Outcomes of mitral transcatheter edge to edge repair versus isolated mitral surgery for the treatment of severe mitral regurgitation:

data from a nationwide analysis.

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Background

Mitral regurgitation (MR) is the more prevalent valvular disease in western countries

In all registries, MR is undertreated and/or at a late stage

MR treatment is associated with poor prognosis (in older patients)

When considering MR, 1ary and 2ary MR could be differentiated

Background

Treatment of MR is indicated by the severity of MR

Isolated mitral surgery (repair/replace) has been the only curative treatment for severe MR

From 2011, transcatheter edge-to-edge repair (TEER) has offered an alternative to surgery for the treatment of severe MR

Objective

To compare long-term outcomes of TEER vs. isolated mitral valve surgery at a nation wide level in France

To compare long-term outcomes of TEER vs. isolated mitral valve repair at a nation wide level in France

To evaluate long-term outcomes of TEER vs. isolated mitral valve surgery in *1ary and 2ary MR* at a nation wide level in France

Methodology

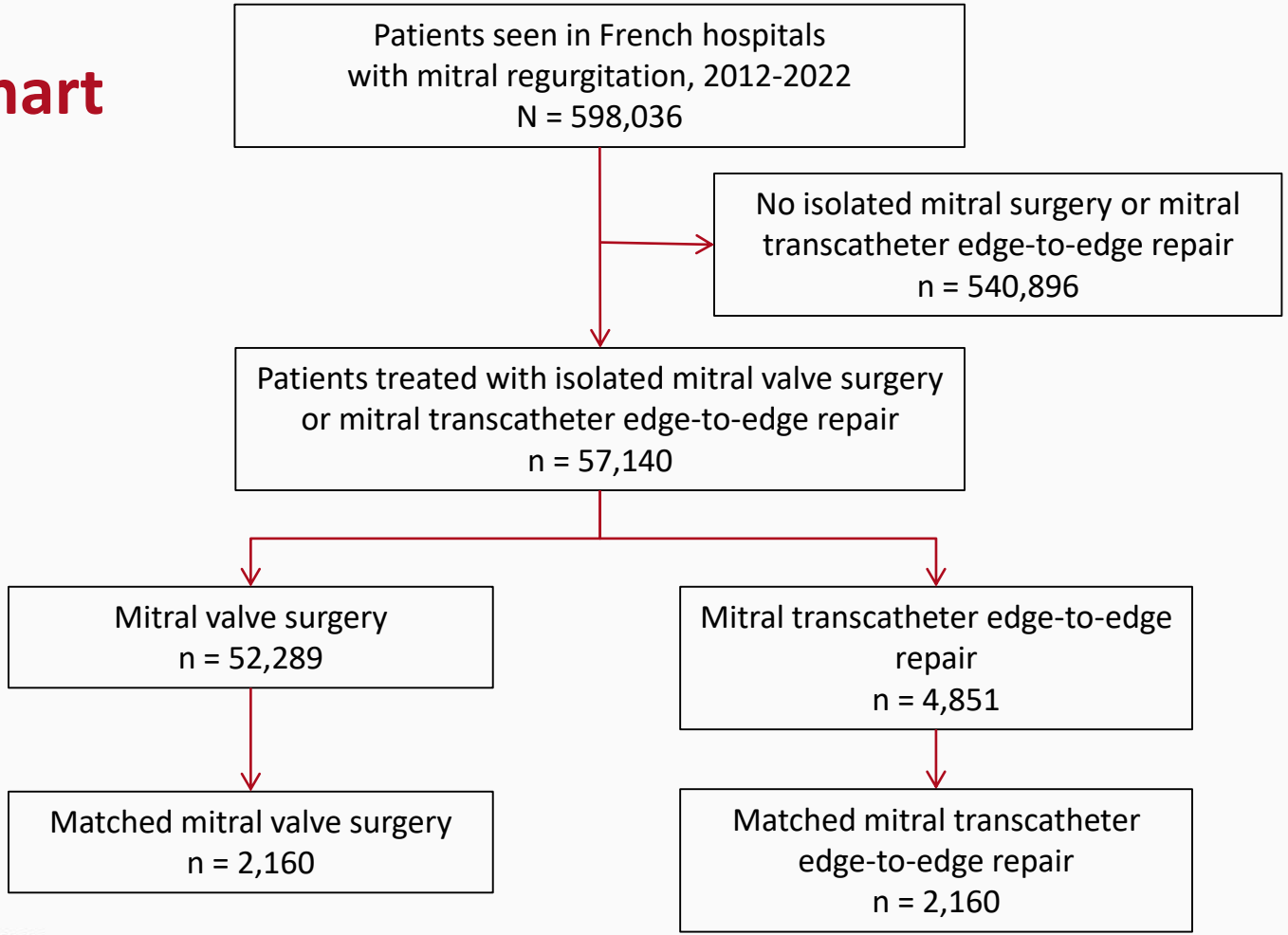
Nationwide analysis

From PMSI database including all patients admitted for severe MR in France from January 2012 to June 2022

Identification and distinction of procedures based on their CCAM codes

Distinction between 1ary and 2ary MR based on codes

Flow chart



FUP 1.0 (± 1.2) year

Baseline characteristics (unmatched)

	Isolated mitral valve surgery (n=52289)	Mitral TEER (n=4741)	p
Age (years), mean±SD	65.9±12.3	79.7±9.2	<0.0001
Coronary artery disease, n (%)	19870 (38.0)	2584 (54.5)	<0.0001
Chronic kidney disease, n (%)	4460 (8.5)	1084 (22.9)	<0.0001
Lung disease, n (%)	8162 (15.6)	1083 (22.8)	<0.0001
Previous cancer, n (%)	4220 (8.1)	857 (18.1)	<0.0001
Poor nutrition, n (%)	6317 (12.1)	1293 (27.3)	<0.0001
Cognitive impairment, n (%)	494 (0.9)	162 (3.4)	<0.0001
Charlson comorbidity index, mean±SD	3.1±2.8	4.2±2.7	<0.0001
Frailty index, mean±SD	7.0±7.6	9.4±8.6	<0.0001
Year of inclusion, mean±SD	2016.7±3.0	2019.8±1.5	<0.0001

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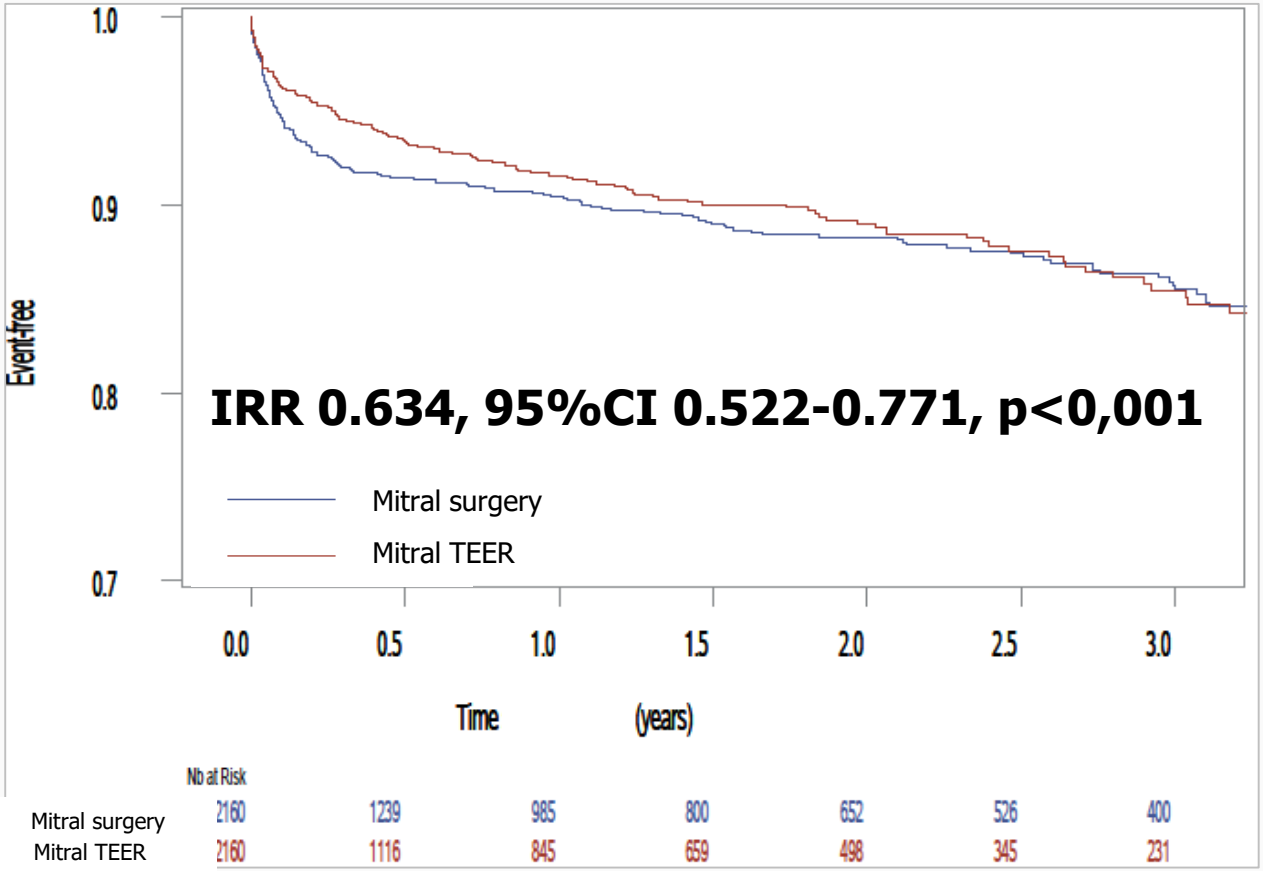
Baseline characteristics (matched)

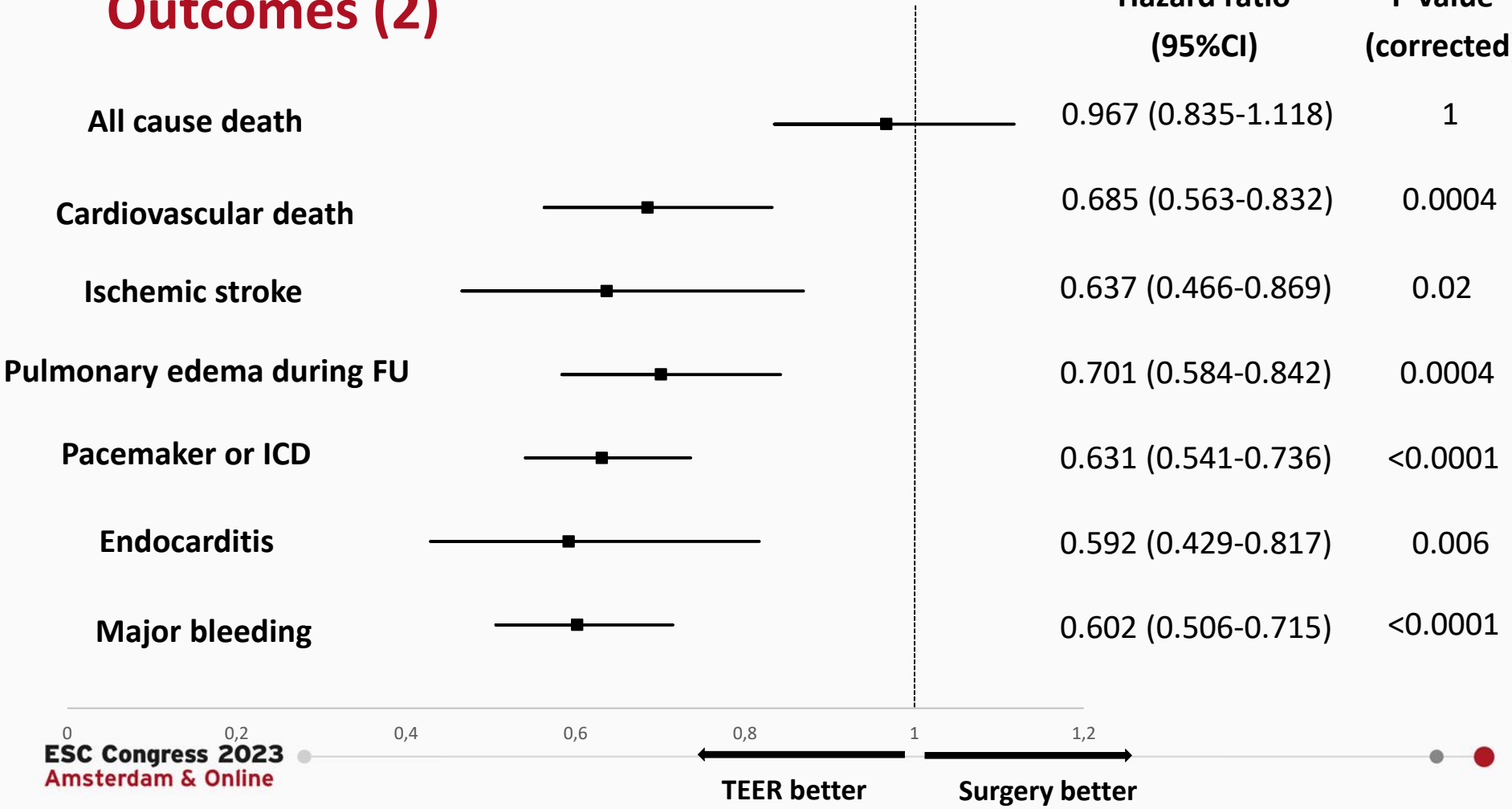
	Isolated mitral valve surgery (n=2160)	Mitral transcatheter edge-to-edge repair (n=2160)	p
Age (years), mean±SD	76.0±8.5	76.0±8.5	1.00
Coronary artery disease, n (%)	1090 (50.5)	1065 (49.3)	0.45
Chronic kidney disease, n (%)	335 (15.5)	380 (17.6)	0.07
Lung disease, n (%)	459 (21.3)	477 (22.1)	0.51
Previous cancer, n (%)	358 (16.6)	353 (16.3)	0.84
Poor nutrition, n (%)	490 (22.7)	522 (24.2)	0.25
Cognitive impairment, n (%)	44 (2.0)	52 (2.4)	0.41
Charlson comorbidity index, mean±SD	3.8±2.8	4.0±2.6	0.19
Frailty index, mean±SD	9.1±8.6	9.0±8.5	0.60
EuroSCORE II, mean±SD	3.9±1.2	3.9±1.2	0.29
Year of inclusion, mean±SD	2019.5±1.5	2019.5±1.5	1.00

Outcomes (1)

Cardiovascular death



Outcomes (2)


Hazard ratio (95%CI)
P value (corrected)
All cause death
0.967 (0.835-1.118)
1
Cardiovascular death
0.685 (0.563-0.832)
0.0004
Ischemic stroke
0.637 (0.466-0.869)
0.02
Pulmonary edema during FU
0.701 (0.584-0.842)
0.0004
Pacemaker or ICD
0.631 (0.541-0.736)
<0.0001
Endocarditis
0.592 (0.429-0.817)
0.006
Major bleeding
0.602 (0.506-0.715)
<0.0001
0
0,2
0,4
0,6
0,8
1
1,2
TEER better
Surgery better

Interaction between subgroups and cardiovascular mortality

Cardiovascular death	Surgery (n=2160)		TEER (n=2160)					
	Number of patients	Number of events	Number of patients	Number of events	Hazard ratio (95% CI)	p value	HR for interaction	p value for interaction
Age <75 yrs	744	51	744	53	0.973 (0.662-1.430)	0.89		
Age ≥75 yrs	1416	119	1416	119	0.608 (0.484-0.764)	<0.0001	**0.611** (0.391-0.955)	**0.03**
EuroSCORE II <4	1274	66	1290	74	1.078 (0.773-1.502)	0.66		
EuroSCORE II ≥4	886	181	870	98	0.539 (0.421-0.689)	<0.0001	**0.487** (0.322-0.736)	**0.0006**

Outcomes (3)

When comparing long-term outcomes of TEER vs. isolated mitral valve repair, cardiovascular death was lower in TEER group versus surgery (IRR 0.698, 0.561-0.869, p 0.001).

When differentiating 1ary versus 2ary MR, cardiovascular death was lower in TEER group versus surgery when treating 2ary MR (IRR 0.664, 0.522-0.846, p 0.001).

In 1ary MR the differences did not reach significance (p 0.08).

Conclusion (1)

Largest propensity matched comparison of mitral TEER versus isolated mitral valve surgery for patients with severe MR

During follow-up we observed that mitral TEER was associated with lower rates of cardiovascular death, pulmonary edema, atrial fibrillation, pacemaker implantation, stroke, major bleeding and endocarditis in matched cohort

Conclusion (2)

We showed a significant interaction between age > 75 years and Euroscore ≥ 4 and reduced cardiovascular and all-cause mortality after TEER versus surgery.

Same differences were reported when including only isolated mitral valve repair (excluding replacement) versus mitral TEER.

In 2ary MR, TEER was associated with lower incidences of cardiovascular death than isolated surgery.

Thank you

Pierre Deharo MD, PhD**, Jean Francois Obadia** MD, PhD**, Thomas Cuisset** MD, PhD**, Patrice Guerin** MD, PhD**, Jean Francois Avierinos** MD, PhD**, Gilbert Habib** MD, PhD**, Olivier Torras** MD**, Arnaud Bisson** MD**, Pascal Vigny** MD**, Christophe Saint Etienne** MD**, Carl Semaan** MD**, Mickael Guglieri** MD, PhD**, Nicolas Dumonteil** MD**, Frederic Collart** MD, PhD**, Martine Gilard** MD, PhD**, Thomas Modine** MD, PhD**, Erwan Donal** MD, PhD**, Bernard Iung** MD, PhD and **Laurent Fauchier** MD, PhD**.**