurgitation) following Carillon®:
  Position of the Carillon® device in the coronary sinus leads to partial annuloplasty and therefore eventually to asymmetry of the underlying mitral valve annulus potentially aggravating an underlying previously not significant pseudoprolaps. This pathomechanism may well explain the eccentric regurgitation jet in this present case, as there was no significant prolaps present before the Carillon implantation.
- Successful Repair after Carillon® Device with no residual mitral insufficiency
- Uneventful surgical repair in a patient initially estimated for transcatheter approach; recommendation for surgical approach in experienced centers;
- Minimally invasive surgery is well worth considering for complex pathology.

Conclusions

Failed percutaneous mitral valve repair remains a clinical challenge. Cardiac surgery is essential for addressing complex conditions, such as advanced valve disorders, offering a comprehensive approach through open-heart procedures. Its ability to perform through structural repairs makes it irreplaceable in severe cases. Interventional cardiology on other hand with its minimally invasive techniques has transformed the treatment landscape by reducing recovery times and procedural risks, making it ideal for some patients. The synergy between these fields ensures that patients receive tailored, effective care- balancing the precision of less invasive methods with the depth of surgical expertise. Together, they provide a holistic approach, ensuring that even the most challenging conditions can be met with the appropriate care.

Conflict of Interest

No potential conflict of interest relevant to this article has been reported.

Patient Consent

Informed consent has been obtained from the patient for publication of this case report and accompanying images.

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