

Presenter Disclosure Information

Mitral and Tricuspid Valve Repair and Growth in Unbalanced Atrioventricular Canal Defects

I have no relevant financial relationships to
disclose

I will not discuss off label use or investigational
drug use in my presentation

Outside honoraria: None

Employee of: University of Minnesota

Mitral and Tricuspid Valve Repair and Growth in Unbalanced Atrioventricular Canal Defects

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Unbalanced AVC defects

The problem:

Single ventricle repairs usual

Our goal:

2VR in (virtually) all

To determine:

Will quality AV valves result?

Will the 2VRs be adequate?

Hypoplasia

Echo assessment:

AV valve diameter

End diastolic ventricular volume

two orthogonal planes

Outflow (semilunar) size

Z value (standard error of mean)
gives degree of hypoplasia

Border of adequacy at $z < -2$

Hypoplasia defined as ≤ -3.0

Hypotheses

Hypoplasia is acquired (developmental)

Forward flow across the AV valve
produces the ventricular growth signal

The **growth signal** can be harnessed

Rapid catch-up growth will occur

Patient population

(24 consecutive UAVC patients)
(1990-2005)

21 UAVC, 3 AVC subsets

14 female, 10 male

Hypoplasia of AV valve and/or ventricle (all)

19 left, 5 right sided hypoplasia

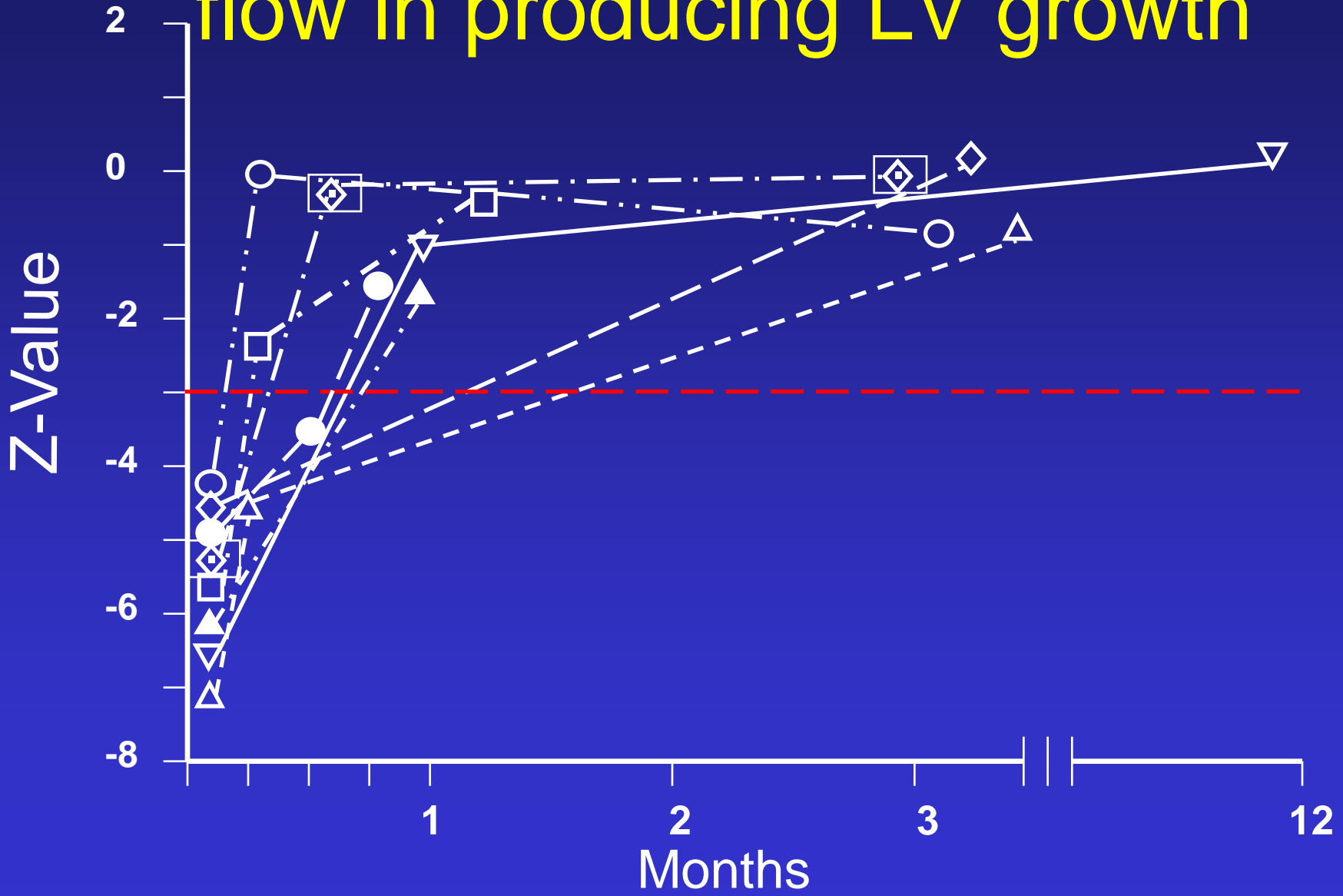
(hypoplasia = $z \leq -3.0$)

Operative procedures

1. Staged UAVC repair (10)
 - a) First stage to promote growth
increase AV valve flow
complete AV valve repair, partial ASD,
VSD closure

*(3 had vestigial mitral; partition large TV
to create second mitral valve)*
 - b) Second stage after growth
complete ASD, VSD closure
2. Partition AV valve to correct hypoplasia (9)
AV valve partitioned by septal patches
3. Repair with ASD/VSD left for shunting (5)

Effectiveness of increased mitral flow in producing LV growth



UAVC with vestigial A-V valve

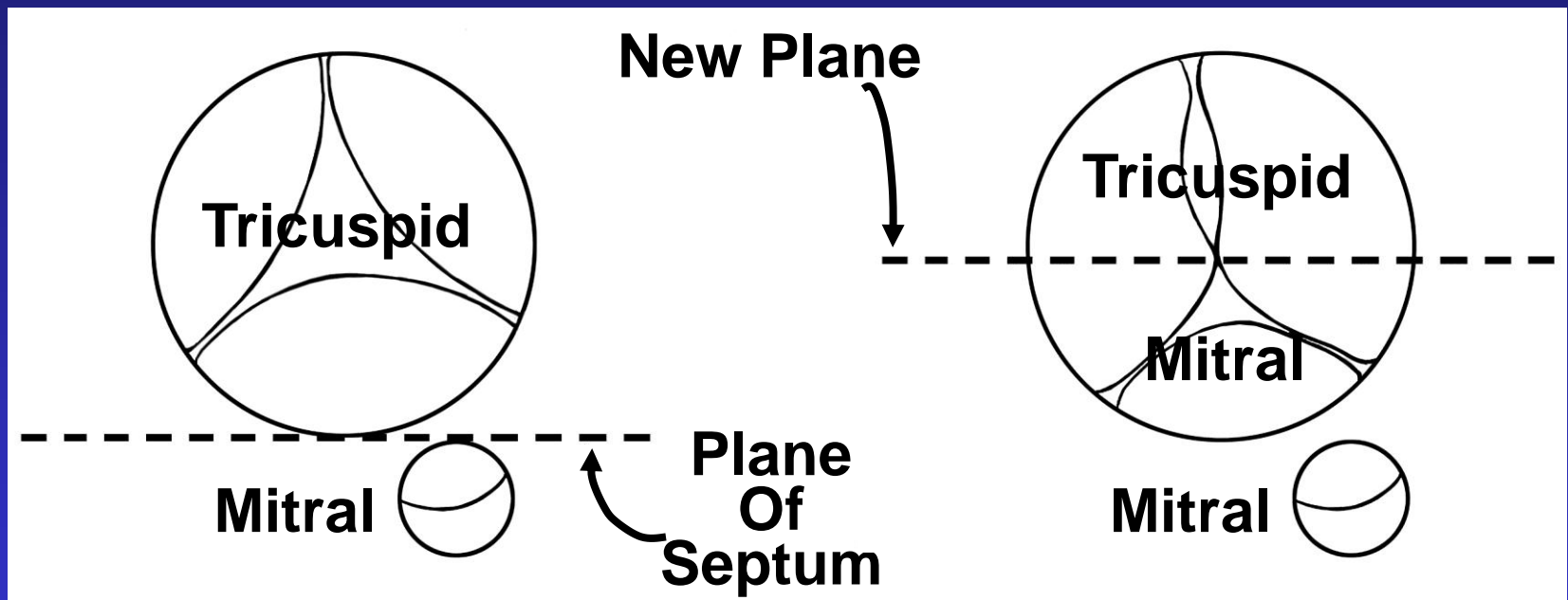
One A-V valve may be vestigial
(10-20% of normal area)

Unsuitable as mitral valve

The other A-V valve, however, is large

Solution: make two valves out of the
large valve

UAVC defect with vestigial mitral valve

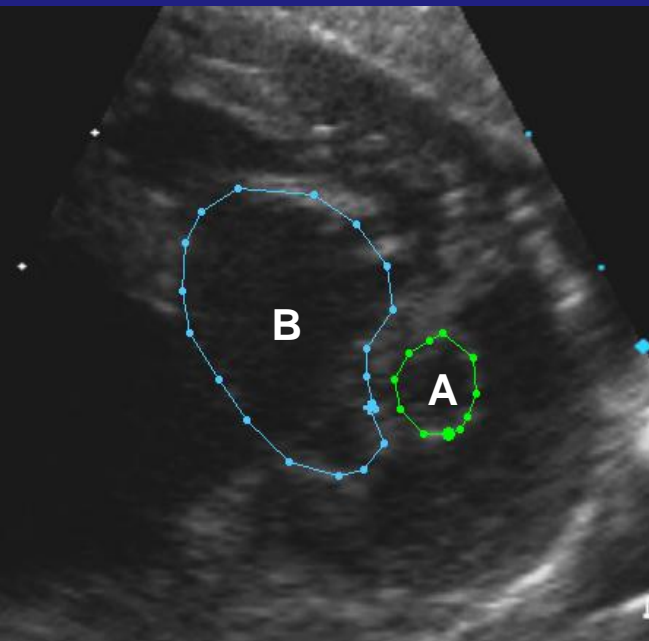


Unrepaired very large tricuspid

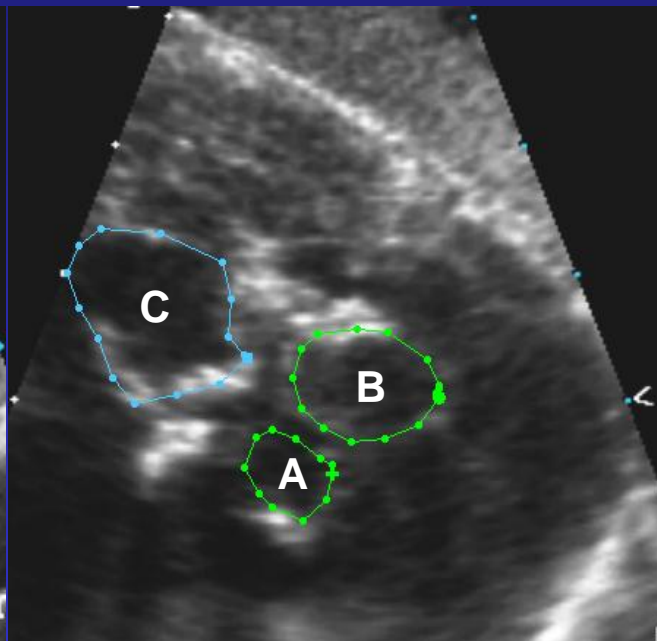
Repaired creating a double orifice mitral

LH-UAVC with vestigial mitral component

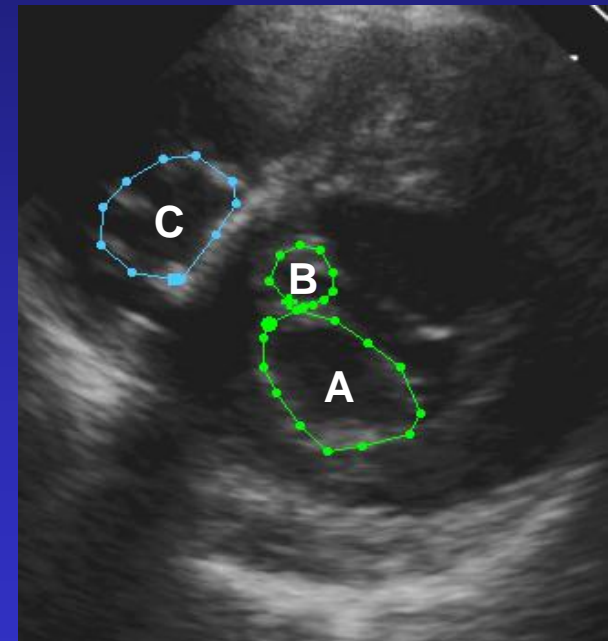
(preop echo)



Double orifice MV created
(postop echo)



7 year follow-up



A. Mitral component = 0.27 cm^2
B. Tricuspid component = 2.0 cm^2

A. Mitral component = 0.28 cm^2
B. Mitral component = 0.68 cm^2
C. Tricuspid component = 1.2 cm^2

A. Original mitral valve = 1.9 cm^2
B. Created MV = 0.36 cm^2
C. Tricuspid valve = 1.5 cm^2

Results and Follow-up

(Follow-up 5.6 -15.1 years)

Surgical results

Deaths

Early (1) – CNS bleed as weaning from ECMO

Late (2) – potassium overdoses

Additional operations

UAVC related

MV replacement (1)

Repair of AV regurgitation (3)

UAVC unrelated

Repair of Tetralogy of Fallot (1)

Ross procedure (1)

Midterm survival: 78%

Results and Follow-up (con't.)

Evaluation

survivors (21) evaluated (19), lost to f/u (2)

Echo assessment

Initial AV valve <u>z scores</u>	Initial HV <u>z scores</u>	Mid-term AV valve <u>z scores</u>	Mid-term HV <u>z scores</u>
-1.0 to -7.5	-2.8 to -7.4	-2.0 to +1.8 and 8 wnl	-0.6 to -2.7 and 11 wnl

wnl = within normal limits
when biplane echo not available

All have 2VRs

No cardiac medications 15/19

Repair and Growth of UAVC

Conclusions

AV valve flow produces a physiologic growth signal

Valve and ventricular growth can be induced

Additional AV valve repair 4 (20)%
(satisfactory)

Adequate 2VRs will result