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Arterial Switch Operation and Complex Coronary Patterns

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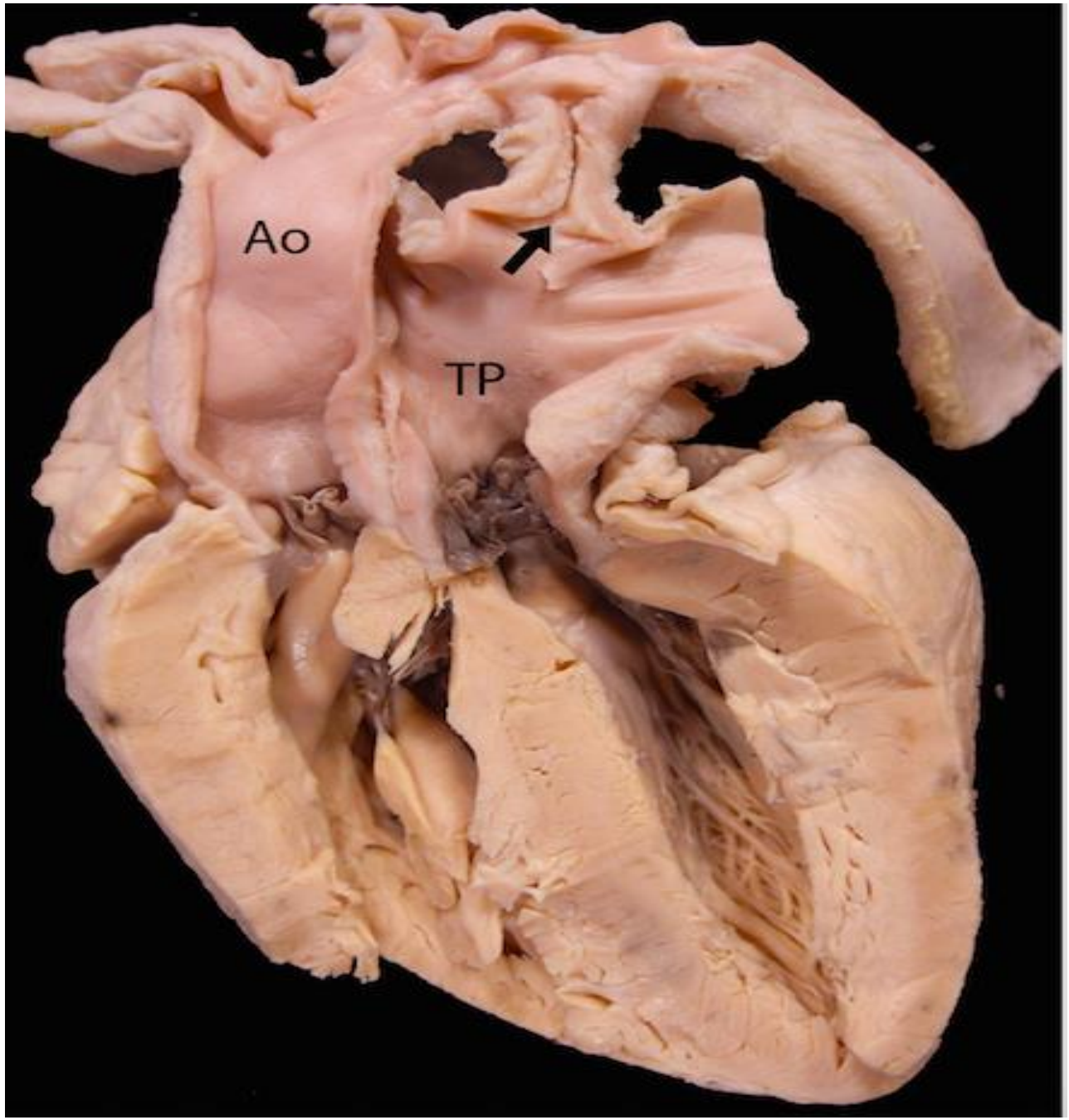
No disclosures



TGA

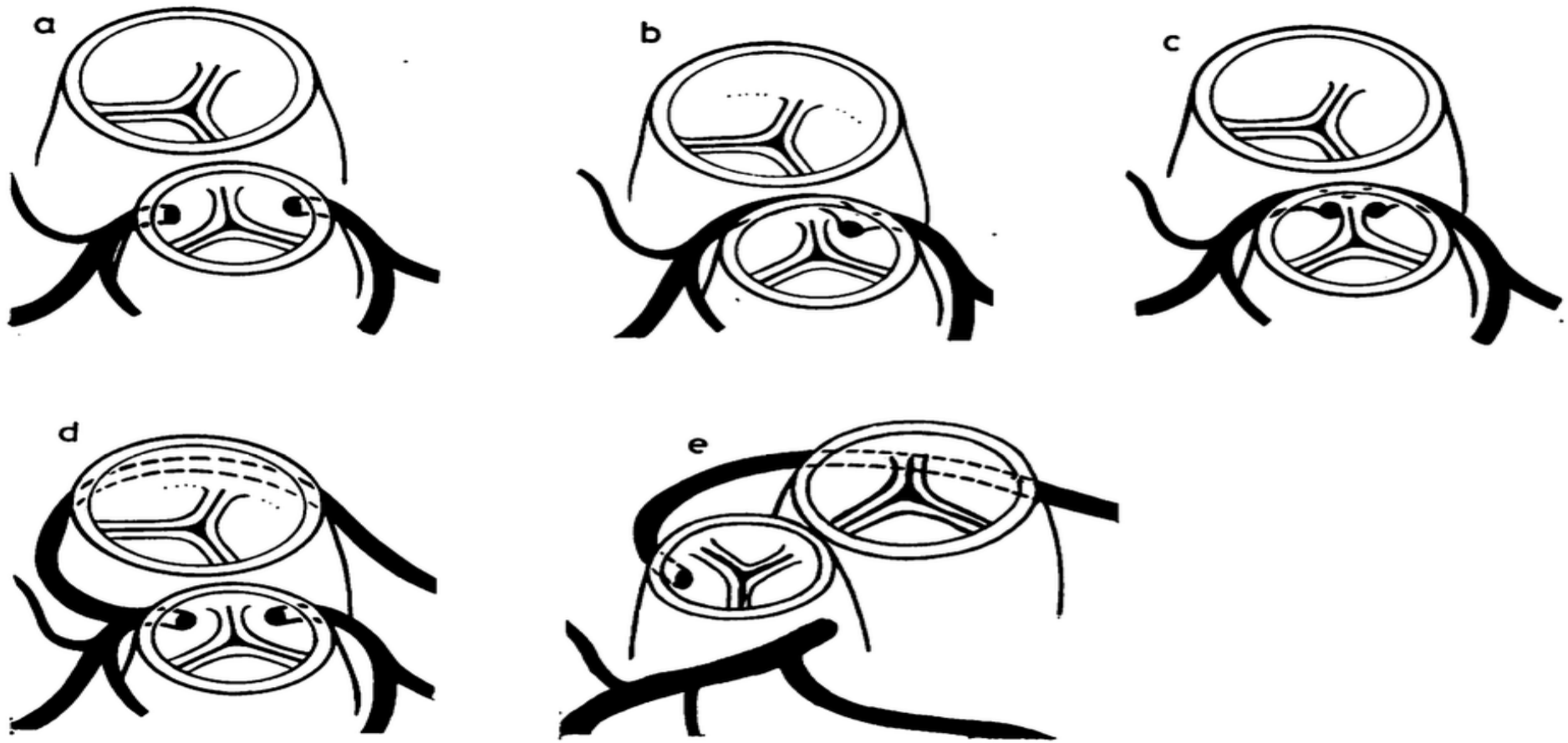
Coronary Anatomy

Table 1. Previous Classifications of Coronary Anatomy in TGA

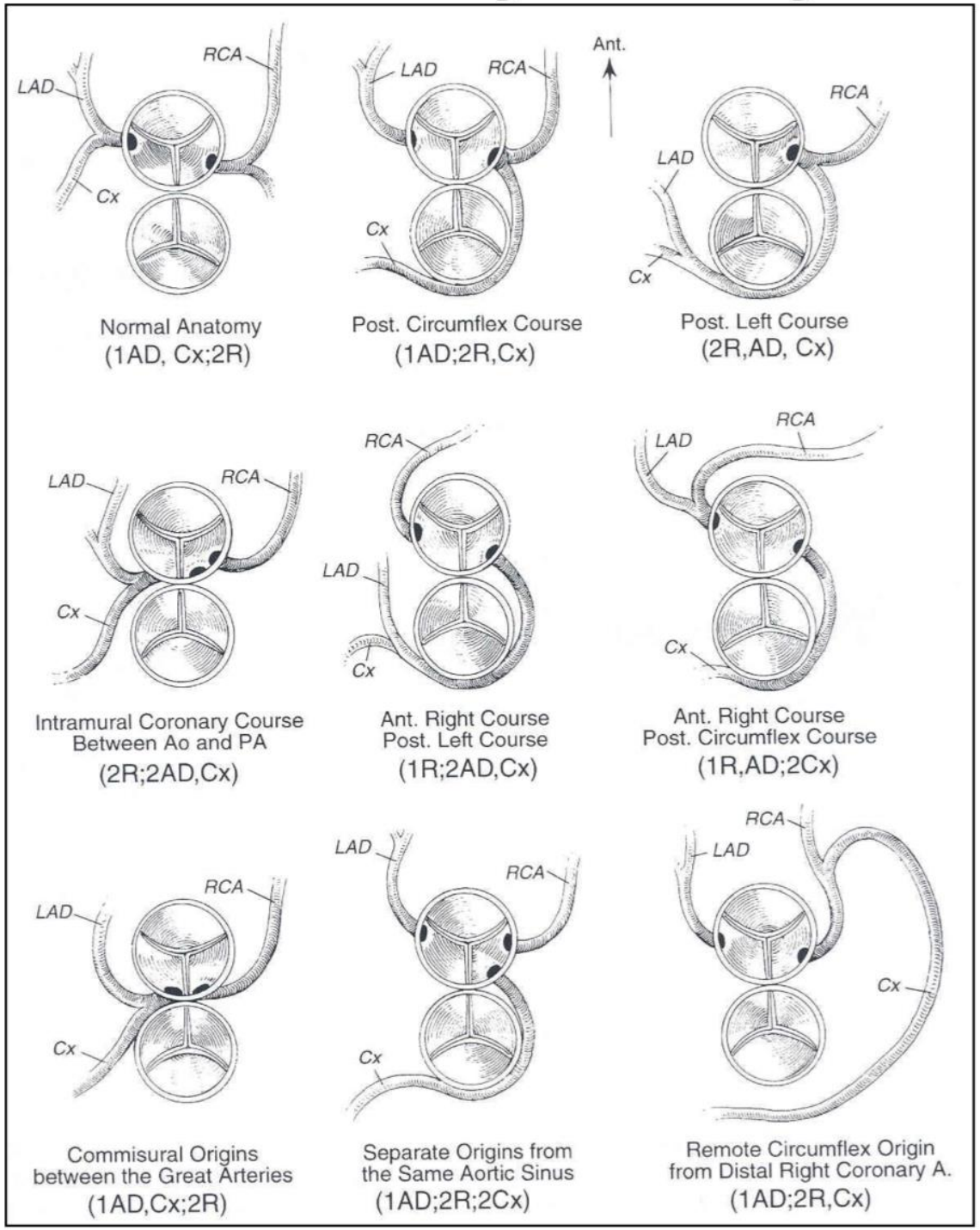
Authors (Year)	Surgical or Pathological Series (Cases Examined)	Types of Coronary Pattern Identified, n
Shaher and Paddu (1966)	Pathological (166)	9
Yacoub (1978)	Surgical (18)	5
Quaegebeur (Leiden) (1986)	Surgical (66)	N/A*
Gittenberg (1983)	Surgical (103)	12
Pasquini (1987)	Surgical (32)	5

Anatomy of the coronary arteries in transposition of the great arteries and methods for their transfer in anatomical correction

MAGDI H YACOUB AND ROSEMARY RADLEY-SMITH



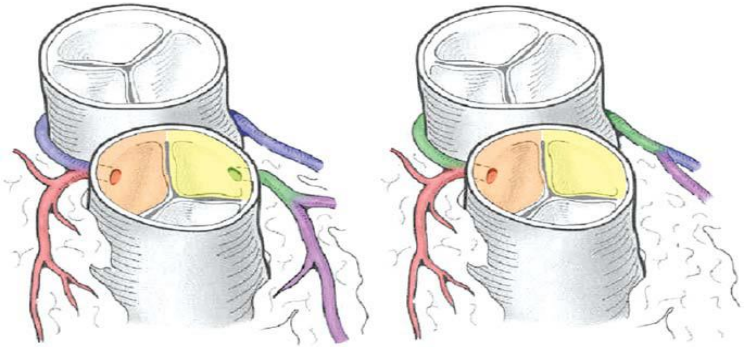
Thorax, 1978, **33**, 418–424



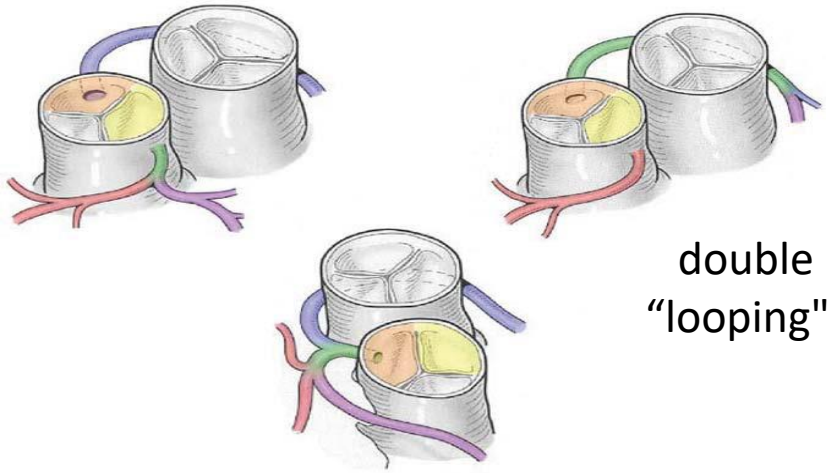
Leiden Classification

TGA – Coronary anatomy

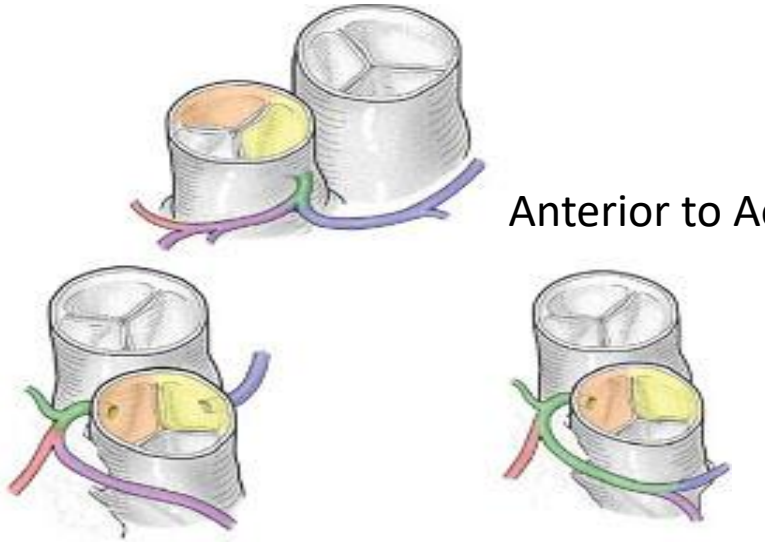
Posterior to PA



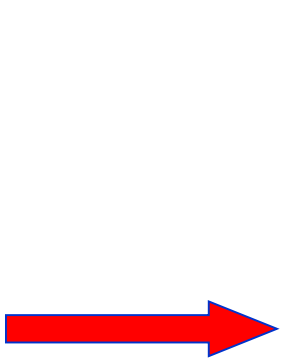
"Looping" traject

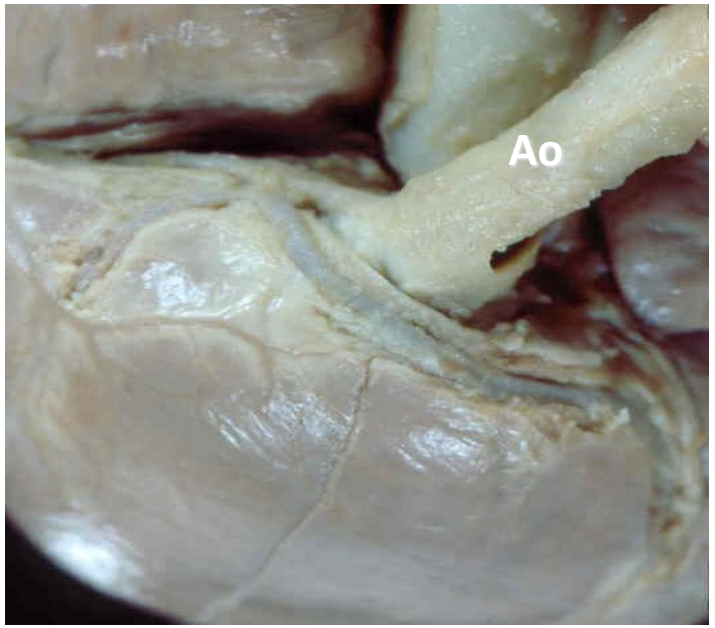


double "looping"



Anterior to Ao



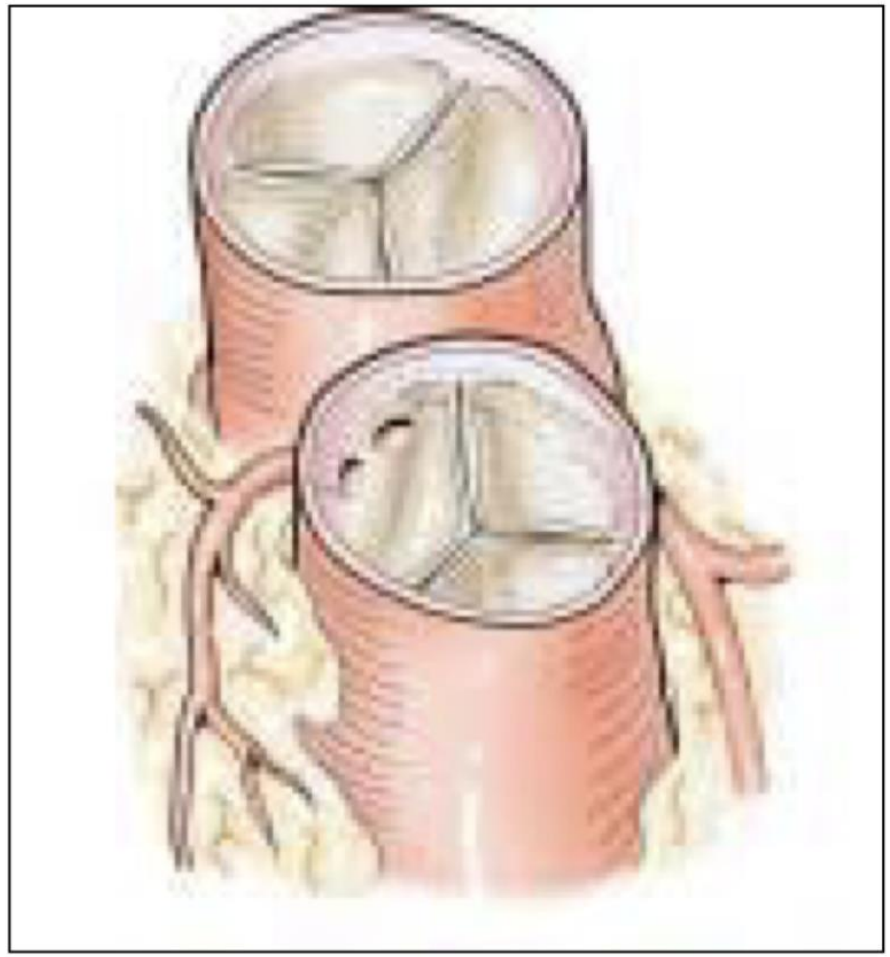


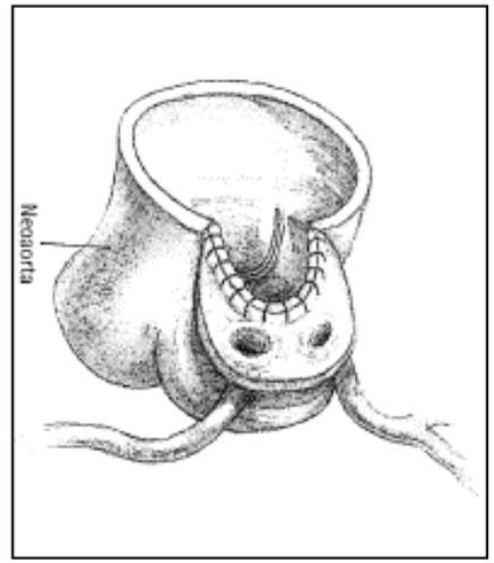
From: Lacour-Gayet & Anderson, 2005

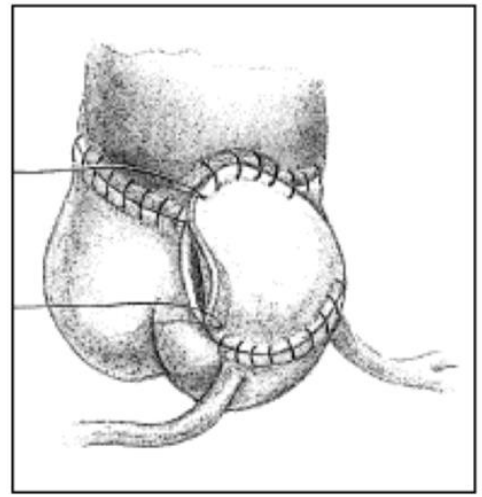
High risk coronary artery patterns

- Intra-mural coronary artery course
- Single coronary with inter-arterial coronary artery course
- Posterior looping courses

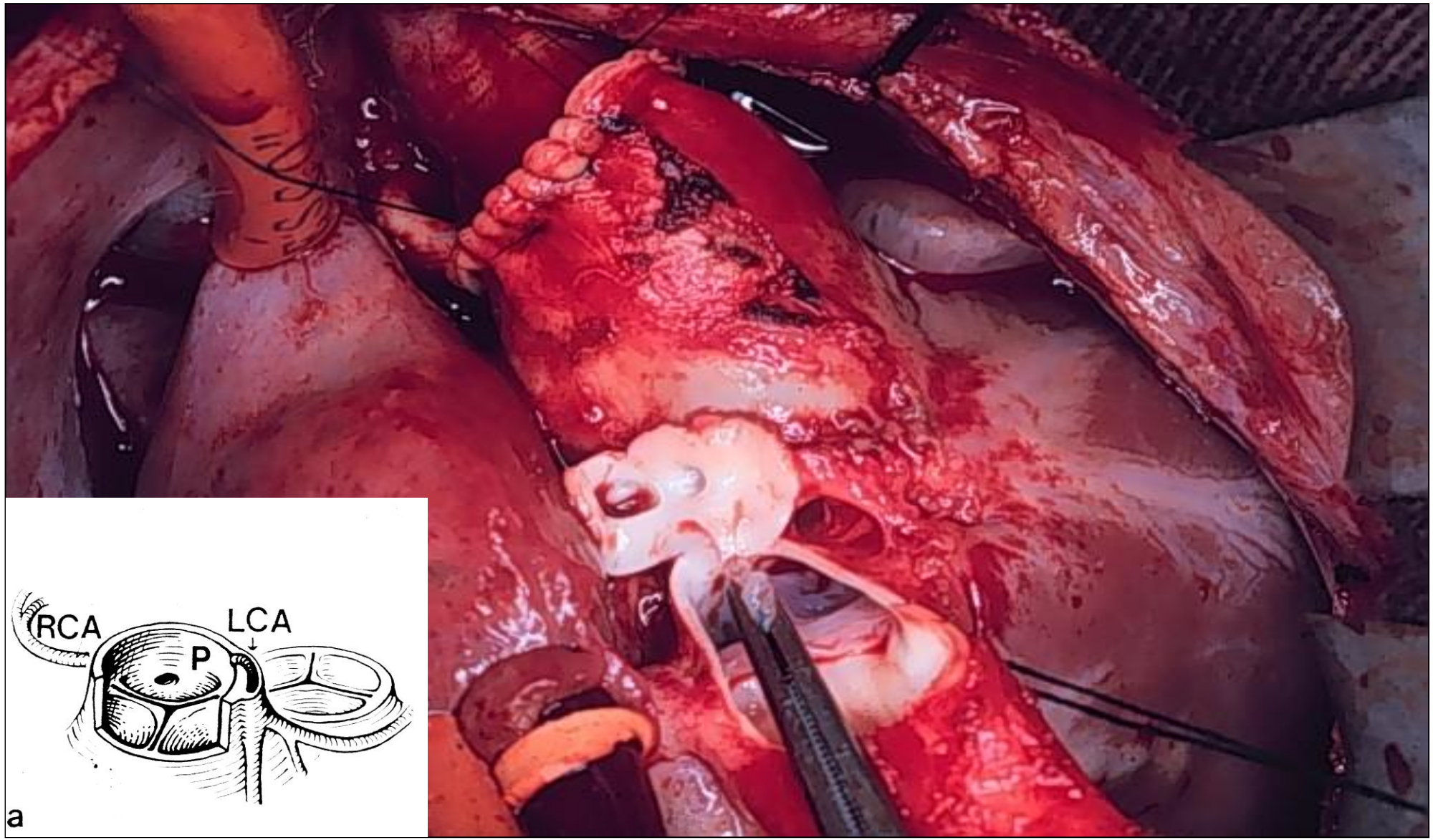
Single coronary from right sinus with Inter-arterial course



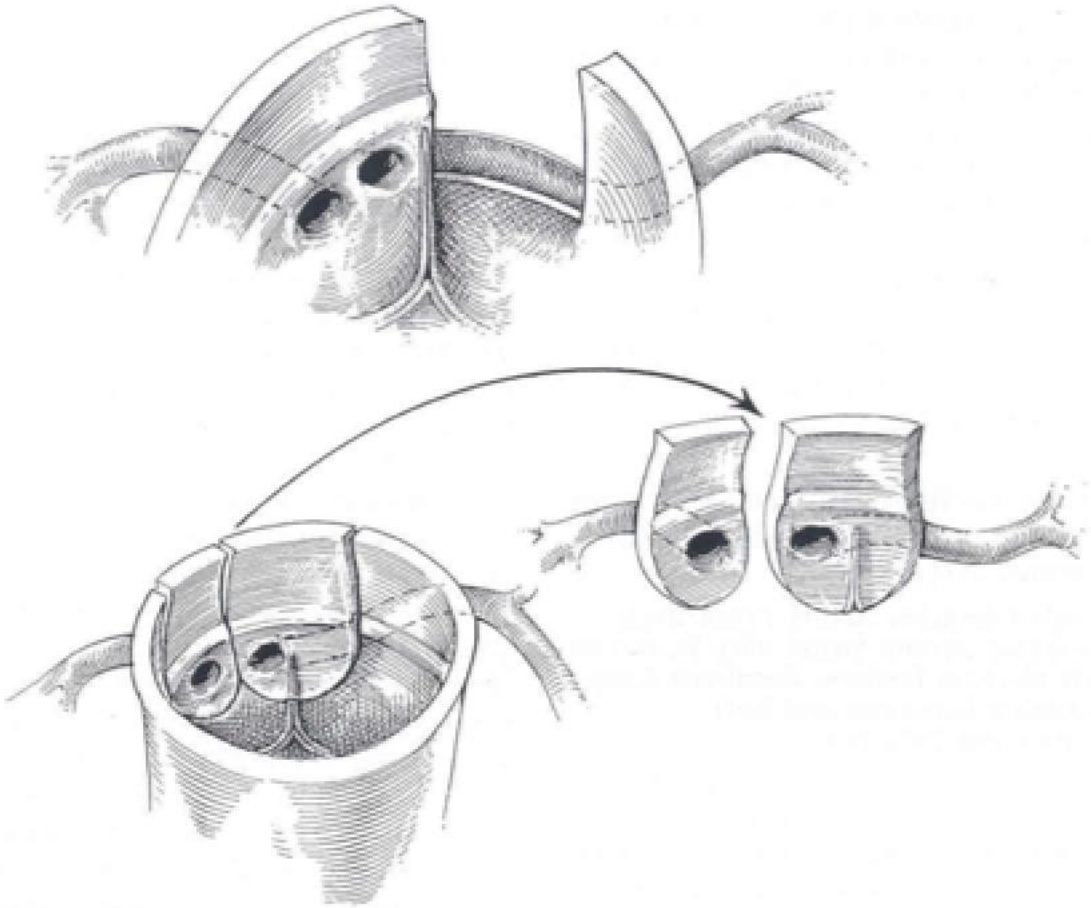


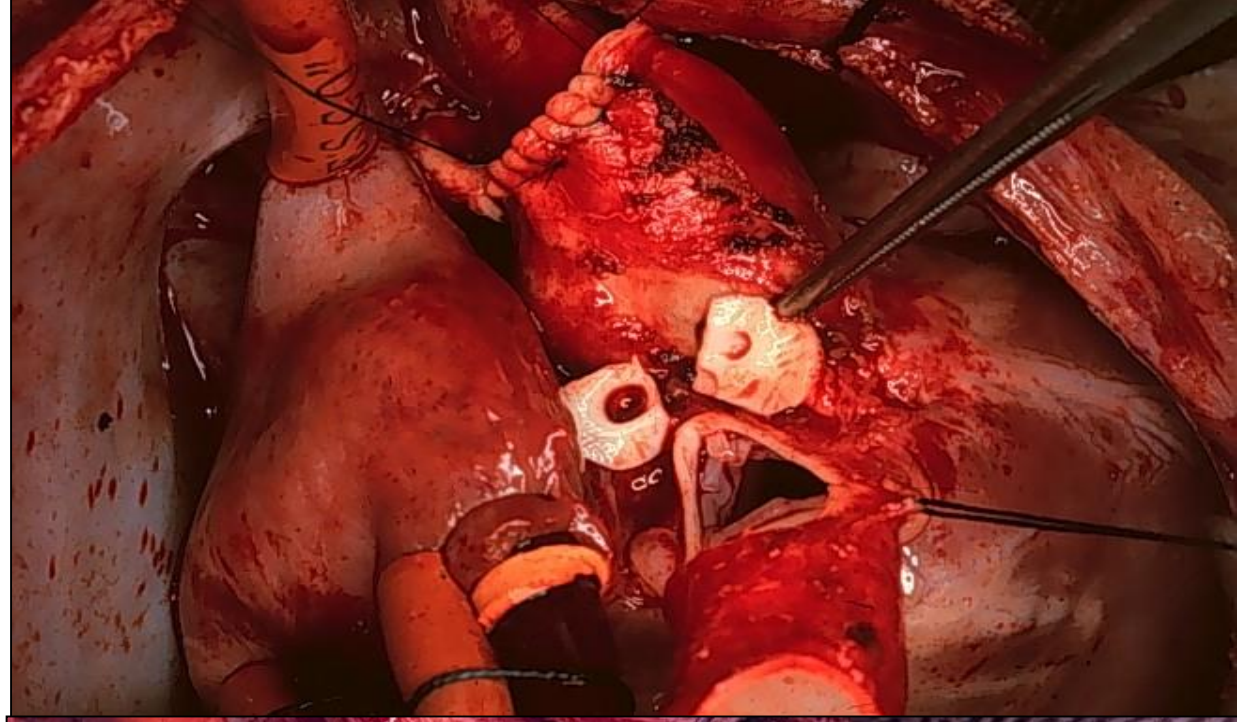


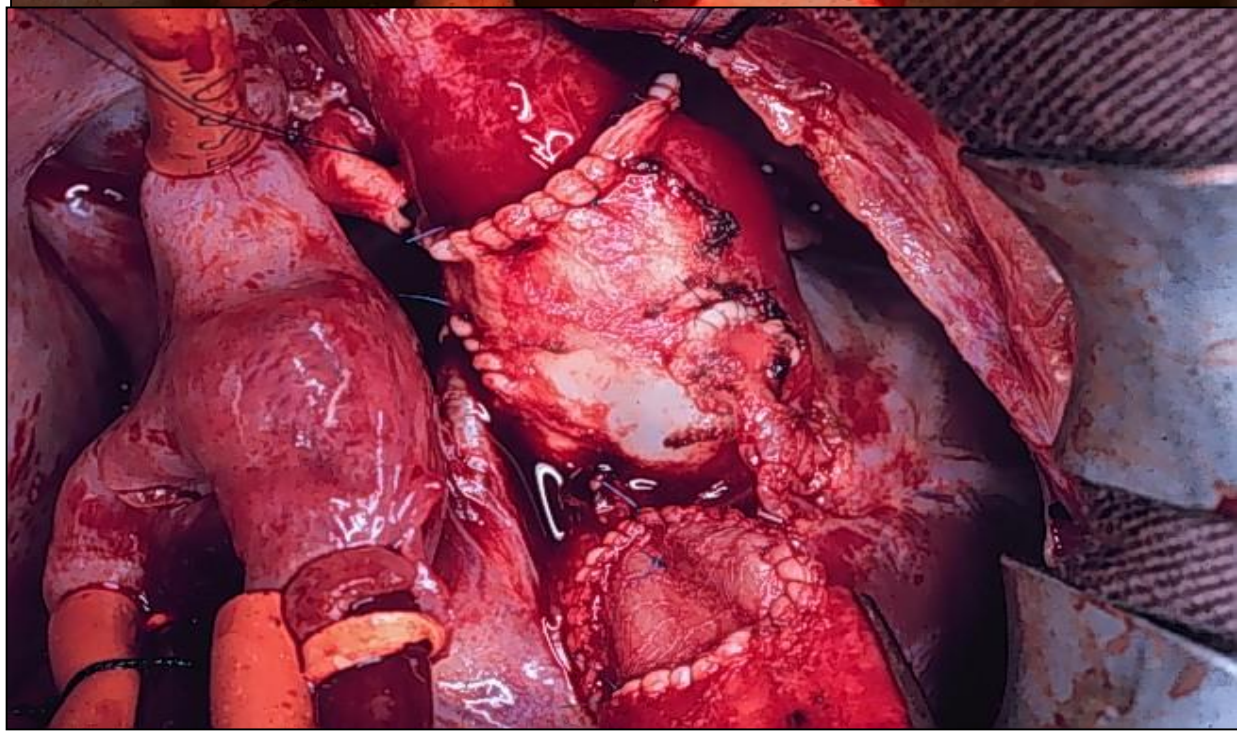
Juxta comissural and intramural course



Juxta comissural and intramural course







Single coronary translocation

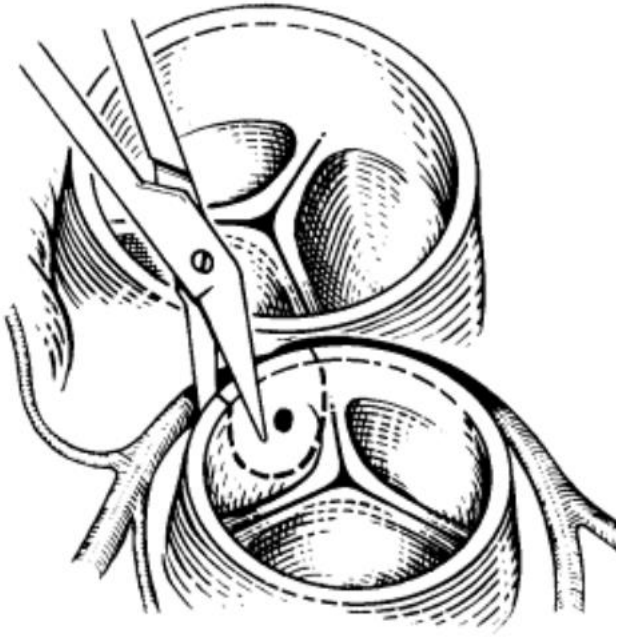


Fig 8 *Mobilisation of a disc or aortic wall around a single coronary ostium.*

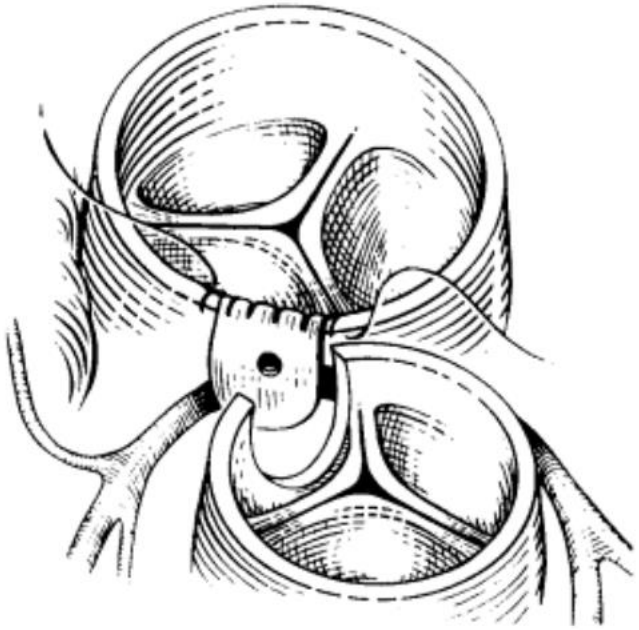


Fig 9 *Anastomosis of upper border of mobilised disc bearing a common coronary ostium to border of transected posterior vessel.*

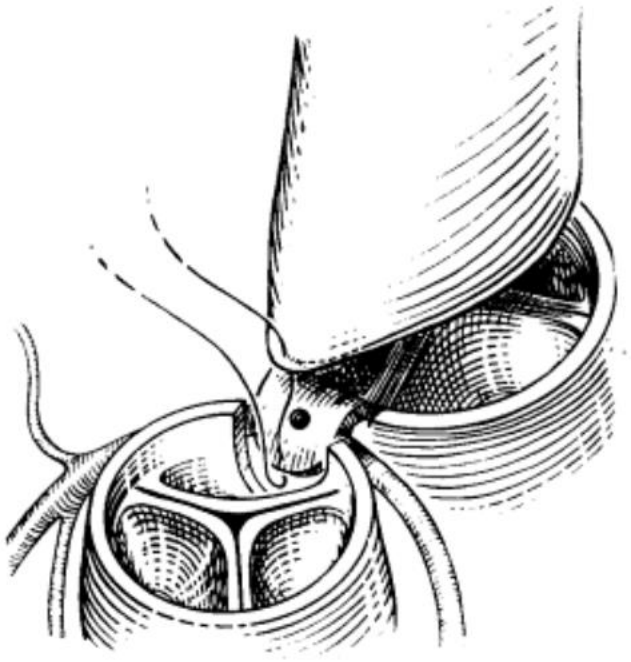


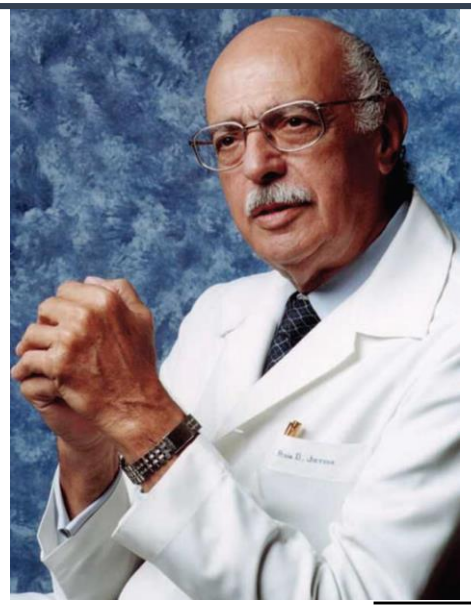
Fig 10 *Anastomosis of upper end of transected anterior vessel to lower end of posterior vessel in a fashion to include disc bearing a common coronary ostium.*

Thorax. 1978 Aug; 33(4): 418–424.

Arq Bras Cardiol. 1975 Aug;28(4):461-64.

Successful anatomic correction of transposition of the great vessels. A preliminary report.

Jatene AD, Fontes VF, Paulista PP, de Souza LC, Neger F, Galantier M, Souza JE.



NOTA PRÉVIA

SUCCESSFUL ANATOMIC CORRECTION OF TRANSPOSITION OF THE GREAT VESSELS. A PRELIMINARY REPORT.

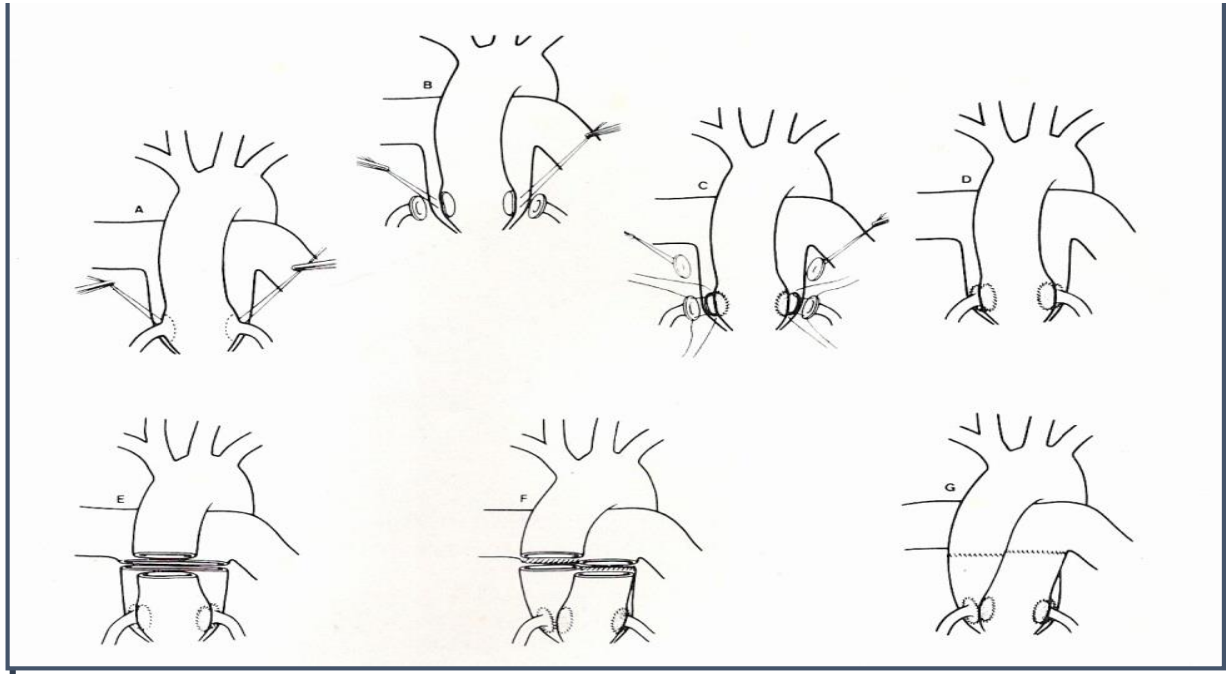
The authors present a new approach for anatomical correction of transposition of the great vessels. The two coronaries with a piece of aortic wall are transposed to the posterior artery. The two aortic openings are closed with a patch. The aorta and pulmonary artery are transected, contraposed and then anastomosed. The interventricular septal defect was closed through a right ventriculotomy with a dacron patch. A 40-day-old white male infant with 3,700 g was operated on with deep hypothermia and total circulatory arrest and made an uneventful recovery. The hemodynamic study 20 days after surgery showed the complete correction of the malformation. At 50 days after surgery, he weighed 5,500 g, without cyanosis and in good conditions.

Anatomic correction of transposition of the great vessels

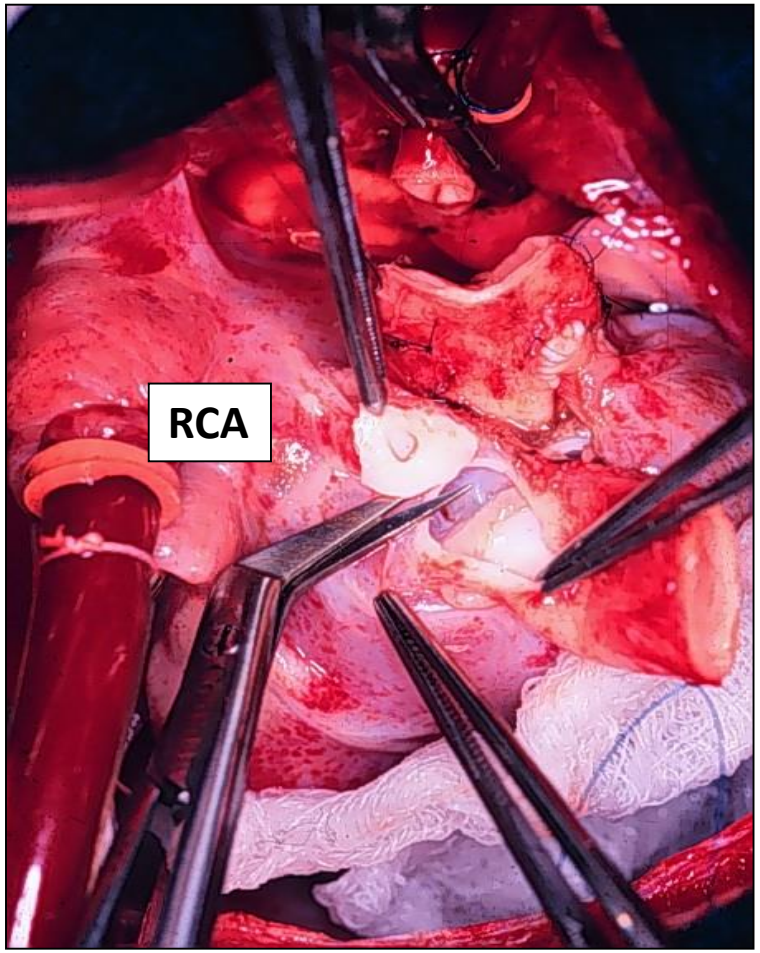
AD Jatene, VF Fontes, PP Paulista, LC Souza, F Neger, M Galantier and JE Sousa

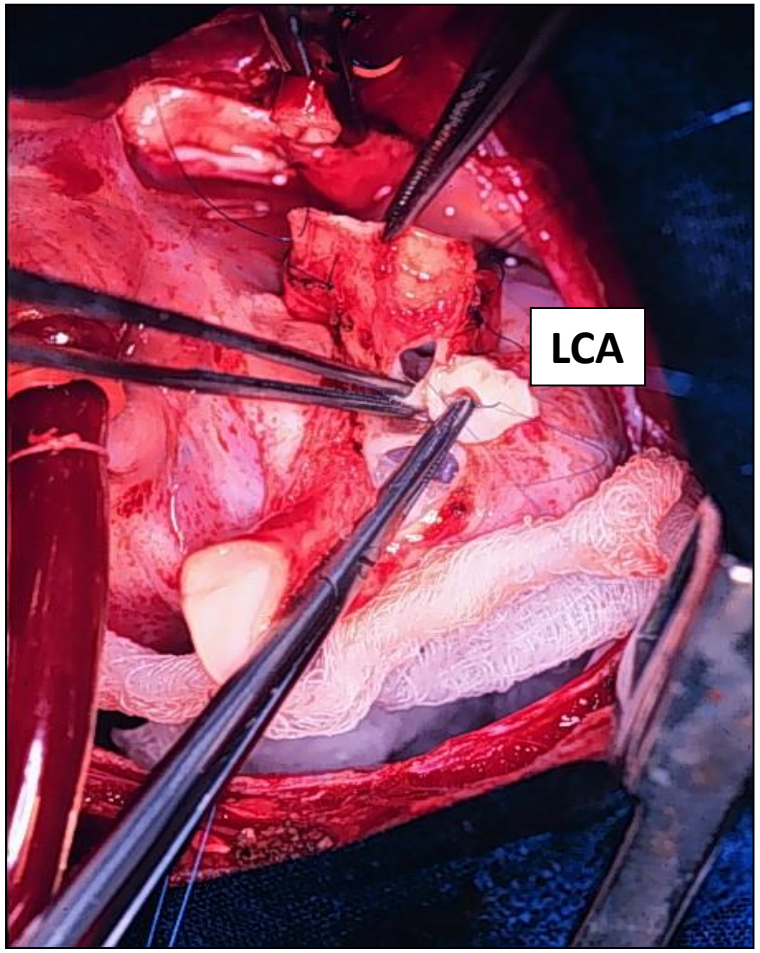
The Journal of Thoracic and Cardiovascular Surgery, Vol 72, 364-370, 1976

We present a new approach for anatomic correction of transposition of the great arteries. The two coronary arteries, with a piece of the aortic wall attached, are transposed to the posterior artery. The two aortic openings are closed with a patch. The aorta and pulmonary artery are transected, contraposed, ant then anastomosed. The interventricular septal defect is closed with a patch, through a right ventriculotomy approach, because the right ventricle is no longer part of the systemic circulation. Two patients, aged 3 months and 40 days weighing 4,200 and 3,700 grams, respectively, were operated upon with deep hypothermia and total circulatory arrest. There was good recovery from the operation, with normal cardiocirculatory conditions. Renal failure developed in the first patient, and she died on the third postoperative day. During this time the cardiocirculatory conditions were good. The second patient made an uneventful recovery. Hemodynamic studies 20 days after the operation showed complete correction of the malformation. Five and one-half months after the operation, he weighs 7,500 grams, and his development is very good. We believe that this operation will be reproducible by most cardiovascular septal defect and pulmonary hypertension.



The Development of the Arterial Switch Operation

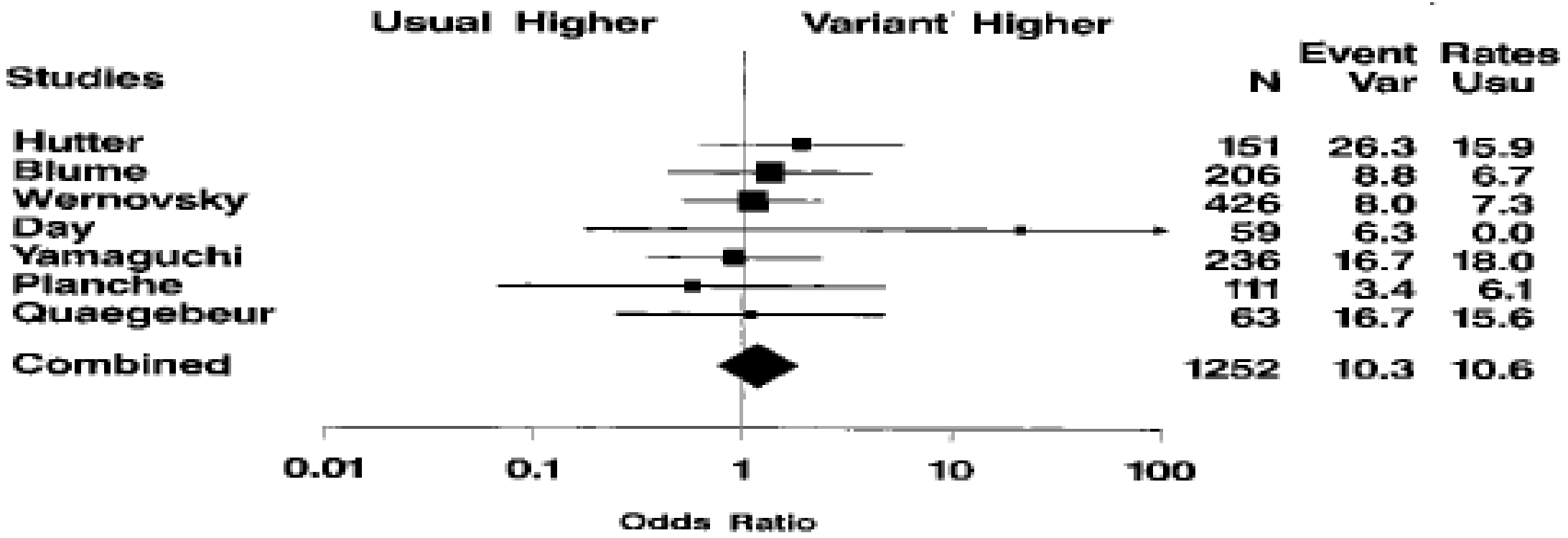




Coronary Artery Pattern and Outcome of Arterial Switch Operation for Transposition of Great Arteries
A Meta-Analysis

Sara K. Pasquali, et al

C Two Coronary Ostia



Circulation November 12, 2002

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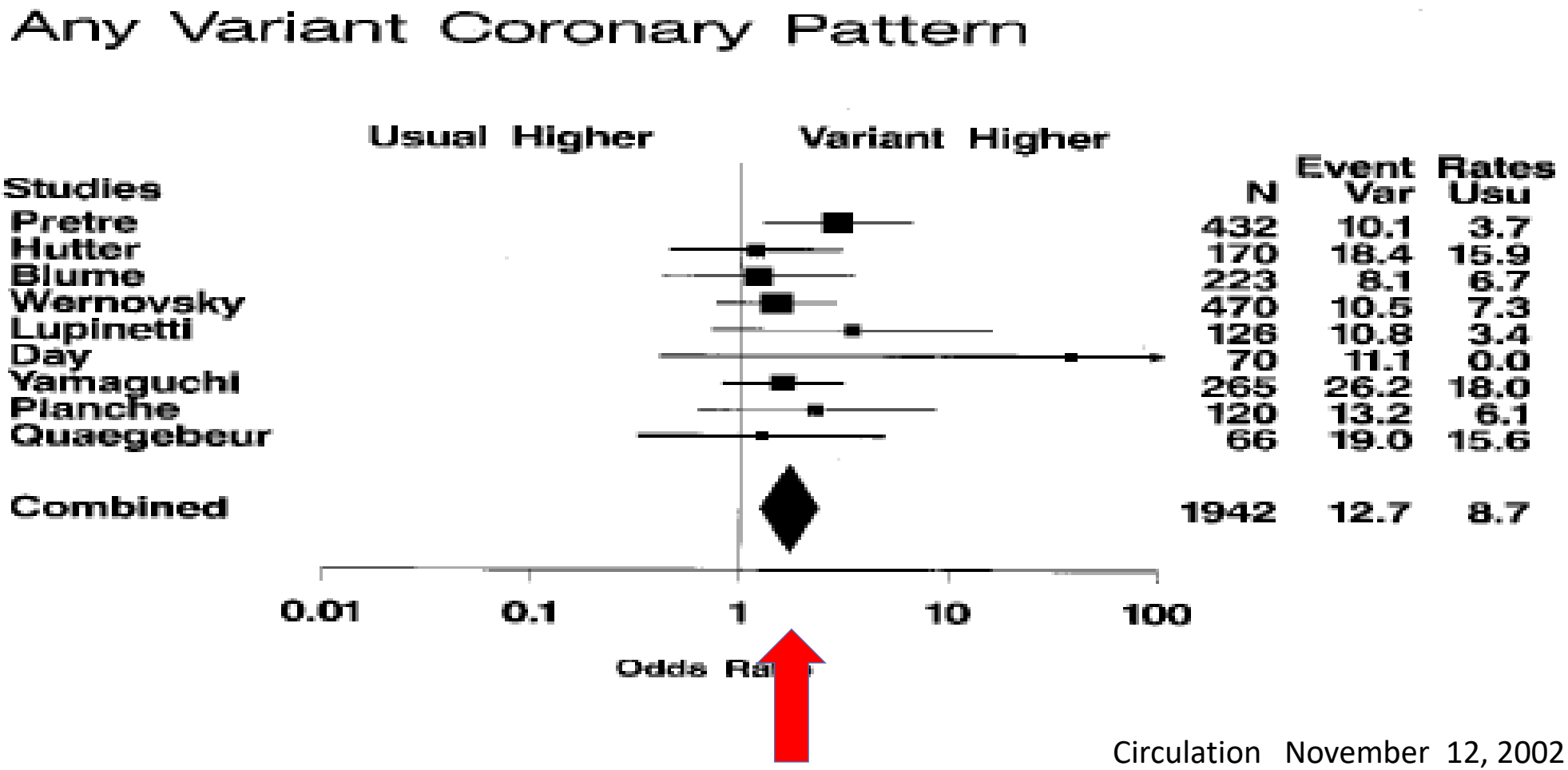

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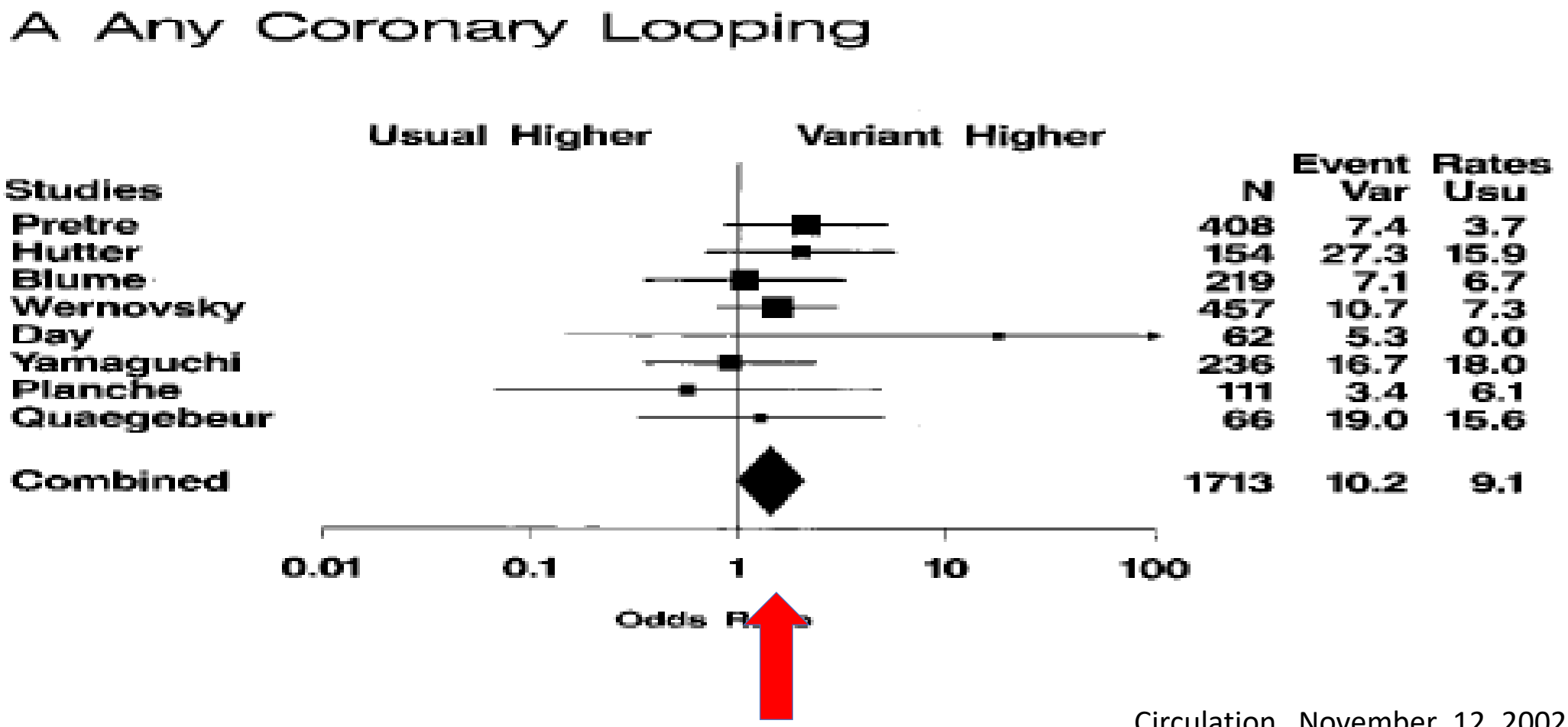

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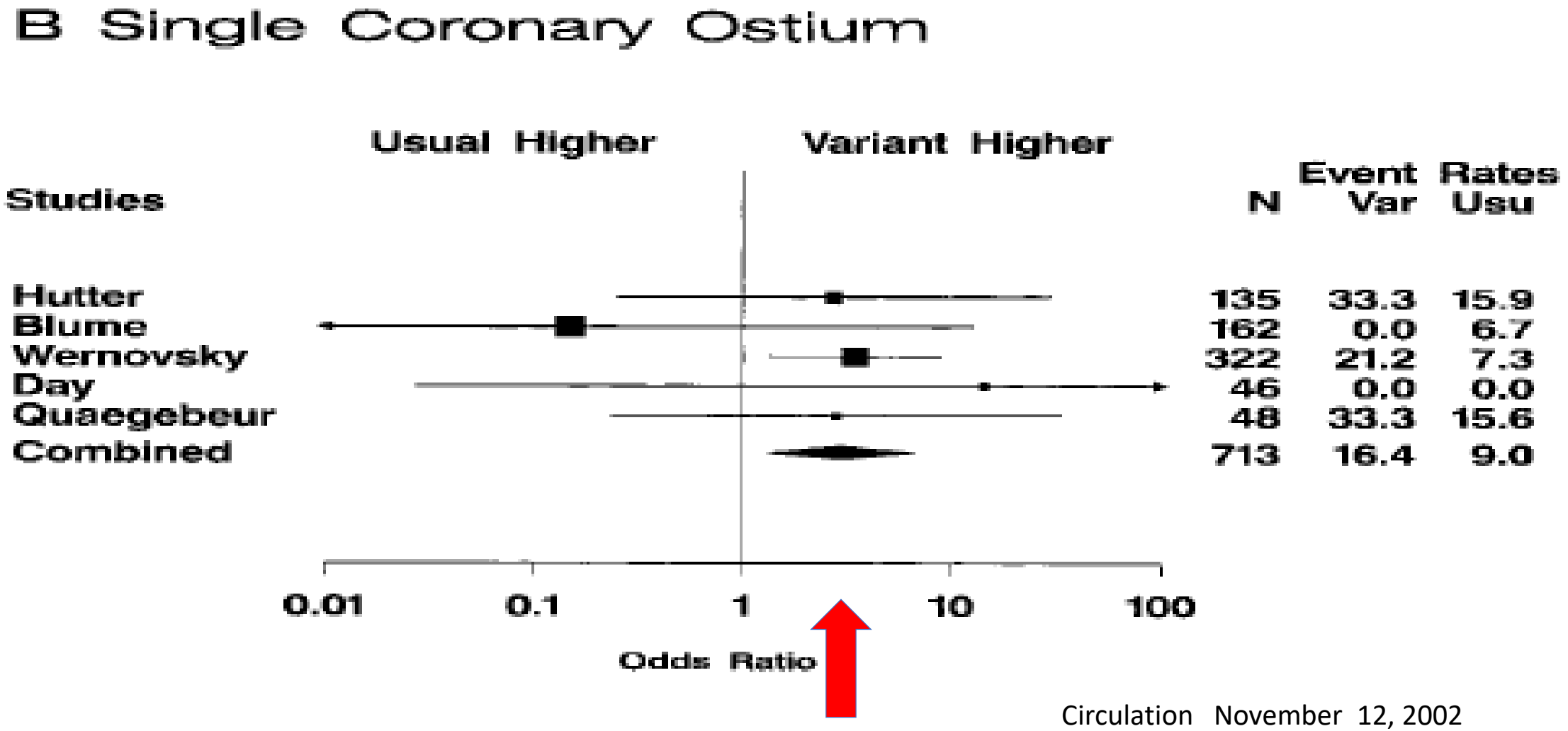

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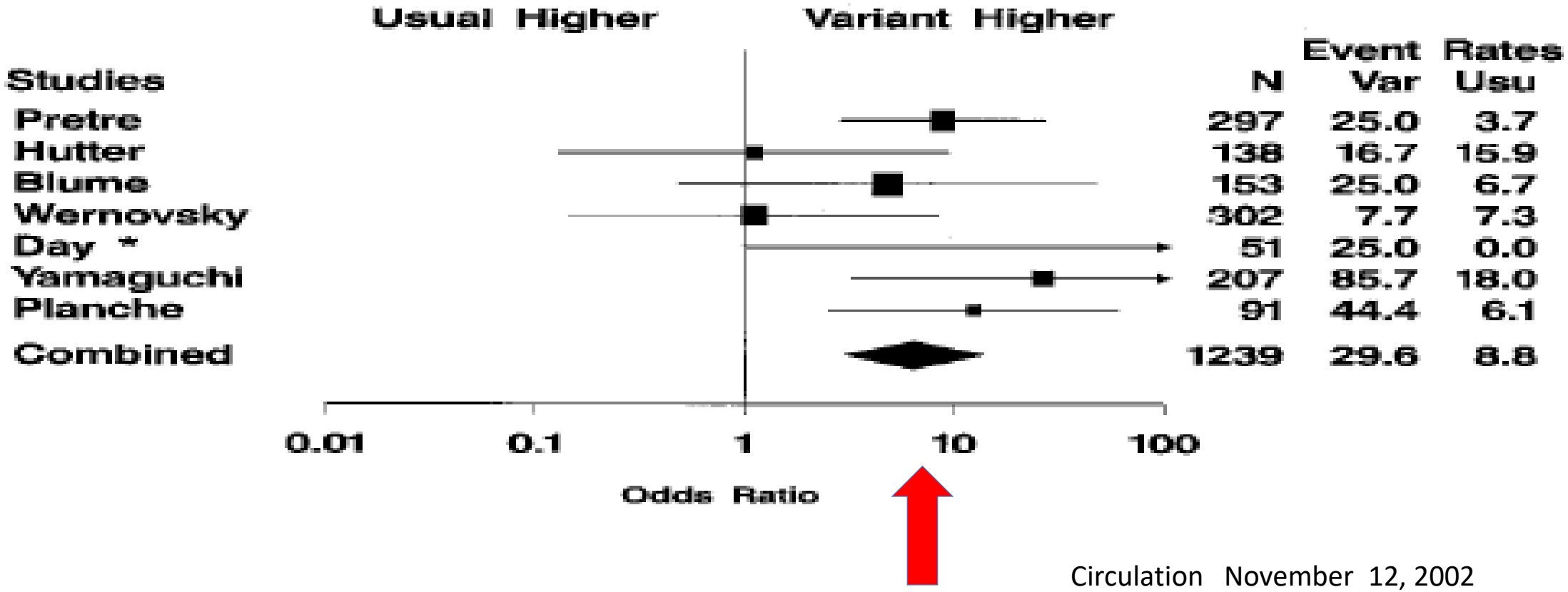
Intramural Coronary Artery



Circulation November 12, 2002

Intramural coronary arteries and outcome of neonatal Arterial switch operation

Olivier Metton, et al

1987-2008
919 Jatene operation

46 pac (5%) – intramural

28 – LCA
12 – LAD
3 – RCA
3 – LCA and RCA

MORTALITY

Intramural – 28%
Other patterns – 3,9%

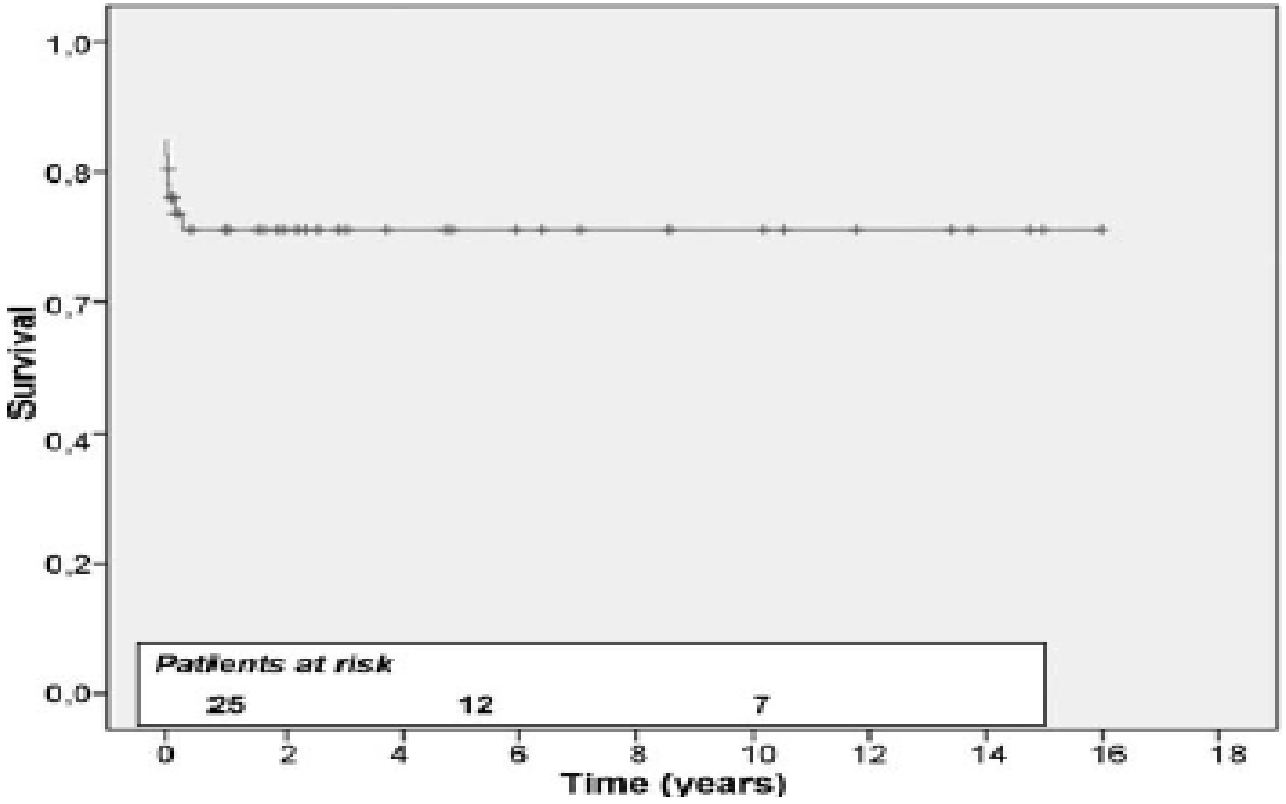


Fig. 3. Actuarial survival.

European Journal of Cardio-thoracic Surgery 37 (2010) 1246-1253

Intramural coronary arteries and outcome of neonatal Arterial switch operation

Olivier Metton, et al

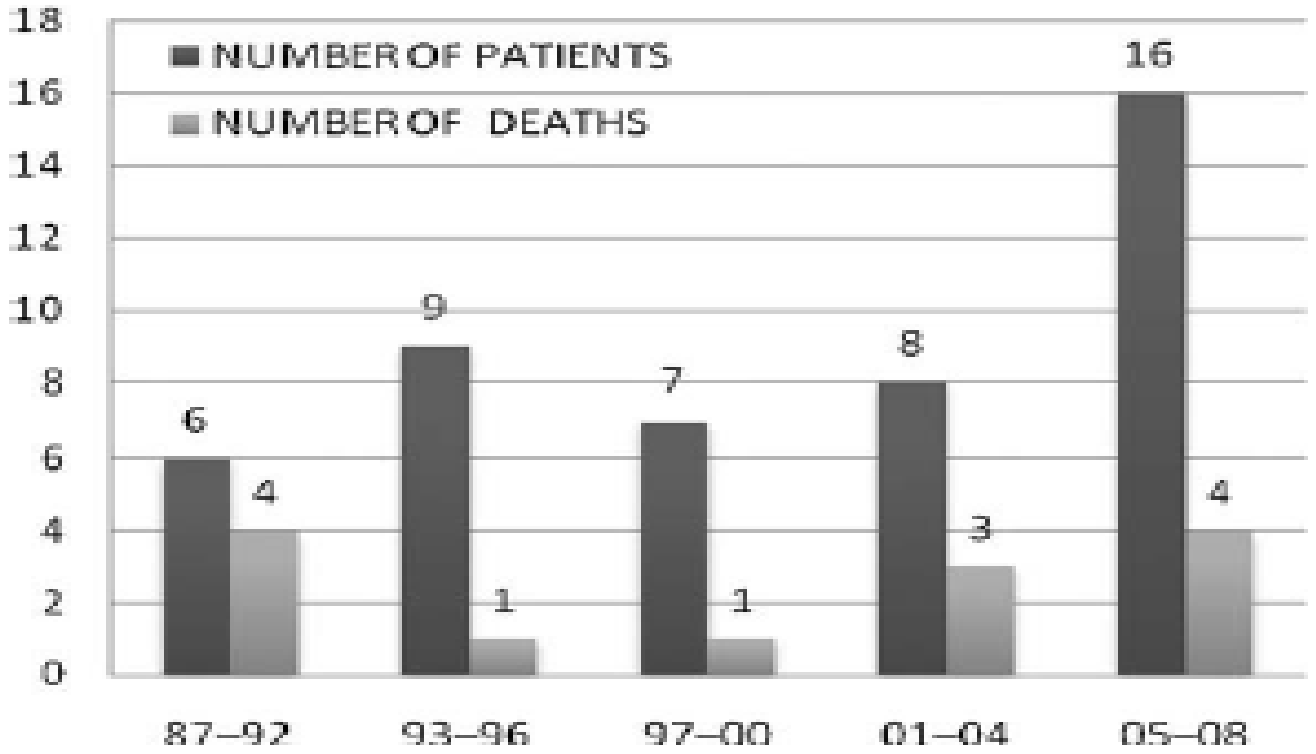


Fig. 2. Distribution of the numbers of patients and deaths per periods of 4 years.

European Journal of Cardio-thoracic Surgery 37 (2010) 1246-1253

Intramural coronary arteries and outcome of neonatal Arterial switch operation

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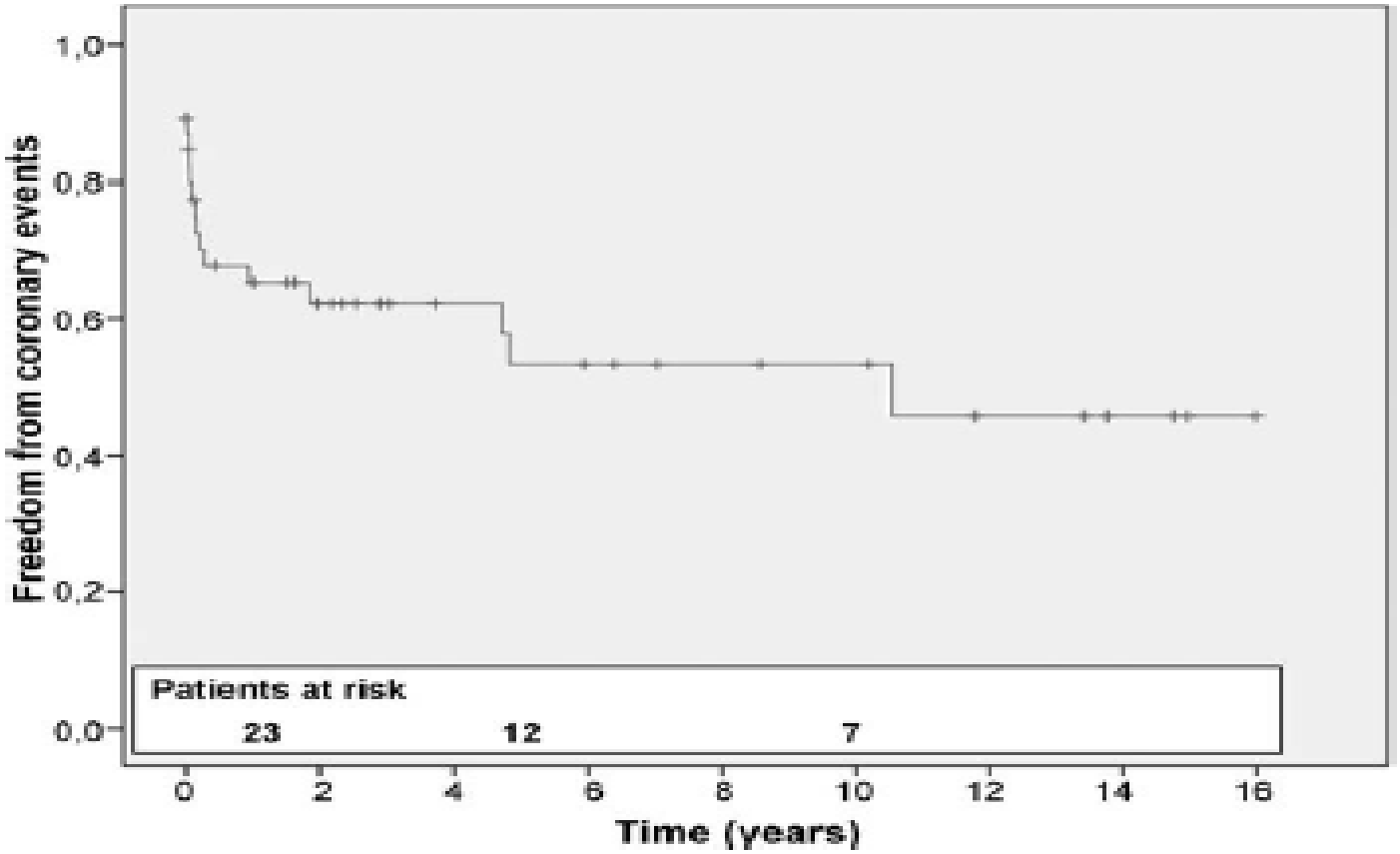
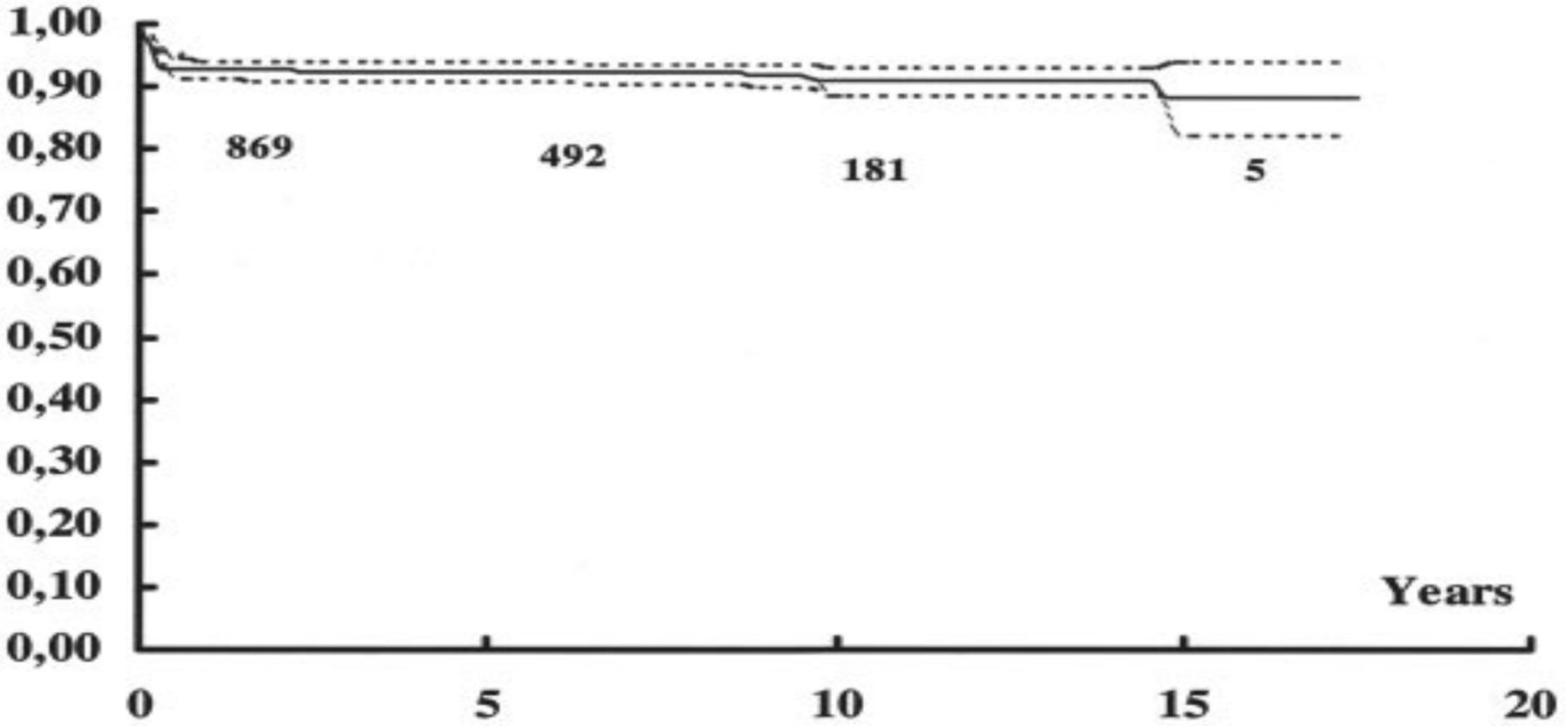


Fig. 4. Actuarial freedom from coronary events.

European Journal of Cardio-thoracic Surgery 37 (2010) 1246-1253

Coronary Events After Arterial Switch Operation for Transposition of the Great Arteries



Survival free of coronary events – 1304 patients

Circulation. 2003;108[suppl II]:II-186-II-190.

Coronary Events After Arterial Switch Operation for Transposition of the Great Arteries

TABLE 2. Risk Factors of Coronary Events

A. Univariate analysis	With CE	Without CE	*P*
Year of surgery (before 1990 versus after 1990) %	56.3	26.7	<0.0001
Coronary pattern B or C versus type A, D, E, %	19.1	2.9	<0,0001
Cardiopulmonary bypass time, minutes	191	155	<0.0001
Major operative events, %	56.3	18	<0.0001
Reperfusion time, minutes	66	47.5	<0.0001
B. Multivariate analysis		**Odds ratio**	***P***
Type B or C Coronary pattern versus type A, (D+E), %		6,6	<0.0001
Major operative events		3	0.0024

CE indicates coronary events.

Circulation. 2003;108[suppl II]:II-186-II-190.

TABLE 4. Myocardial Ischemia Test Value

	ECG	Echo	Exercise Test	Myocardial Scintigraphy
Sensitivity %	32	36	21	50
Specificity %	98	98	98	90
Positive predictive value %	54	53	43	38
Negative predictive value %	95	95	93	94

TABLE 5. Value of Association of Myocardial Ischemia Tests

	ECG+ Echo	ECG+Echo+ MS	ECG+Echo+ ET	All Tests
Number of patients	324	115	174	85
Sensitivity %	41	75	43	73
Specificity %	96	81	93	74
Positive predictive value %	41	31	33	23
Negative predictive value %	96	97	95	95

ECG indicates electrocardiography; Echo, echocardiography; ET, exercise test; MS, myocardial scintigraphy.

Circulation. 2003;108[suppl II]:II-186-II-190.

Transposition of Great Arteries

Abr 03 – Mar 18 – 180 crianças

- Age – 3 to 180 days (18,1d)
- Weight – 2,2 to 7,5kg (3,54kg)
- L-TGA
  - 73,2% – intact septum
  - 20,6% – VSD
  - 6,2% – complex (VSD+PS; CoAo; IAA)
- Overall mortality - 5,8%
- Type A coronary (intact septum) – 2,5%
- Other coronary anomalies – 12,5%

Inferences

- Complex coronary patterns are related with higher morbidity and mortality
- Pre-op definition of the pattern is important, but not necessary
- Single ostium and intramural course are high risk patterns
- Different surgical techniques can be used, depending of the anatomical issues