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Does the presence of a mitral valve prosthesis adversely affect the hemodynamic performance of the aortic valve prosthesis in patients who had double valve replacement?

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Hypothesis

- Mitral valve prosthesis prevents the intervalvular fibrous body to move away from the interventricular septum during systole and may adversely affect the effective orifice of the aortic valve prosthesis.

Patients and methods

- AVR + MVR with the same type of valve : 1/1990 to 8/2008
- St. Jude Medical Regent (SJM)
- Hancock II (HT)
- Carpentier-Edwards Perimount (CEP)
- Pooled data from Cleveland Clinic Foundation for inadequate sample size of DVR with CEP
- EF <40% were excluded
- AV sizes: 21, 23, 25 and 27
- DVR patients were matched for valve size and type, age and BSA with isolated AVR

Patients and methods (cont'd)

- Echocardiography before patient's discharge

- Parameters examined: AVR
  - Aortic valve area (AVA)
  - Aortic peak gradient (APG)
  - Aortic mean gradient (AMG)
  - Flow velocity across AV (AvVel)
  - AI grade

- Parameters examined: MVR
  - Mitral valve area (MVA)
  - Mitral peak gradient (MPG)
  - Mitral mean gradient (MMG)
  - Flow velocity across MV (MvVel)
  - MR grade

  - STATISTICAL ANALYSIS

Results

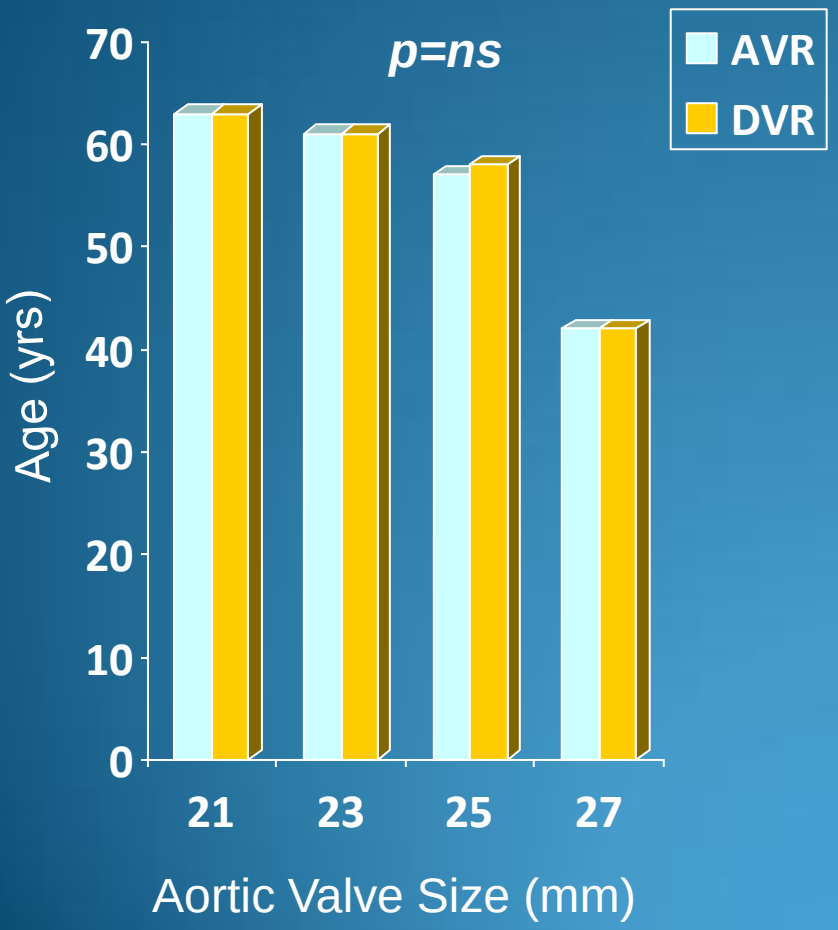
- AV pathology

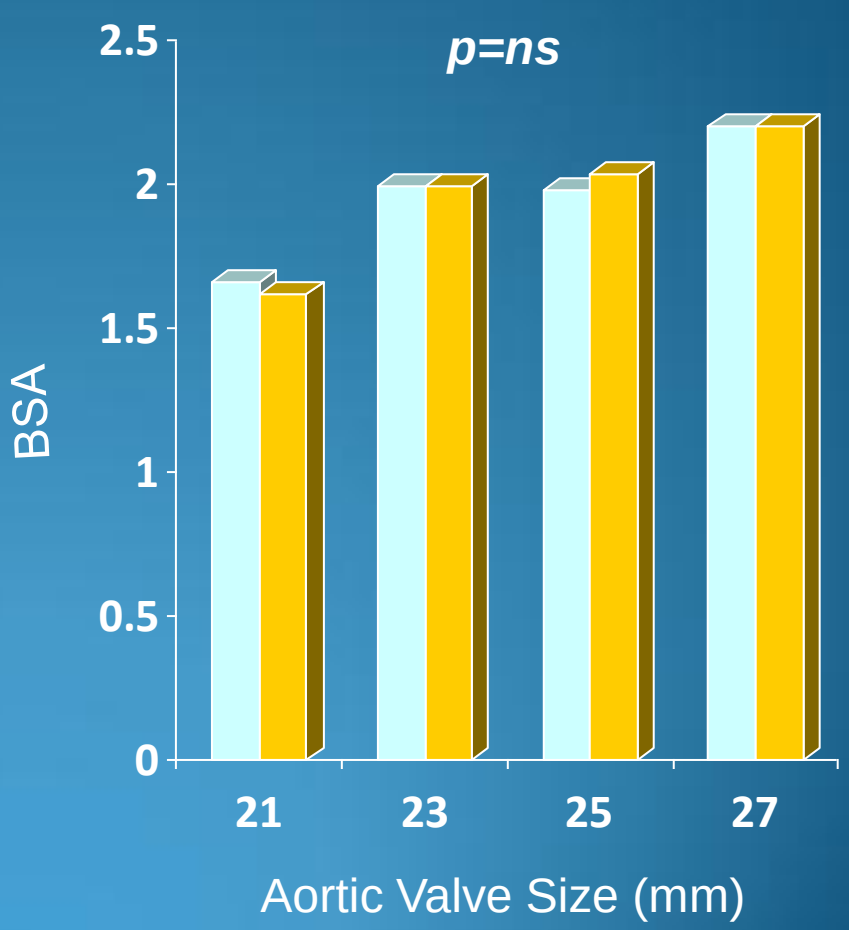
	Rheumatic (%)	Calcified (%)	Bicuspid (%)	Other (ie: prosthetic dysfunction, congenital) (%)
SJM	25	21.7	33.3	20
HT	20	46.7	20	13.3

- MV pathology

	Rheumatic (%)	Other (ie: ischemic, myxomatous, prosthetic dysfunction) (%)
SJM	70	30
HT	70	30

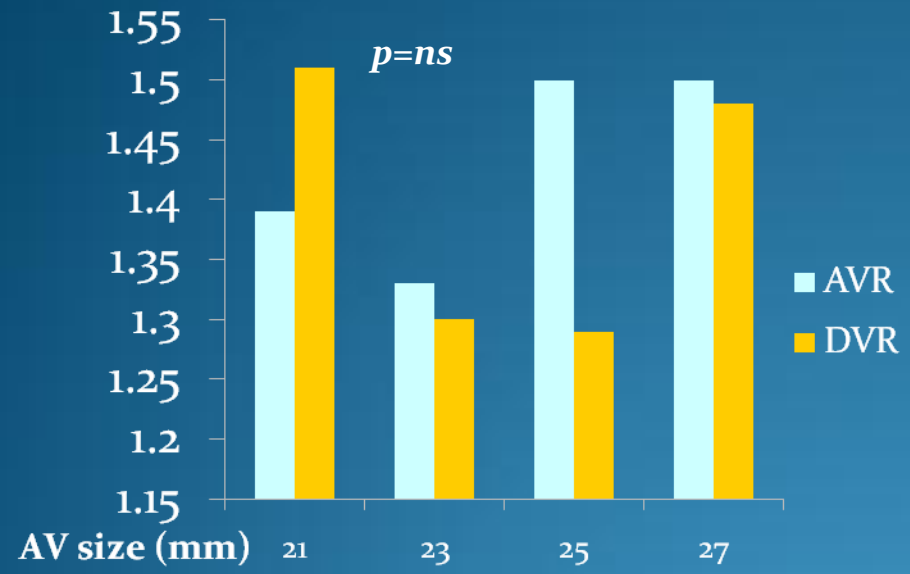
Patients Demographics-SJM



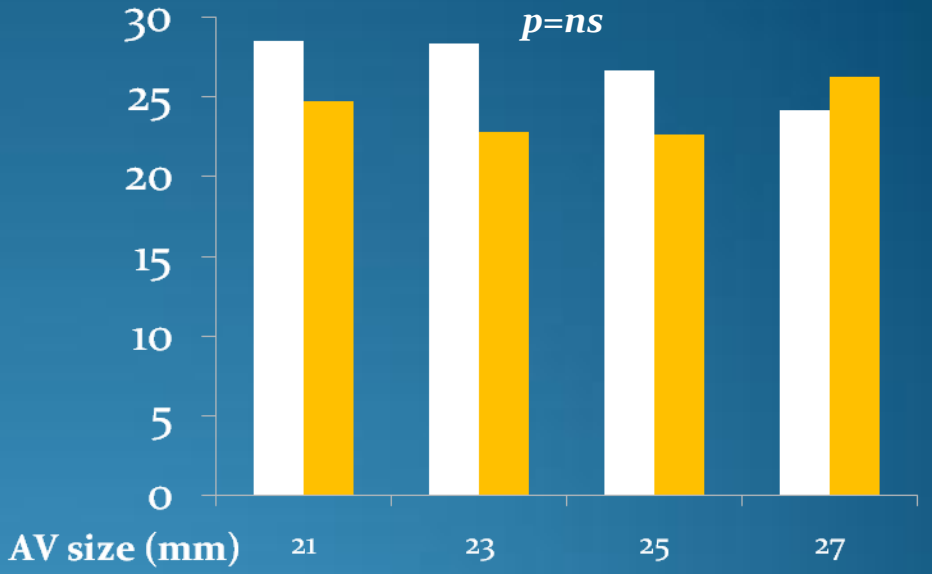


Results-SJM

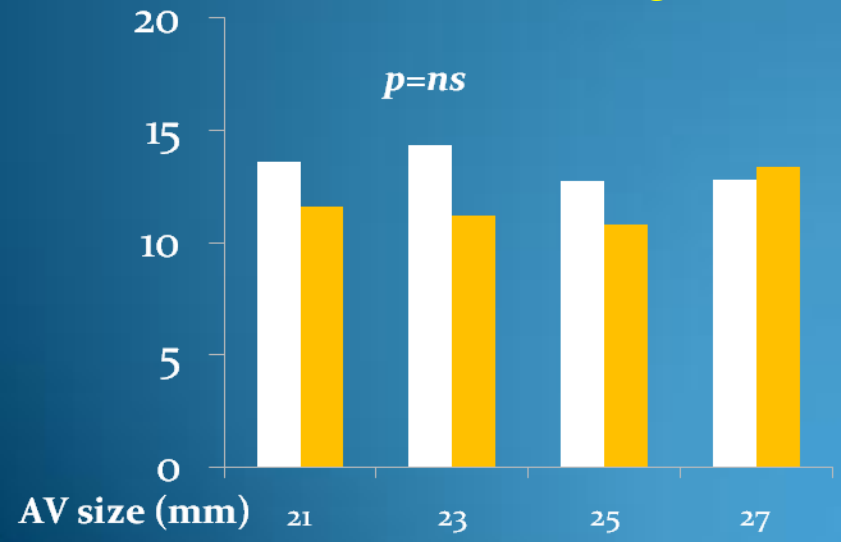
Mean AVA (cm2)



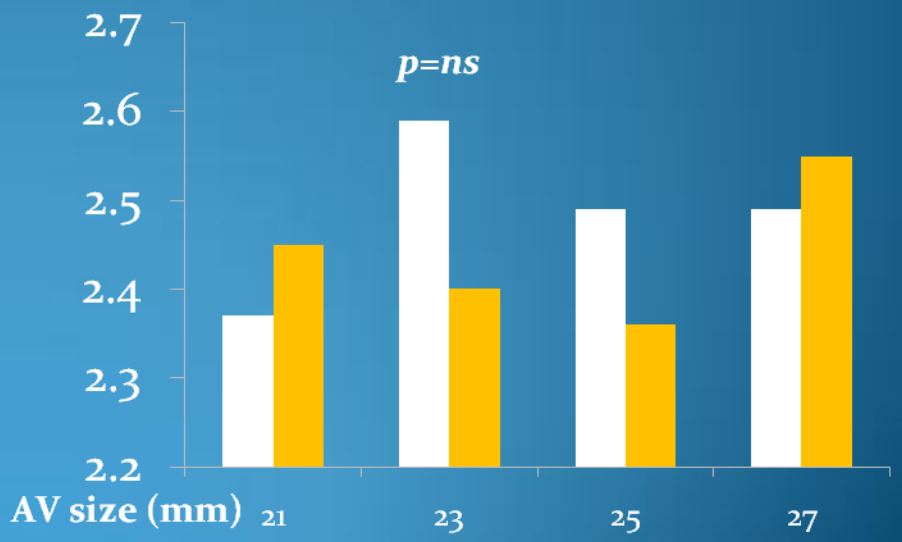
Mean APG (mmHg)



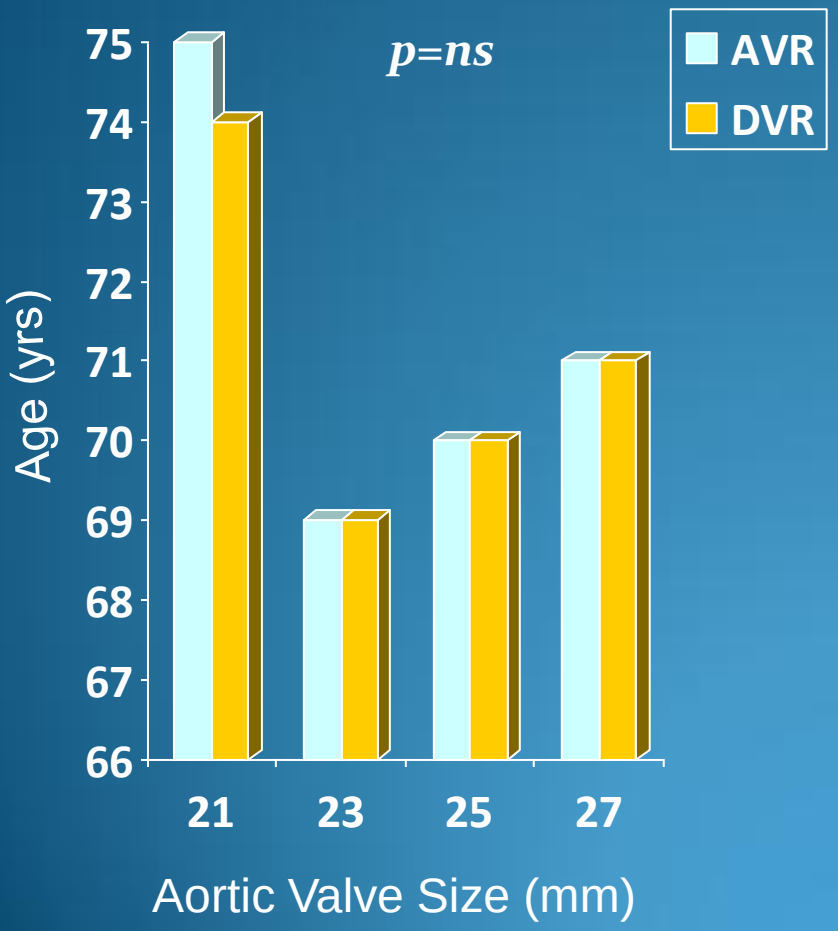
Mean AMG (mmHg)

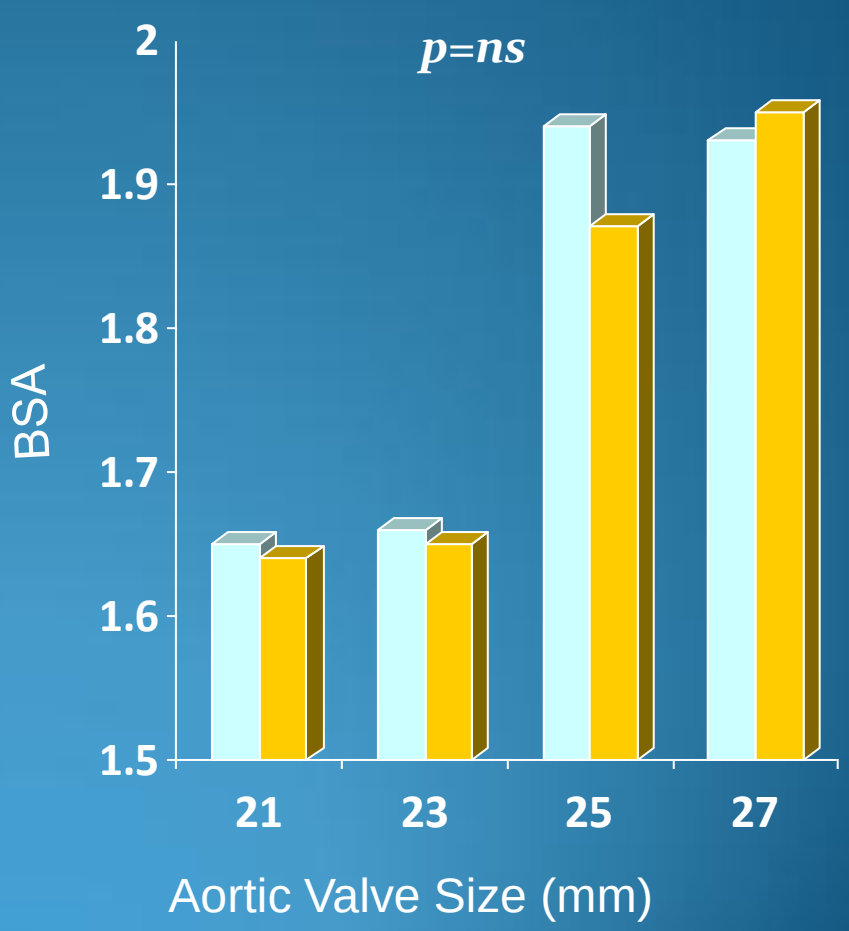


Mean AvVel (m/sec)

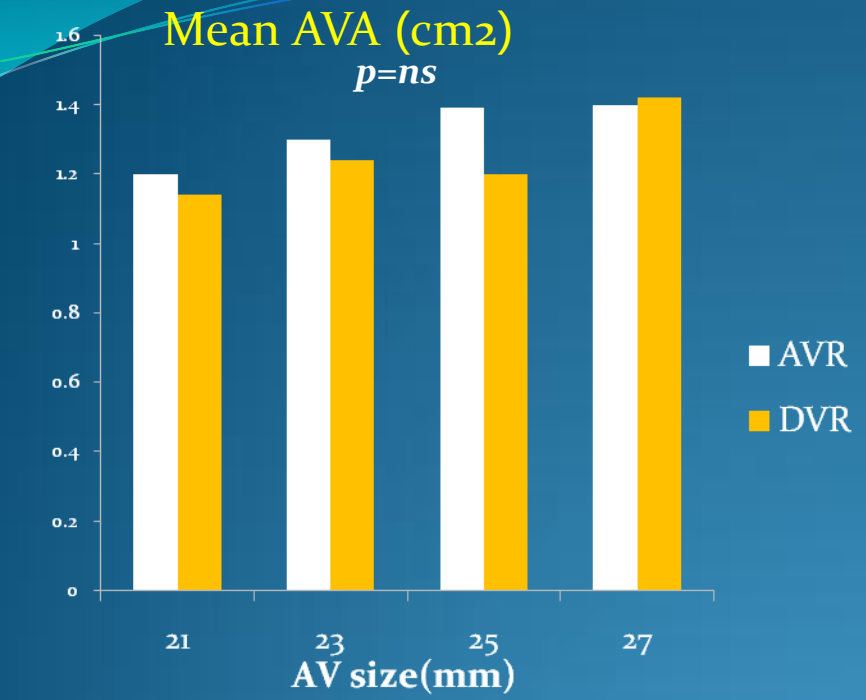


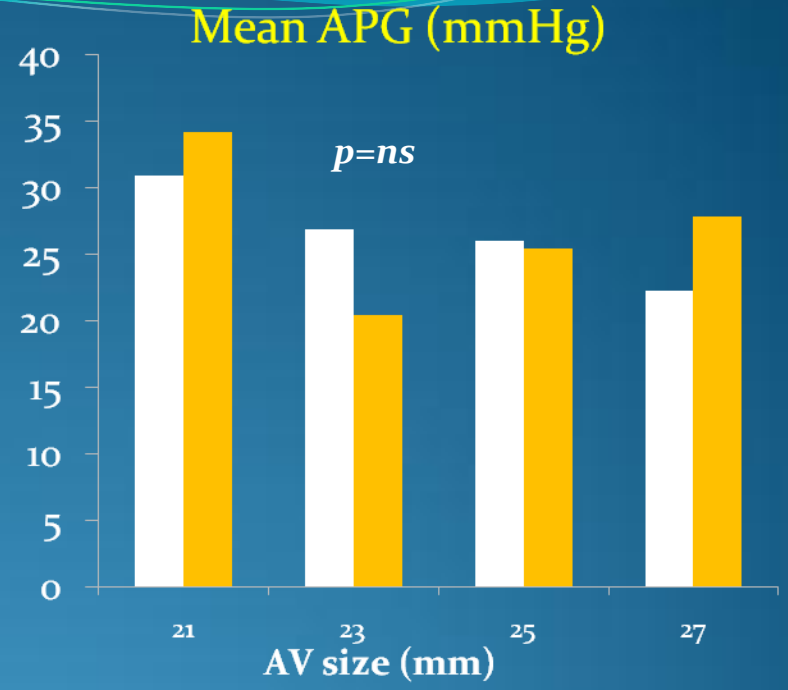
Patients Demographics-HT

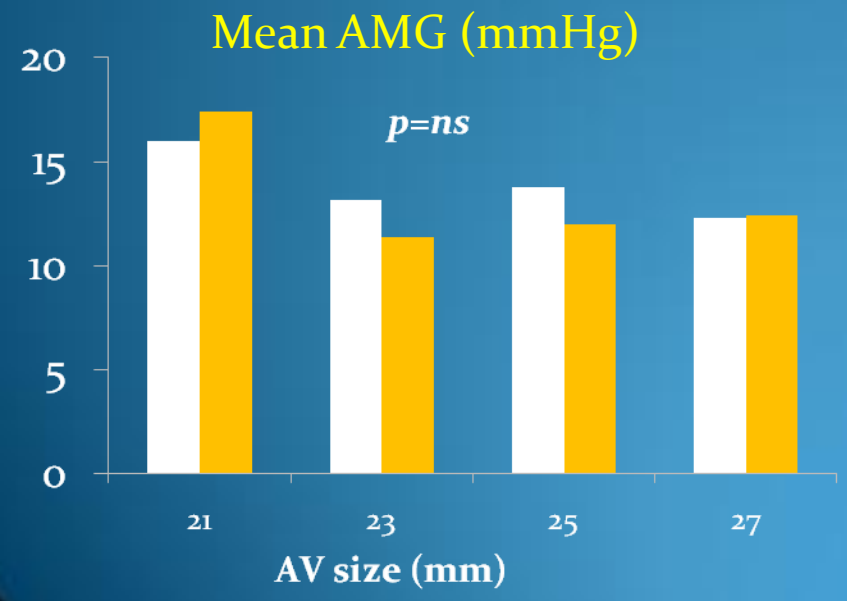


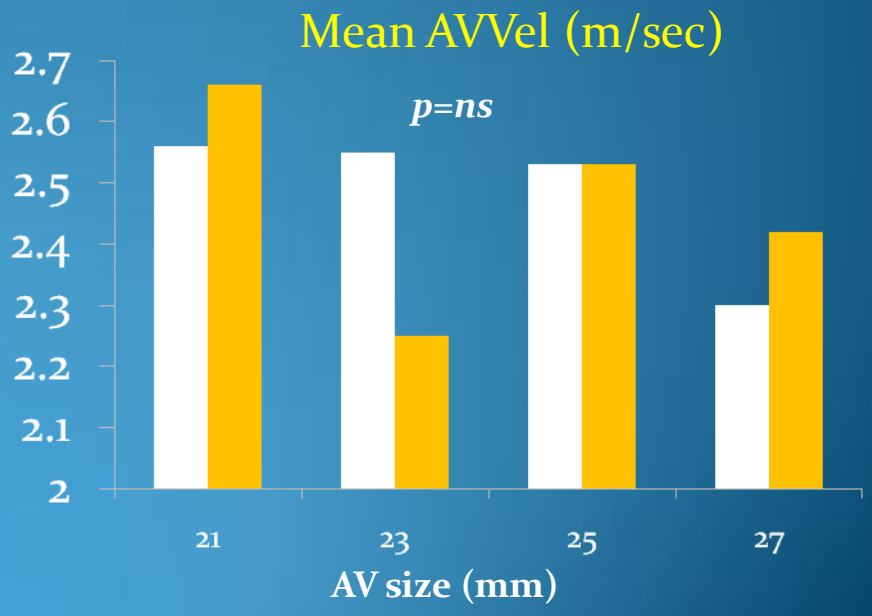


Results-HT

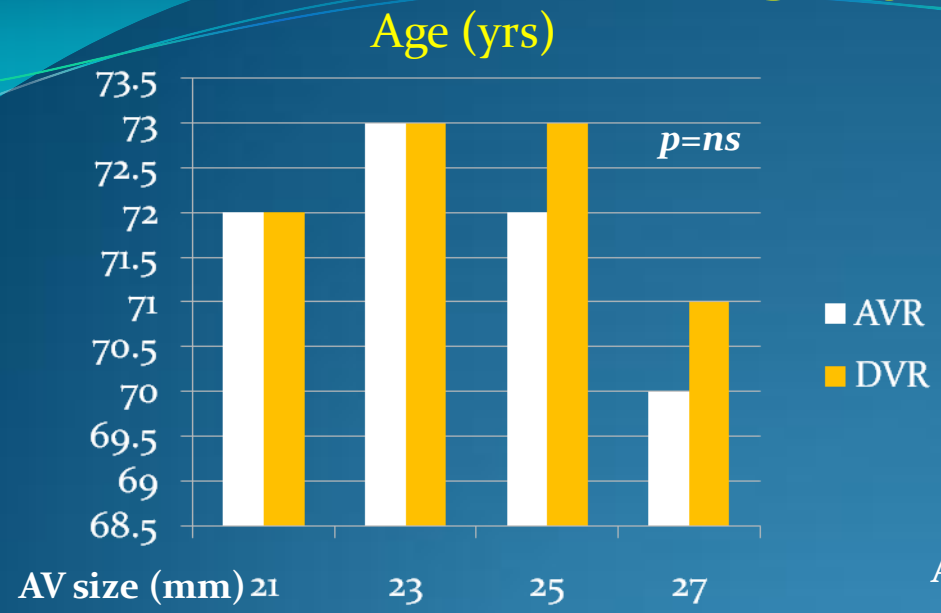

Mean AVA (cm2)
p=ns
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
21
23
25
27
AV size(mm)
AVR
DVR

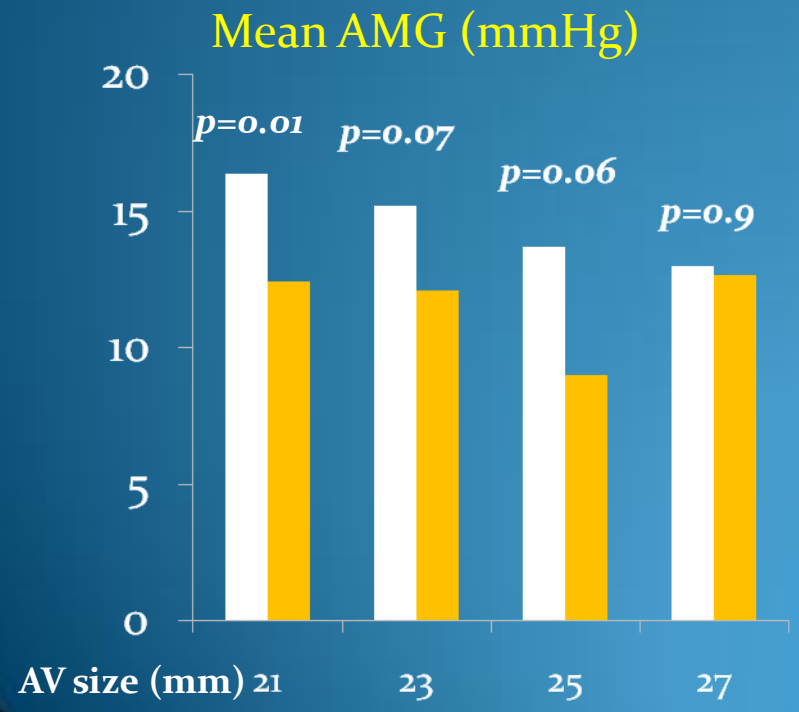

Mean APG (mmHg)
p=ns
40
35
30
25
20
15
10
5
0
21
23
25
27
AV size (mm)


Mean AMG (mmHg)
p=ns
20
15
10
5
0
21
23
25
27
AV size (mm)

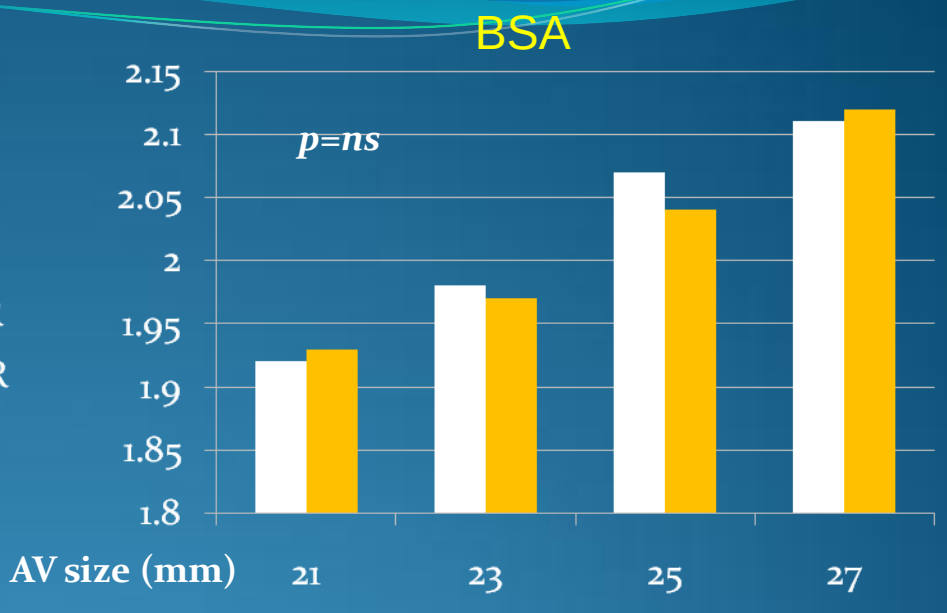

Mean AVVel (m/sec)
p=ns
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2
21
23
25
27
AV size (mm)

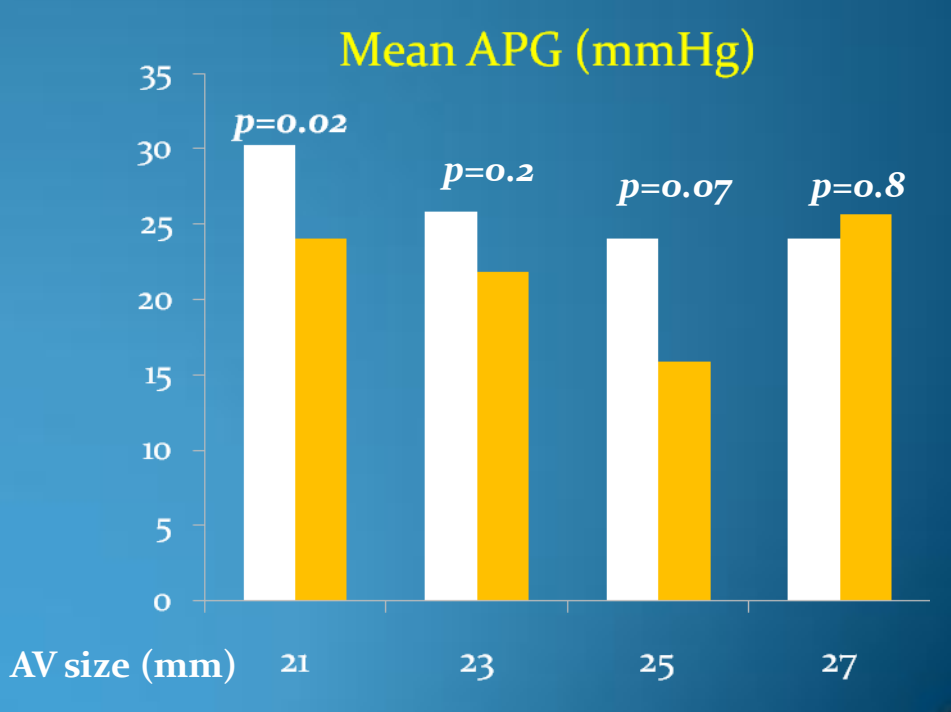
Patients demographics and Results-CEP





AVR
DVR





Conclusion

- Prosthetic mitral valve appears to have no adverse effect on the hemodynamic performance of the aortic valve prosthesis in patients who had double valve replacement

Limitations of the Study

- Echocardiographic studies were done too soon after valve implantation
- Newer prosthetic valves have improved hemodynamic and stuctural characteristics
- Operations were performed by experienced surgeons who were aware of the interplays between aortic and mitral valves and took measures to prevent interference of the mitral valve prosthesis on the aortic valve hemodynamics
- **THANK YOU!**