Surgical outcomes of mixed aortic valve disease : Severe aortic stenosis with regurgitation exceeding a moderate degree

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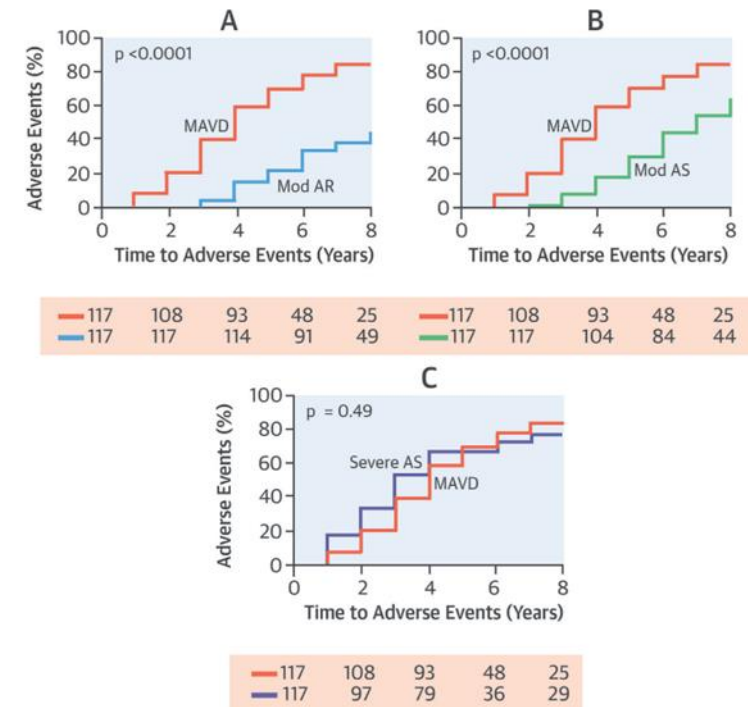
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Introduction

- **Mixed Aortic Stenosis (AS) with Aortic Regurgitation (AR)**

	Population	AS	AR
Total cases	10 164 211	36 319	13 853

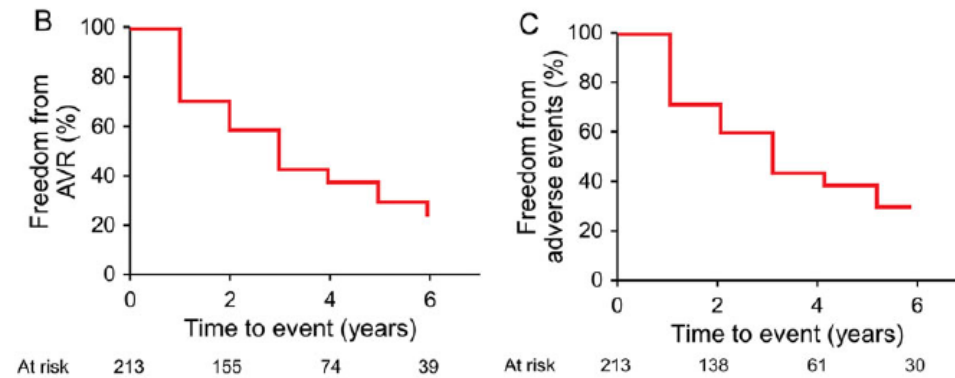|	AS		AR	
	N	%	N	%
AS	36 319	100	2482	17.9
AR	2482	6.8	13 853	100.0
MS	543	1.5	117	0.8
MR	1849	5.1	1488	10.7
PS	54	0.1	75	0.5
PR	13	0.0	33	0.2
TS	37	0.1	11	0.1
TR	206	0.6	156	1.1

Heart. 2017 Nov;103(21):1696-1703

J Am Coll Cardiol. 2016 May 24;67(20):2321-2329.

Introduction

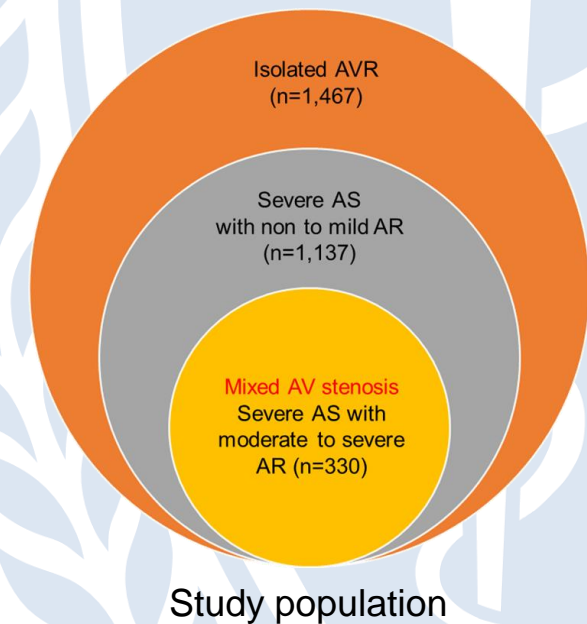- **Mixed AS with exceeding a moderate degree AR**

Eur Heart J. 2016 Sep 7;37(34):2671-8.

- **Long-term clinical and echocardiographic consequences after aortic valve replacement (AVR) in mixed AS and isolated AS patient**

Methods

- **The study enrolled patients undergoing isolated AVR (n=1,467) between Oct 2000 and Dec 2021**

- **The AS group**
  - **n=1,137, 66.3±9.5yrs, 47.4% female**
  - **Mild or less AR combined with severe AS**

- **The mixed AS group**
  - **n=330, 64.6±10.8yrs, 39.1% female**
  - **Moderate to severe AR alongside severe AS**

Isolated AVR
(n=1,467)

Severe AS
with non to mild AR
(n=1,137)

Mixed AV stenosis
Severe AS with
moderate to severe
AR (n=330)

Study population

Methods

- **The primary endpoints**
  - **All-cause mortality**
  - **Serial echocardiographic parameters**

- **The secondary endpoints**
  - **Composite outcomes**
    - Death
    - Valve-related adverse events including
      - Heart failure requiring hospitalization
      - reoperation
      - stroke

Results

- **Baseline characteristics**

	AS (n = 1,137)	Mixed AS (n = 330)	p-value	SMD
Characteristics				
Age, years (mean ± SD)	66.3 ± 9.5	64.6 ± 10.8	0.005	0.171
Female, n (%)	539 (47.4)	129 (39.1)	0.009	0.168
BMI, m^2/kg (mean ± SD)	25.0 ± 3.4	24.3 ± 3.5	<0.001	0.222
DM, n (%)	279 (24.5)	62 (18.8)	0.035	0.140
HTN, n (%)	572 (50.3)	153 (46.4)	0.230	0.079
Dyslipidemia, n (%)	403 (35.4)	88 (26.7)	0.004	0.191
COPD, n (%)	73 (6.4)	21 (6.4)	1.000	0.071
CVA, n (%)	45 (4.0)	18 (5.5)	0.305	0.002
ESRD, n (%)	43 (3.8)	11 (3.3)	0.830	0.024
Previous PCI, n (%)	71 (6.2)	13 (3.9)	0.146	0.105
Redo OHS, n (%)	13 (1.1)	7 (2.1)	0.182	0.077
Atrial fibrillation, n (%)	550 (41.0)	937 (56.1)	<0.001	0.055

*AS : aortic stenosis; BMI : Body mass index; COPD : chronic obstructive pulmonary disease;
CVA : cerebrovascular accident; DM : Diabetes mellitus; ESRD : End stage renal disease;
HTN : Hypertension; OHS : Open heart surgery; PCI : Percutaneous coronary intervention;
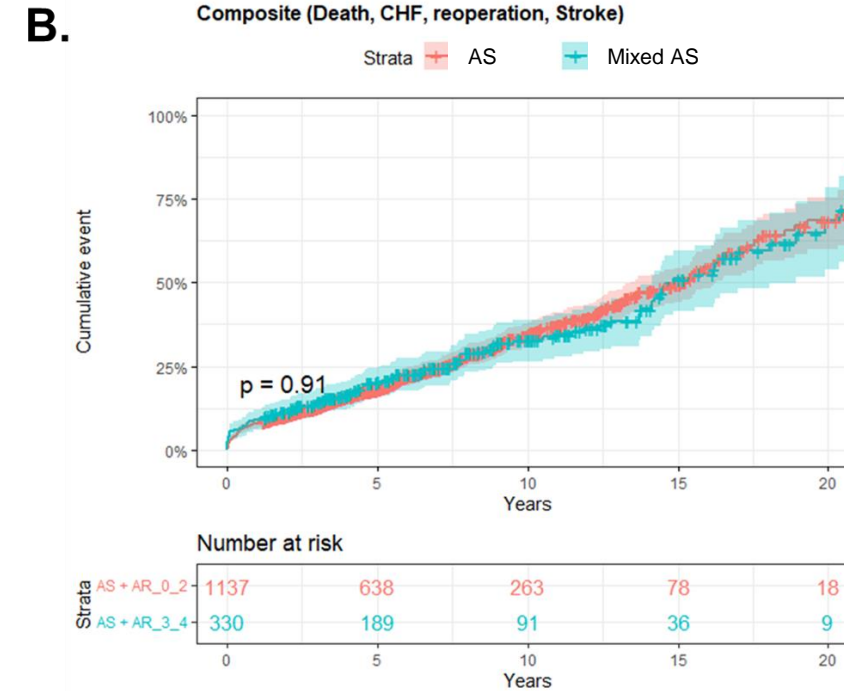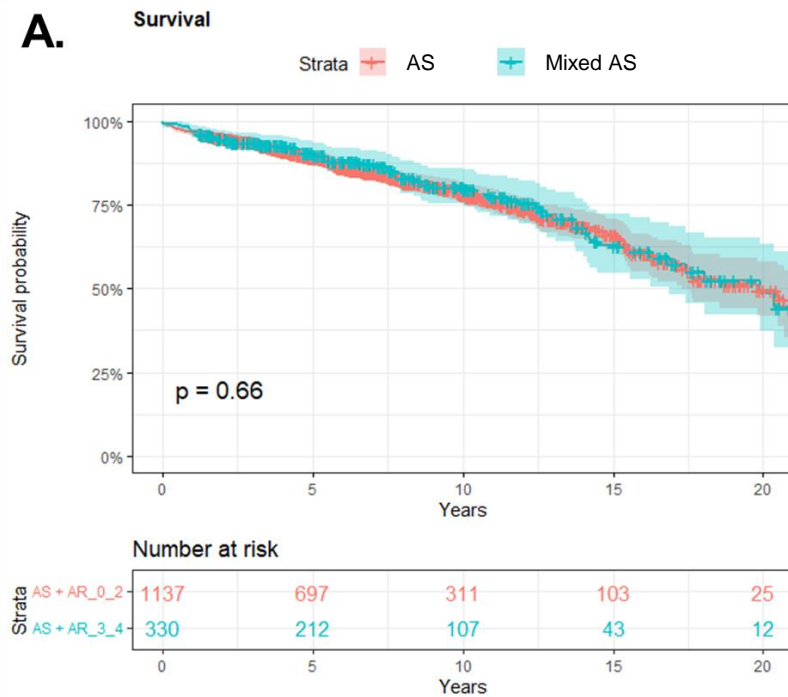SD : standard deviation*

Results

▪ Echocardiographic and Operative characteristics

	AS (n = 1,137)	Mixed AS (n = 330)	p-value	SMD
Echocardiographic Data				
Bicuspid aortic valve, n (%)	559 (49.2)	103 (31.5)	<0.001	0.366
LVD systolic, mm (mean ± SD)	30.4 ± 7.6	37.2 ± 9.1	<0.001	0.811
LVD diastolic, mm (mean ± SD)	48.4 ± 6.1	55.6 ± 7.7	<0.001	1.039
LV mass index, g/m^2 (mean ± SD)	130.8 ± 37.2	171.5 ± 48.3	<0.001	0.946
AV_PG_Mean (mean ± SD)	64.4 ± 20.1	66.1 ± 19.7	0.185	0.083
EF, % (mean ± SD)	60.8 ± 10.2	57.2 ± 11.9	<0.001	0.320
MR, n (%)			<0.001	0.485
Non to trace	984 (86.6)	237 (71.8)		
Mild	123 (10.8)	71 (21.5)		
Moderate	27 (2.4)	17 (5.2)		
Severe	3 (0.3)	5 (1.5)		
Operative characteristics				
Tissue valve, n (%)	695 (61.1)	192 (58.2)	0.369	0.060
Valve size, mm (mean ± SD)	21.9 ± 2.0	22.7 ± 2.1	<0.001	0.379
MICS, n (%)	388 (34.1)	98 (29.7)	0.150	0.095
CPB time, min (mean ± SD)	101.1 ± 45.4	102.9 ± 34.9	0.529	0.042
ACC time, min (mean ± SD)	66.4 ± 23.8	67.3 ± 24.4	0.578	0.035

ACC : Aortic cross clamping; AS : aortic stenosis; CPB : Cardiopulmonary bypass; EF : ejection fraction; AV_PG : left ventricular pressure gradient; LVD : Left ventricular dimension; MICS : minimal invasive cardiac surgery; MR : Mitral regurgitation; SD : standard deviation
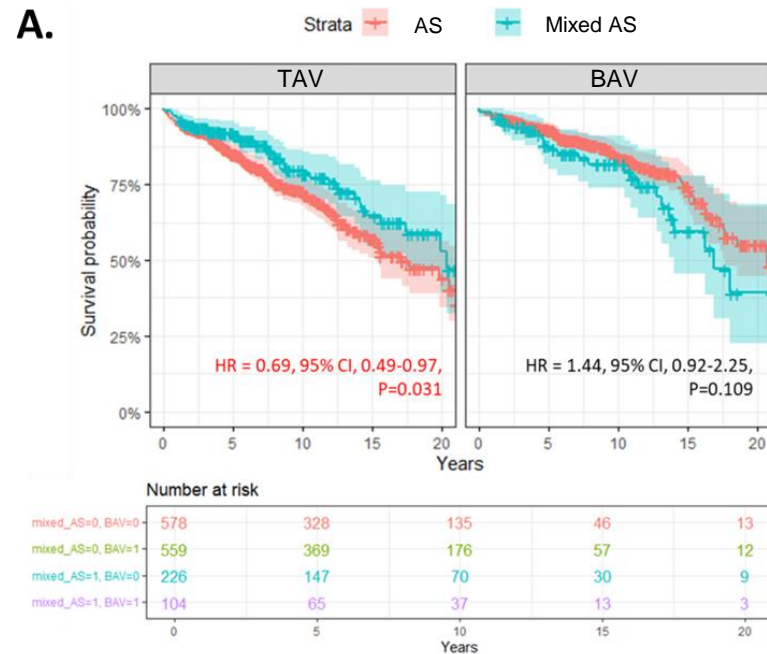
Results

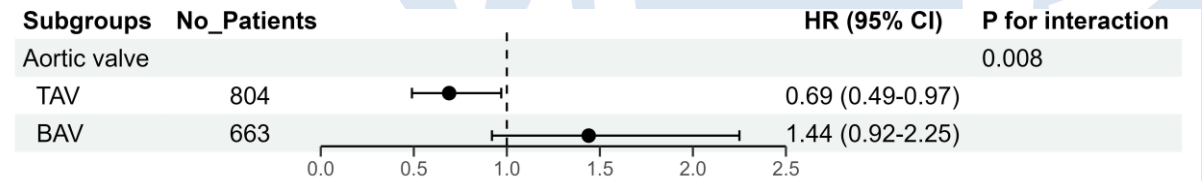- **Survival (A) and Composite outcomes of valve related adverse events (B) between AS and mixed AS group**

Results

- **Survival curve according to presence of BAV (A) and subgroup analysis for mortality (B) between AS and mixed AS group**
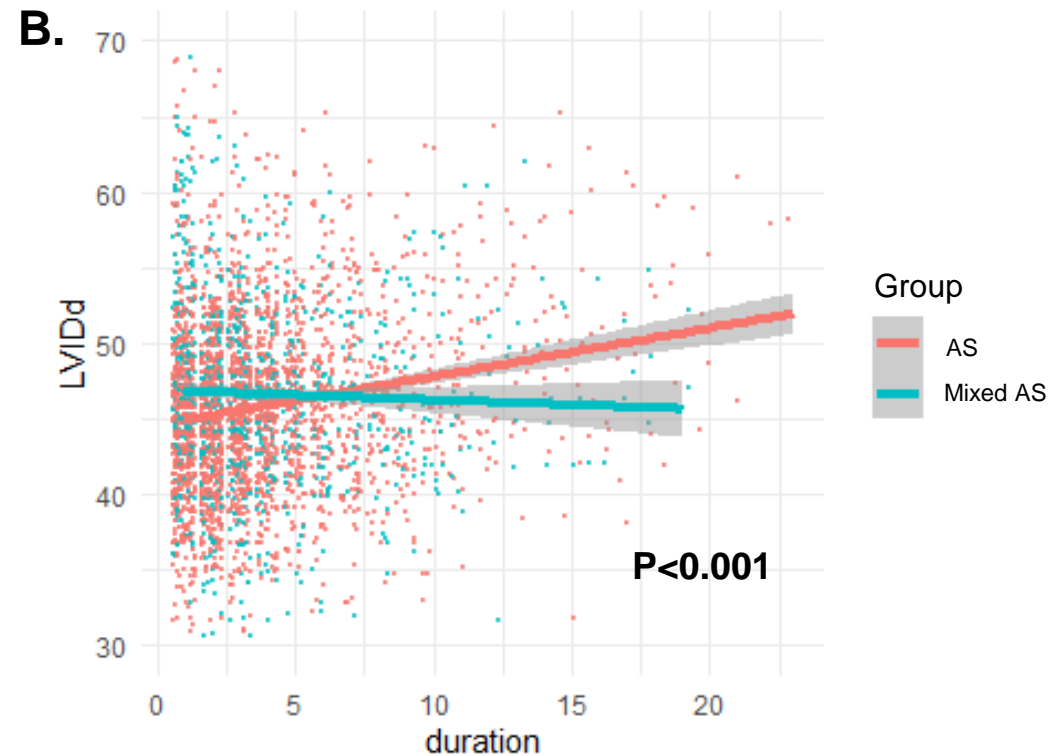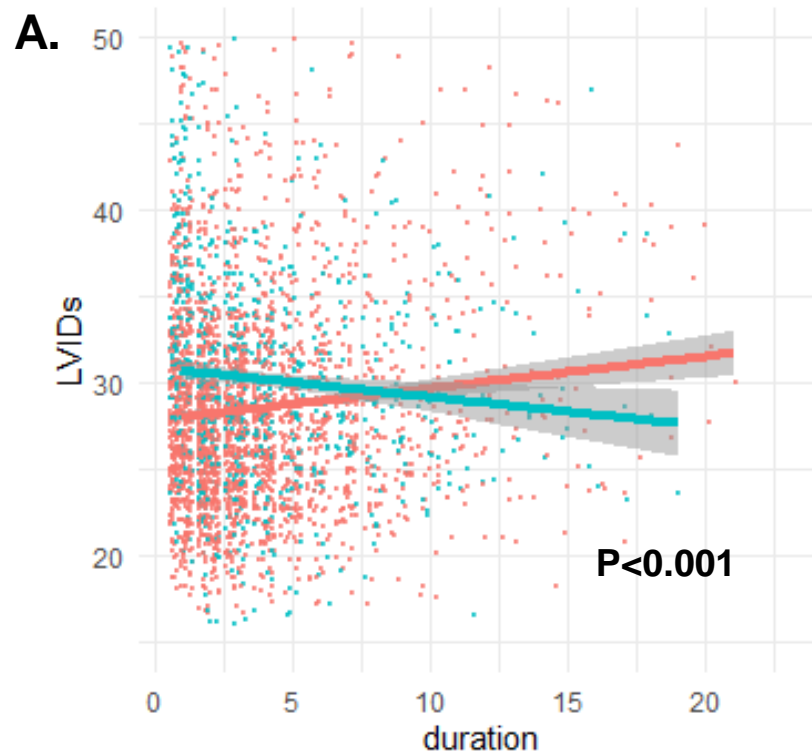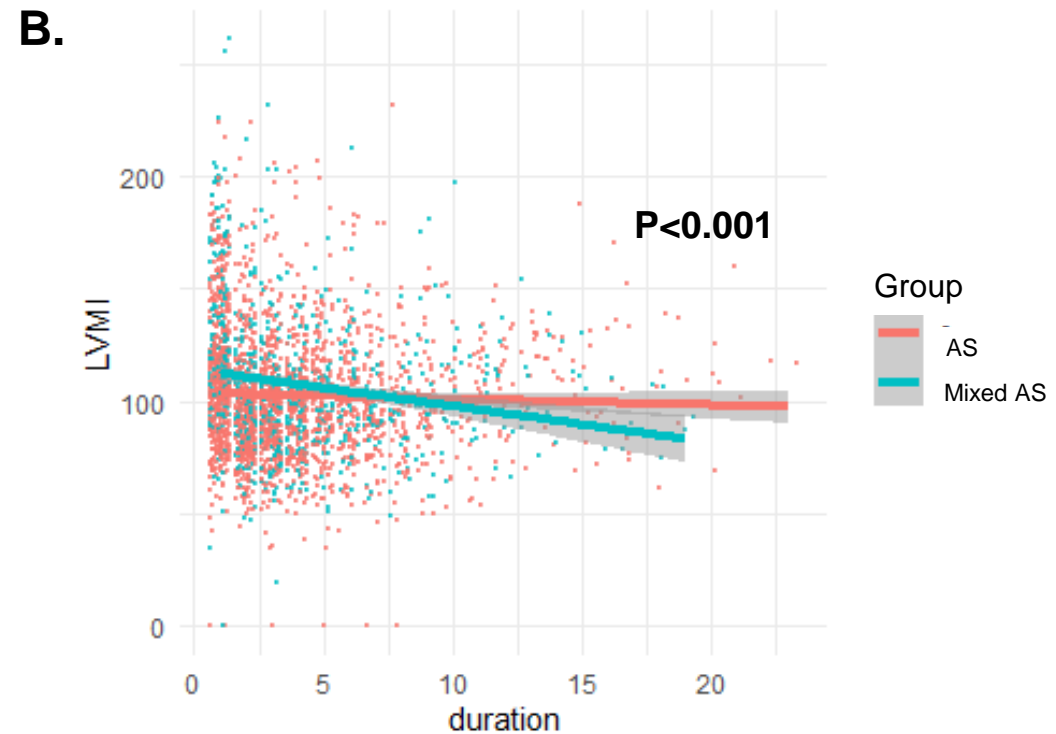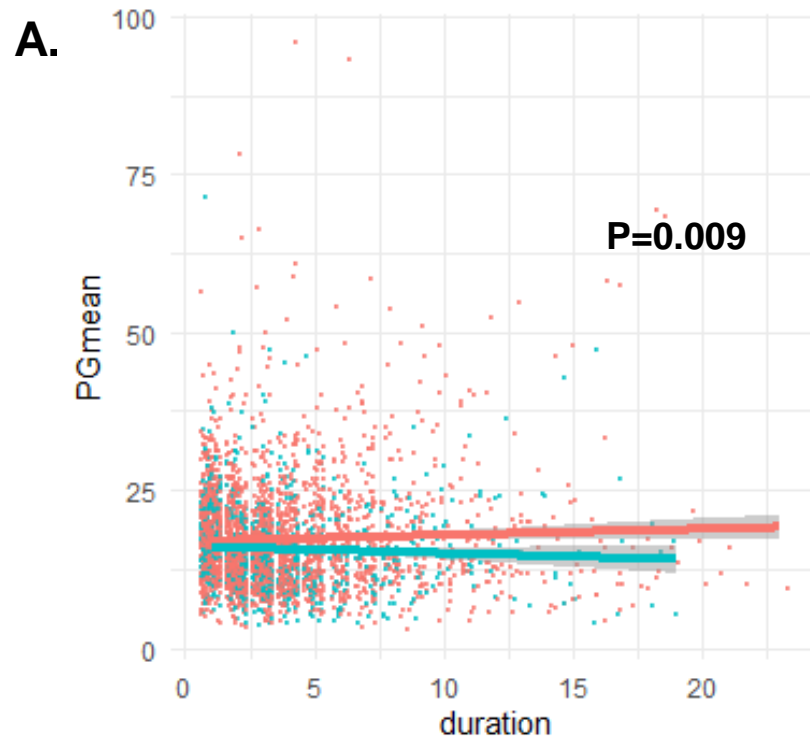
Results

- **Serial echocardiographic parameter of LVIDs (A), LVIDd (B) between TAV patients of AS and mixed AS group**

Results

- **Serial echocardiographic parameter of PG mean across AV (A), LVMI (B) between TAV patients of AS and mixed AS group**

Conclusions

- **The AS and mixed AS group, which underwent AVR, showed comparable survival and composite of valve related adverse events.**

- **However, the mixed AS group exhibited more favorable survival rates in patients with TAV.**

- **LV dimensions, PG across AV and LVMI showed a progressive reduction in the mixed AS group compared to isolated AS group after AVR in patients with TAV.**