Mitraliskirurgi

SFKF HÖSTMÖTE 2024-10-04

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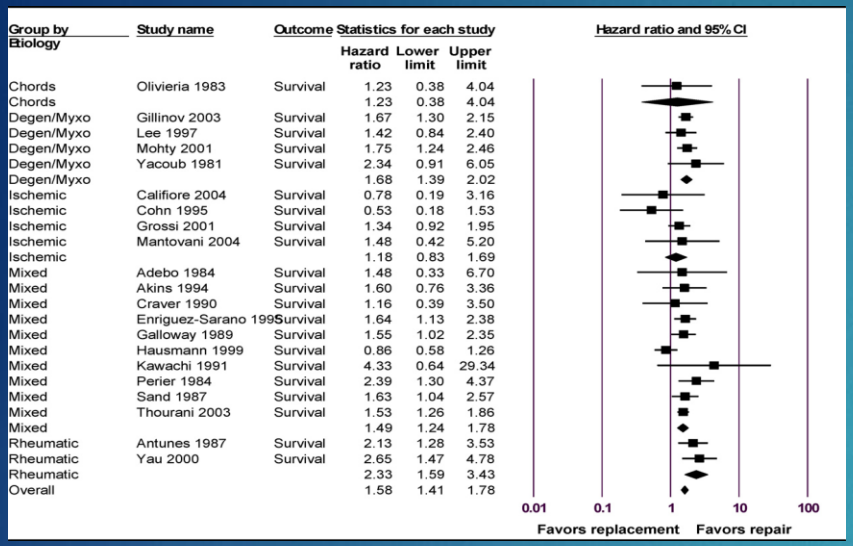
Mitraliskirurgi:

- **MVR (mitral valve replacement) – Biologisk eller mekanisk**
  - **Mitralisstenos**
  - **Mitralisinuficiens som man inte kan laga**
- **Mitralisplastik**
  - **Bäst kort- och långtidsresultat oavsett ålder**
  - **Förutsätter att plastiken är hållbar**
  - **Olika tekniker används och kombineras**

Repair v Replacement metaanalyser

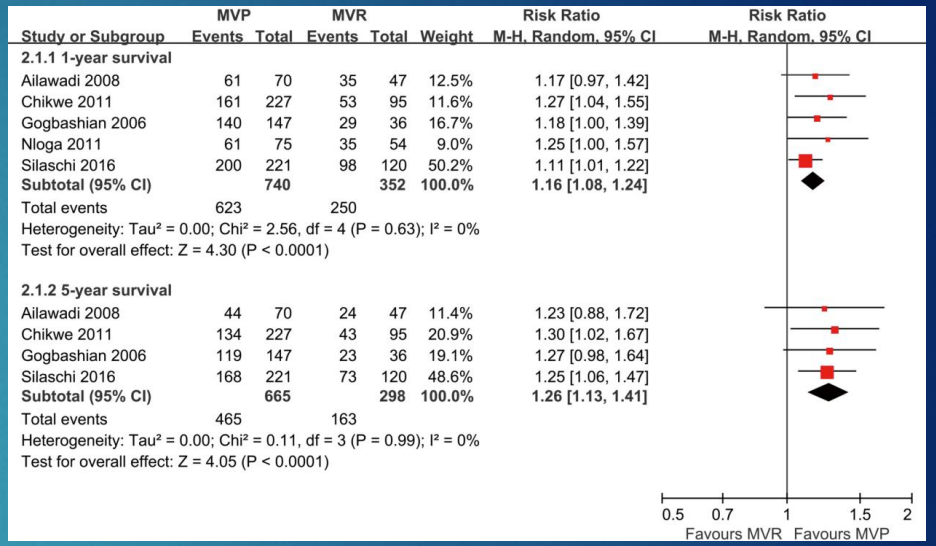
30d överlevnad



Group by Etiology	Study name	Outcome	Hazard ratio	Lower limit	Upper limit
Chords	Olivieria 1983	Survival	1.23	0.38	4.04
Chords			1.23	0.38	4.04
Degen/Myxo	Gillinov 2003	Survival	1.67	1.30	2.15
Degen/Myxo	Lee 1997	Survival	1.42	0.84	2.40
Degen/Myxo	Mohty 2001	Survival	1.75	1.24	2.46
Degen/Myxo	Yacoub 1981	Survival	2.34	0.91	6.05
Degen/Myxo			1.68	1.39	2.02
Ischemic	Califiore 2004	Survival	0.78	0.19	3.16
Ischemic	Cohn 1995	Survival	0.53	0.18	1.53
Ischemic	Grossi 2001	Survival	1.34	0.92	1.95
Ischemic	Mantovani 2004	Survival	1.48	0.42	5.20
Ischemic			1.18	0.83	1.69
Mixed	Adebo 1984	Survival	1.48	0.33	6.70
Mixed	Akins 1994	Survival	1.60	0.76	3.36
Mixed	Craver 1990	Survival	1.16	0.39	3.50
Mixed	Enriguez-Sarano 199	Survival	1.64	1.13	2.38
Mixed	Galloway 1989	Survival	1.55	1.02	2.35
Mixed	Hausmann 1999	Survival	0.86	0.58	1.26
Mixed	Kawachi 1991	Survival	4.33	0.64	29.34
Mixed	Perier 1984	Survival	2.39	1.30	4.37
Mixed	Sand 1987	Survival	1.63	1.04	2.57
Mixed	Thourani 2003	Survival	1.53	1.26	1.86
Mixed			1.49	1.24	1.78
Rheumatic	Antunes 1987	Survival	2.13	1.28	3.53
Rheumatic	Yau 2000	Survival	2.65	1.47	4.78
Rheumatic			2.33	1.59	3.43
Overall			1.58	1.41	1.78

J. Shuhaiber, R.J. Anderson / European Journal of Cardio-thoracic Surgery 31 (2007)

1 och 5 årsöverlevnad



Study or Subgroup	MVP Events	MVP Total	MVR Events	MVR Total	Weight	Risk Ratio M-H, Random, 95% CI
2.1.1 1-year survival						
Ailawadi 2008	61	70	35	47	12.5%	1.17 [0.97, 1.42]
Chikwe 2011	161	227	53	95	11.6%	1.27 [1.04, 1.55]
Gogbashian 2006	140	147	29	36	16.7%	1.18 [1.00, 1.39]
Nloga 2011	61	75	35	54	9.0%	1.25 [1.00, 1.57]
Silaschi 2016	200	221	98	120	50.2%	1.11 [1.01, 1.22]
Subtotal (95% CI)		**740**		**352**	**100.0%**	**1.16 [1.08, 1.24]**
Total events	623		250			
Heterogeneity: Tau² = 0.00; Chi² = 2.56, df = 4 (P = 0.63); I² = 0%						
Test for overall effect: Z = 4.30 (P < 0.0001)						
2.1.2 5-year survival						
Ailawadi 2008	44	70	24	47	11.4%	1.23 [0.88, 1.72]
Chikwe 2011	134	227	43	95	20.9%	1.30 [1.02, 1.67]
Gogbashian 2006	119	147	23	36	19.1%	1.27 [0.98, 1.64]
Silaschi 2016	168	221	73	120	48.6%	1.25 [1.06, 1.47]
Subtotal (95% CI)		**665**		**298**	**100.0%**	**1.26 [1.13, 1.41]**
Total events	465		163			
Heterogeneity: Tau² = 0.00; Chi² = 0.11, df = 3 (P = 0.99); I² = 0%						
Test for overall effect: Z = 4.05 (P < 0.0001)						

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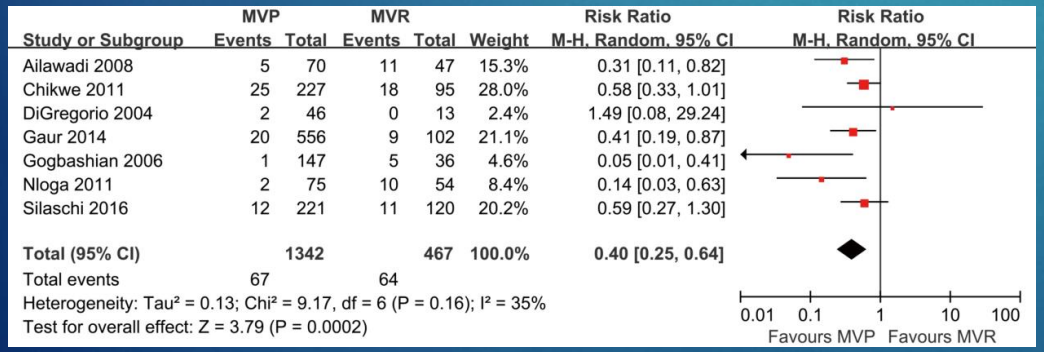
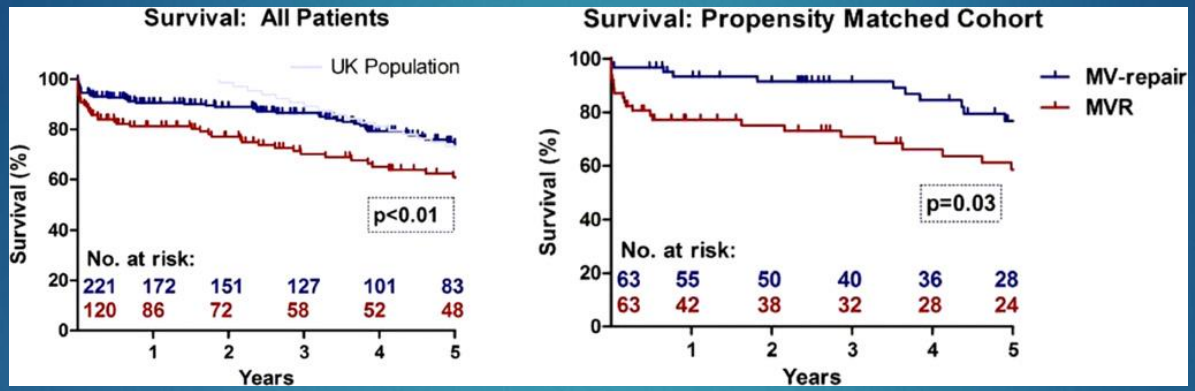


Study or Subgroup	MVP Events	MVP Total	MVR Events	MVR Total	Weight	Risk Ratio M-H, Random, 95% CI
Ailawadi 2008	5	70	11	47	15.3%	0.31 [0.11, 0.82]
Chikwe 2011	25	227	18	95	28.0%	0.58 [0.33, 1.01]
DiGregorio 2004	2	46	0	13	2.4%	1.49 [0.08, 29.24]
Gaur 2014	20	556	9	102	21.1%	0.41 [0.19, 0.87]
Gogbashian 2006	1	147	5	36	4.6%	0.05 [0.01, 0.41]
Nloga 2011	2	75	10	54	8.4%	0.14 [0.03, 0.63]
Silaschi 2016	12	221	11	120	20.2%	0.59 [0.27, 1.30]
Total (95% CI)		**1342**		**467**	**100.0%**	**0.40 [0.25, 0.64]**
Total events	67		64			
Heterogeneity: Tau² = 0.13; Chi² = 9.17, df = 6 (P = 0.16); I² = 35%						
Test for overall effect: Z = 3.79 (P = 0.0002)						

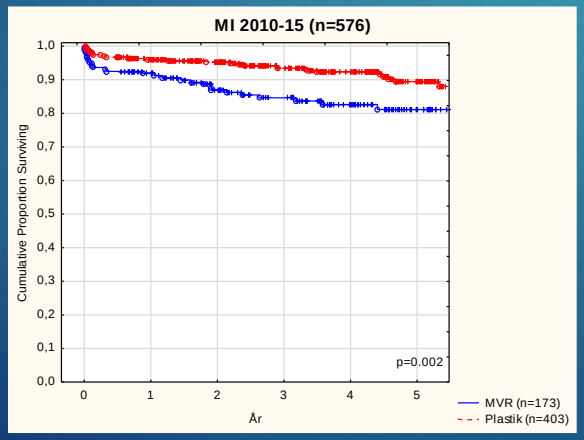
Repair v Replacement

- **Patients > 75yrs, survival**

Conclusions—Excellent outcomes can be achieved after MV surgery in elderly patients. Long-term survival is superior after MV-repair and the re-operation rate is low. MV-repair should be the preferred surgical approach in elderly patients. (J Am Heart Assoc. 2016)

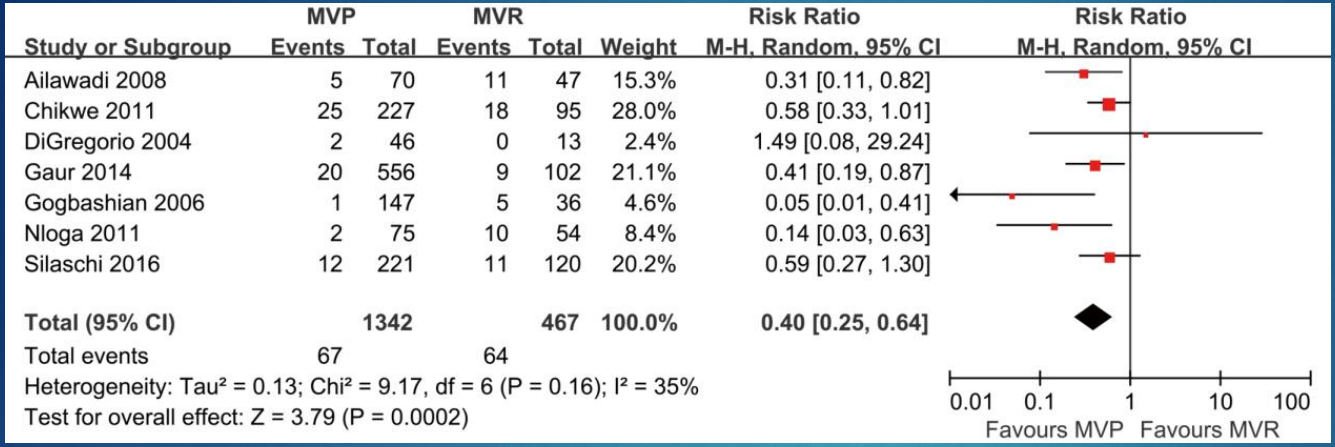


- **Linköping, alla åldrar, överlevnad**



Repair v Replacement (metaanalyser)

Reoperation under uppföljningen



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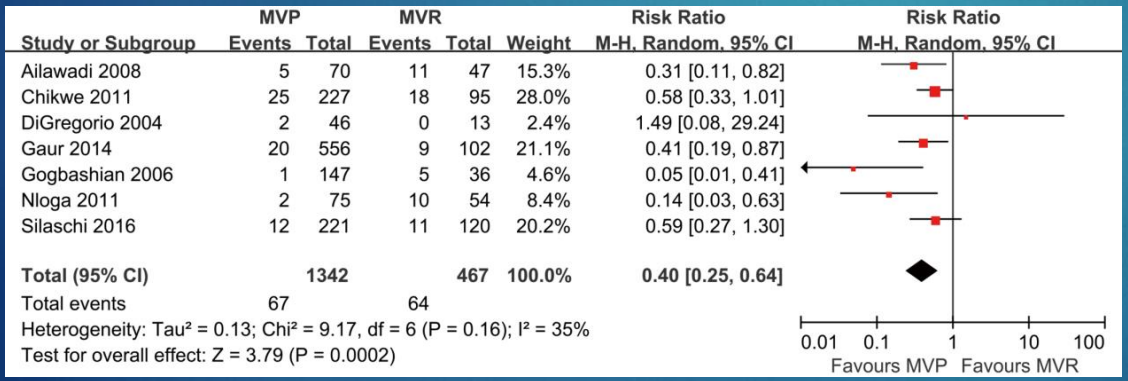

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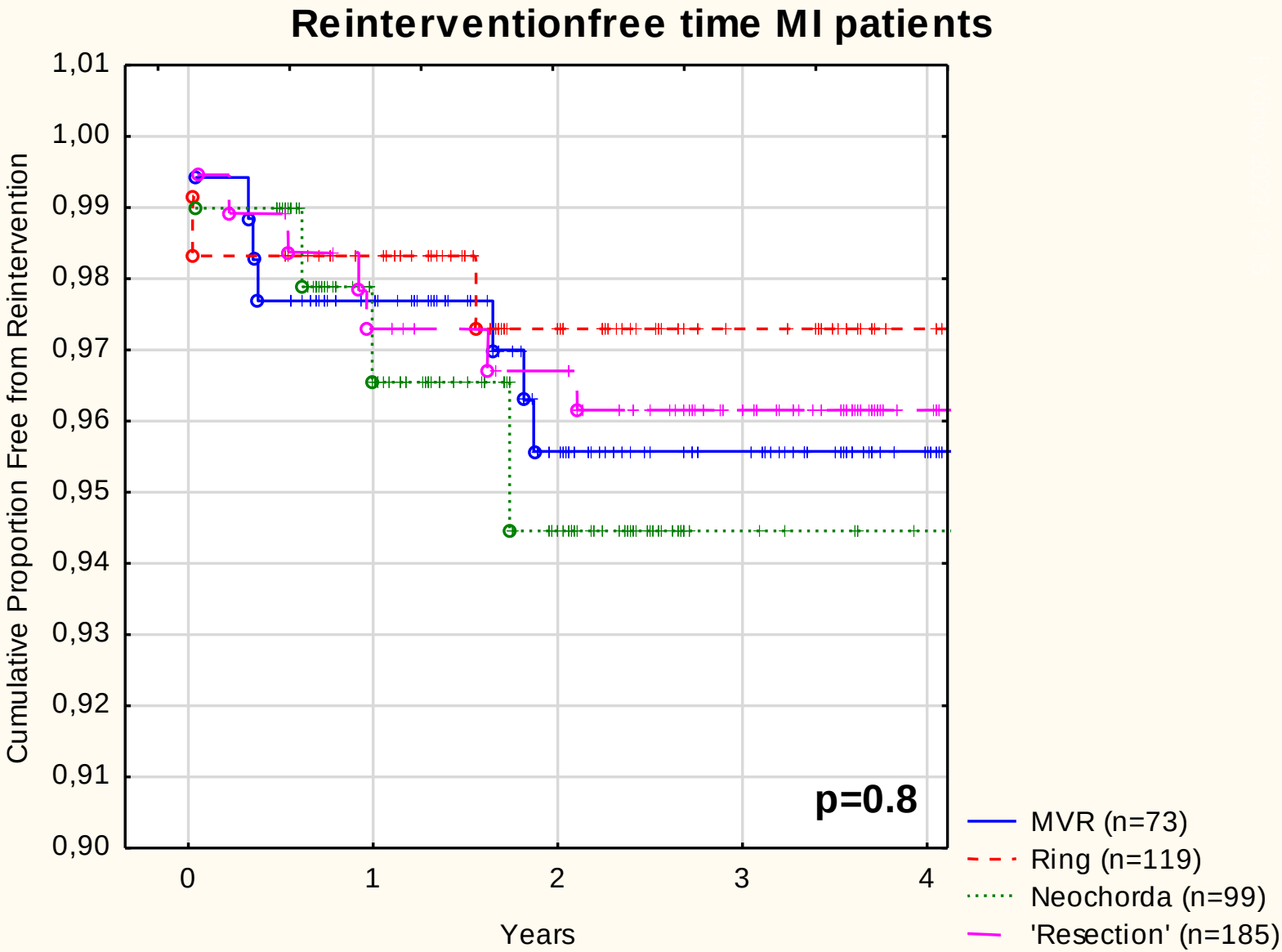
Reoperation

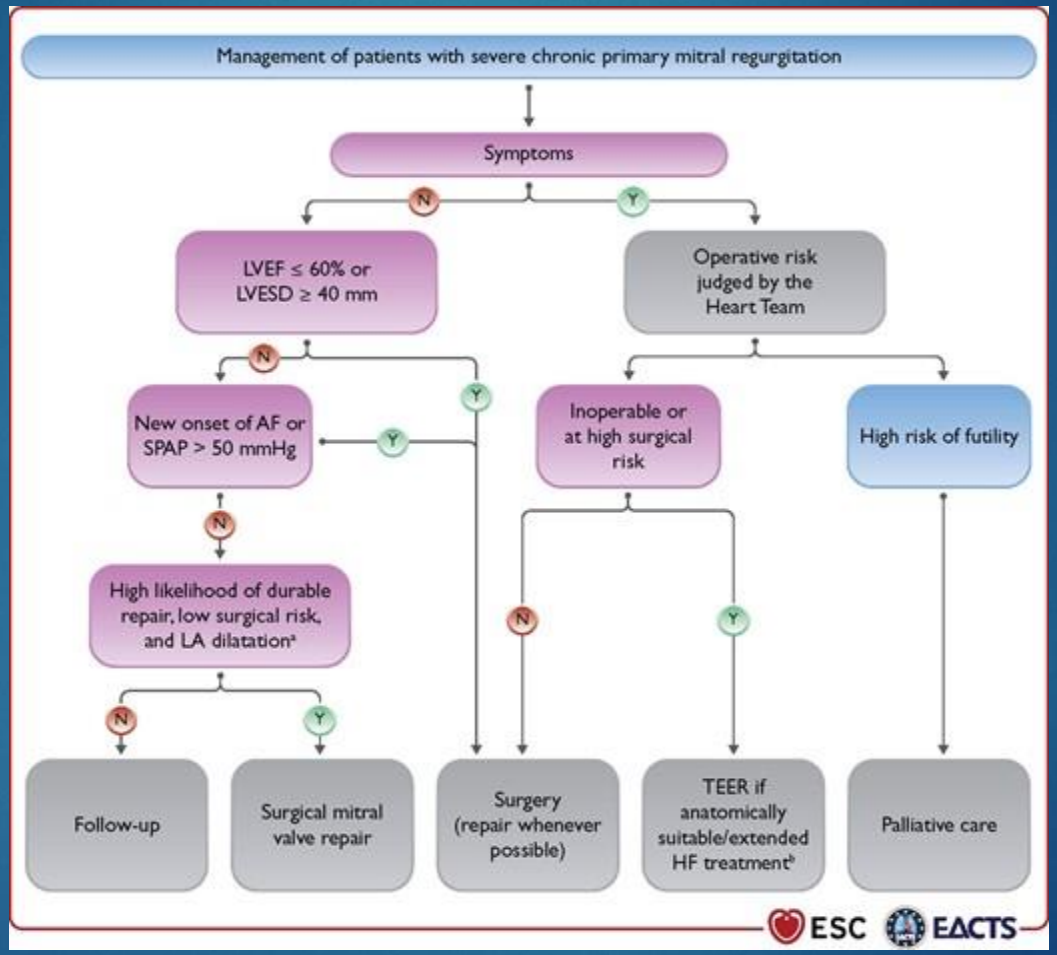


Reintervention efter primär MVS

Mitr reintervention efter primär MVS 23/600 (3.8%)									
MVR 8/197 (4.1%)		**Ring enbart 3/119 (2.5%)**		**Neochordae 5/99 (5.1%)**		**Resektion 7/185 (3.8%)**			
Orsak	**Åtgärd**	**Orsak**	**Åtgärd**	**Orsak**	**Åtgärd**	**Orsak**	**Åtgärd**		
EC	MVR	Ring släppt	Resut	MI-recidiv	MVR	MI-recidiv	MVR		
EC	MVR	SAM	Alfierisut	MI-recidiv	MVR	MI-recidiv	MVR		
EC	MVR	MI-recidiv (OI)	MI-plastik	MI-recidiv	MVR	MI-recidiv	Mi-clip	!->MI	MVR
EC	MVR			MI-recidiv	MI-clip	MI-recidiv	Mi-clip	!->MI	
Valvinsuff	TAVI V-in-V			SAM	MI-clip	MI-recidiv	TAVI i ring		
PVL	KatPlug					PVL vid ring	Kat plug		
PVL	KatPlug					EC	MVR	!->PVL	KatPlug
Klafftrombos	MVR								

När indikationen för kirurgi är fastställd, primär MR

2021 ESC/EACTS Guidelines for the management of valvular heart disease:



Recommendations	Class[a]	Level[b]
Mitral valve repair is the recommended surgical technique when the results are expected to be durable.[293–296]	I	B
Surgery is recommended in symptomatic patients who are operable and not high risk.[293–296]	I	B
Surgery is recommended in asymptomatic patients with LV dysfunction (LVESD ≥40 mm and/or LVEF ≤60%).[277,286,292]	I	B
Surgery should be considered in asymptomatic patients with preserved LV function (LVESD <40 mm and LVEF >60%) and AF secondary to mitral regurgitation or pulmonary hypertension[c] (SPAP at rest >50 mmHg).[285,289]	IIa	B
Surgical mitral valve repair should be considered in low-risk asymptomatic patients with LVEF >60%, LVESD <40 mm[d] and significant LA dilatation (volume index ≥60 mL/m^2 or diameter ≥55 mm) when performed in a Heart Valve Centre and a durable repair is likely.[285,288]	IIa	B
TEER may be considered in symptomatic patients who fulfil the echocardiographic criteria of eligibility, are judged inoperable or at high surgical risk by the Heart Team and for whom the procedure is not considered futile.[299–302]	IIb	B

Vad behöver vi veta inför kirurgi (plastik)?

Prolaps – var? hur stor?

Restriktivitet? (tenting: 0-5, 5-10, >10mm)

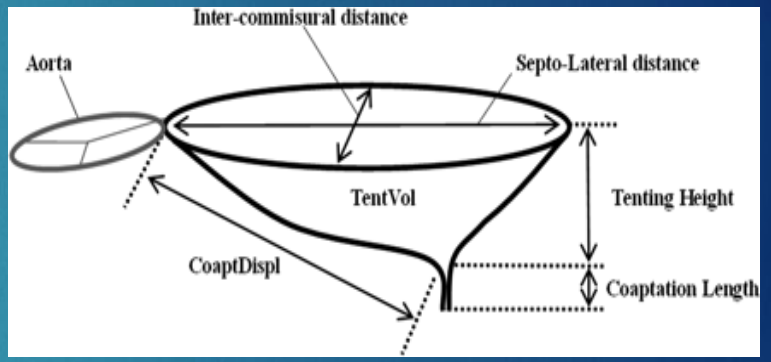
Ringmått – AP/IC

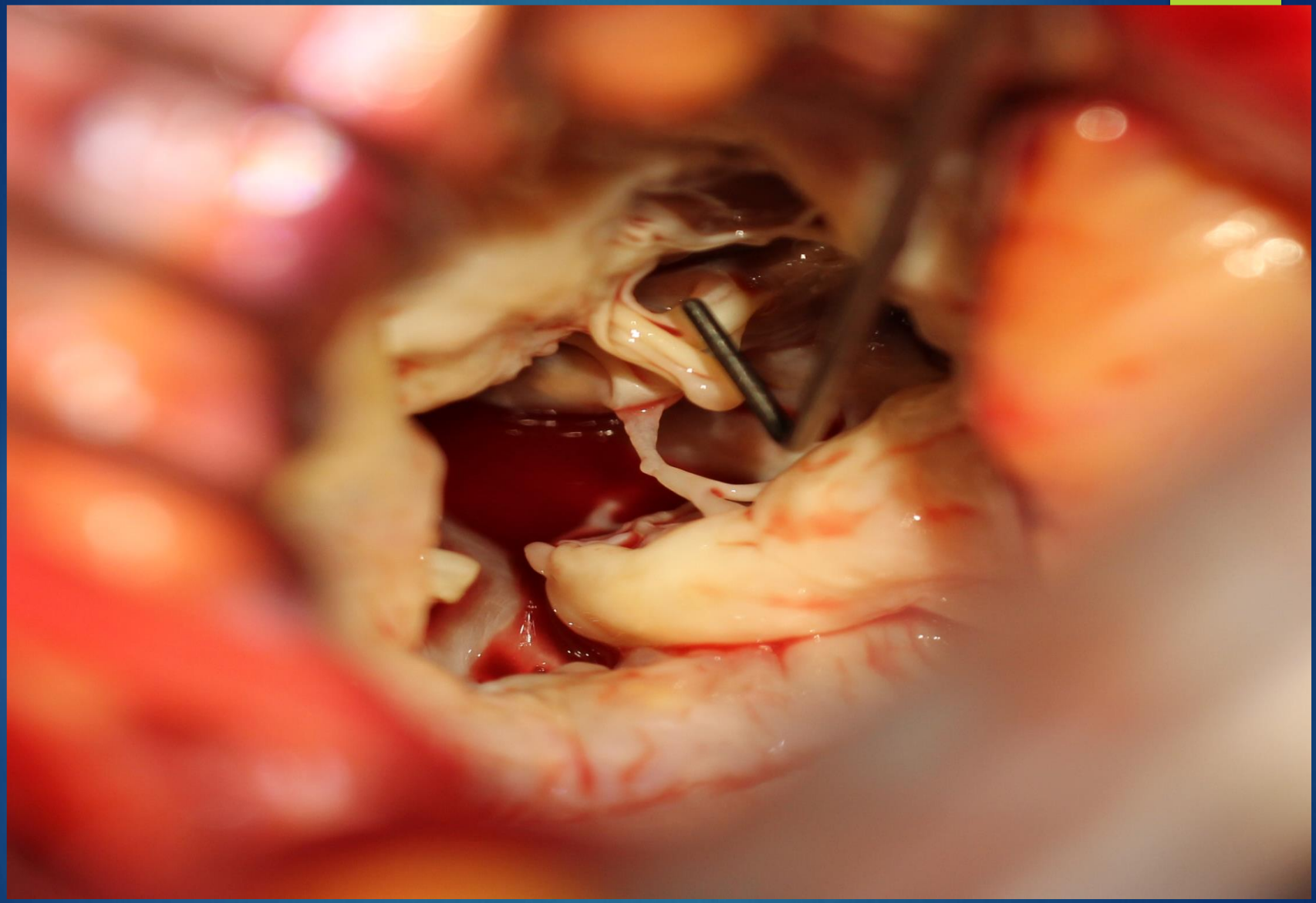
Barlow

LVOT obstruktion – tendens till SAM

Aorto-mitral vinkel

Övriga vitier, koronarkärl (stenoser, anatomi), lungfunktion





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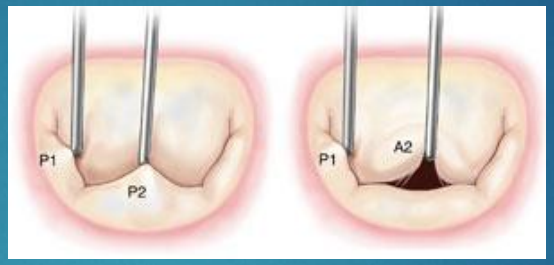
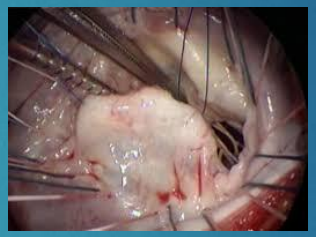
Peroperativ kirurgisk klaffanalys

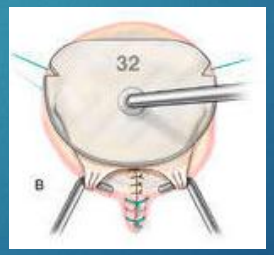
P1 referens för chorda-längd

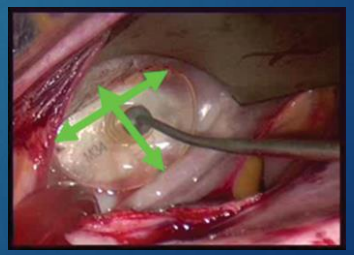


Baksegellängd



Framsegelyta + IC distans -> Ringstorlek

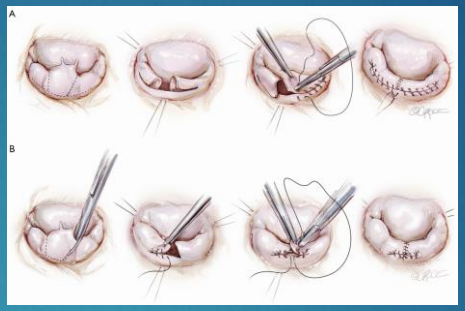




Plastikmetoder I

Resektion (endast baksegel – P2)

- Kvadrangulär (slidin/folding)



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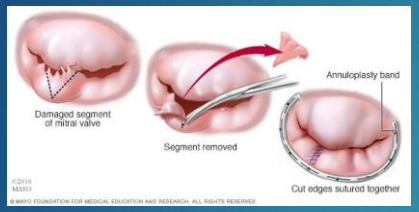
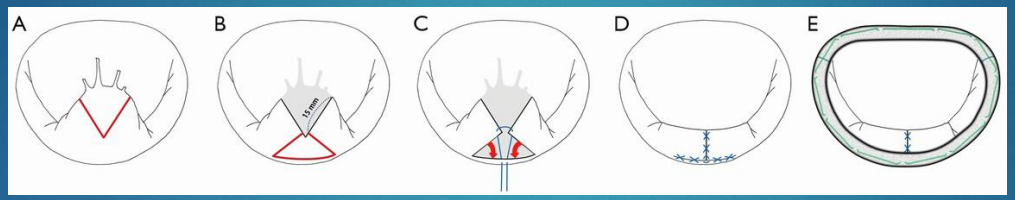


- butterfly

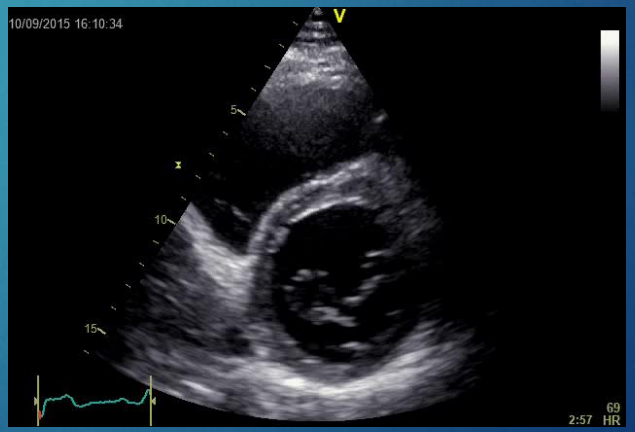


Komissurplastik

Edge-to-edge, Alfieri stich

Barlow

SAM



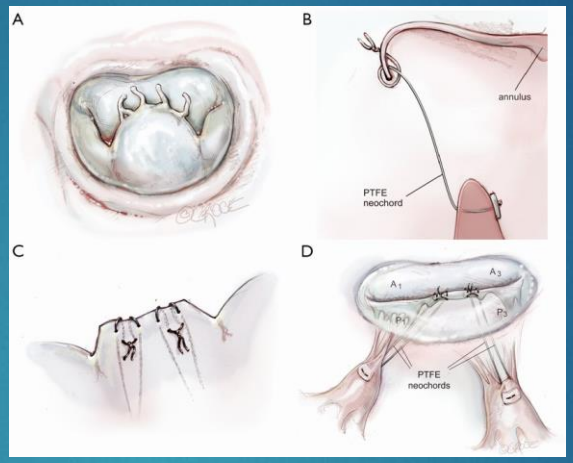
Resektionsplastik, för- och nackdelar

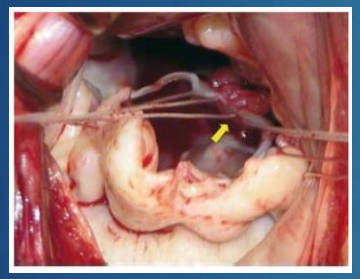
- Sjuk vävnad tas bort
- Välbeprövad teknik
- Mindre risk för SAM

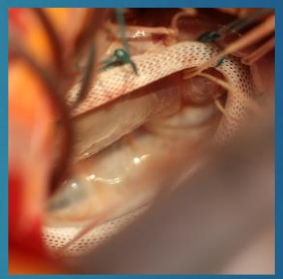
- Endast baksegel
- Mindre ring/ostium
- Ingen återvändo

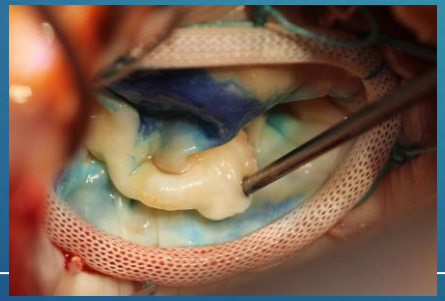
Plastikmetoder II

Neochorda (Gore-Tex)





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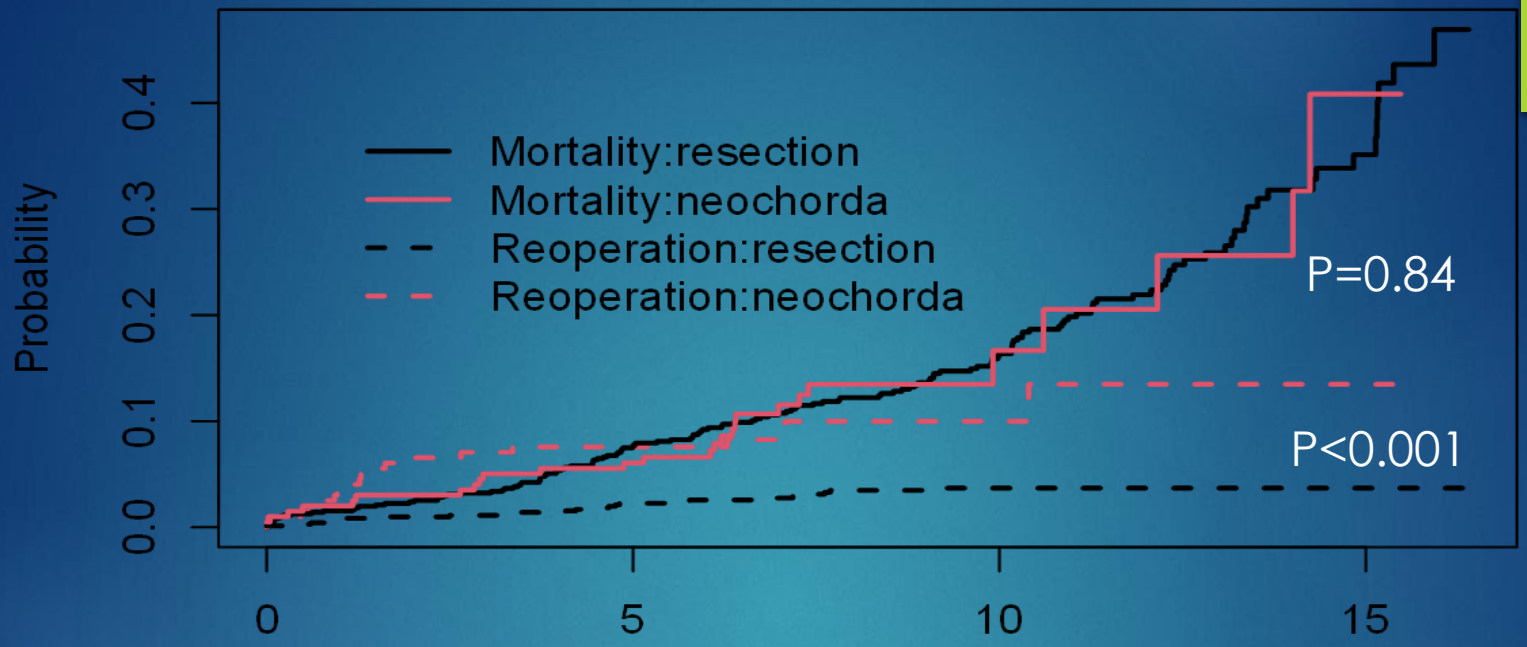
Neochorda, för- och nackdelar

- Alla klaffsegment kan åtgärdas, även omfattande Barlow
- Kan testas och justeras
- Större ring/ostium

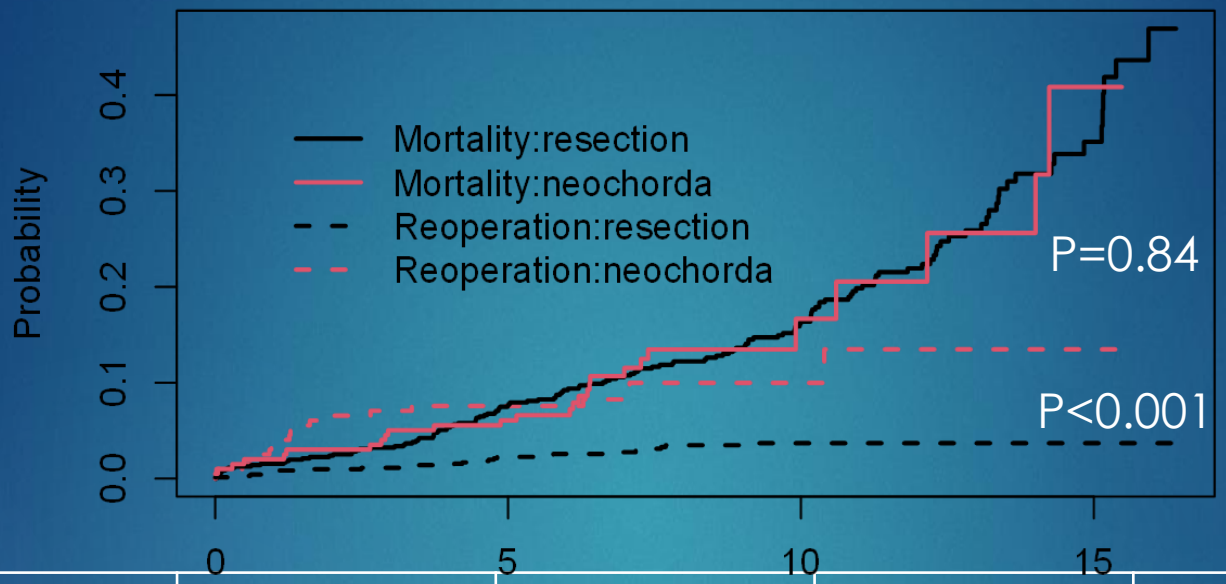
- Sjuk vävnad kvar
- Större risk för SAM
- Välbeprövad (>20 år) men fortfarande vissa **frågetecken kring hållbarhet**

Svensk multicenterstudie (under publ)



Neochorda				
At risk	198	166	22	1
Events	0	15	18	19
Resection				
At risk	709	602	331	42
Events	0	16	24	24

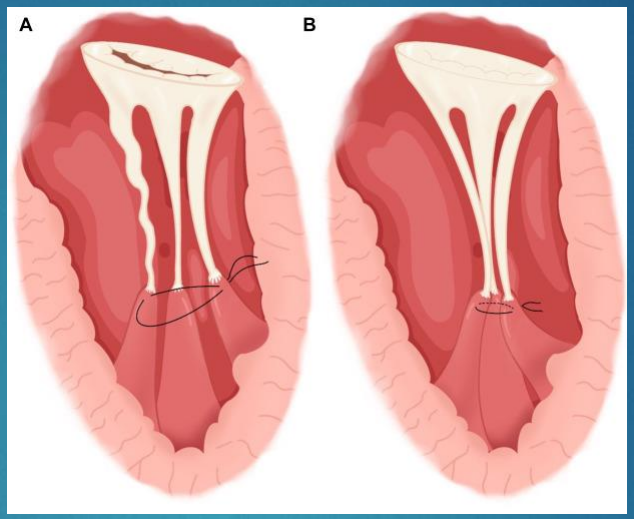
Results 2



Neochorda				
At risk	198			
Events	0			
Resection				
At risk	709			
Events	0			

Plastikmetoder III

Papillarmuskelplastik



Chordaförflyttning fr PL till AL

Alltid annuloplastik med ring!

Med ytterst få undantag

Mål att eftersträva med mitralisplastiken för ett hållbart resultat:

Inget läckage

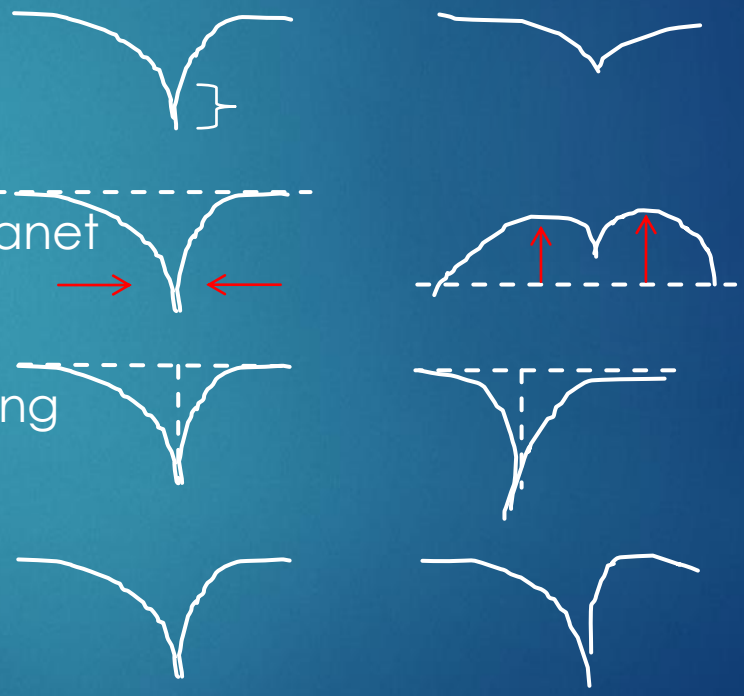
Ring - remodellering

Coaptationsyta > 3-4mm (7mm)

Coaptationsnivå nedanför annulusplanet

Coaptationsläge i anteposterior riktning

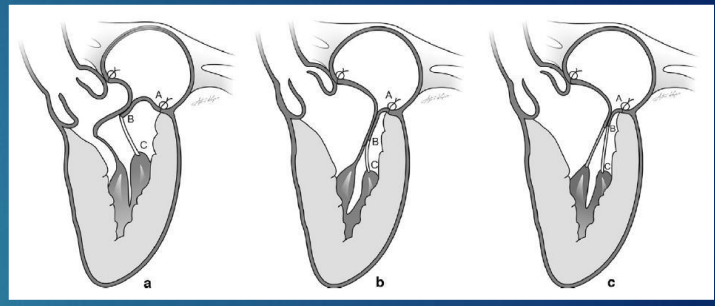
Apposition symmetrisk



Fallgropar

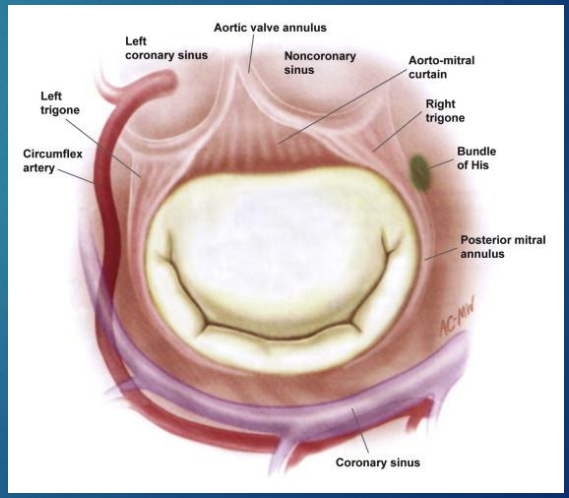
Systolic anterior motion (SAM)
Ökad risk om:

- Baksegellängd > 2 cm (1,5 cm)
- Coapt-sept distans < 3 cm (2,5 cm)
- Hypertrof, buktande septum > 1,5 cm
- Vinkeln aorta- och mitralisklaffplanet < 120°



Cx obstruktion

Aortainsufficiens

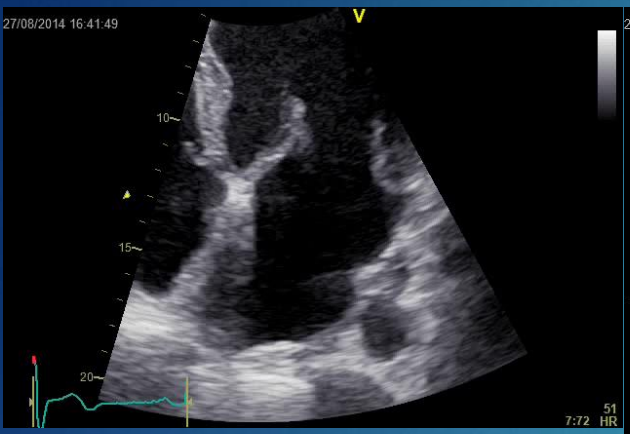


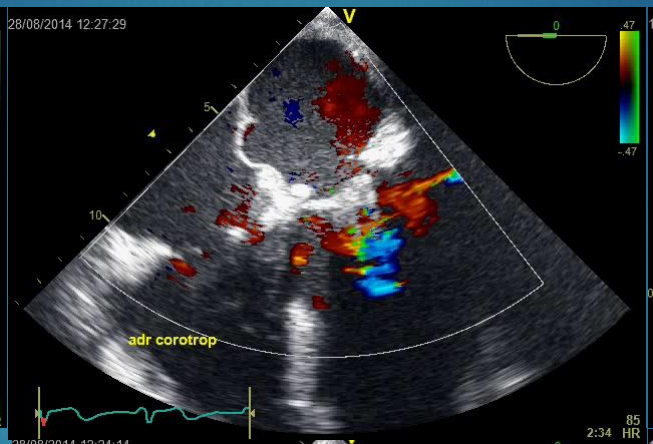
SAM (CT -57)

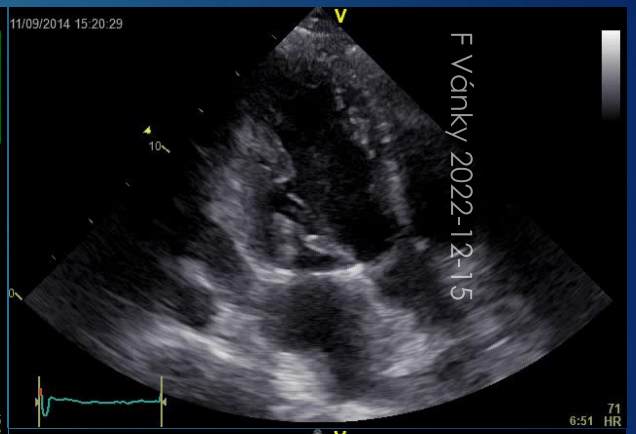
Preop: Barlow, dil ring, måttl MI
Mitral annulus disjunction (MAD)

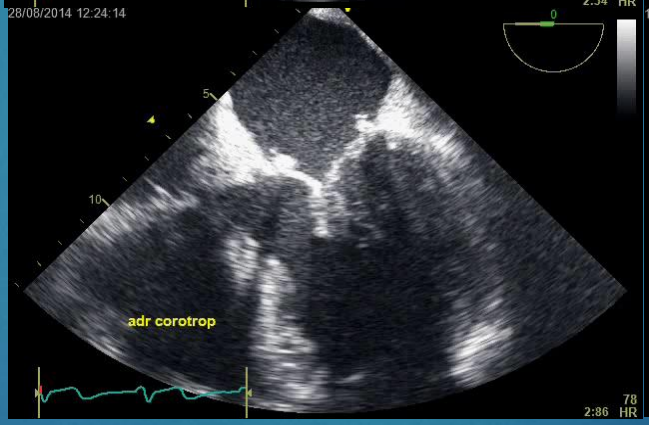
Op: CE-ring
Perop: Turbulens i LVOT, SAM

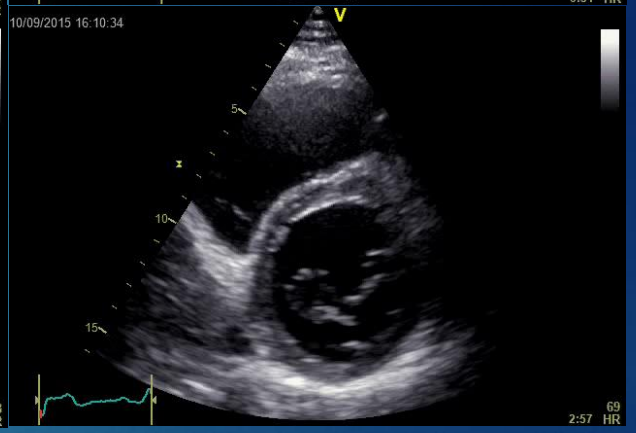
Reop: Alfierisutur
Postreop: Fritt i LVOT, dubbel orifice







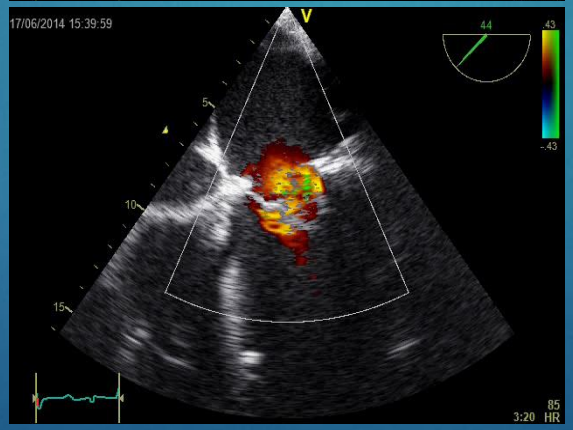




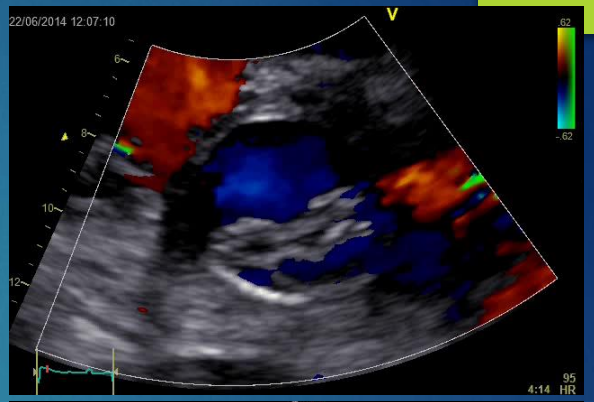
MI-recidiv (CT -70) pre-perop

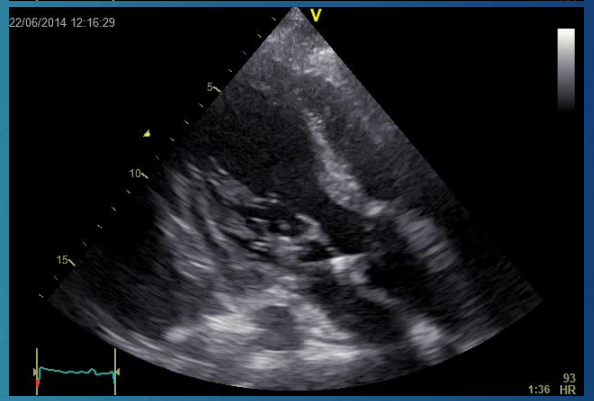
Preop
Chordaeruptur P2, AP58/IC47

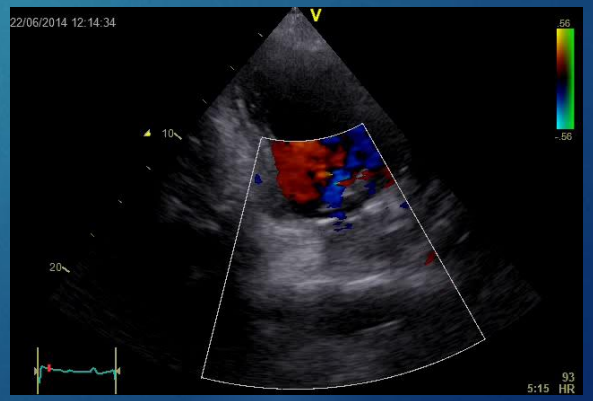
Op CE-ring 38mm, Neochordae
4 st
Perop: Inget läckage



Postop D5
Välfungerande plastik

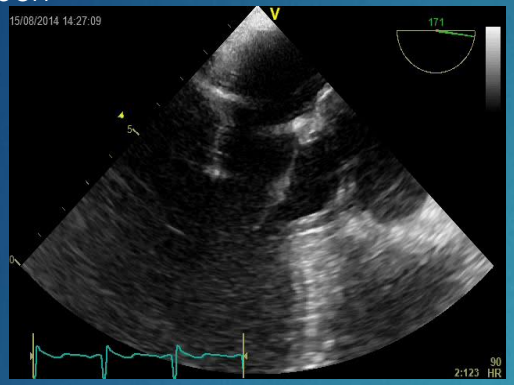


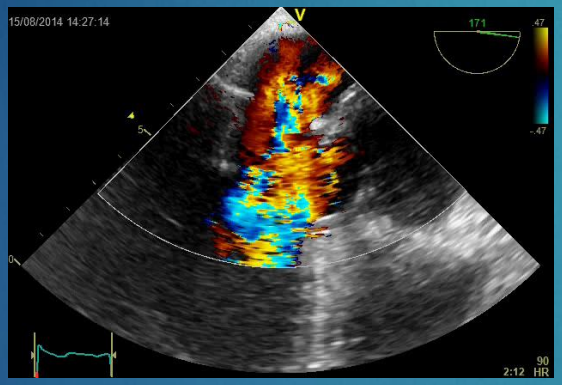


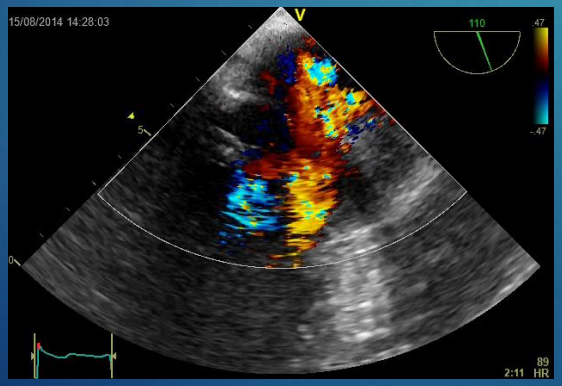


MI-recidiv (CT -70) postop

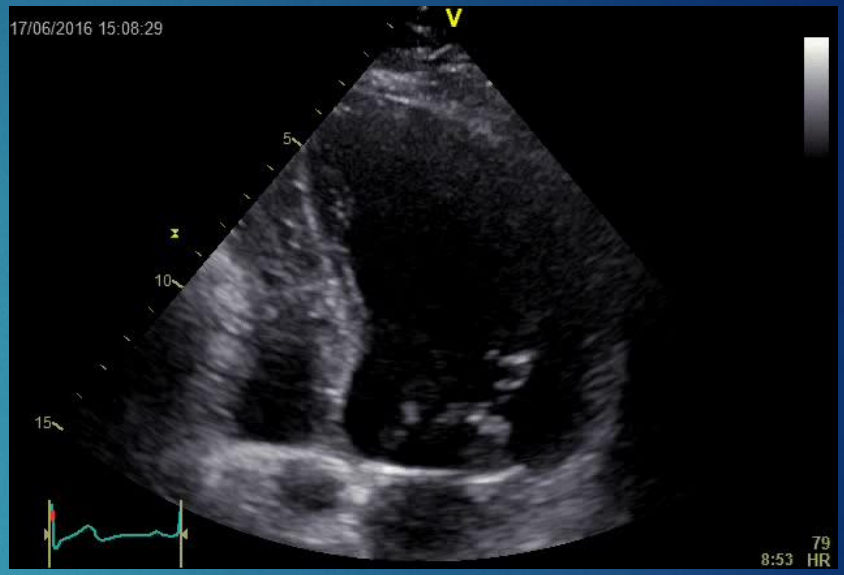
Postop 2 mån: VK 61mm, EF 44%,
måttlig MI '1,5', PL-prolaps
Mi-clip testas -> för hög gradient, tas bort





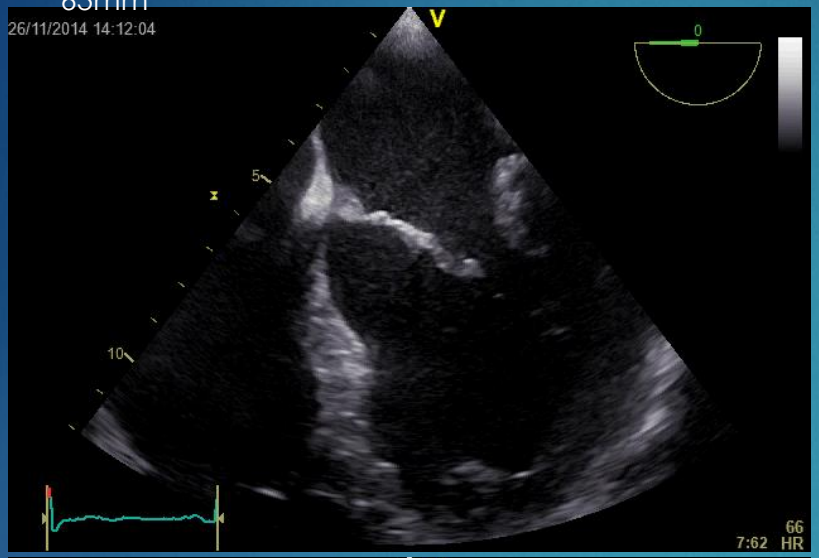


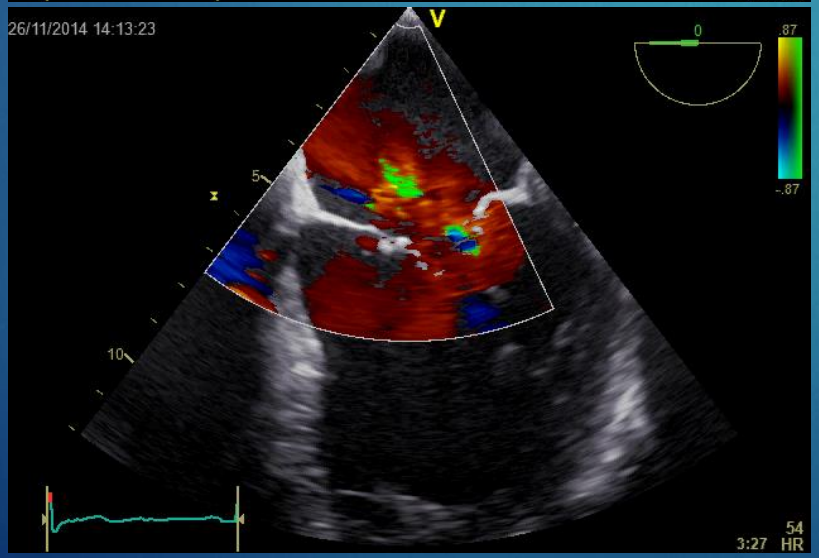
Postop 2 år
EF 64%, hyperdynamisk VK,
MI kvar men svårvärderad



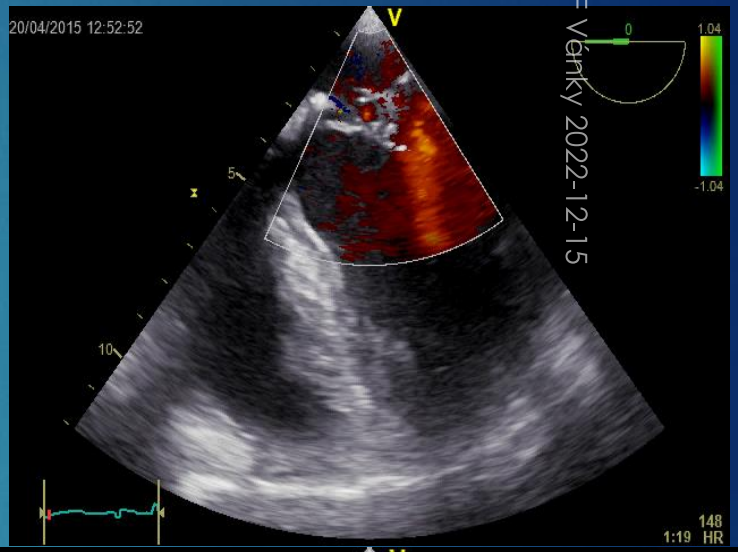
MI-recidiv (LJ -60) pre-perop

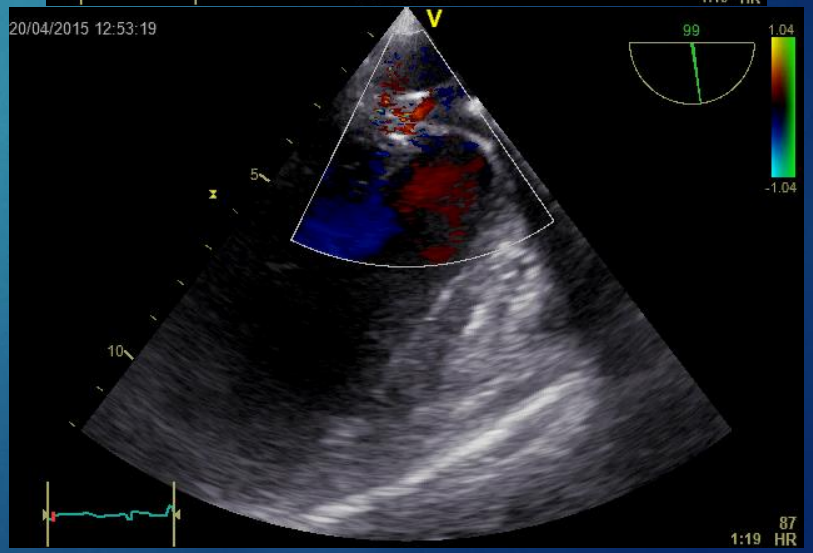
Preop
P2-prolaps, AP39/IC42, Dil VK
63mm





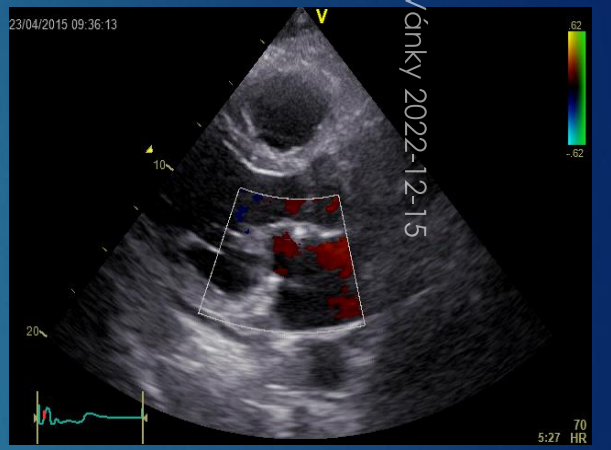
Op PhII-ring 36mm, Neochordae 2 st i P2
Perop: Liten splittrad MI, minskar med ökande tryck





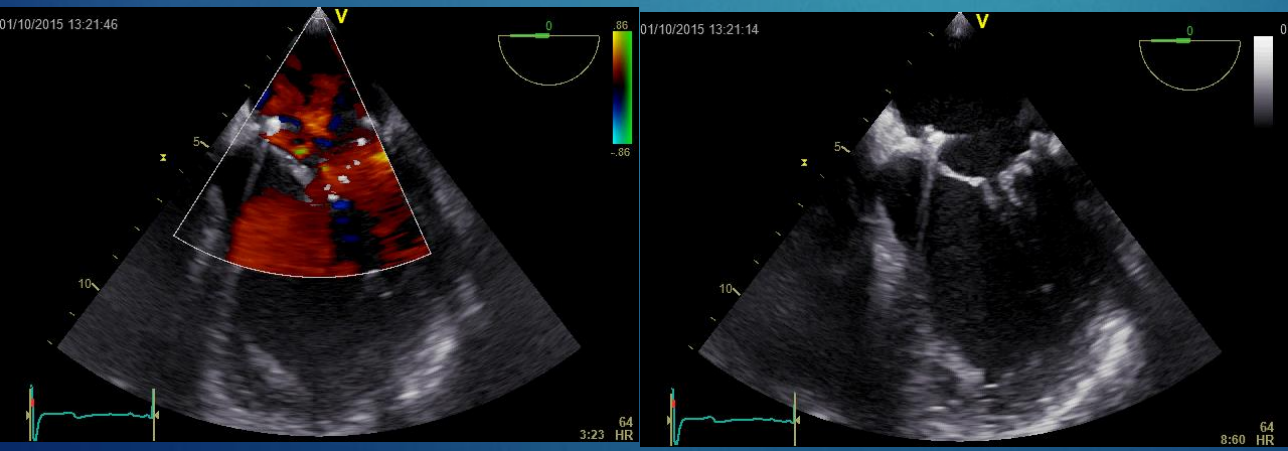
MI-recidiv (LJ -60) postop

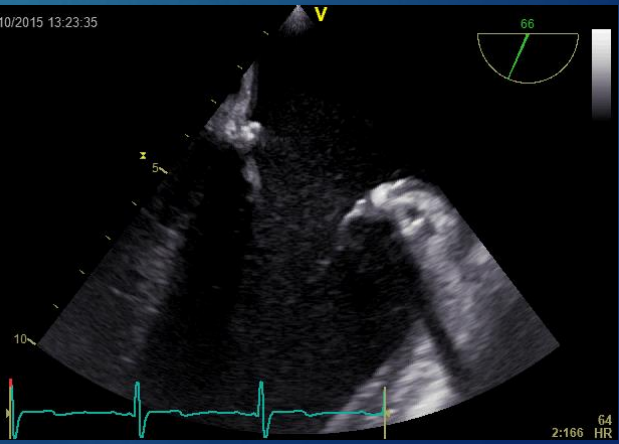
Postop 2 mån: Lätt-måttl MI, lätt dil VK 62, God syst VK-funktion



F Vánky 2022-12-15

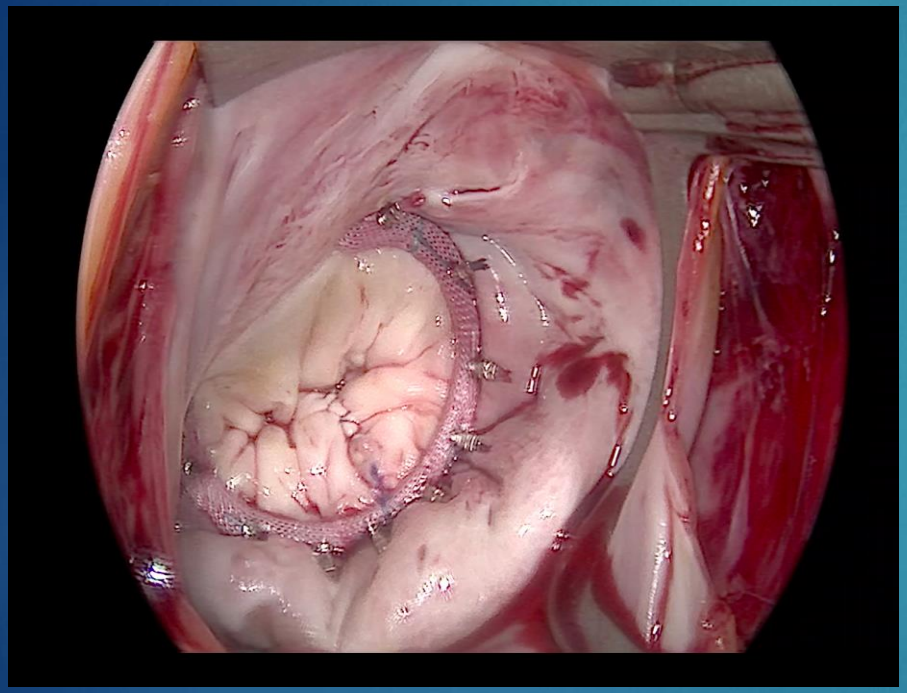
Postop 6 mån: Måttl MI, Normalstor VK med god syst funktion, P2-prolaps
Asymptomatisk, inga begränsningar -> aktiv expectans





MIMS – Linköping 2019-2023

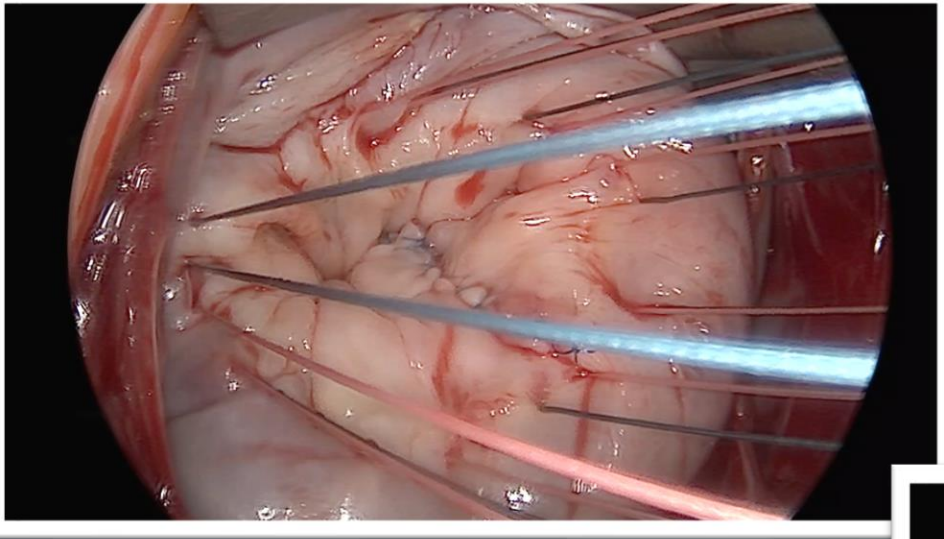
Farkas Vánky,

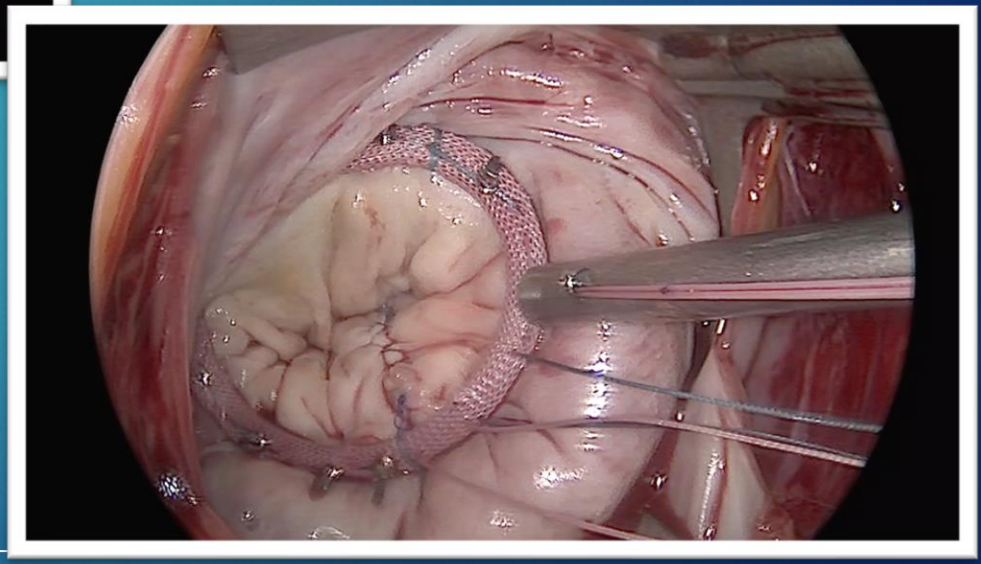


Region Östergötland

LINKÖPING UNIVERSITY

MIMS





Vår erfarenhet, N = 173

(2019-09-10 till 2023-11-01)

Mitralis (162)

- Redo 11 (7%)
- Cox maze IV 21 (13%)
- Tricusp 18 (11%)
- Annat 15 (9%)

Övriga (11)

- Tumörer (myxom, fibroelastom) 4
- Tricuspidalisplastik/-protes 3
- PFO 2
- LV pseudoaneurysm redo 1
- Shunt Ao – RV redo 1

MIMS (162)

Diagnos - åtgärd

n	Insufficiens	Stenos	Endokardit	Plastik/protes-dysfunktion
Plastik	146 (96%)		1	
Protes	6	1	1	8

Plastik N=147	Antal
Enbart ring	10
Resektion	113
Resektion + neochorda	9
Neochorda	7
Papillarmuskelplastik	11
Baksegel	123
Framsegel	31

Resultat

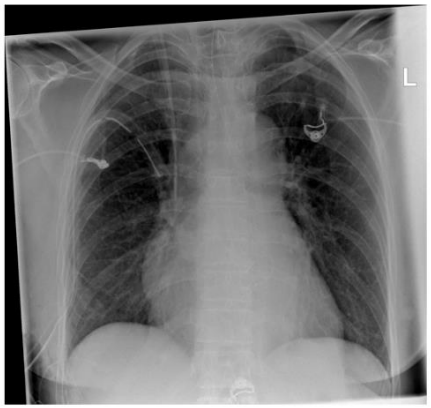
Preop - Op	Median, antal	Percentil 25:e-75:e
Ålder år	61	53-70
Kvinnor	21%	
EuroSCORE II	1.13	0.69-2.16
CCT min	98	83-115
ECC min	183	156-222
Optid min	238	196-280
Konvertering	6*	*5/70 första

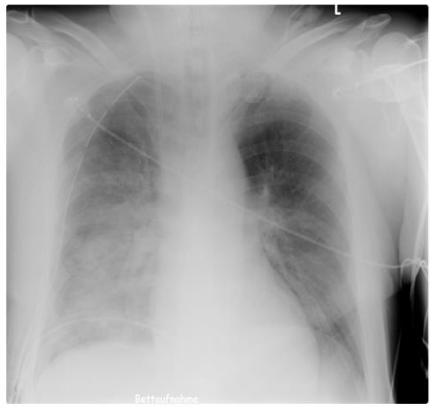
Postop	Median, antal	Percentil 25:e-75:e
CK-MB d1	30	22-52
Vårdtid postop (d)	5	4-7
Uppföljning		
Total mortalitet (50 mån, median 24 mån)	2 (1.2%)	D0, D29
MI > +1	0	
Reop klaffdysfunktion	0	

Unilateralt lungödem (UPE)

Upp till 20% efter MIMS

"In-hospital outcome with UPE after MIMVS was **not significantly worse** compared to non-UPE patients, and no differences were observed in
the long-term follow-up. However, **prolonged aortic clamp time, worse renal and left ventricular
function, pulmonary hypertension and transfusion are associated** with UPE."
(T Puehler, J. Clin. Med. 2021)





Sammanfattning MIMS

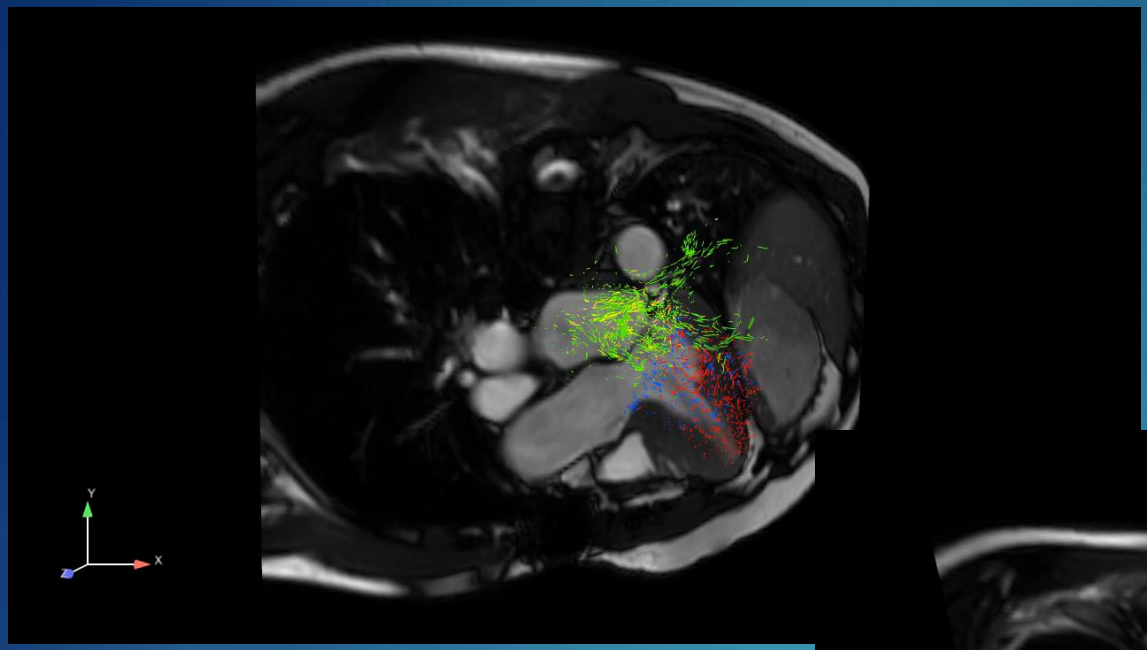
Patien

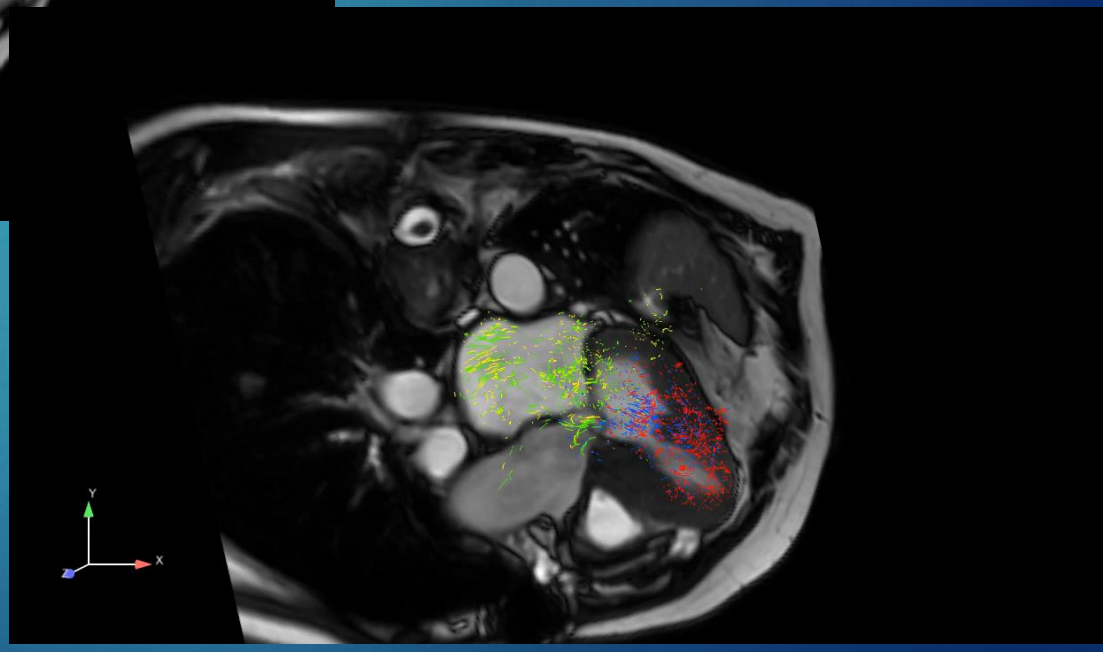
- Bättre visualisering
- Hög andel plastiker (96%)
- Kortare vårdtid (2d)
- Snabbare mobilisering
- Kortare sjukskrivning
- Alternativ till resternotomi vid redo
- Längre op tid (60-90 min)
- Specifika komplikationer att beakta

Organisation

- Lägsta volym
- Underlättar utbildning / delaktighet

4D-flowMRI





Tack för er uppmärksamhet

Frågor?