Euro CHORUS

CURRENT HIGH END OPTION of CARDIOVASCULAR CARE

February 5 - 7, 2015, Strasbourg, France

Abnormal coronary arteries take off

Pierre Aubry
Bichat Hospital, Paris, France
on behalf of the ANOCOR Working Group

Conflict of interest: nothing to report

GACI

Groupe Athérome et Cardiologie Interventionnelle
de la Société Française de Cardiologie

ANOmalous connections of the CORonary arteries
ANOCOR study

- an ongoing observational prospective study
- started on January 31, 2010
- cohort of young people ≥15 years or adults
- proximal anomalous connection of ≥ one coronary artery
- end of the inclusion period on January 31, 2013
- last clinical follow-up on January 31, 2018

Pierre Aubry (Paris), Xavier Halna du Fretay (Orléans),
Patrick Dupouy (Antony), Phalla Ou (Paris), Jean-Michel Juliard (Paris),
on behalf of the ANOCOR investigators.

Rationale

- Rare abnormalities (5/1000 invasive CA)
- Lot of case reports
- Heterogeneous management
- Lack of established evidence-based guidelines
- Need of a risk stratification model
- Few prospective studies with large cohorts

  (AAOCA / ANOCOR)

AAOCA: anomalous aortic origin of coronary artery
ANOCOR: anomalous connections of the coronary arteries
CA: coronary angiography

Study endpoints

- Primary endpoint:
  - to determine the therapeutic strategy of diagnosed patients with ANOCOR

- Secondary endpoints:
  - to identify the circumstances of diagnosis
  - to describe the frequency of each type of ANOCOR
  - to evaluate the morbimortality in the follow-up period according to the initial therapeutic strategy

Recruited patients
n = 490

Non enrolled patients
n = 12

- 6 non ANOCOR
- 4 anatomical variants
- 1 doubloon
- 1 out of time

Non analysed patients
n = 17

?

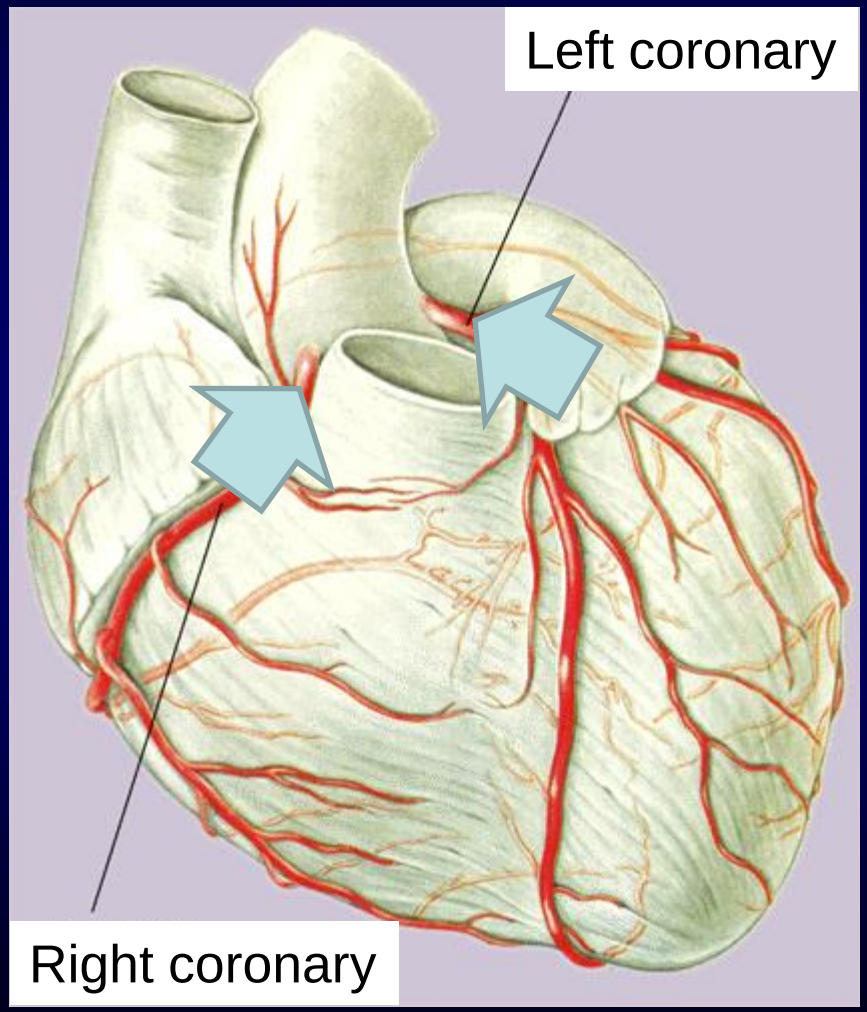
Enrolled patients
n = 461

January 31, 2015

Old and current concepts

Anomalous connections of the coronary artery

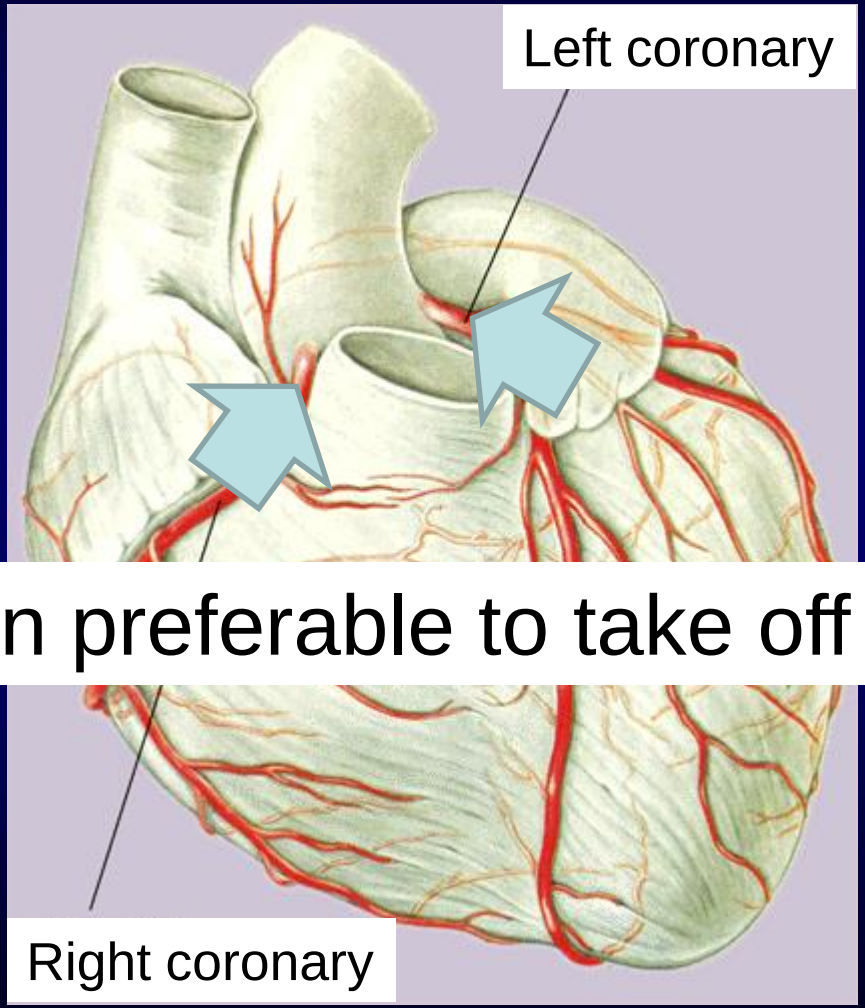
Endothelial outgrowth from the aorta ?
Endothelial ingrowth from the peritruncal ring ?



Anomalous connections of the coronary artery

Endothelial outgrowth from the aorta

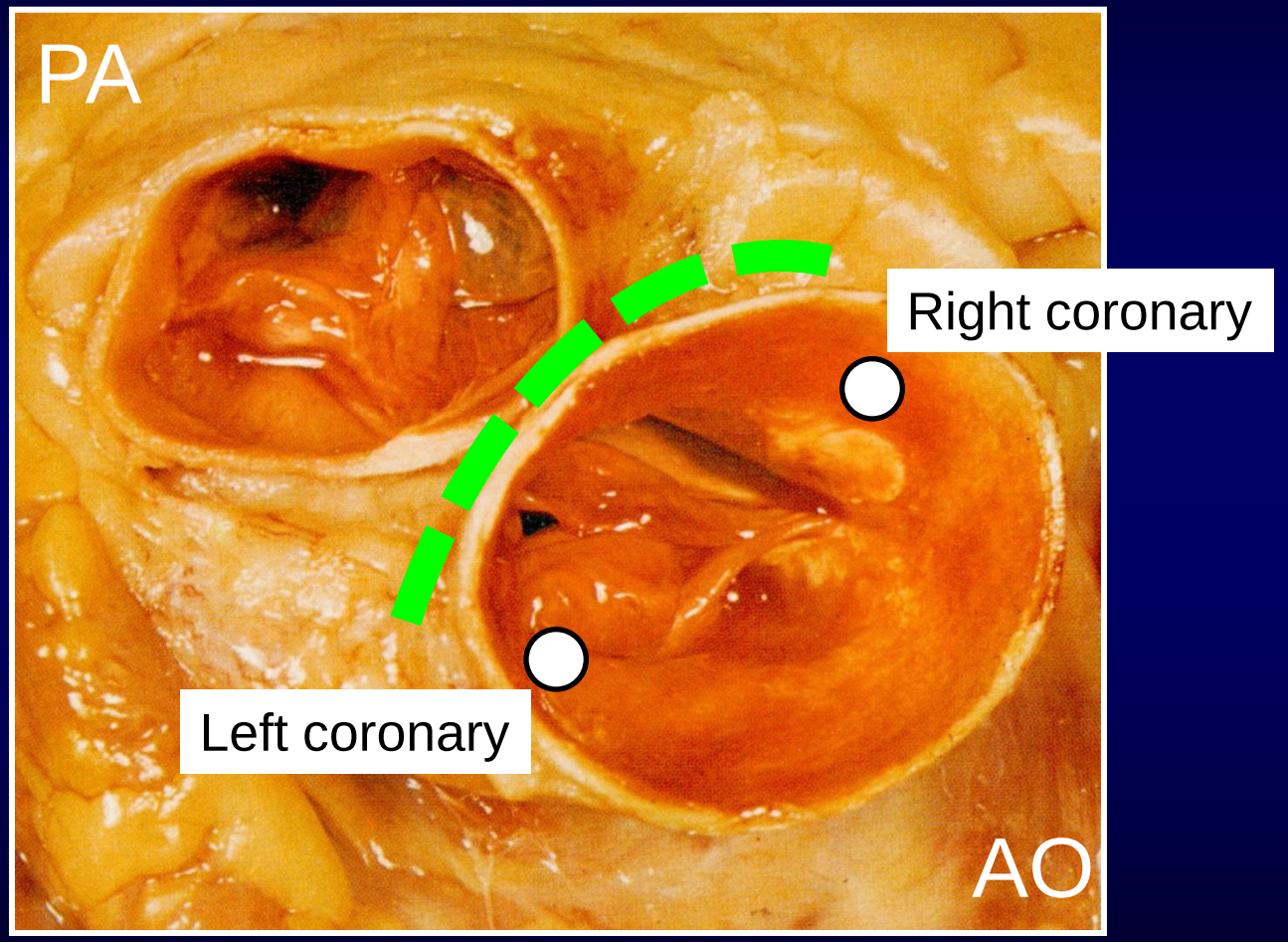
Endothelial ingrowth from the peritruncal ring



Connection preferable to take off or origin

Anomalous connections of the coronary arteries

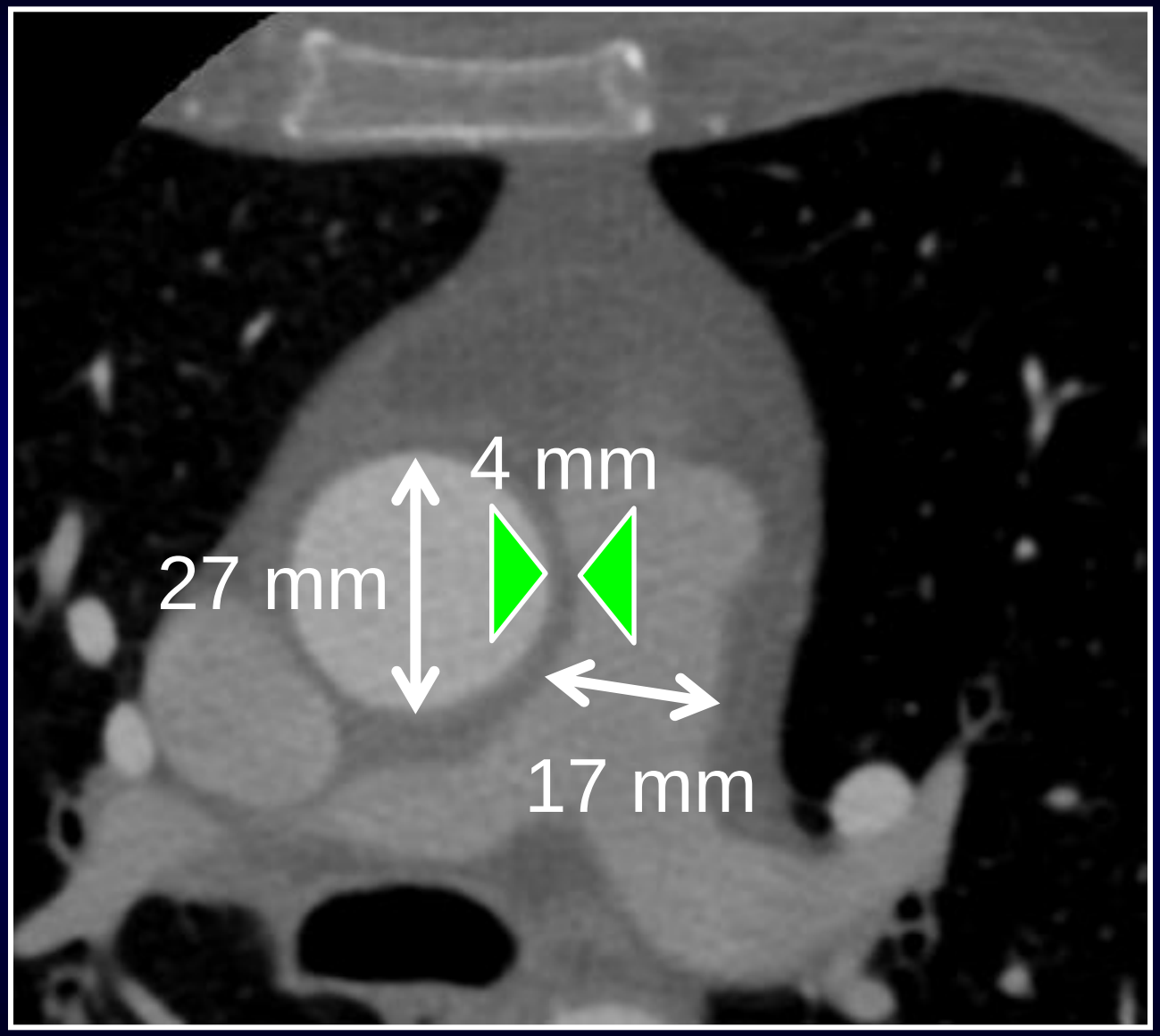
ANTERIOR



POSTERIOR

Anomalous connections of the coronary arteries

Anomalous connections of the coronary arteries

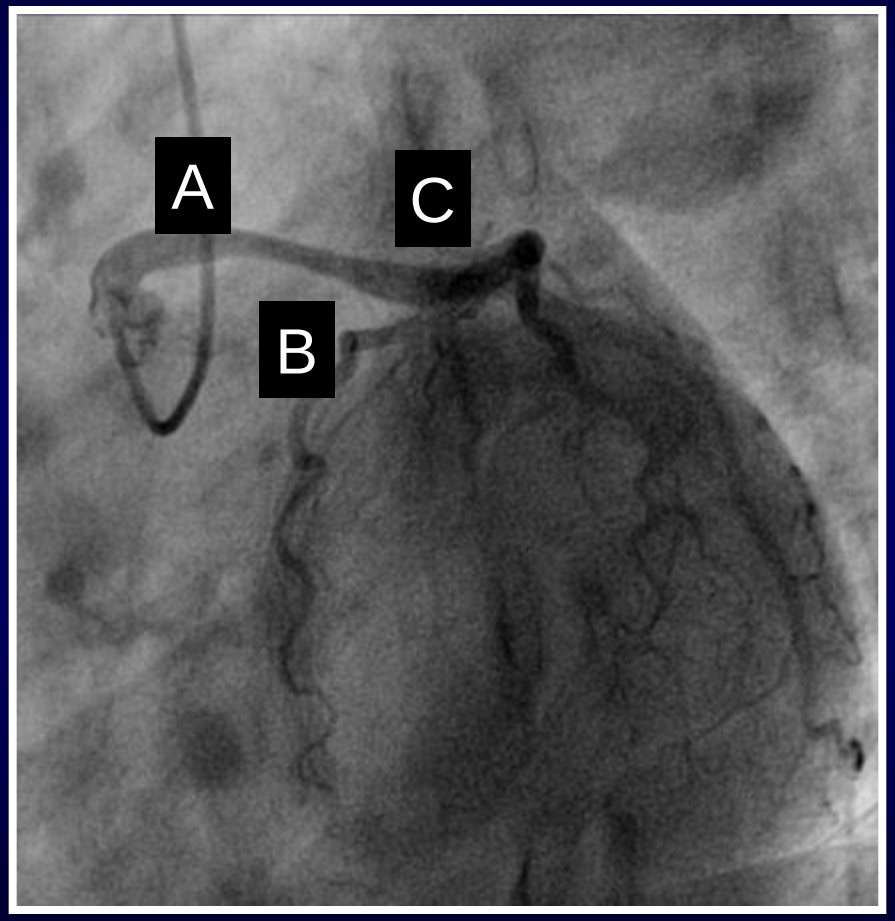


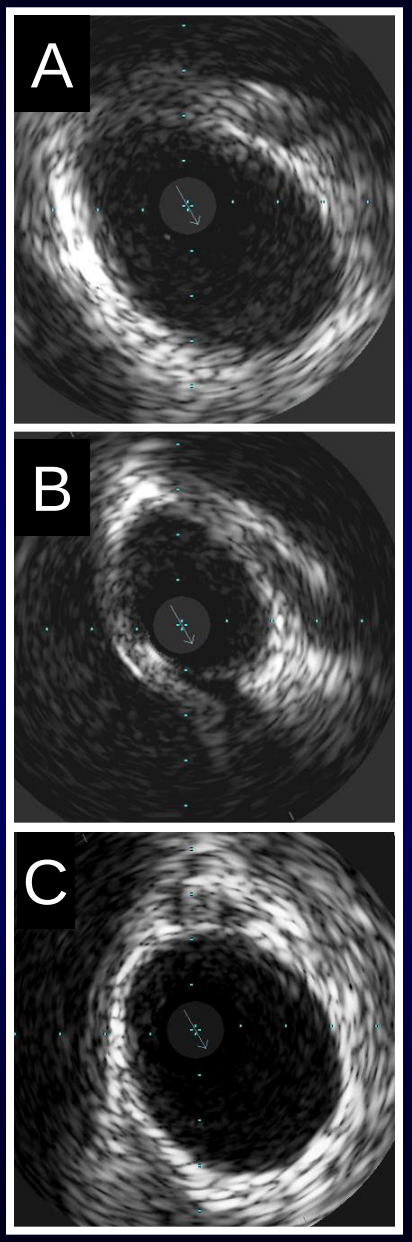
Lumen area reduction

Arterial compression
or
Arterial deformation?

Anomalous connections of the coronary arteries

Anomalous connection of the left main





Anomalous connections of the coronary arteries

Anomalous connection of the right coronary artery

Intramural pathway

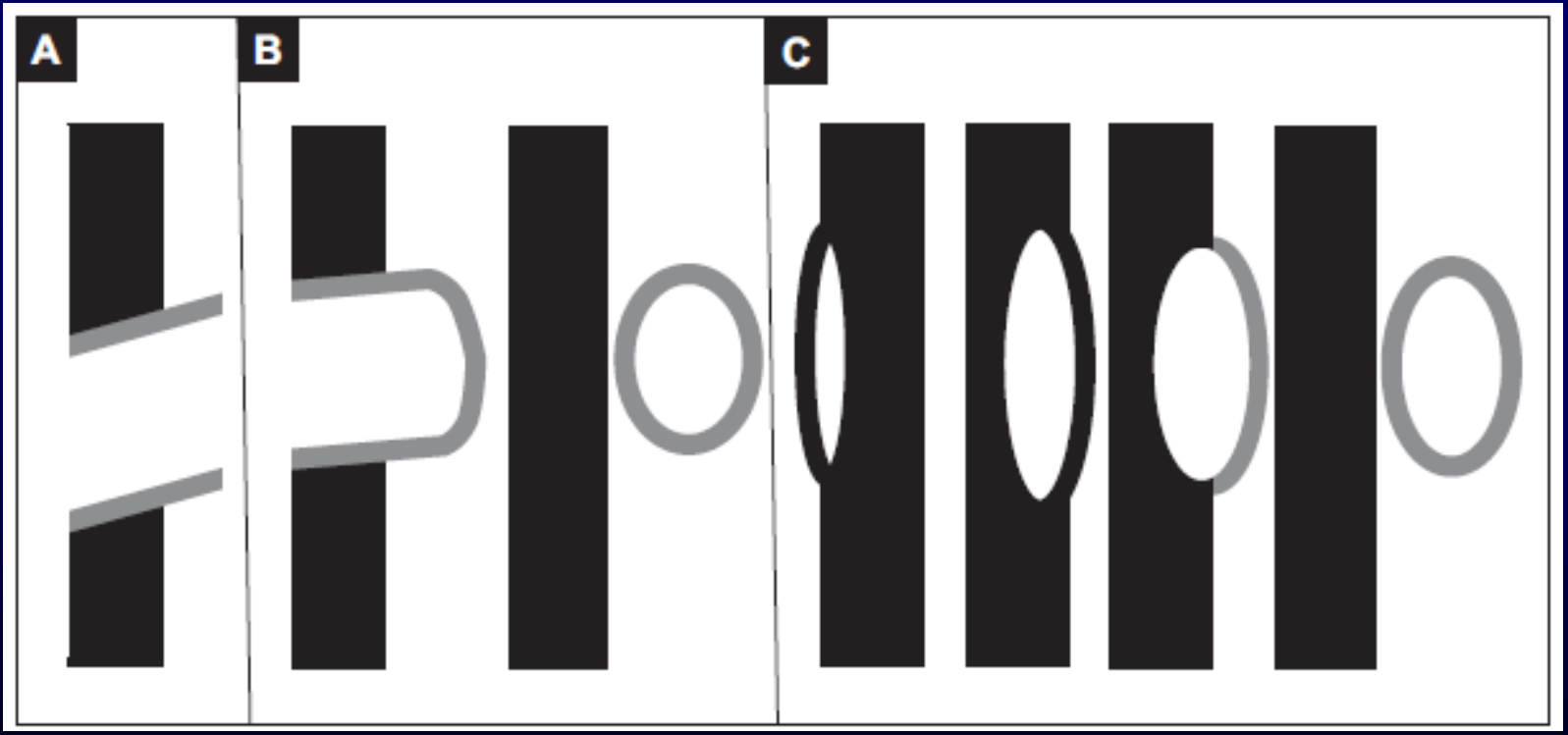
Anomalous connections of the coronary arteries

Frescura G et al. Human Pathology 1998

Anomalous connections of the coronary arteries

Intramural pathway

A : normal connection
B : connection with preaortic course and without intramural pathway
C : connection with preaortic course and intramural pathway

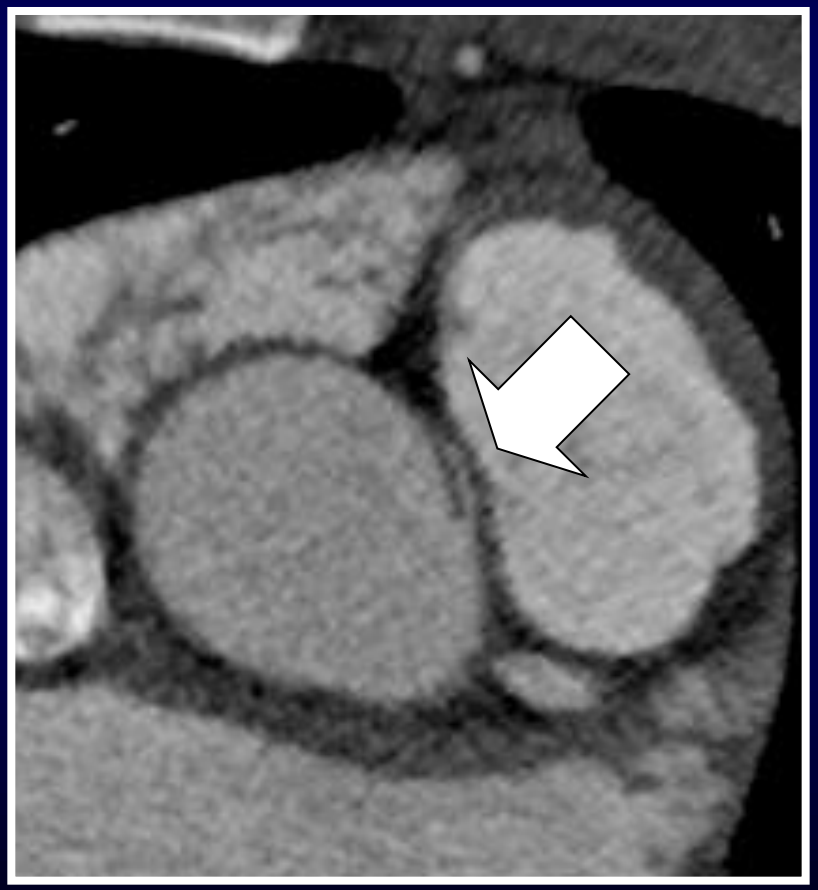


Anomalous connections of the coronary arteries

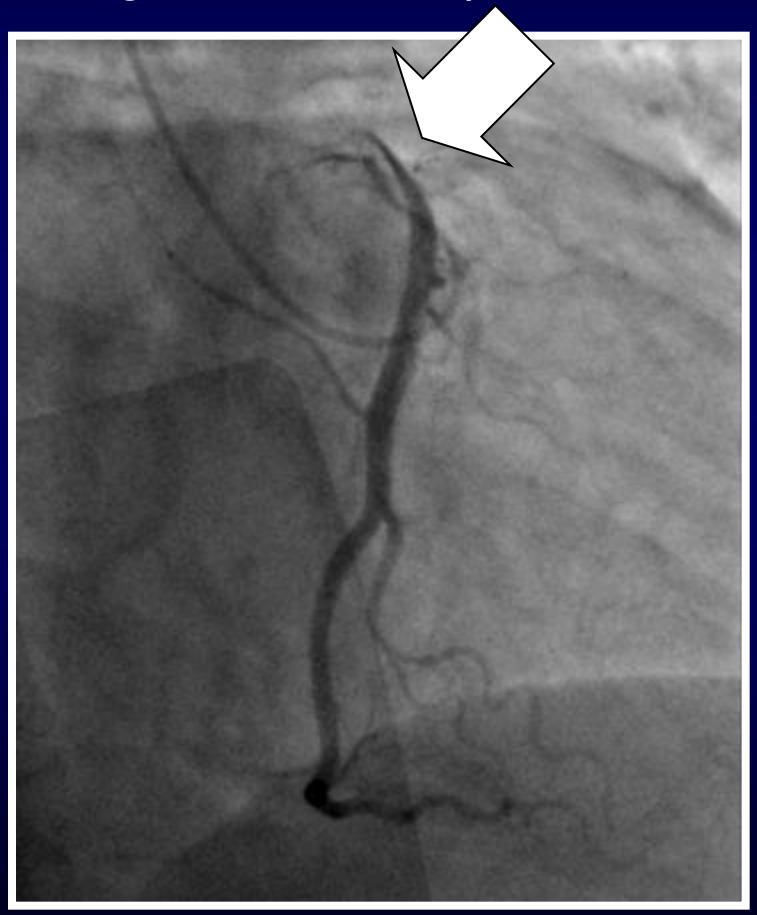
Suspected intramural pathway

Anomalous connection of the right artery

CT scan axial view

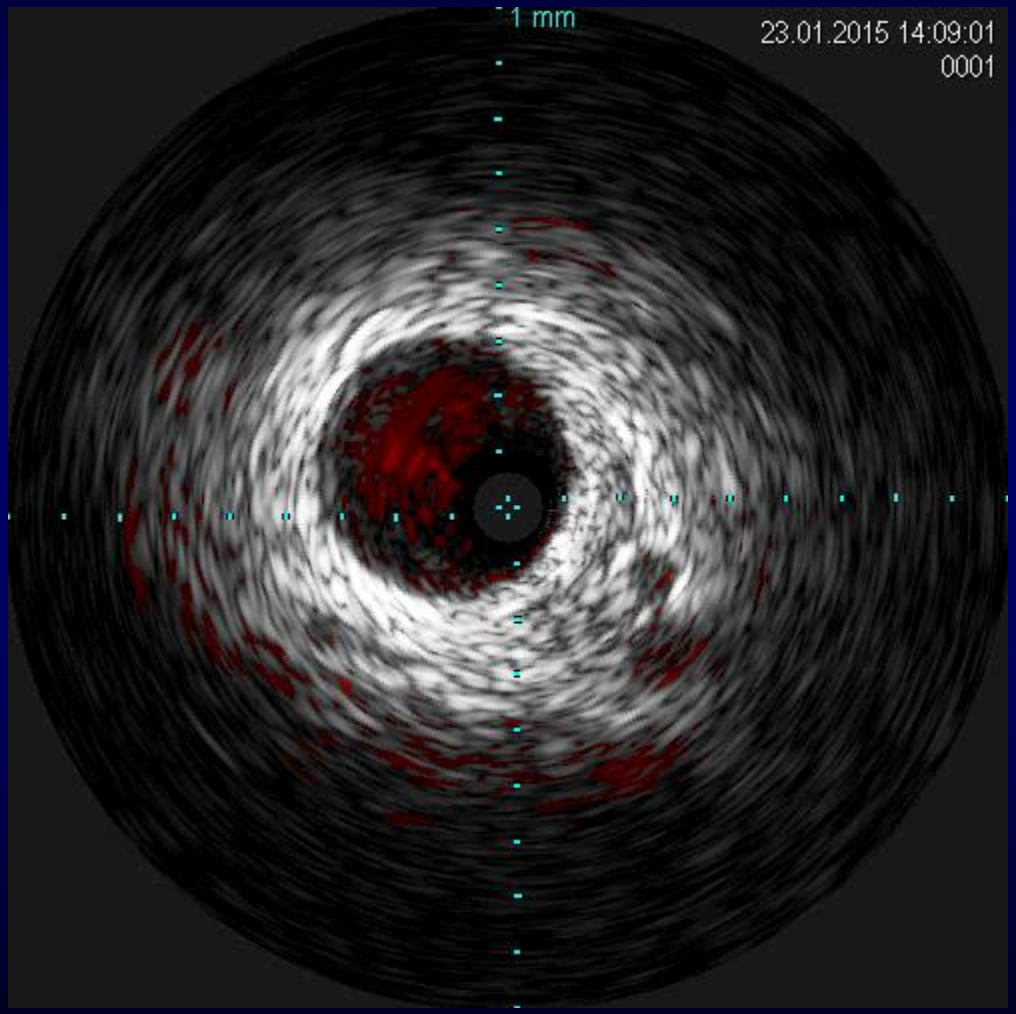


Right anterior oblique > 30˚



Confirmed intramural pathway

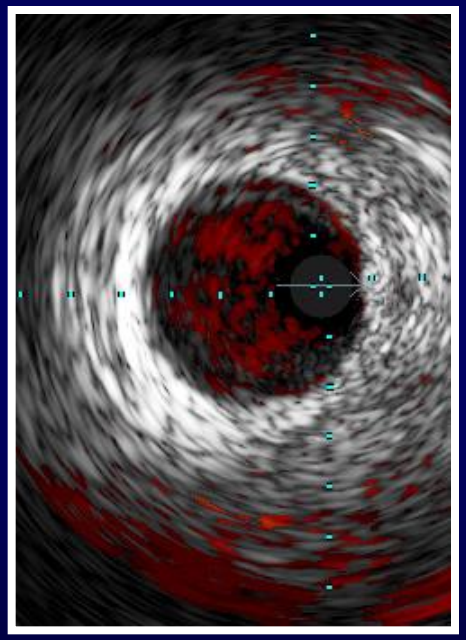
Anomalous connection of the right coronary artery



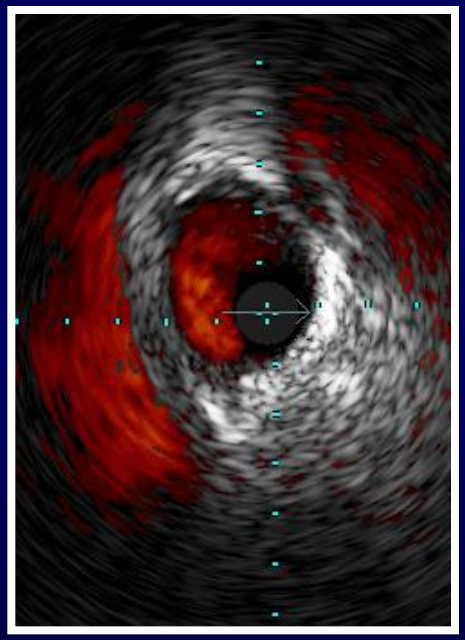
Confirmed intramural pathway

Anomalous connection of the right coronary artery
IVUS analysis

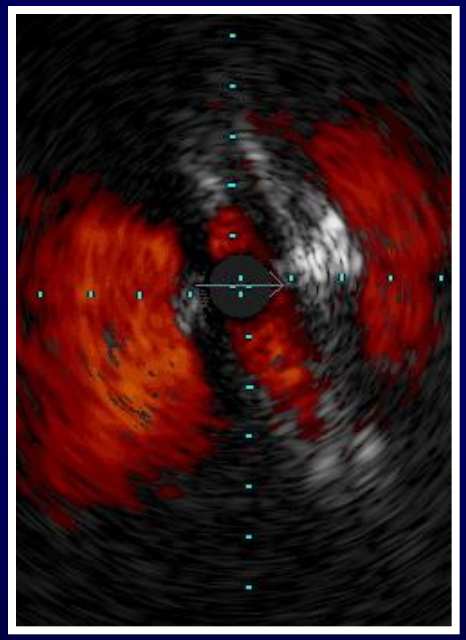
extramural



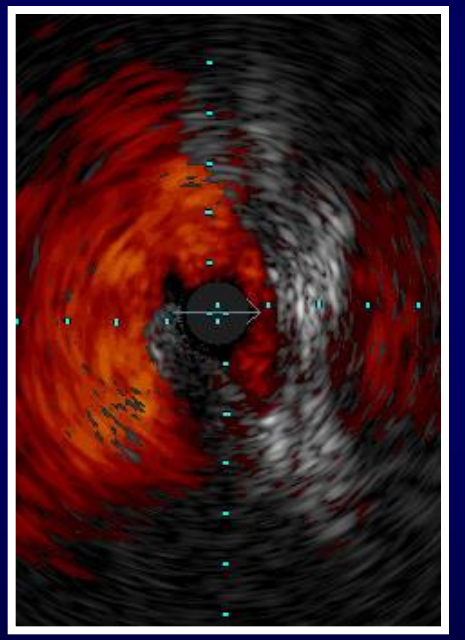
juxtamural



intramural



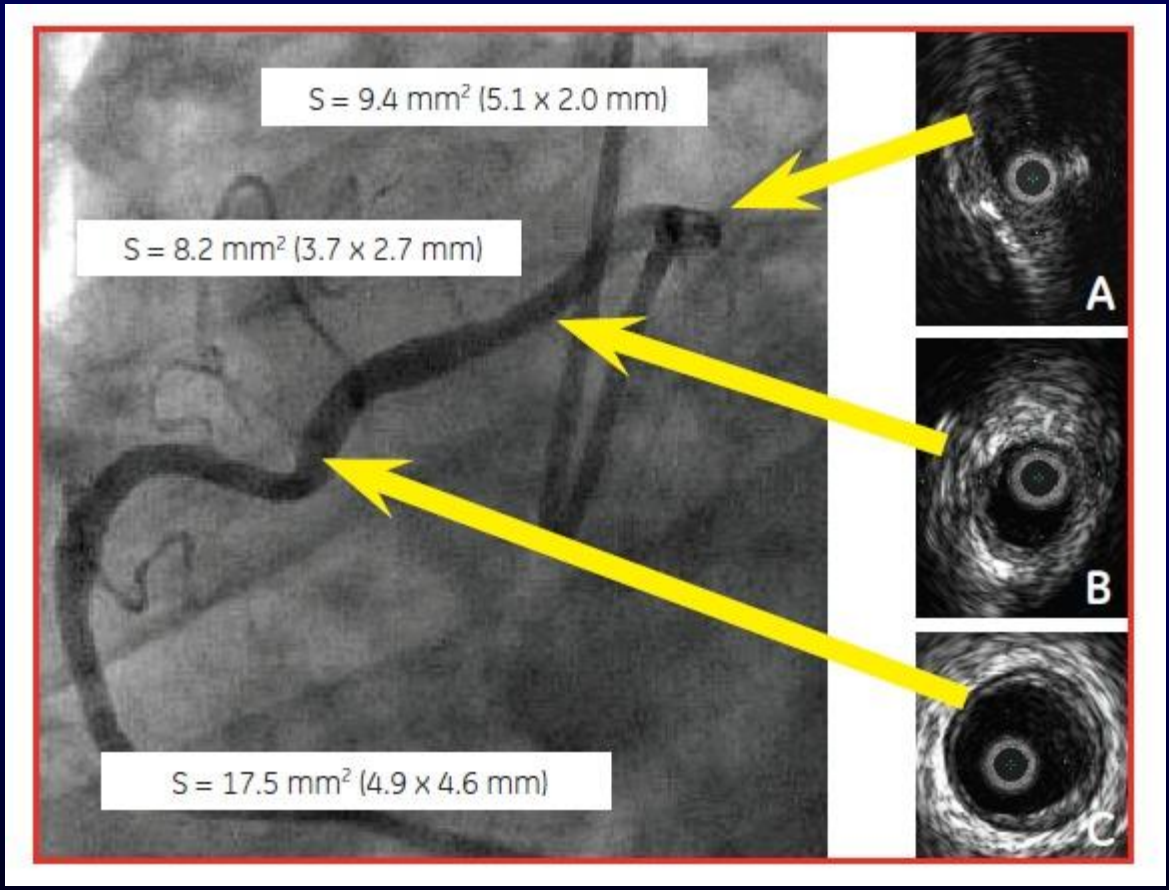
ostium



Analysis of the lumen area

Anomalous connection of the right coronary artery

Maximal lumen area reduction = 46%



intramural segment

juxtamural segment

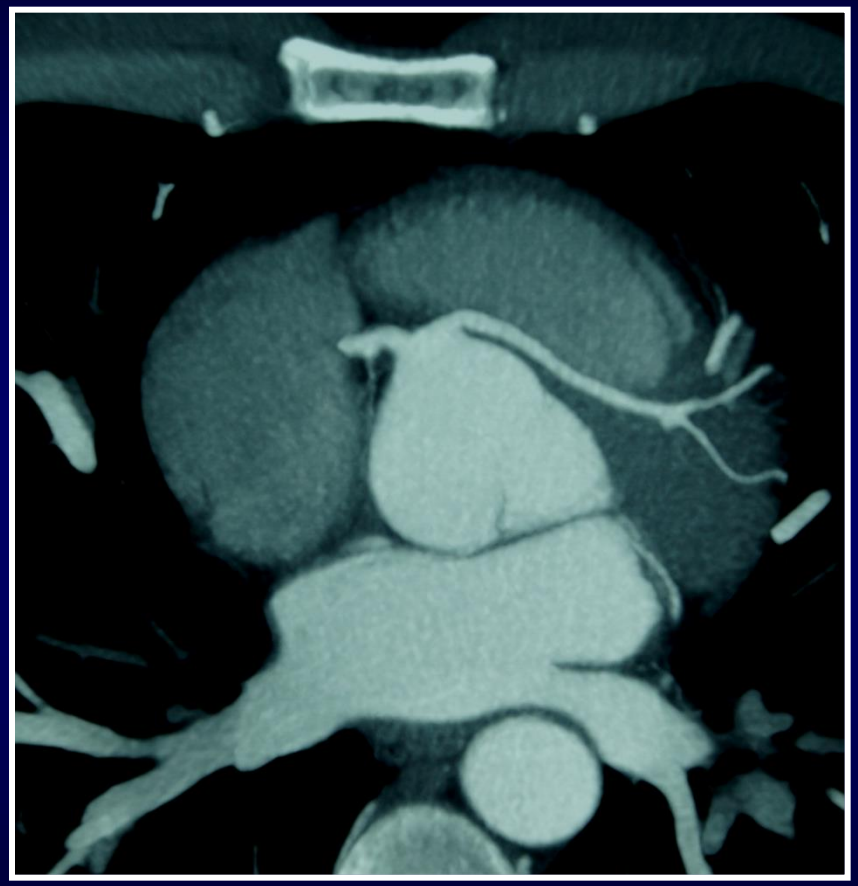
extramural segment

Anomalous connections of the coronary arteries

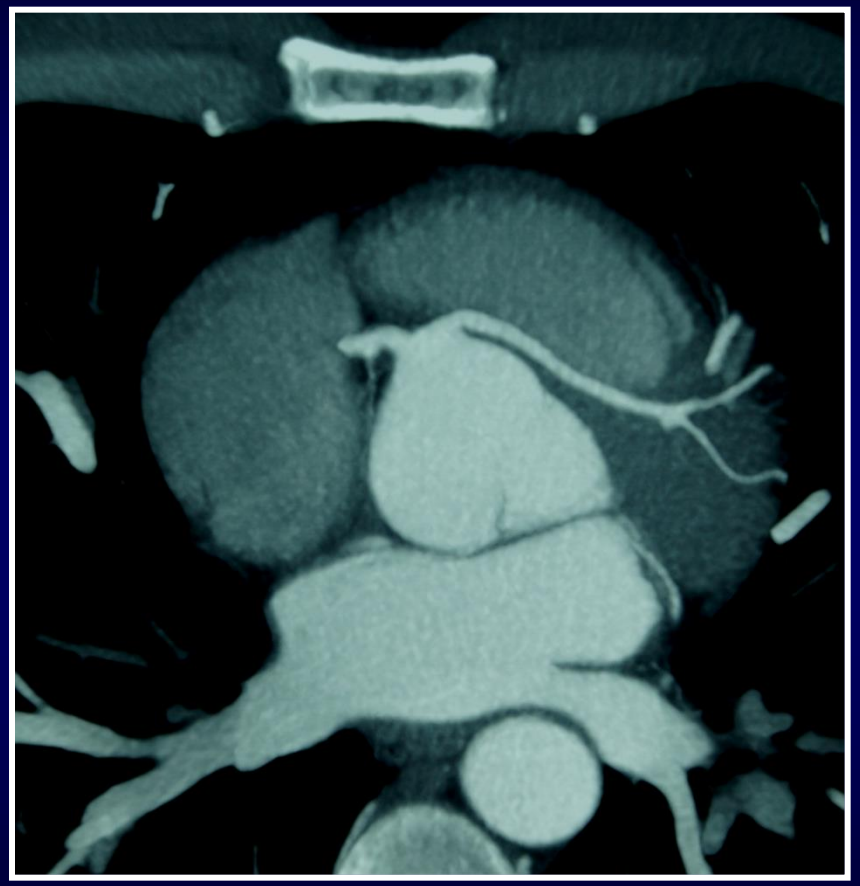
Interarterial course or interaorticopulmonary course

A good definition?

Classification of ectopic courses



Classification of ectopic courses

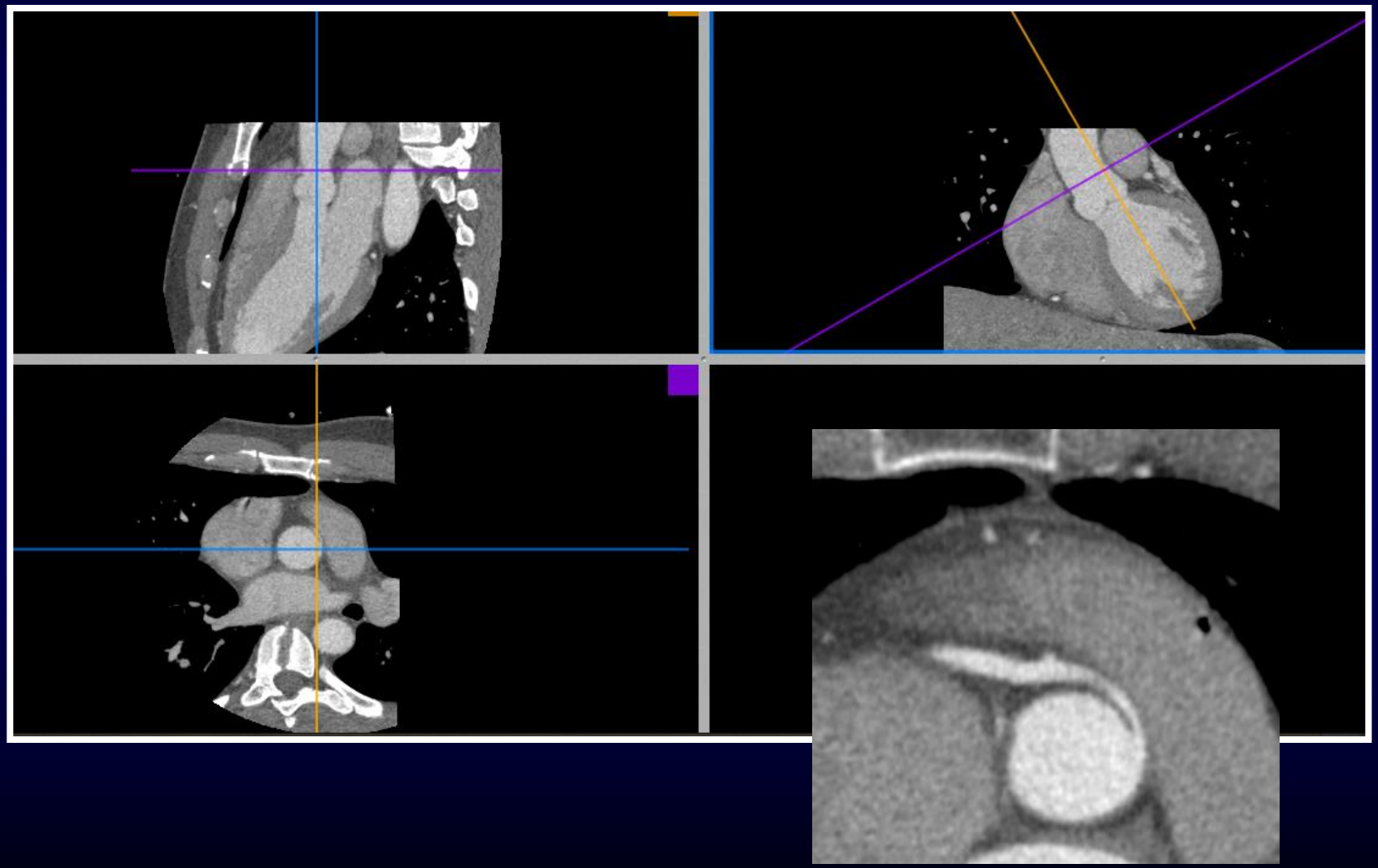


ANOCOR with low risk

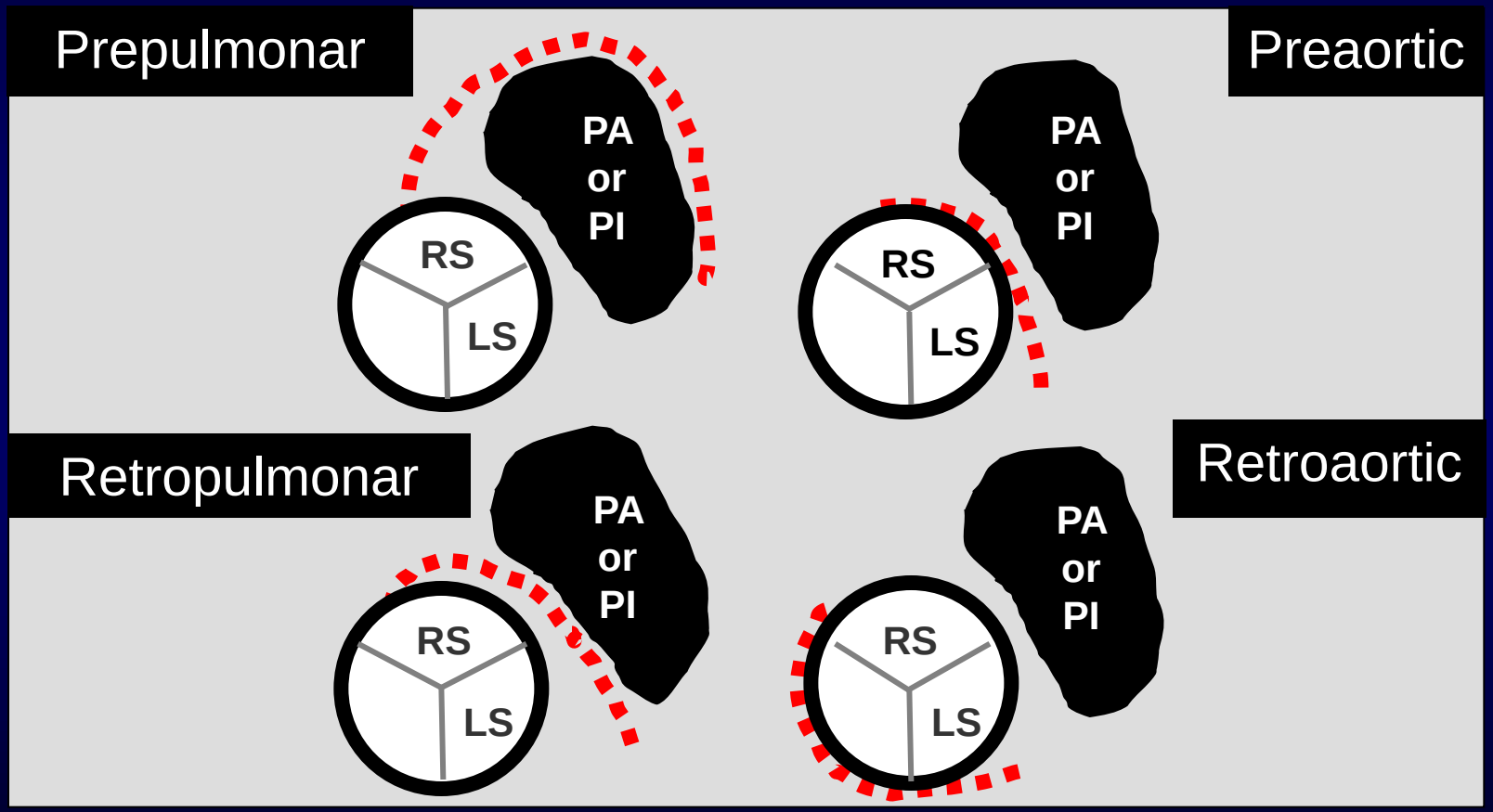
ANOCOR with high risk

Analysis of ectopic course with CT scan

Anomalous connection of the right coronary artery



Classification of ectopic courses

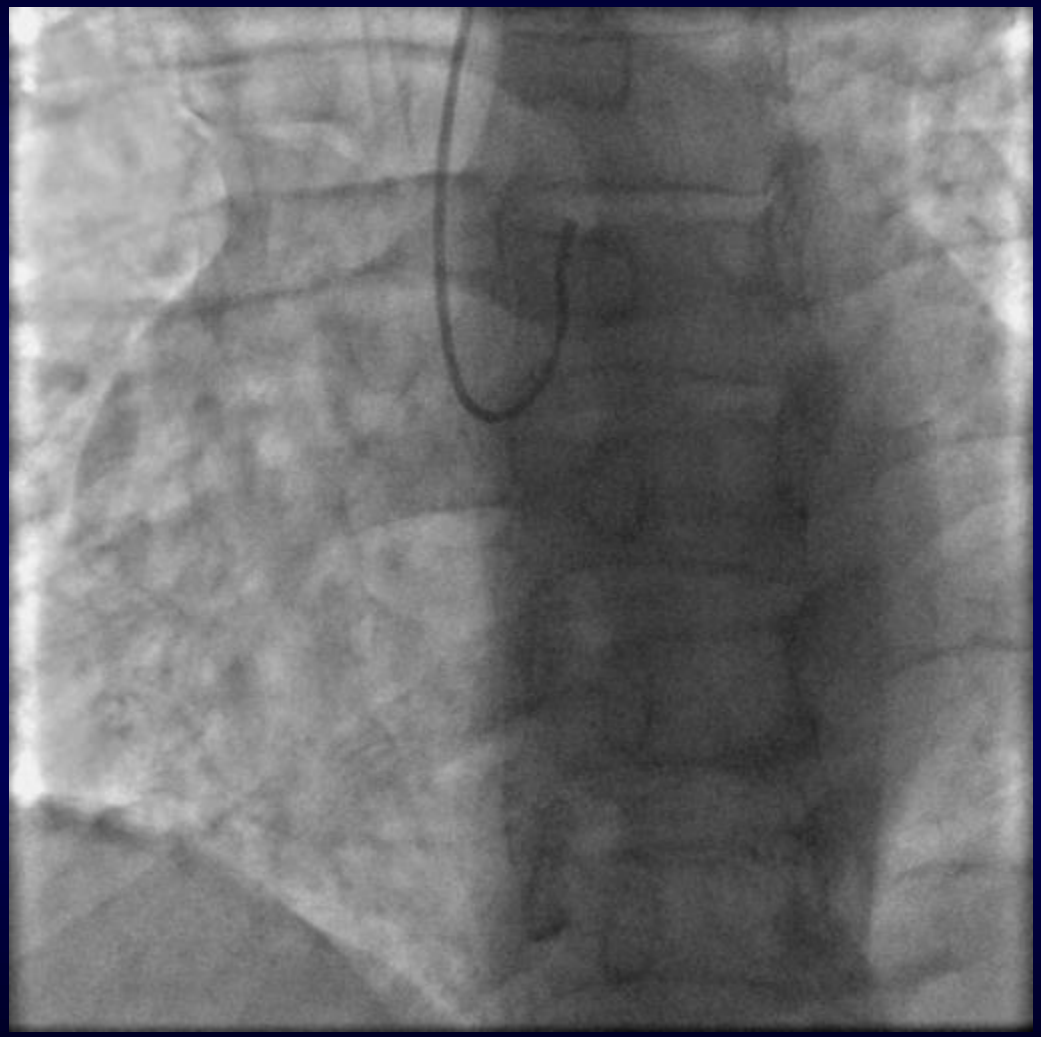


PA: pulmonary artery, PI : pulmonary infundibulum
LS: left sinus, RS: right sinus

Catheterization of
a right coronary artery connected
with the left coronary sinus

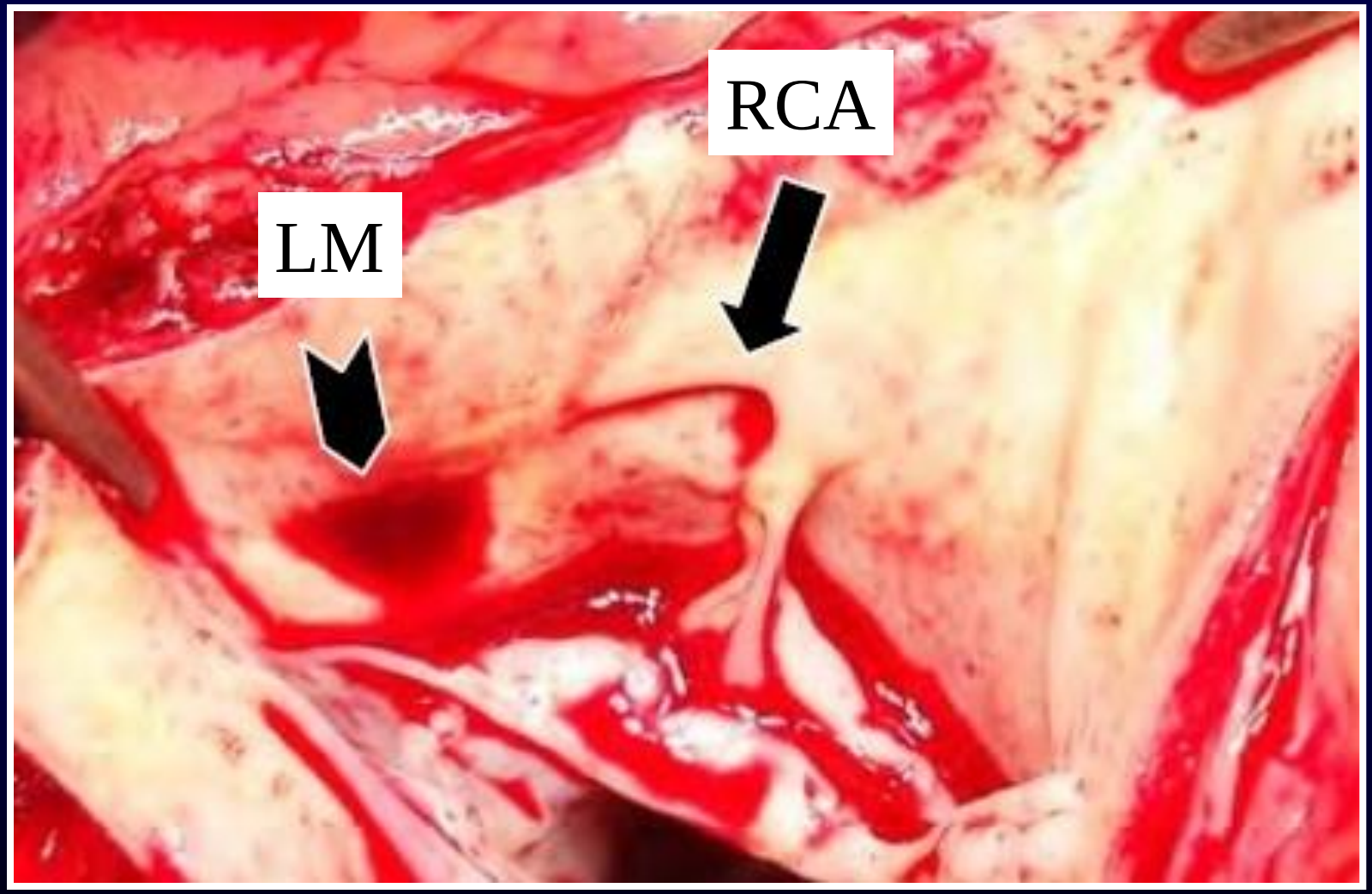
Anomalous connections of the coronary arteries

Anomalous connection of a right coronary artery



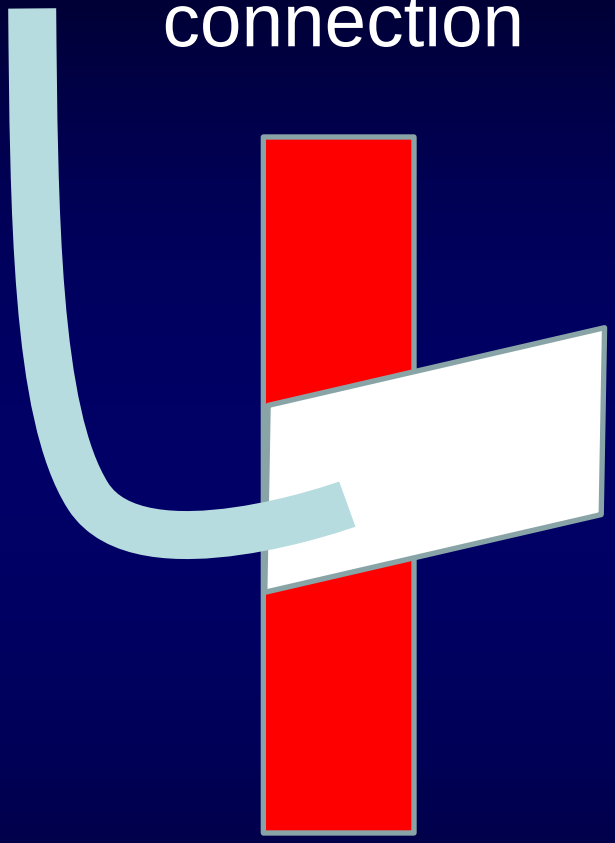
Anomalous connections of the coronary arteries

Anomalous connection of a right coronary artery with an intramural pathway



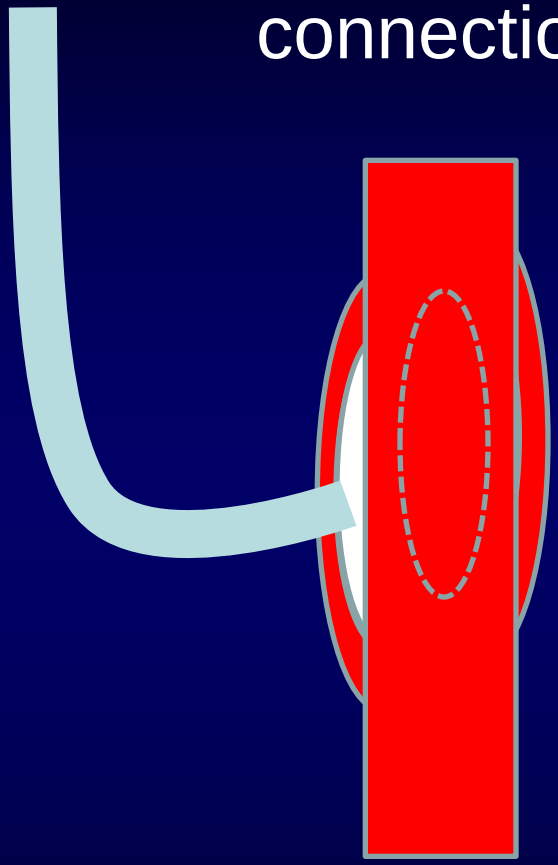
Anomalous connections of the coronary arteries

normal connection



cannulation with coaxial position

ectopic connection



cannulation with coaxial position

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of inadequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of failure of adequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of failure of adequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of failure of adequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of failure of adequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of failure of adequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of failure of adequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of failure of adequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Anomalous connections of the coronary arteries

Catherization of anomalous connection of
a right coronary artery connected with the left coronary sinus

My technique

(in case of failure of adequate opacification with usual technique)

1. Left anterior oblique 30° projection
2. Use of 6F guiding catheters
3. Use of Amplatz Left or Extra Back-Up catheters
4. Cannulation of the left ostium
5. Push the catheter gently to extubate from the ostium
6. Torque the catheter slowly and clockwise
7. Tip of the catheter may arrive facing the ectopic ostium
8. Opacification of the ectopic coronary artery
9. Rapid insertion of a 0.014 wire (better opacification, IVUS, PCI)

Thank you