

Anesthetic Considerations in Nonbacterial Thrombotic Endocarditis: Intraoperative Heparin Resistance and Hypercoagulability in Cardiac Surgery

B. Shturman MD; N. Jalili MD; S. Jalili MD; M. Sadat, MD; K. Tyagaraj MD, FASA

Department of Anesthesiology, Maimonides Medical Center

Introduction

Nonbacterial thrombotic endocarditis (NBTE) is a rare condition typically associated with malignancy or autoimmune disorders. It entails unique diagnostic and perioperative challenges. The case presents the anesthetic management of a 37-year-old female with NBTE requiring surgical excision of mitral valve vegetation.

Case Summary

- 37 years female with a complex hypercoagulable history: multiple spontaneous abortions, recurrent VTE (including PEs on anticoagulation), and uterine fibroids.
- Referred for mitral valve surgery due to enlarging vegetations on TEE (1 cm anterior leaflet, 2 mm posterior kissing lesion).
- Extensive infectious and autoimmune workup was negative.
- Diagnosis: Nonbacterial thrombotic endocarditis (NBTE).
- Planned for vegetation excision with possible valve replacement.

Preoperative Planning

- Multidisciplinary collaboration with cardiology, infectious disease, cardiothoracic surgery and hematology.
- Anticipated heparin resistance based on clinical history.
- Pre-induction arterial line placed.
- Induction with IV midazolam, fentanyl, lidocaine, propofol, rocuronium.
- Post-induction placement of central line and PA catheter.

Intraoperative Course

- Initial heparin bolus of 300 u/kg did not achieve ACT >400.
- Repeat bolus ineffective; ACT remained <400.
- Pre-op AT III level: 74% (normal: 80–120%).
- Intraoperative AT III administration achieved ACT >400, CPB initiated.
- Successful mitral valve vegetation excision, valve preserved.

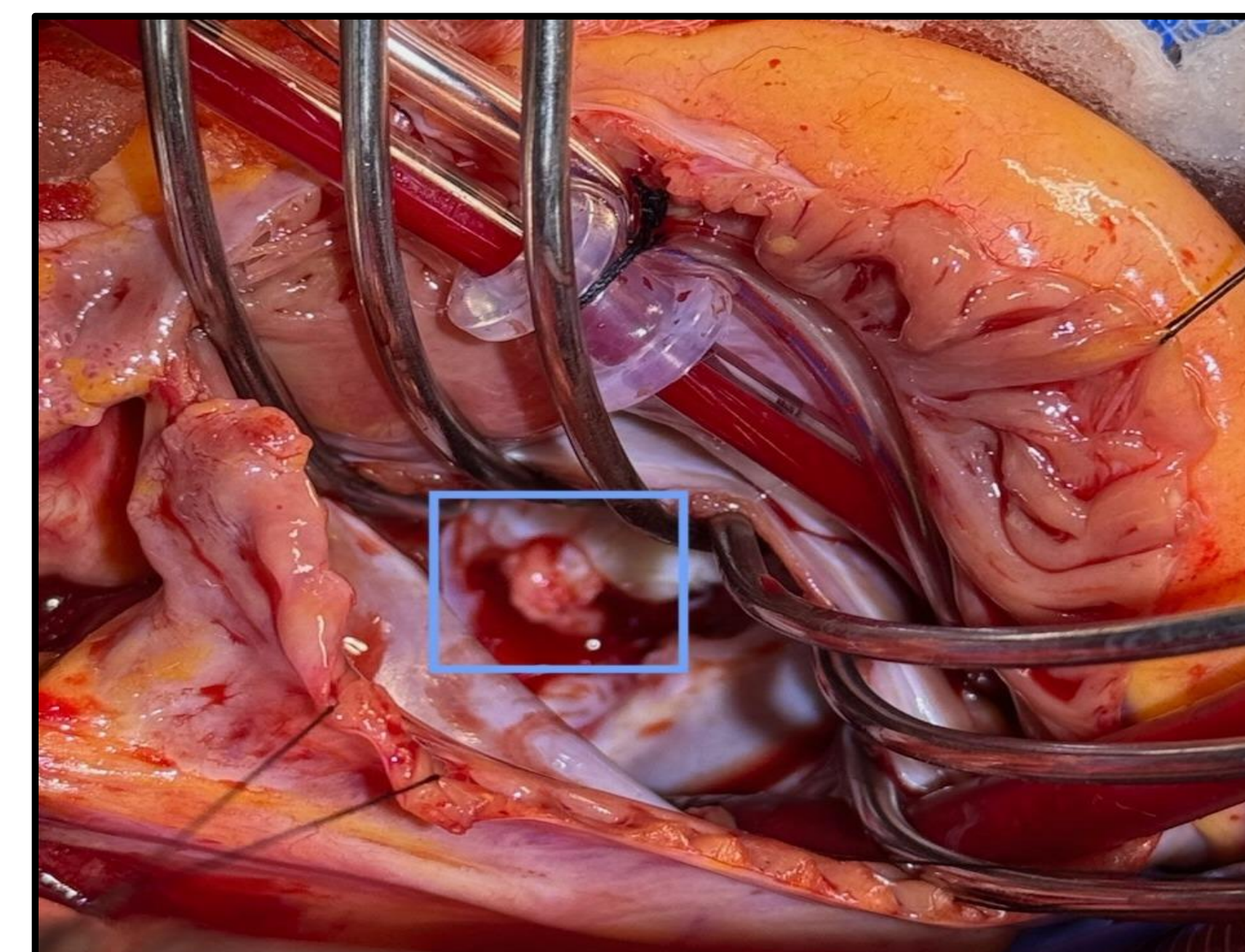


Figure 1: Mitral Valve Lesion

Postoperative Management

- Heparin infusion bridged to warfarin (goal INR 2.5).
- Daptomycin initiated due to MRSE growth from intraoperative cultures.
- Weekly monitoring labs (CBC, CMP, ESR, CRP, CPK).
- Pain control with non-narcotic analgesia, lidoderm.
- Post Op pericarditis managed with colchicine and ibuprofen.

Discussion

- NBTE vs. Infective Endocarditis (IE):
 - NBTE vegetations are typically small, noninvasive, and non-destructive.
 - Unlike IE, NBTE vegetations rarely cause overt hemodynamic compromise
 - Despite being non-destructive, NBTE vegetations still pose a substantial risk of systemic embolization
- Anticoagulation Challenges:
 - NBTE presents unique anesthetic challenges driven by its prothrombotic state and embolic potential
 - In this case, heparin resistance was recognized only after the failure of two 300 u/kg boluses to achieve the target ACT
 - Functional AT III deficiency is a known but often underrecognized contributor to heparin resistance, especially in hypercoagulable states
- Management and Anesthesiologist's Role:
 - Anesthesiologists must anticipate unpredictable ACT kinetics
 - Immediate access to adjunctive anticoagulants (e.g., AT III, FFP, Direct thrombin inhibitors)
 - Multidisciplinary coordination is vital