Operative Techniques in Thoracic and Cardiovascular Surgery

Myxomatous Mitral Valve Repair: Loop Neochord Technique ☆

Robert C. Neely, MD, and Michael A. Borger, MD, PhD

Surgical repair techniques for myxomatous mitral regurgitation have evolved over time, with multiple different methods in current use. The loop neochord technique provides a versatile and reproducible method that can be used for anterior, posterior, or bileaflet prolapse, as well as Barlow's disease. Preoperative planning and careful intraoperative valvular assessment are used to determine the appropriate loop length. Prefabricated commercial loops are available, but loops can also be created at the time of operation with polytetrafluroethylene 4-0 sutures and pledgets. We describe specific leaflet and subvalvular landmarks and suture placement techniques to ensure an accurate and durable mitral valve repair. Although these principles can be applied via a full sternotomy, we illustrate our preferred approach using the loop technique via a right minithoracotomy and femoral cardiopulmonary bypass.

Operative Techniques in Thoracic and Cardiovascular Surgery 20:106-123 © 2015 Published by Elsevier Inc.

KEYWORDS Mitral regurgitation, Minimally invasive, Loop technique, Neochord

Introduction

Mitral valve (MV) repair remains the preferred treatment of myxomatous mitral regurgitation.[1-3] Although MV repair techniques have evolved over the preceding decades, no particular method has emerged as the predominant technique in current day practice.[4-6] To be a successful MV repair surgeon, one should be comfortable performing several different repair techniques that can be tailored to a patient's individual valvular pathology. Nonetheless, we prefer using the loop neochord technique for most patients with MV prolapse.[7-9]

A variety of approaches to expose the MV have been described, including minimally invasive approaches with an array of cannulation strategies for cardiopulmonary bypass.[8,10-12] The advantages and disadvantages of minimally invasive cardiac surgery have been discussed at length in the literature.[12-15] We describe our preferred method for treating myxomatous mitral regurgitation using the loop neochord technique for MV repair. Although the approach described herein is via a right minithoracotomy (our preferred approach for patients requiring MV surgery or tricuspid valve repair or both, closure of atrial septal defects, and atrial fibrillation ablation), the loop technique can be applied also via a full sternotomy. We use a minimal invasive valve XS system (Aesculap, Melsungen, Germany) and femoral cannulation for minimally invasive MV surgery Figs. 1-14.

☆Disclosure: Dr Borger reports receiving consulting fees from Edwards Lifesciences and Sorin and lecture fees from Medtronic, Edwards Lifesciences and St Jude medical. Dr Neeley has no commercial interests to disclose.

Division of Cardiac, Vascular, and Thoracic Surgery, New York-Presbyterian Hospital, Columbia University Medical Center, New York, NY

Address reprint requests to Michael A. Borger, MD, PhD. Division of Cardiac, Vascular, and Thoracic Surgery, New York-Presbyterian Hospital, Columbia University Medical Center, Milstein 7GN-435 177 Fort Washington Ave, New York, NY 10032. E-mail: mb3851@cumc.columbia.edu

 1522-2942/$-see front matter © 2015 Published by Elsevier Inc.
http://dx.doi.org/10.1053/j.optechstcvs.2015.10.003

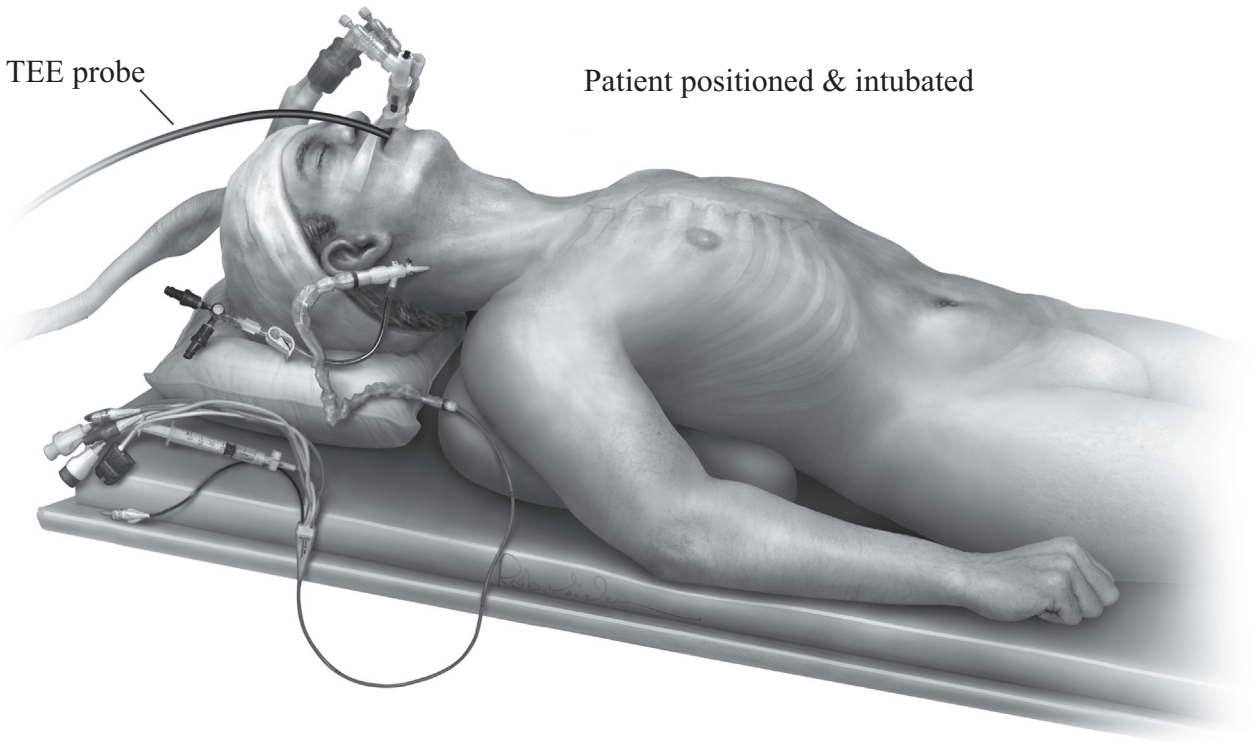

Figure 1 Set-up and patient positioning includes double-lumen endotracheal intubation, central line placement, and a Swan Ganz catheter inserted high in the neck to allow for supplemental internal jugular venous cannulation, if needed. A foley catheter is placed. The patient is positioned supine with a roll under the right chest, and the right arm is tucked slightly posteriorly to expose the anterolateral chest wall. External defibrillator pads are placed and TEE is standard. TEE = transesophageal echocardiography.