

Successful Transcatheter Edge-to-Edge Tricuspid Repair for a Patient with Double Inlet Ventricle and Congenitally Corrected Transposition of The Great Arteries

Takashi Matsumoto, MD, PhD, FSCAI, FACC
Department of Cardiology and Catheterization Laboratory
Shonan Kamakura General Hospital



Case

Patient: 44-yo man

Clinical Symptoms: Shortness of breath
(NYHA functional class III)

Past Medical History:

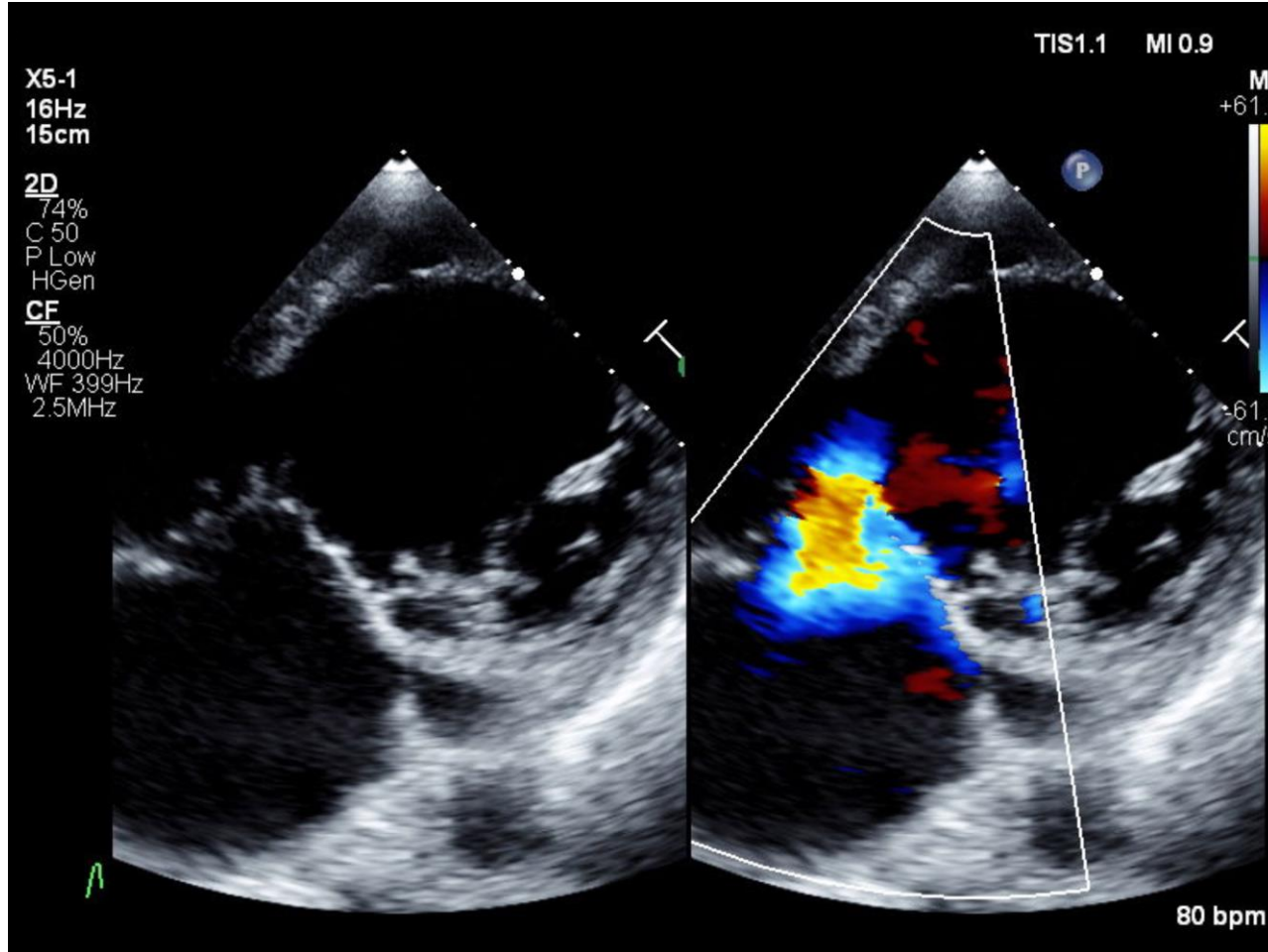
- ✓ Double inlet LV
- ✓ Corrected TGA
- ✓ Pulmonary atresia
- ✓ ASD
- ✓ PDA
- ✓ NSVT

Past Surgical History:

- ✓ Left side modified BT shunt
- ✓ AP shunt
- ✓ Stent implantation (AP shunt & PDA)



Baseline TTE



【LAD】 35.5mm

【LVDd】 78.1mm

【LVDs】 55.7mm

【EF(mod-Simpson)】 55.2%

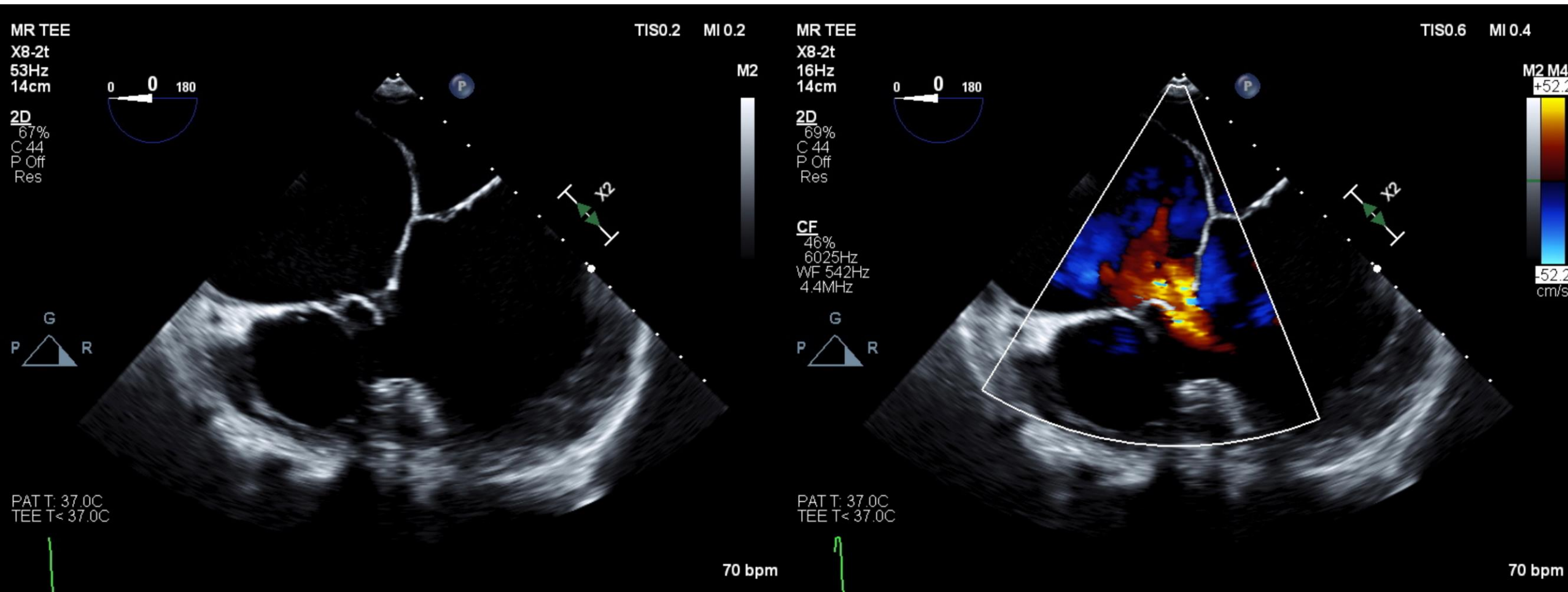
【EDV(mod-Simpson)】 252.0ml

【ESV(mod-Simpson)】 113.0ml

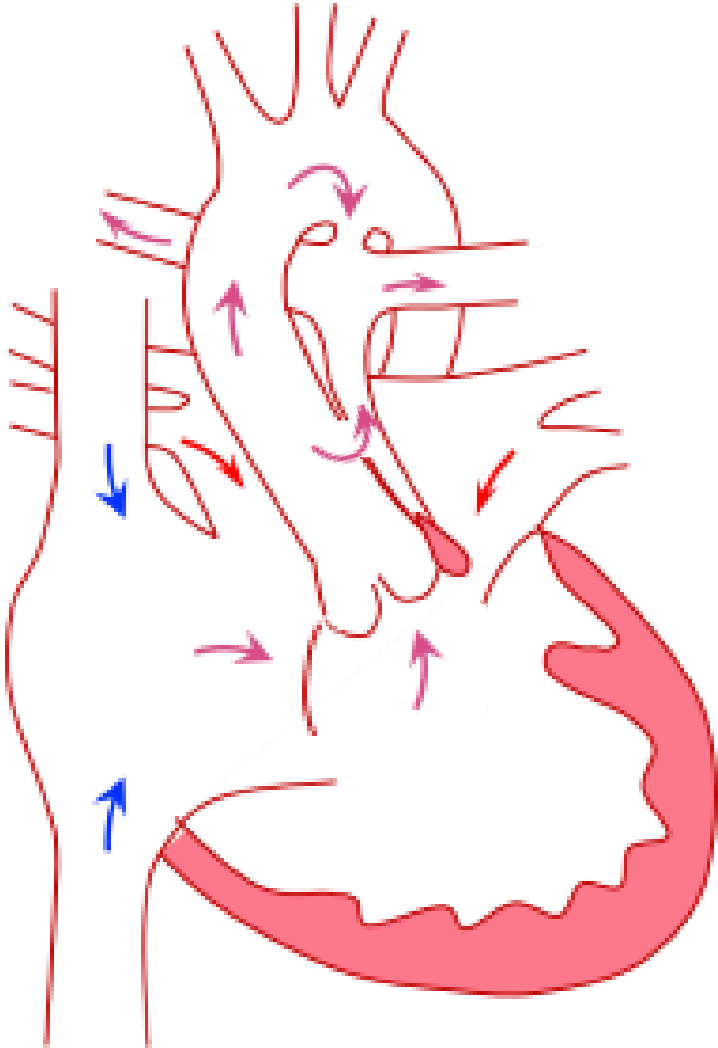
【MV】 MR (mild)

【TV】 TR (severe)

Baseline TEE



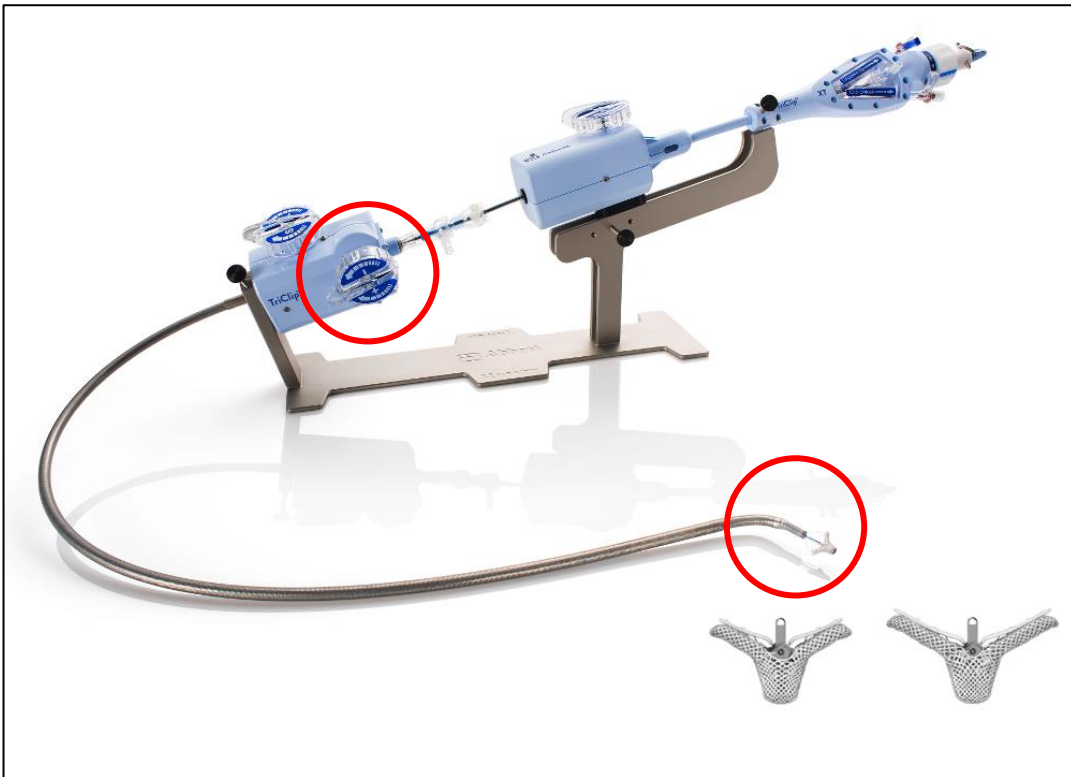
Case summary



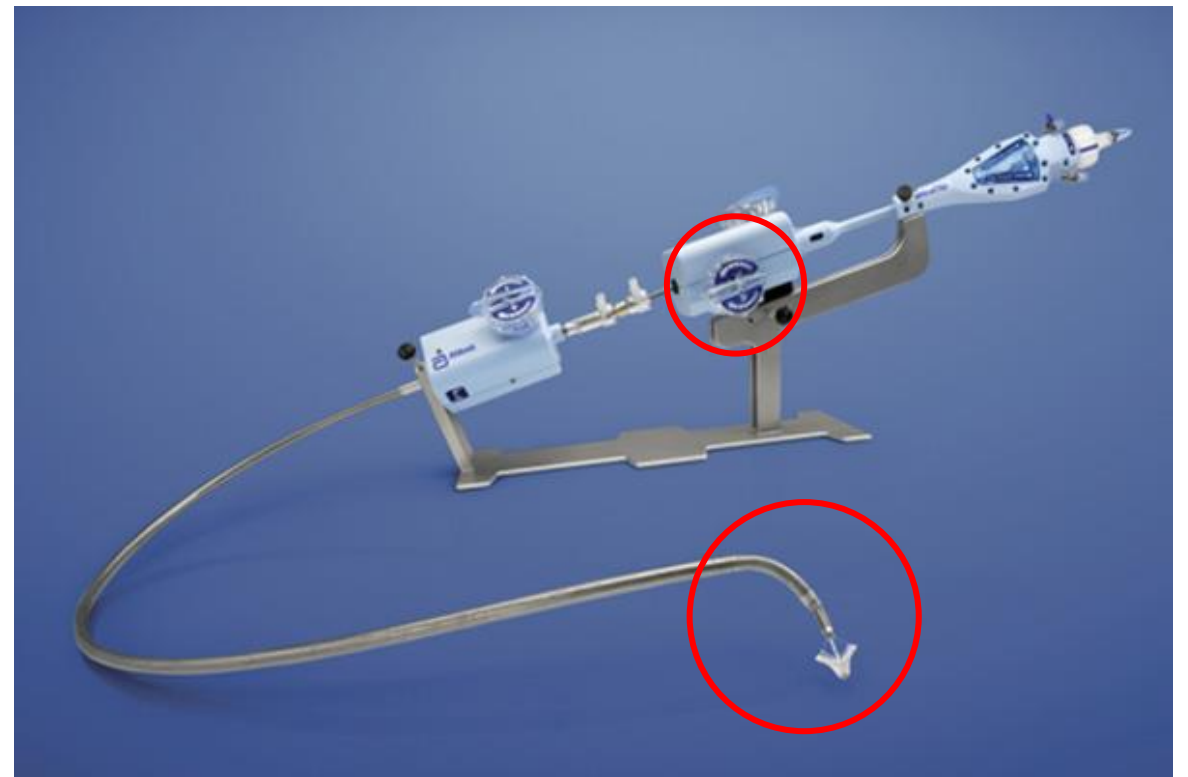
- 44-yo man
 - ✓ Double inlet LV, Corrected TGA, Pulmonary atresia, ASD, & PDA
- Considered treatment option
 - ✓ Tricuspid valve replacement & Glenn shunt
 - ✓ MitraClip -> Glenn shunt (option)

TriClip vs. MitraClip

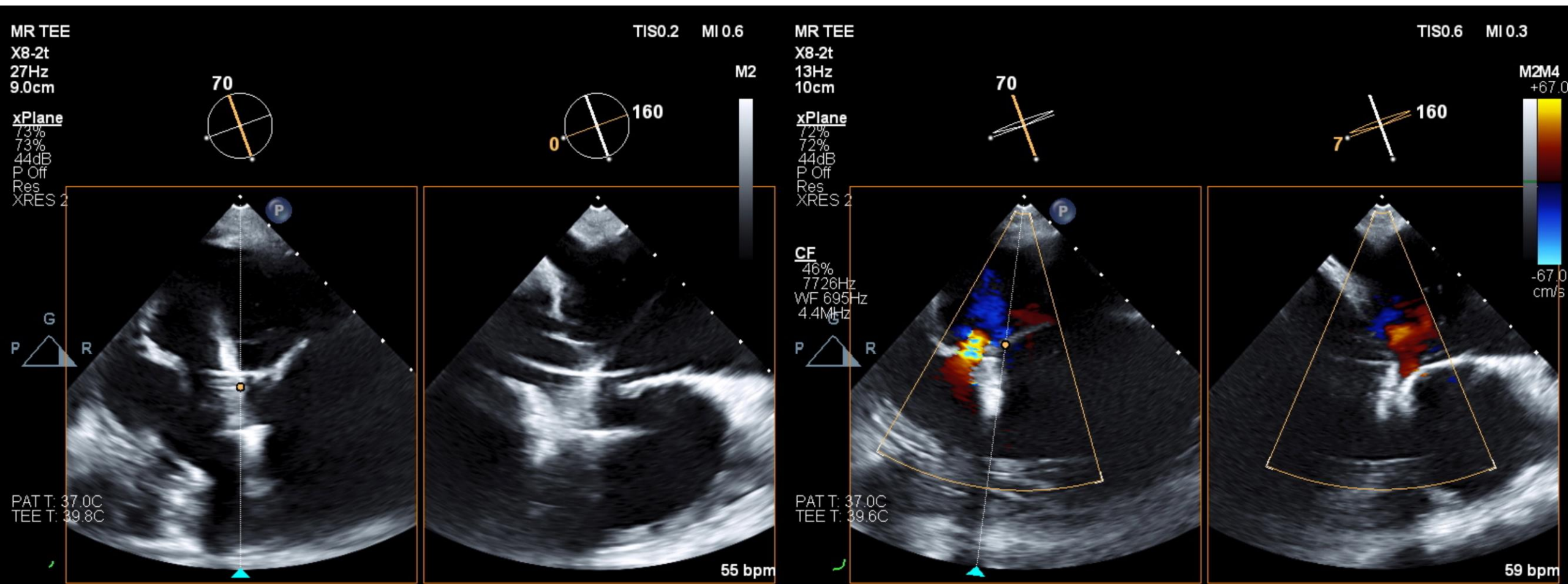
TriClip



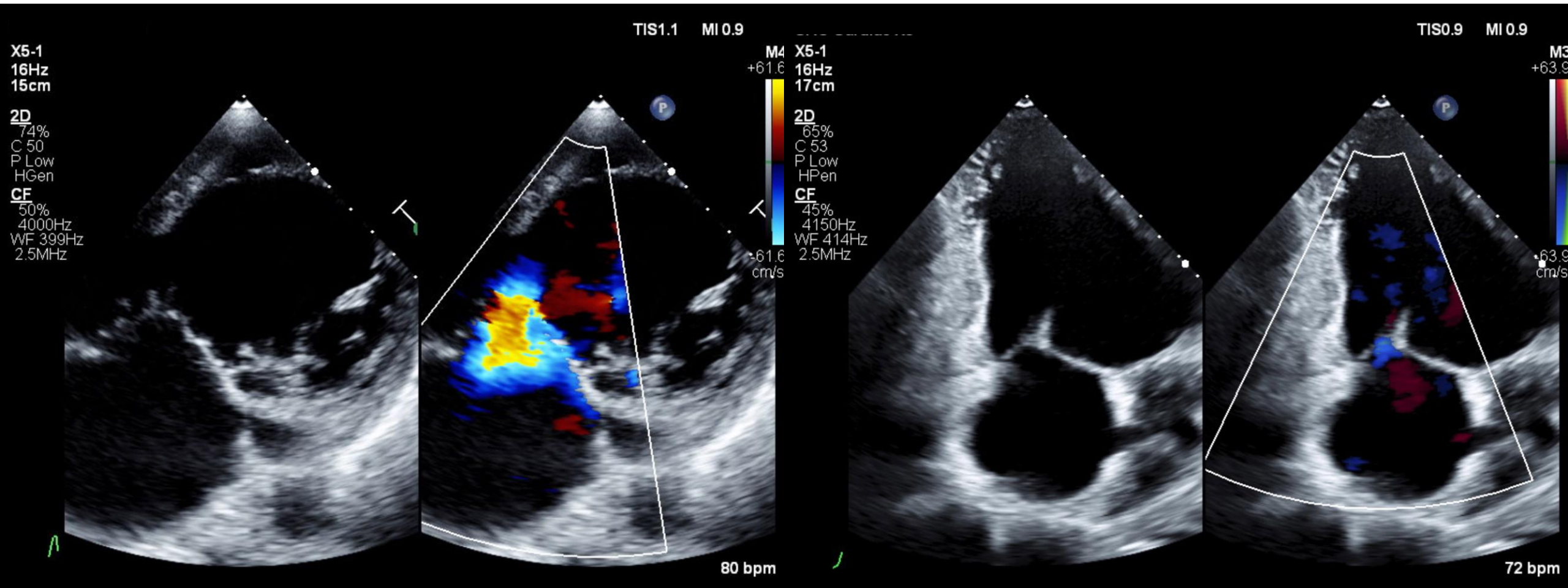
MitraClip



Procedural TEE

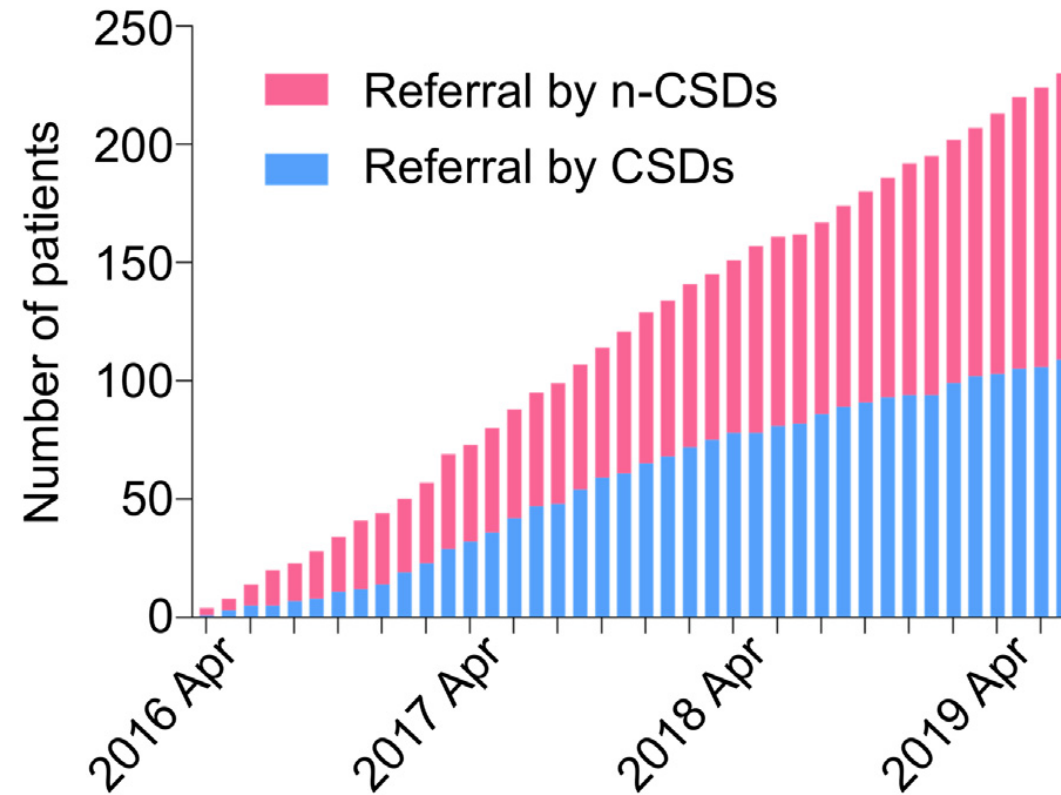


Baseline & 1M FU TTE



Discussion 1

- Adult congenital heart diseases -



- Number of ACHD patients is increasing

Discussion 2

- MitraClip for TR -

JACC: CARDIOVASCULAR INTERVENTIONS
© 2019 BY THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION
PUBLISHED BY ELSEVIER

VOL. 12, NO. 15, 2019

1-Year Outcomes After Edge-to-Edge Valve Repair for Symptomatic Tricuspid Regurgitation

Results From the TriValve Registry

Michael Mehr, MD,^{1,2,3,4} Maurizio Taramasso, MD,^{1,5} Christian Besler, MD,¹ Tobias Ruf, MD,⁶ Kim A. Connelly, MD,¹ Marcel Weber, MD,⁷ Ermela Yzeiraj, MD,⁸ Davide Schiavi, MD,¹ Antonio Mangieri, MD,¹ Laura Vaskelyte, MD,¹ Hannes Alessandrini, MD,⁹ Florian Deuschl, MD,¹ Nicolas Brugger, MD,¹⁰ Hasan Ahmad, MD,¹¹ Luigi Biasco, MD,¹² Mathias Orban, MD,¹³ Simon Deseive, MD,¹⁴ Daniel Braun, MD,¹⁵ Karl-Philipp Rommel, MD,¹⁶ Alberto Pozzoli, MD,¹⁷ Christian Frerker, MD,¹⁸ Michael Nábauer, MD,¹⁹ Steffen Massberg, MD,²⁰ Giovanni Pedrazzini, MD,²¹ Gilbert H.L. Tang, MD,²² Stephan Windecker, MD,²³ Ulrich Schäfer, MD,²⁴ Karl-Heinz Kuck, MD,²⁵ Horst Sievert, MD,²⁶ Paolo Denti, MD,²⁷ Azeem Latib, MD,²⁸ Joachim Schofer, MD,²⁹ Georg Nickenig, MD,³⁰ Neil Fam, MD,³¹ Stephan von Bardeleben, MD,³² Philipp Lurz, MD,³³ Francesco Maisano, MD,³⁴ Jörg Hausleiter, MD³⁵

ABSTRACT

OBJECTIVES The purpose of this study was to evaluate procedural and 1-year clinical and echocardiographic outcomes of patients treated with tricuspid edge-to-edge repair.

BACKGROUND Transcatheter edge-to-edge repair has been successfully performed in selected patients with symptomatic tricuspid regurgitation (TR) and high risk for surgery, but outcome data are sparse.

METHODS This analysis of the multicenter international TriValve (Transcatheter Tricuspid Valve Therapies) registry included 249 patients with severe TR treated with edge-to-edge repair in compassionate and/or off-label use. Clinical and echocardiographic outcomes were prospectively collected and retrospectively analyzed.

RESULTS In 249 patients (mean age 77 ± 9 years; European System for Cardiac Operative Risk Evaluation II score 6.4% [interquartile range: 3.9% to 13.9%]), a successful procedure with TR reduction to grade ≤2+ was achieved in 77% by placement of 2 ± 1 tricuspid clips. Concomitant treatment of severe TR and mitral regurgitation was performed in 52% of patients. At 1-year follow-up, significant and durable improvements in TR severity (TR ≤2+ in 72% of patients) and New York Heart Association functional class (≤II in 69% of patients) were observed. All-cause mortality was 20%, and the combined rate of mortality and unplanned hospitalization for heart failure was 35%. Predictors of procedural failure included effective regurgitant orifice area, tricuspid coaptation gap, tricuspid tenting area, and absence of central or anteroposterior TR jet location. Predictors of 1-year mortality were procedural failure, worsening kidney function, and absence of sinus rhythm.

CONCLUSIONS Transcatheter tricuspid edge-to-edge repair can achieve TR reduction at 1 year, resulting in significant clinical improvement. Predictors of procedural failure and 1-year mortality identified here may help select patients who will benefit most from this therapy. (J Am Coll Cardiol Intv 2019;12:1451-61) © 2019 by the American College of Cardiology Foundation.

From the ¹Medizinische Klinik und Poliklinik I, Klinikum der Universität München, Ludwig-Maximilians-Universität, Munich, Germany; ²German Centre for Cardiovascular Research, Partner Site Munich Heart Alliance, Munich, Germany; ³Department of Cardiovascular Surgery, University Hospital of Zürich, University of Zürich, Switzerland; ⁴Leipzig Heart Center, University of Leipzig, Leipzig, Germany; ⁵Mainz University Hospital, University of Mainz, Mainz, Germany; ⁶Division of Cardiology, St. Michael's Hospital, University of Toronto, Toronto, Ontario, Canada; ⁷Bonn University Hospital, University of Bonn, Bonn, Germany; ⁸Albertinen Heart Center, Hamburg, Germany; ⁹San Raffaele University Hospital, Milan, Italy; ¹⁰CardioVascular Center, Frankfurt, Germany; ¹¹Katholische Klinik St. Georg, Hamburg, Germany; ¹²University Heart Center Hamburg, University of Hamburg, Hamburg, Germany; ¹³Hospitall, University of Bern, Bern, Switzerland; ¹⁴Westchester Medical Center, Valhalla, New York; ¹⁵CardioCentro Ticino, Lugano, Switzerland; and the ¹⁶Mount Sinai Medical Center, New York, New York. *Drs. Mehr and Taramasso share first authorship. †Drs. Maisano and Hausleiter share last authorship. Dr. Mehr has received travel grants from ISSN 1936-8798/\$36.00 <https://doi.org/10.1016/j.jcin.2019.04.019>

- Europe and North America (compassionate use)
- 249 patients (mean age 77 ± 9 years)
- Successful procedure with TR reduction to grade ≤2+ in 77% of cases
- Combined MitraClip procedure in 52% of cases
- No procedural deaths

In-Hospital Adverse Events	249 patients
All-cause Mortality	7 (2.8%)
Cardiovascular Mortality	6 (2.4%)
Blood transfusion/severe bleeding	15 (6.0%)
Infection	12 (4.8%)
Acute kidney injury	9 (3.6%)
Stroke	2 (0.8%)
Conversion to surgery	1 (0.4%)
Pericardial effusion	1 (0.4%)
Acute myocardial infarction	0 (0.0%)

Discussion 3

- Heart team approach -

- Support from hospital
 - ✓ IRB
 - ✓ Research funding
- Heart team approach
 - ✓ Cooperation inside hospital
 - ✓ Cooperation outside hospital



Conclusions

- Number of ACHD patients is increasing
- Catheter intervention is important treatment option for ACHD patients with high surgical risk

