Excellence in Care of Mitral Regurgitation: Centers of Excellence & Physician Competence

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Disclosures

None

Chair, STS Public Reporting Task Force

Objectives

1. **Guidelines of when to refer MR to a COE?**
2. **What defines a MV Repair COE?**
   - ***Surgical and Cardiology Thresholds***
3. **Should MR management be limited to a COE?**
4. **Barriers to optimal MR care?**

Mitral repair best practice: proposed standards

B Bridgewater, T Hooper, C Munsch, S Hunter, U von Oppell, S Livesey, B Keogh, F Wells, M Patrick, J Kneeshaw, J Chambers, N Masani, S Ray

Heart 2006;**92**:939–944. doi: 10.1136/hrt.2005.076109

Objectives: To define best practice standards for mitral valve repair surgery.
Design: Development of standards for process and outcome by consensus.
Setting: Multidisciplinary panel of surgeons, anaesthetists, and cardiologists with interests and expertise in caring for patients with severe mitral regurgitation.
Main outcome measures: Standards for best practice were defined including the full spectrum of multidisciplinary aspects of care.
Results: 19 criteria for best practice were defined including recommendations on surgical training, intraoperative transoesophageal echocardiography, surgery for atrial fibrillation, audit, and cardiology and imaging issues.
Conclusions: Standards for best practice in mitral valve repair were defined by multidisciplinary consensus. This study gives centres undertaking mitral valve repair an opportunity to benchmark their care against agreed standards that are challenging but achievable. Working towards these standards should act as a stimulus towards improvements in care.

Accepted 17 October 2005
Published Online First 26 October 2005

Bridgewater et al. Heart 2006;92:939-944

"Best Practice Standard for Mitral Repair Services"

Surgeons require additional specialized training in MV repair

Intraoperative echocardiography issues

- ***MV repair performed only with available high quality TEE***
- ***Anesthesiologists/Cardiologists TEE accredited***

Volume Thresholds for Competence

- ***Surgeons: should be performing > 25 repairs/year***
- ***Hospitals: should be performing > 50 repairs/year***

Data Audit

- ***Surgeons subject to regular audit of mitral surgery by etiology***
- ***Overall outcomes, mortality for repair of primary degenerative MR < 1%, 5-year reoperation rate < 5%***
- ***Audit data transparent and should be publically available to referring cardiologist***

Bridgewater et al. Heart 2006;92:939-944

"Best Practice Standard for Mitral Repair Services"

Cardiology and imaging issues

1. Clear guidelines for referral for MR

2. Hospitals undertaking MV repair should have at least one designated cardiology consultant with a subspecialist interest in MV disease

3. Validated quantitative echocardiography should be routinely available

Bridgewater et al. Heart 2006;92:939-944

"Best Practice Standard for Mitral Repair Services"

Cardiology and imaging issues

4. Patients after mitral repair should have follow up echocardiography pre-dismissal or at the first postop outpatient visit to quantify residual MR

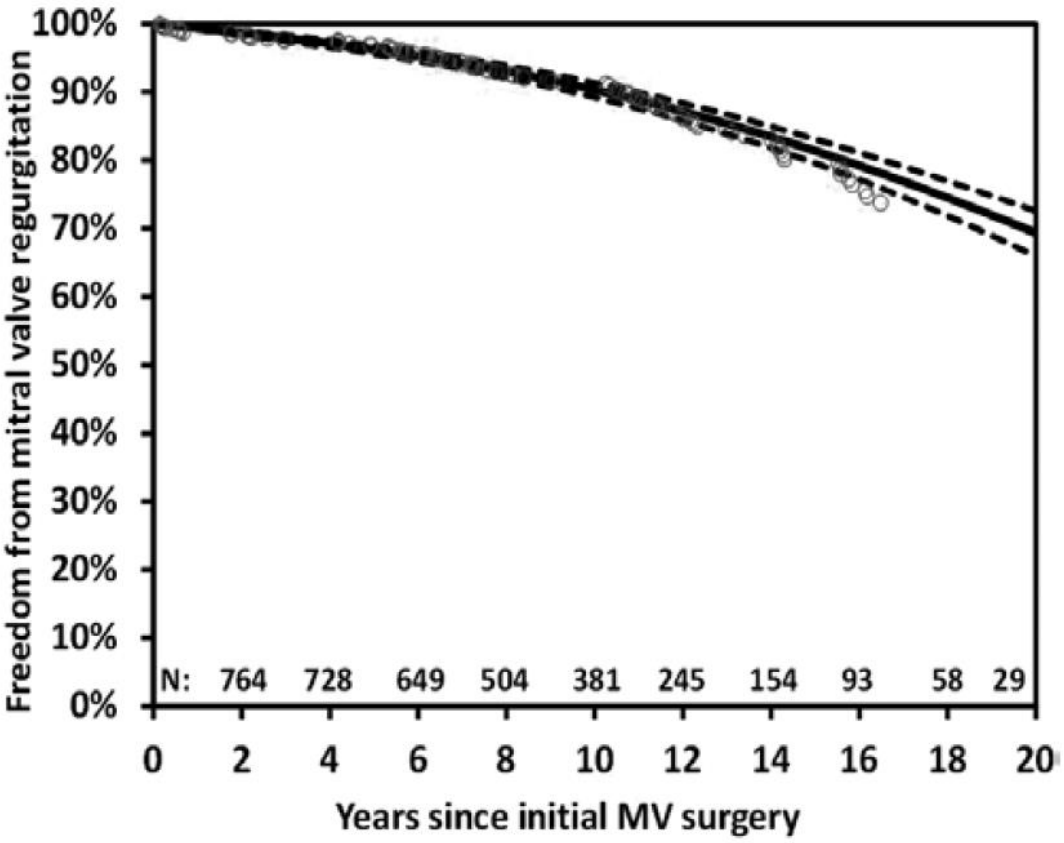
5. Both preoperative and perioperative echocardiography data should be regularly audited to ensure quality control and to provide continuing education

6. Multidisciplinary meetings should be held focusing on mitral repair including discussion of discrepancies between echocardiographic and surgical findings

Bridgewater et al. Heart 2006;92:939-944

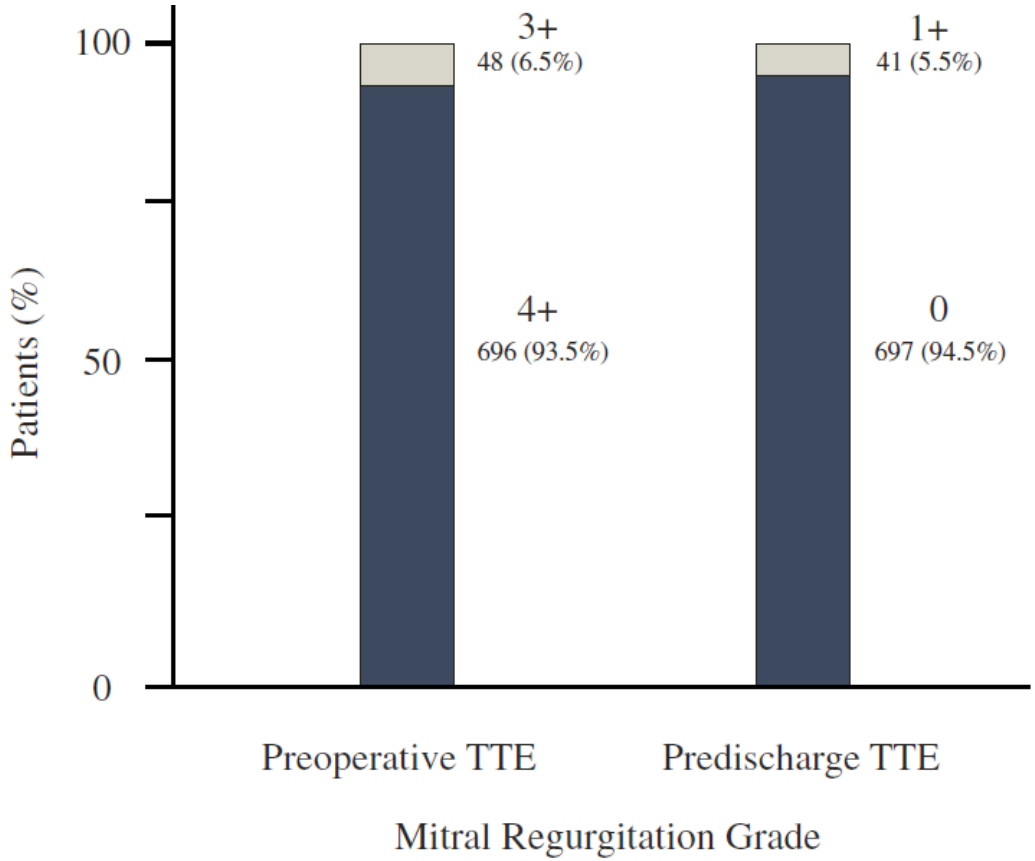
Late Outcomes of Mitral Valve Repair for Mitral Regurgitation Due to Degenerative Disease

Tirone E. David, MD; Susan Armstrong, MSc; Brian W. McCrindle MD; Cedric Manlhiot, BSc



David et al. Circulation 2013;127:1485-1492

A near 100% repair rate for mitral valve prolapse is achievable in a reference center: Implications for future guidelines



Castillo et al. J Thorac Cardiovasc Surg 2012;144:308-12

Predictors of Mitral Valve Repair: Clinical and Surgeon Factors

Marked variability of MVrepair vs. MVR:

Mean repair rate = 41% (range, 0–100%)
Median # isolated mitral valve operations/yr = 5 (1–166)

The largest predictor for mitral valve repair was a surgeon's annual mitral volume:

Surgeon with 100 MVR/r per yr, OR of repair = 3.78 (95% CI, 1.87–7.64)

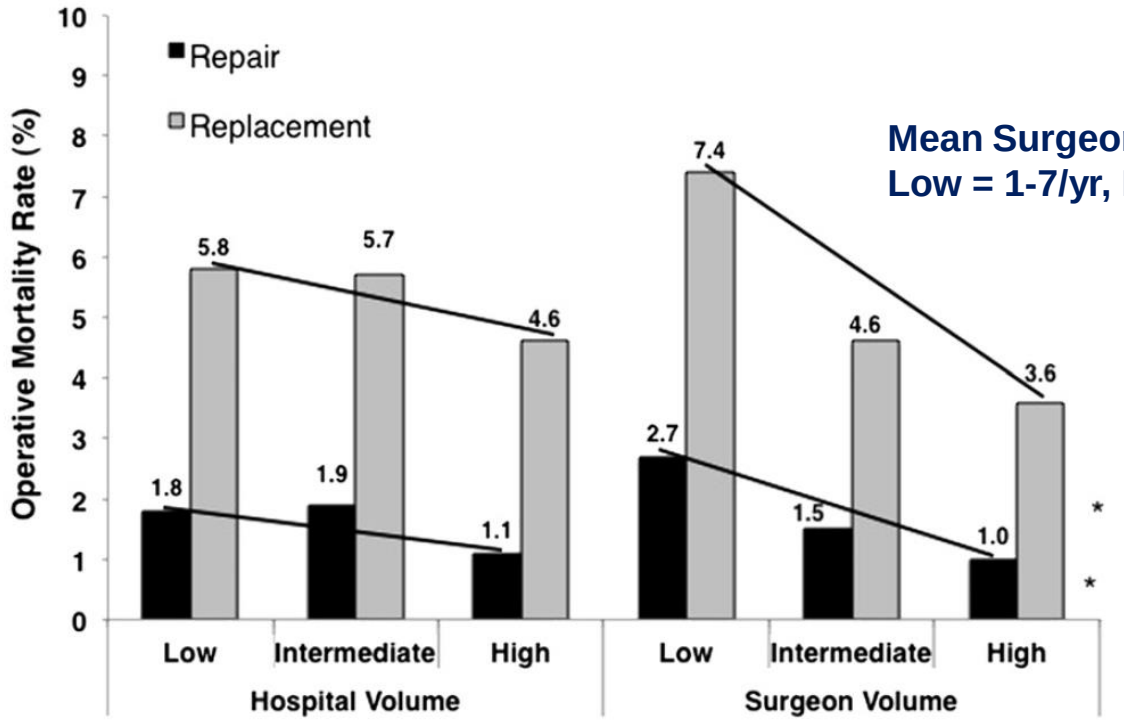
Overall inflection point for "reference center" surgeon volume = 40 / year

Volume													
Predicted Probability of Repair, %	36.5	40.8	46.2	52.3	55.7	62.5	67.0	69.7	71.3	72.1	72.7	73.1	73.6

Bolling et al. Ann Thorac Surg 2010;90:1904-12

Operative outcomes in mitral valve surgery: Combined effect of surgeon and hospital volume in a population-based analysis

Arman Kilic, MD,[a] Ashish S. Shah, MD,[a] John V. Conte, MD,[a] William A. Baumgartner, MD,[a] and David D. Yuh, MD[b]



Mean Surgeon volume 22.9 ± 30.5 cases/yr
Low = 1-7/yr, Interm = 7-21/r, High > 22/yr

Kilic et al. J Thorac Cardiovasc Surg 2012;146:638-46

The lottery of mitral valve repair surgery

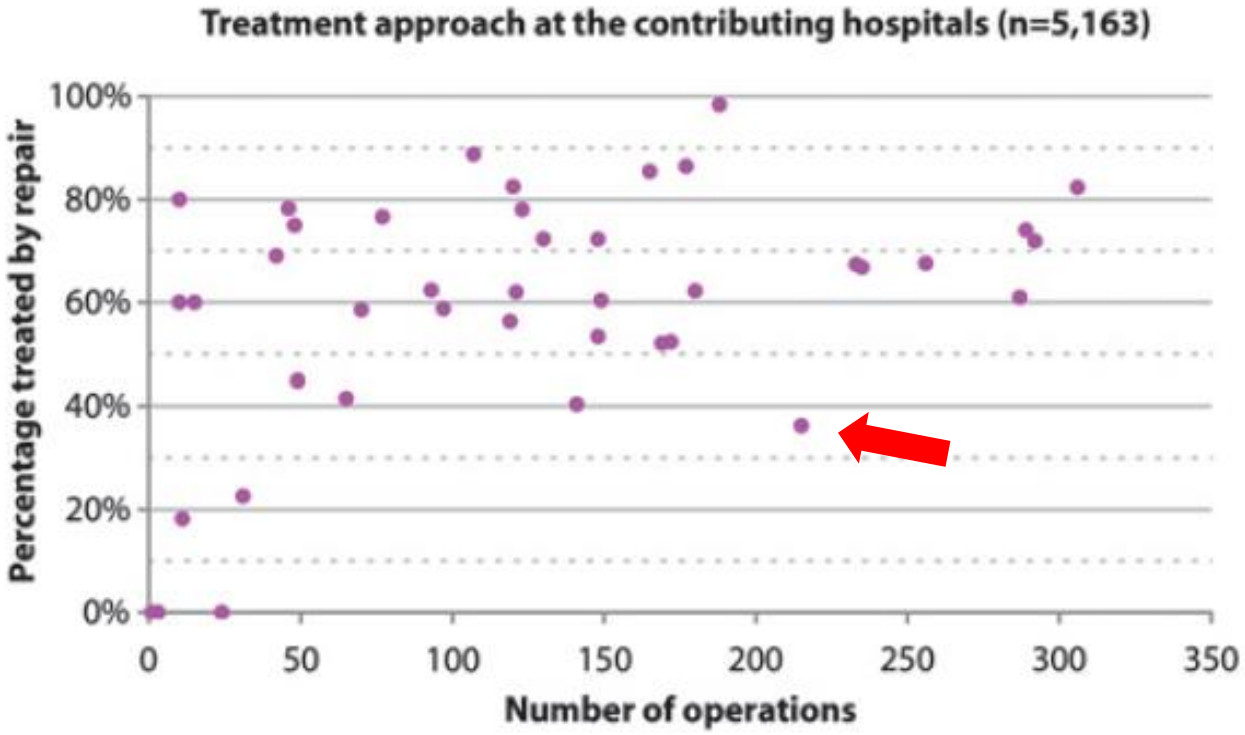
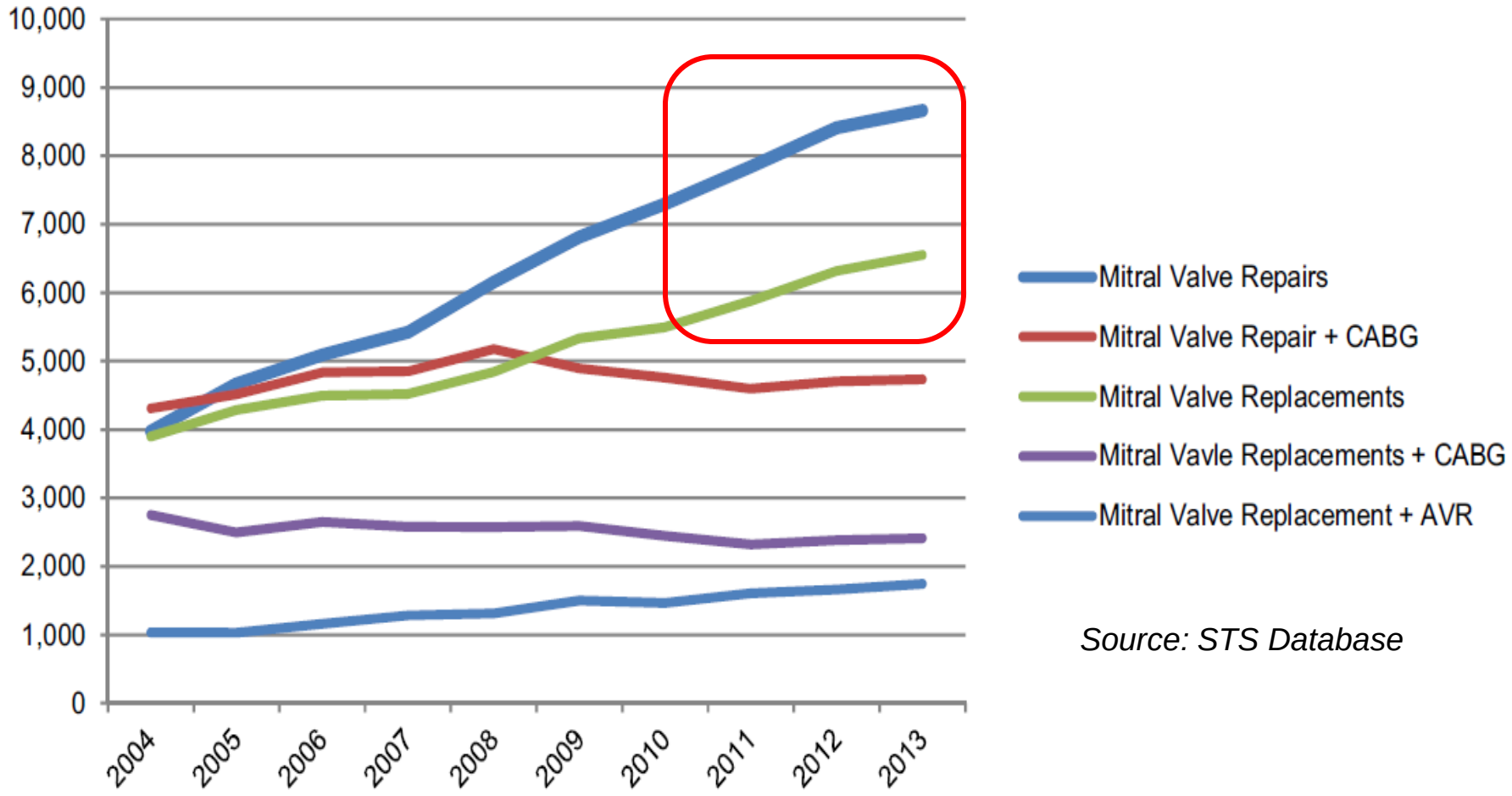


Figure 1 Variations in rates of mitral valve repair for degenerative disease among 46 heart centres in the UK (adapted from Bridgewater, *et al*[1]).

Anyanwu et al. BMJ Heart 2010;10:1136-40

Doubling of MV repairs Over Last 10 yrs



Source: STS Database

Badhwar et al. Trends Cardiovasc Med 2015

The Society of Thoracic Surgeons Mitral Repair/Replacement Composite Score: A Report of The Society of Thoracic Surgeons Quality Measurement Task Force

Vinay Badhwar, MD, J. Scott Rankin, MD, Xia He, MS, Jeffrey P. Jacobs, MD, James S. Gammie, MD, Anthony P. Furnary, MD, Frank L. Fazzalari, MD, Jane Han, MSW, Sean M. O'Brien, PhD, and David M. Shahian, MD

January 2011 – June 2014

61,201 patients with isolated MVRR (±Tvrepair, ASD repair, MAZE)

Conventional sternotomy	**72.5%**
Mini right thoracotomy	**14.2%**
Robotic assistance	**7.0%**
AF was present	**32.2 % (19,689/61,201)**
Surgical ablation	**61.5 % (12,102/19,689)**
Overall mortality	**2.9%**

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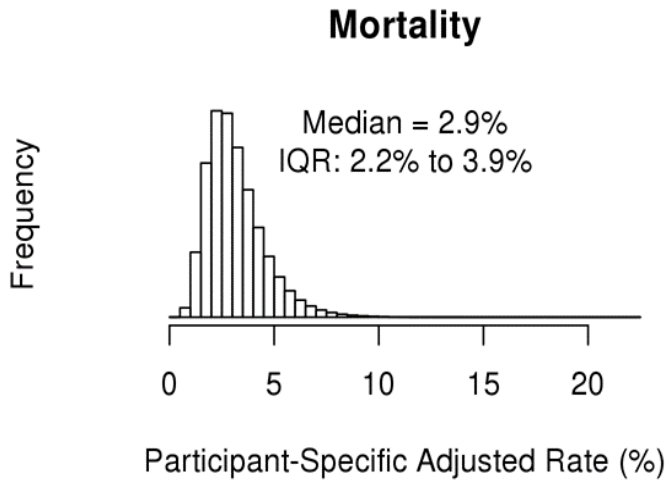

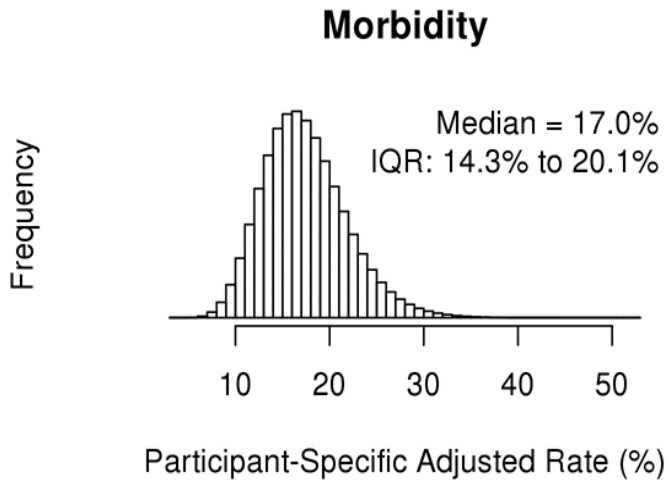

3-yr Risk Adjusted Composite of Outcome

★ **2.6% (23/867)**

★★ **91.7% (795/867)**

★★★ **5.7% (49/867)**

The Society of Thoracic Surgeons Mitral Repair/Replacement Composite Score: A Report

Volume Remains An Issue:

	Programs/Hospitals
3 years, with at least 10 cases	867
3 years, with at least 25 cases	597
3 years, with at least 36 cases	462
3 years, with at least 50 cases	349
3 years, with at least 100 cases	165
Overall mortality	2.9%

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The Society of Thoracic Surgeons Mitral Repa… of Th… Meas…

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James S…
Jane Ha…

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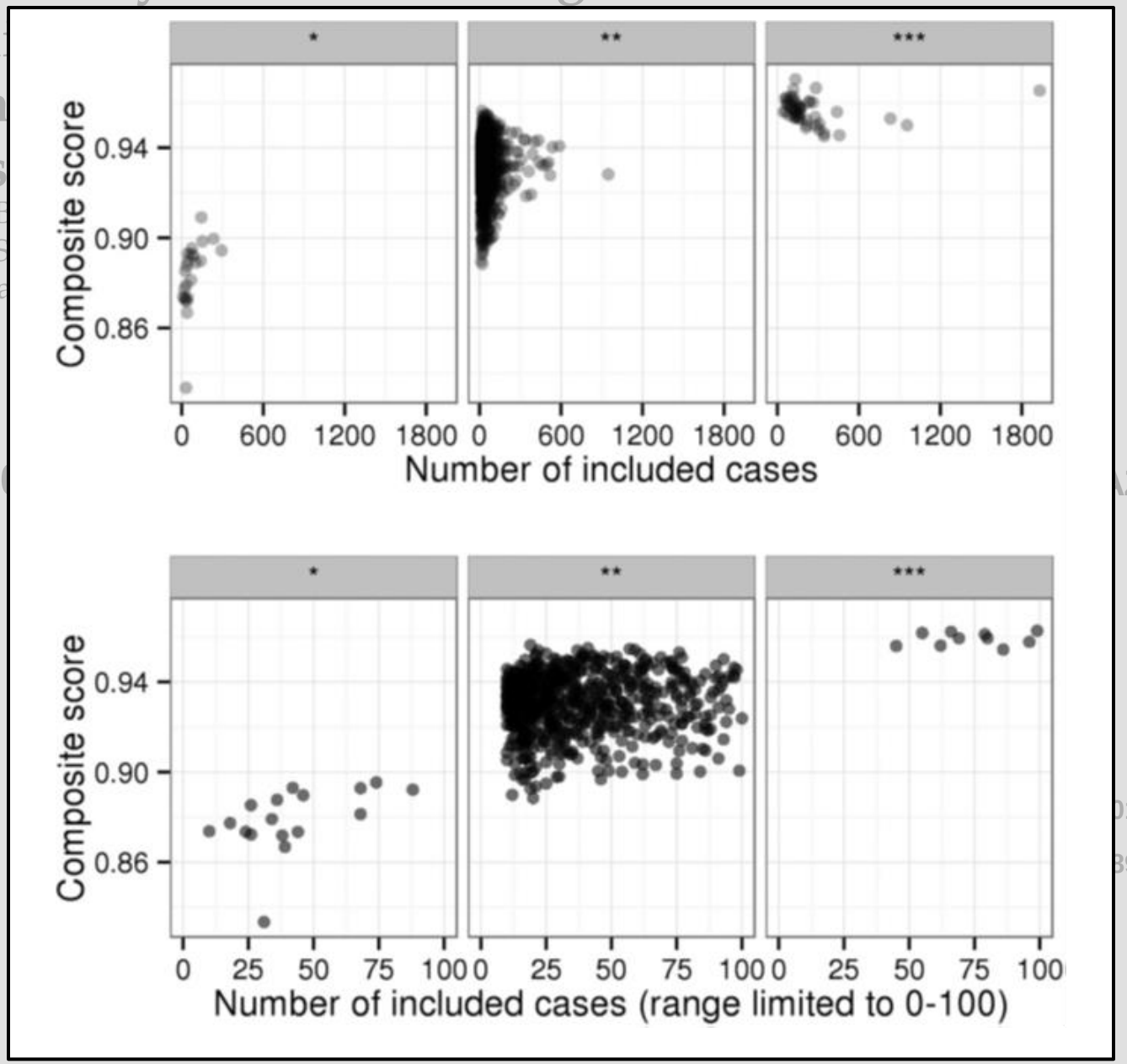

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The Society of Thoracic Surgeons Mitral Repair/Replacement Composite Score: A Report of The Society of Thoracic Surgeons Quality

Mitral Pathology Identified in 87.5%
(53,535/61,201)

Primary MR, 2º Degenerative Disease 56.5%
(30,222/53,535)

Mitral Valve Repair for Primary MR = 75.0%
(22,662/30,222)

Overall mortality 2.9%

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COMMONLY USED CONTEMPORARY SURGICAL TECHNIQUES

PRIMARY MITRAL REGURGITATION

I. Non-resection techniques using Gore-Tex® neochord reconstruction with annuloplasty

- May be used for focal leaflet flail or bileaflet prolapse
- May be used for forme fruste diffuse posterior leaflet myxomatous disease
- May be used for isolated anterior leaflet prolapse

II. Focal triangular resection with annuloplasty

- May be used for focal leaflet flail of the posterior or commissural leaflet

III. Sliding leaflet valvuloplasty with annuloplasty

- May be used for forme fruste diffuse posterior leaflet myxomatous disease
- May be used in the setting of bileaflet prolapse with excess posterior leaflet
- May be used in any of the above with significant echocardiographic predictors of systolic anterior motion

Pathoanatomic Approach to Mitral Regurgitation: Trends Cardiovasc Med 2015

COMMONLY USED CONTEMPORARY SURGICAL TECHNIQUES

SECONDARY MITRAL REGURGITATION

I. Restrictive remodeling rigid annuloplasty

- May be used as primary modality for annular dilatation mechanism
- May be used in conjunction with secondary or tertiary chordal cutting
- May be used in conjunction with other adjunctive procedures (i.e. papillary muscle sling)

II. Chord-sparing Mitral Valve Replacement

- May be used as primary modality for annular dilatation with severe leaflet tethering (i.e. > 10 mm tenting height)

Pathoanatomic Approach to Mitral Regurgitation: Trends Cardiovasc Med 2015

Last Week

Nearly Identical TEE echo reports from reputable high volume cardiologists

Case #1: “There is moderate-to-severe MR secondary to leaflet prolapse with significant eccentricity consistent with myxomatous degeneration”

Case #2: “There is evidence of eccentric moderate-to-severe MR consistent with what appears to be posterior leaflet prolapse”

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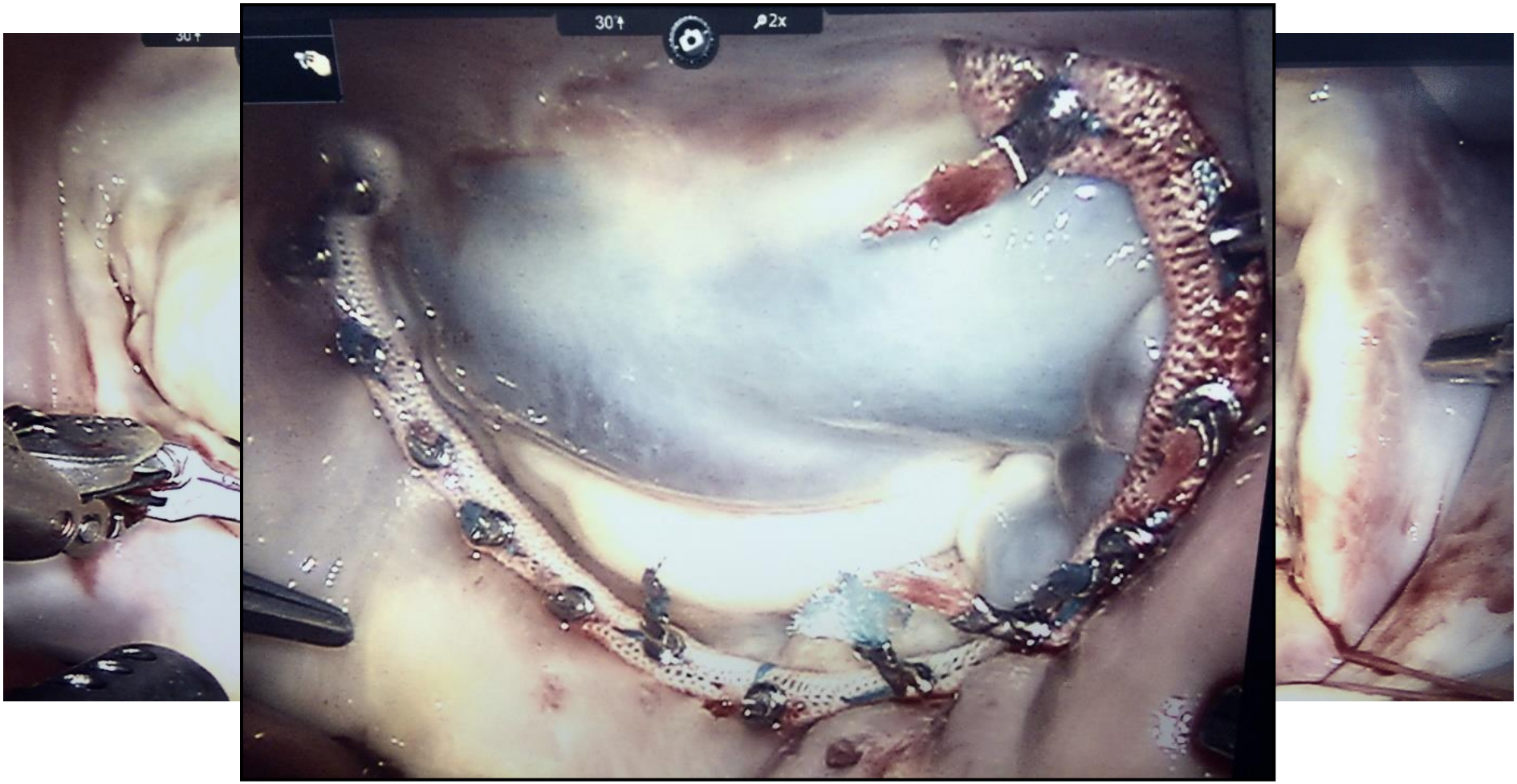

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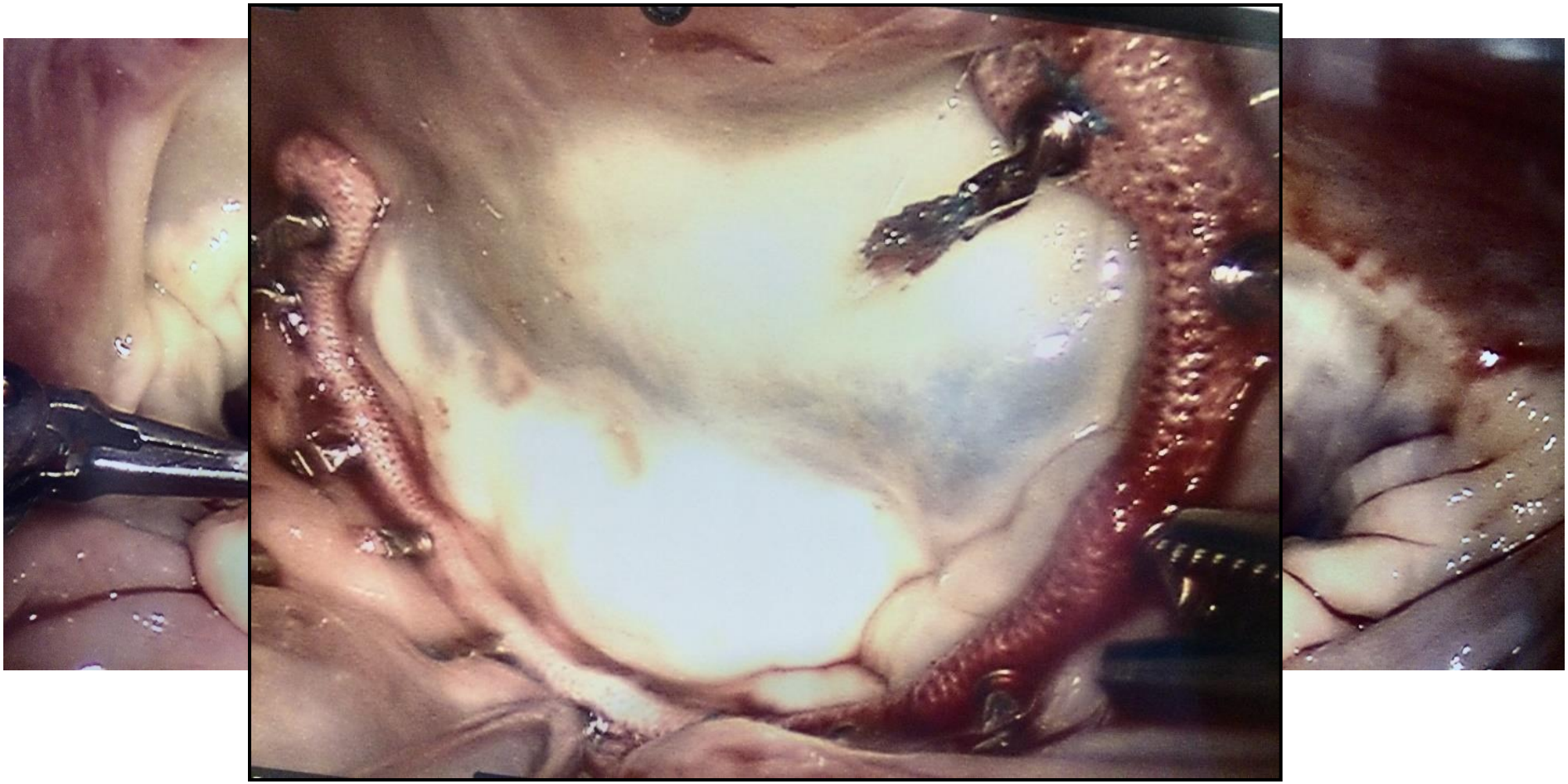

Discussion

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