

LA TETRALOGIE DE FALLOT

1. Généralités
2. Chirurgie du Fallot « régulier »
3. Chirurgie du Fallot « irrégulier »
4. Indications opératoires
5. Autres considérations
6. Conclusion

Histoire du Fallot = histoire de la chir. des congénitaux

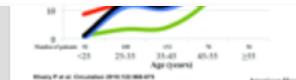
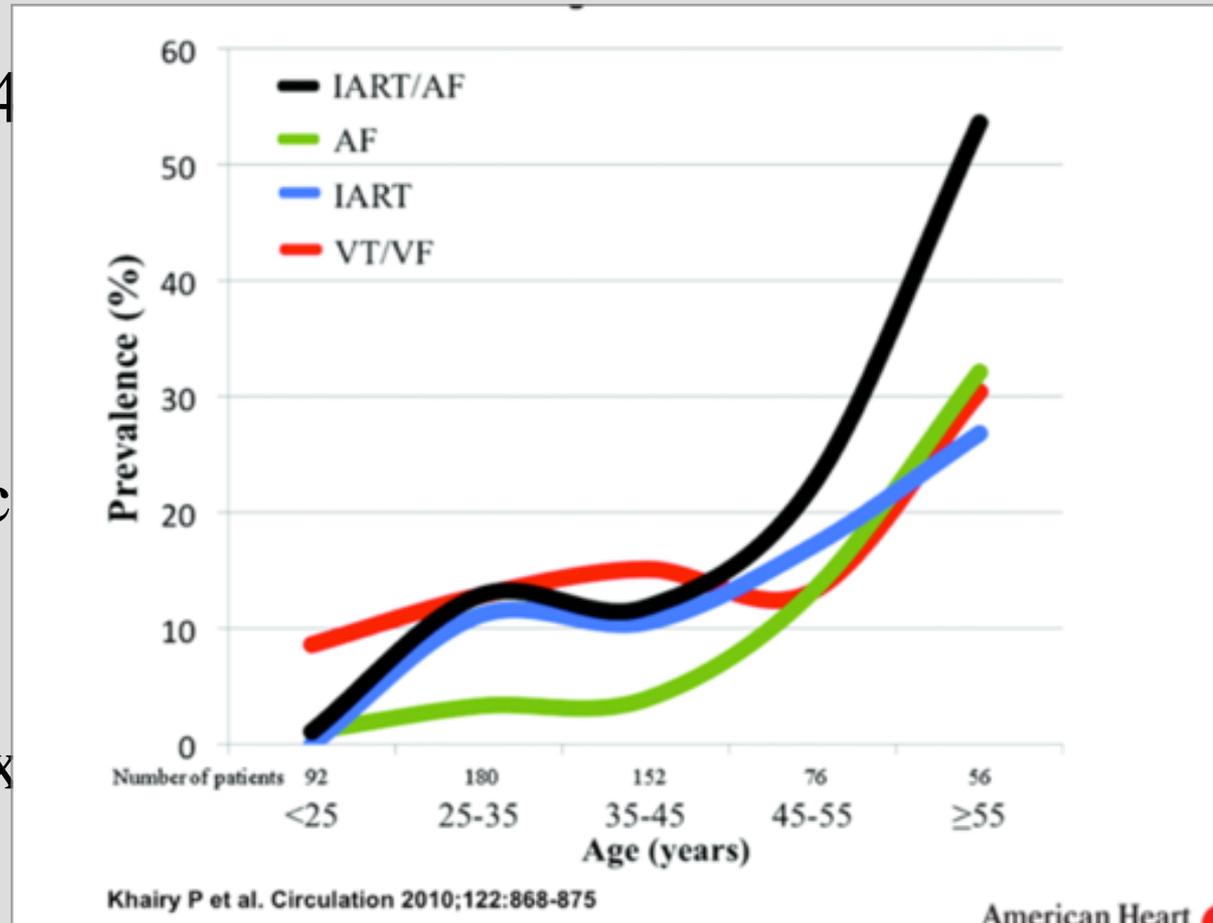
- Fallot, 1888

- Blalock, 194

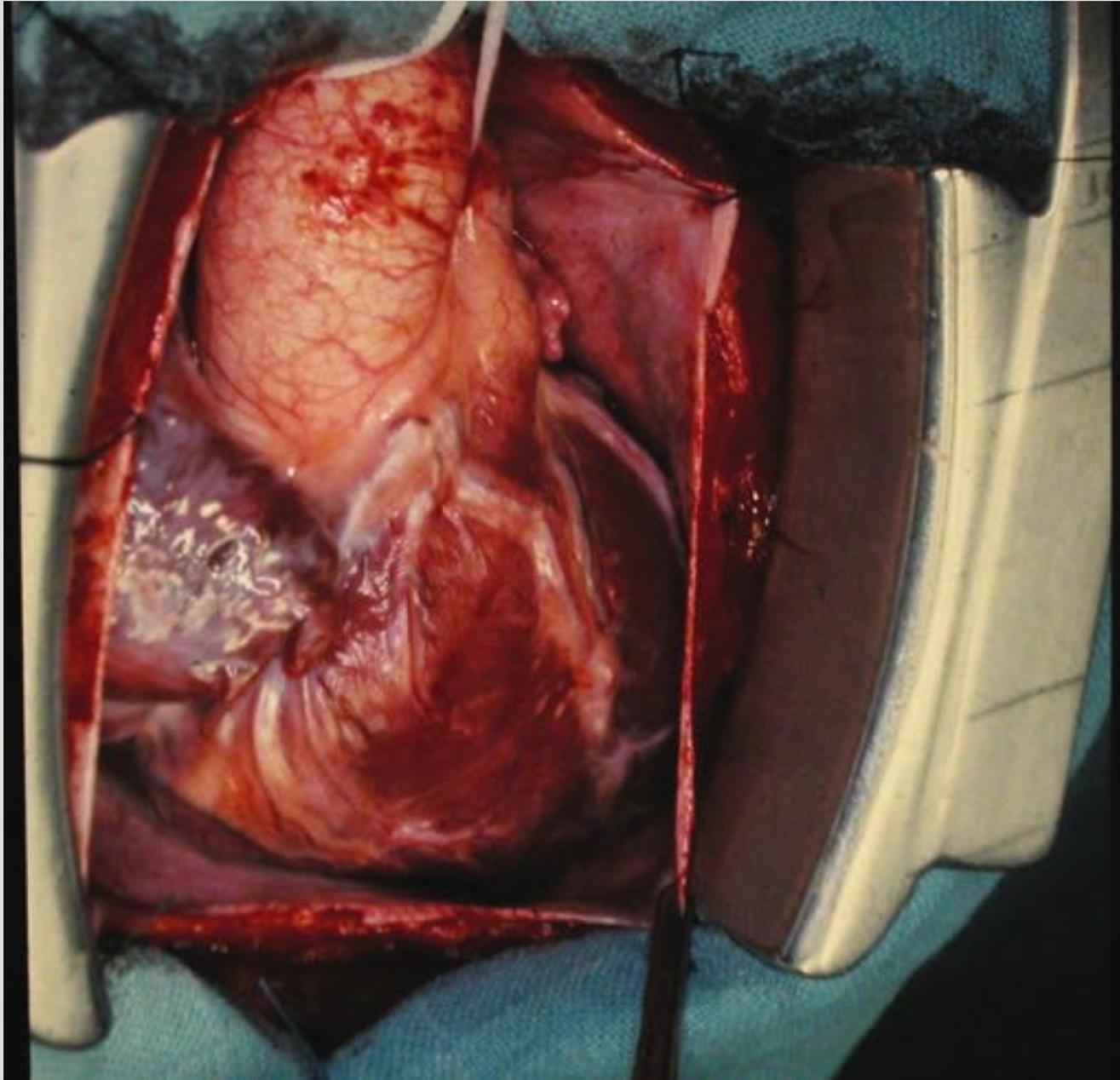
- Palliatif

- Correction c

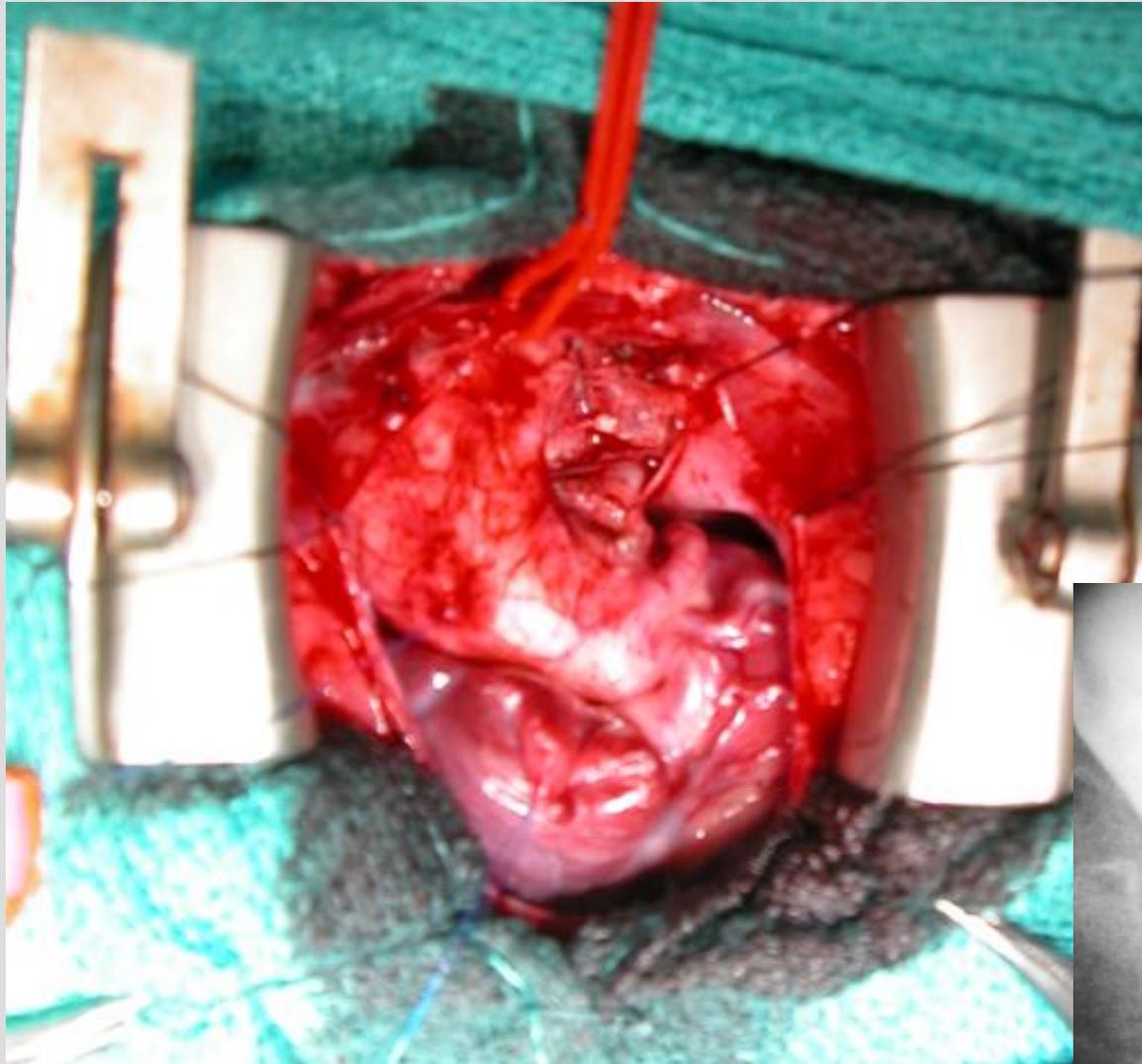
- Congénitaux



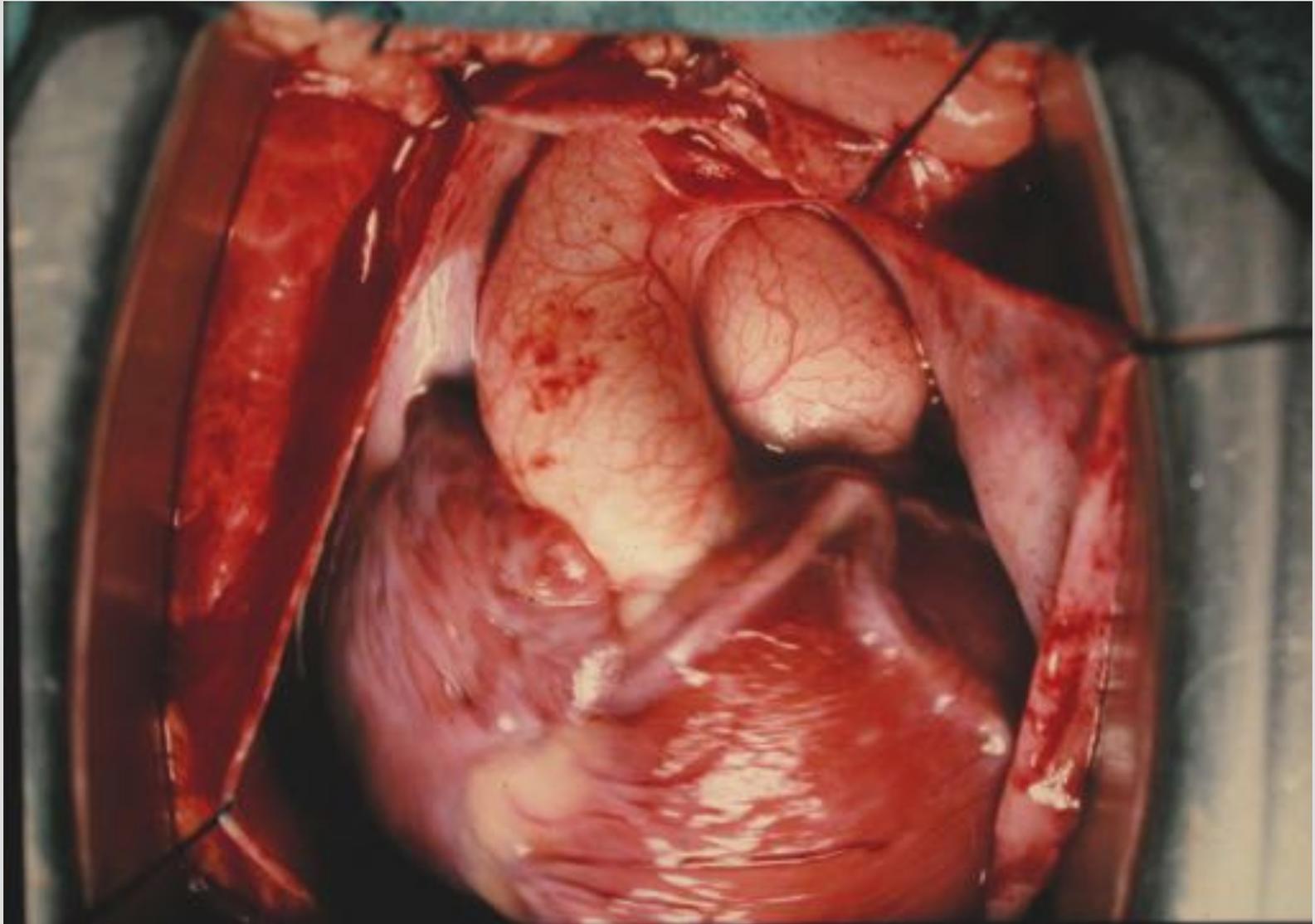
Anomalie coronaire



Anomalie coronaire

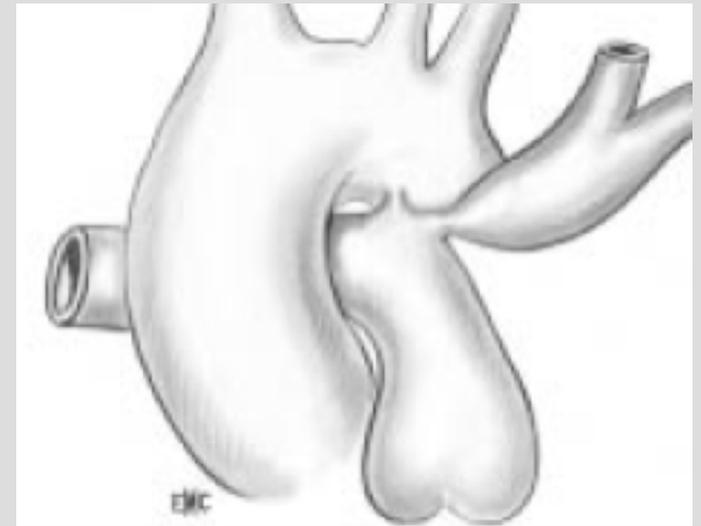
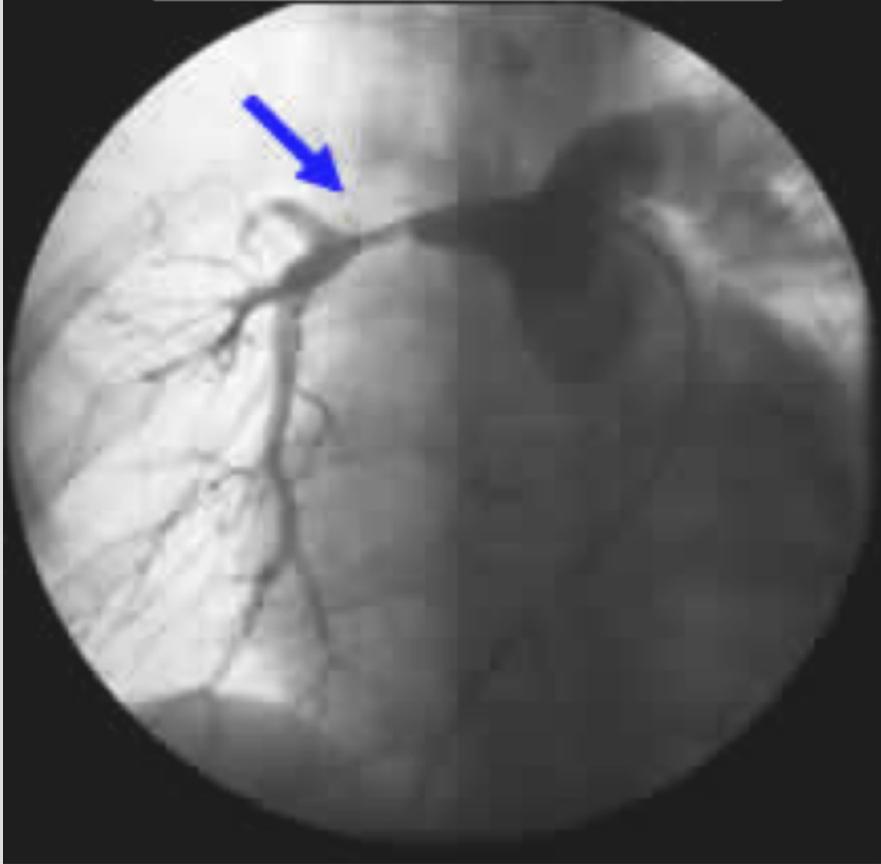


Anomalie coronaire



Anomalie des branches pulmonaires

Angiogram of
Branch PA stenosis



Persistance du canal artériel

CIA

Anomalie des valves atrio-ventriculaires

Crosse Ao. à droite

Veine cave sup. gauche

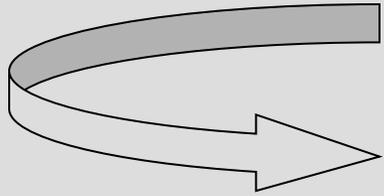
F4 Agénésie des valves pulmonaires

Anomalies chromosomiques et génétiques

environ 20%

- Microdélétion 22q11
- Trisomie 21
- Anomalies vertébrales, anales, tachéo-oesophagienne

Hypoplasie des artères pulmonaires plus fréquentes
chez les enfants syndromiques

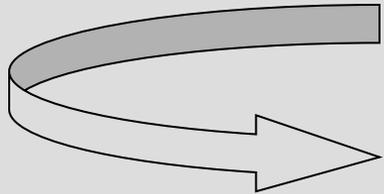


Fallot « régulier »

CIV unique

AP belles

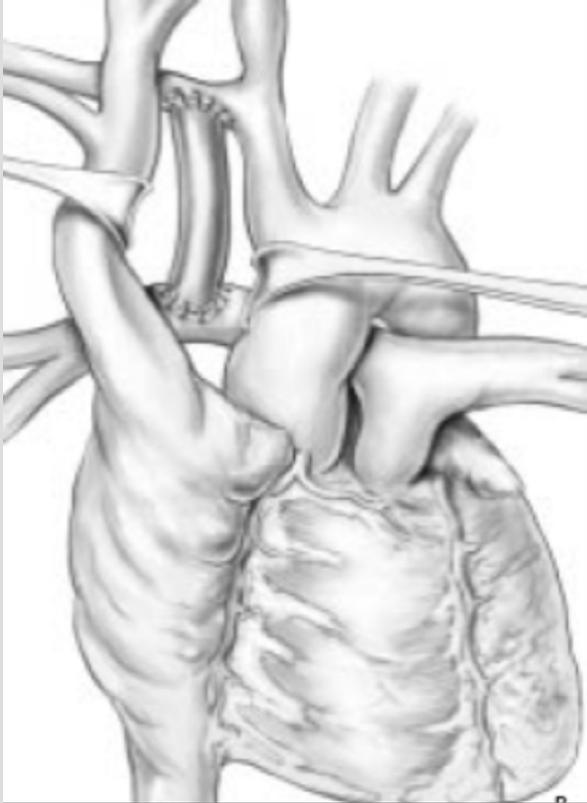
Implantation coronaire normale



Fallot « irrégulier »

Principe thérapeutique

- **Traitement palliatif:** anastomose de BT



- **Correction complète:** fermeture CIV, ouverture voie de sortie VD

2- chirurgie du Fallot « régulier »

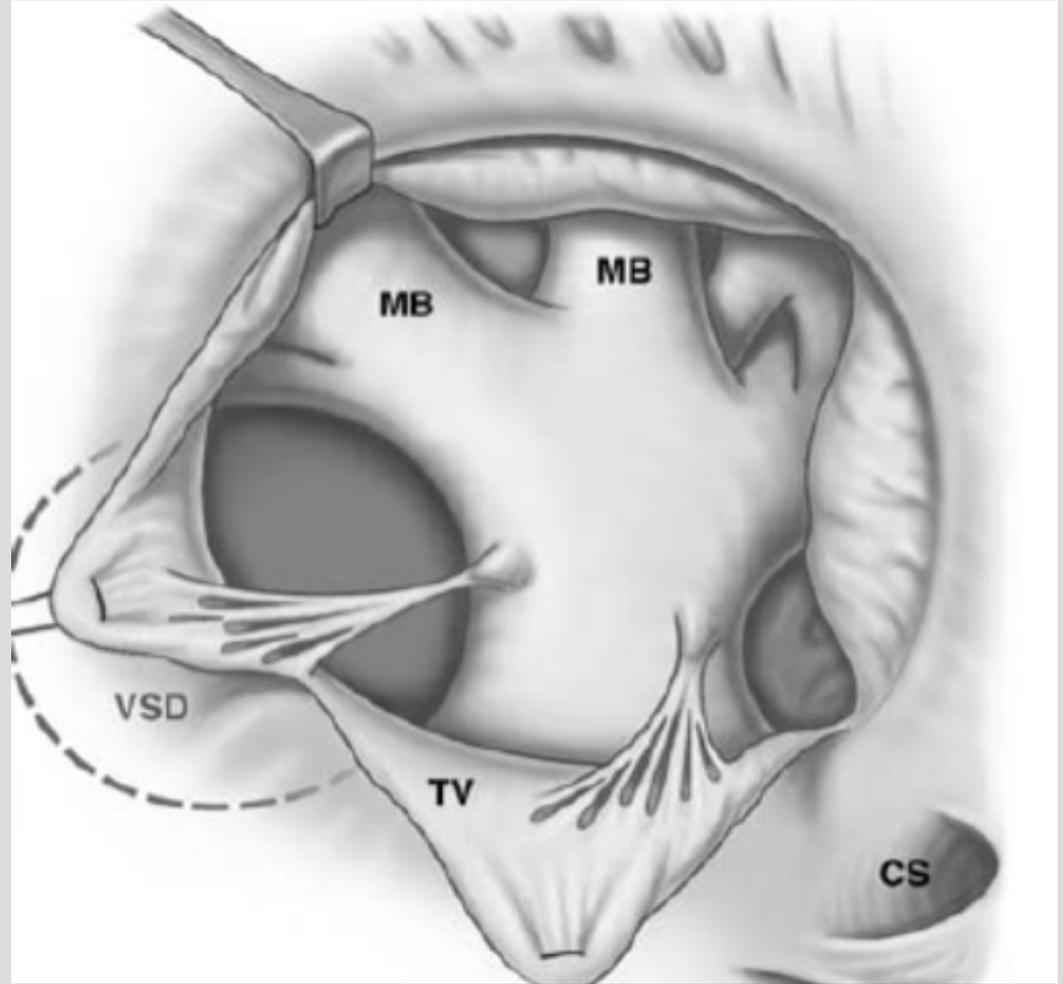
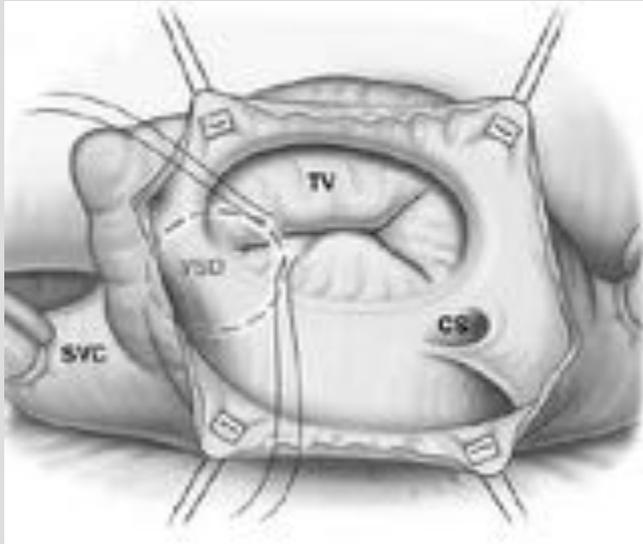
Préambule: préparation anesthésique et chirurgicale concomitantes

**hyper-réactivité infundibulaire,
éviter un malaise anoxique**

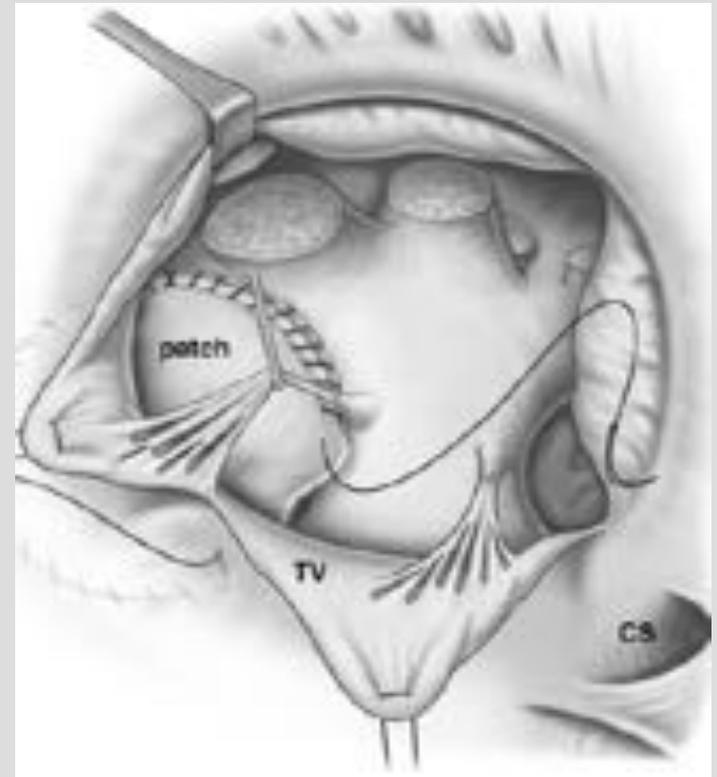
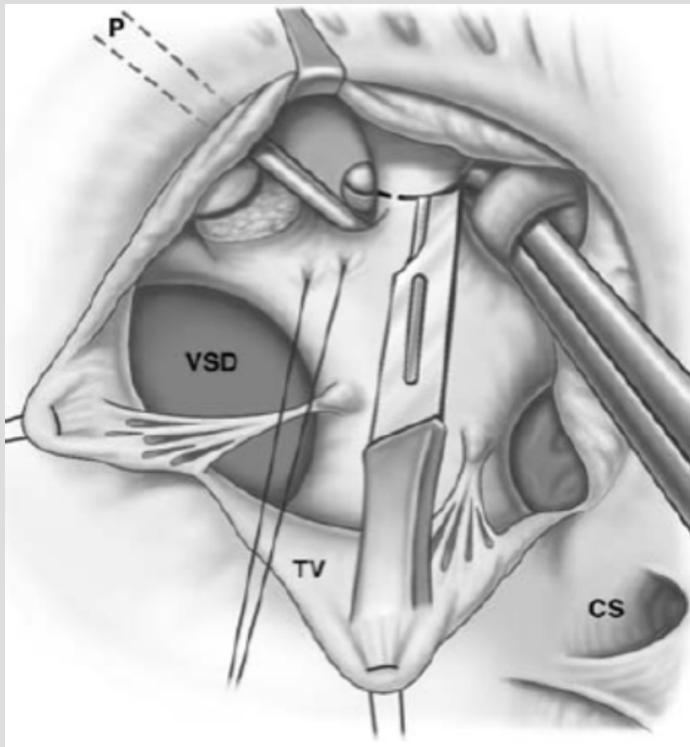
- **Sternotomie prudente**
- **Thymectomie**
- **prélèvement d' un patch de péricarde autologue**
- **Inspection soigneuse du massif cardiaque**
- **Canulation aortique et veineuse (x2)**
- **Contrôle éventuel d' une anastomose palliative**

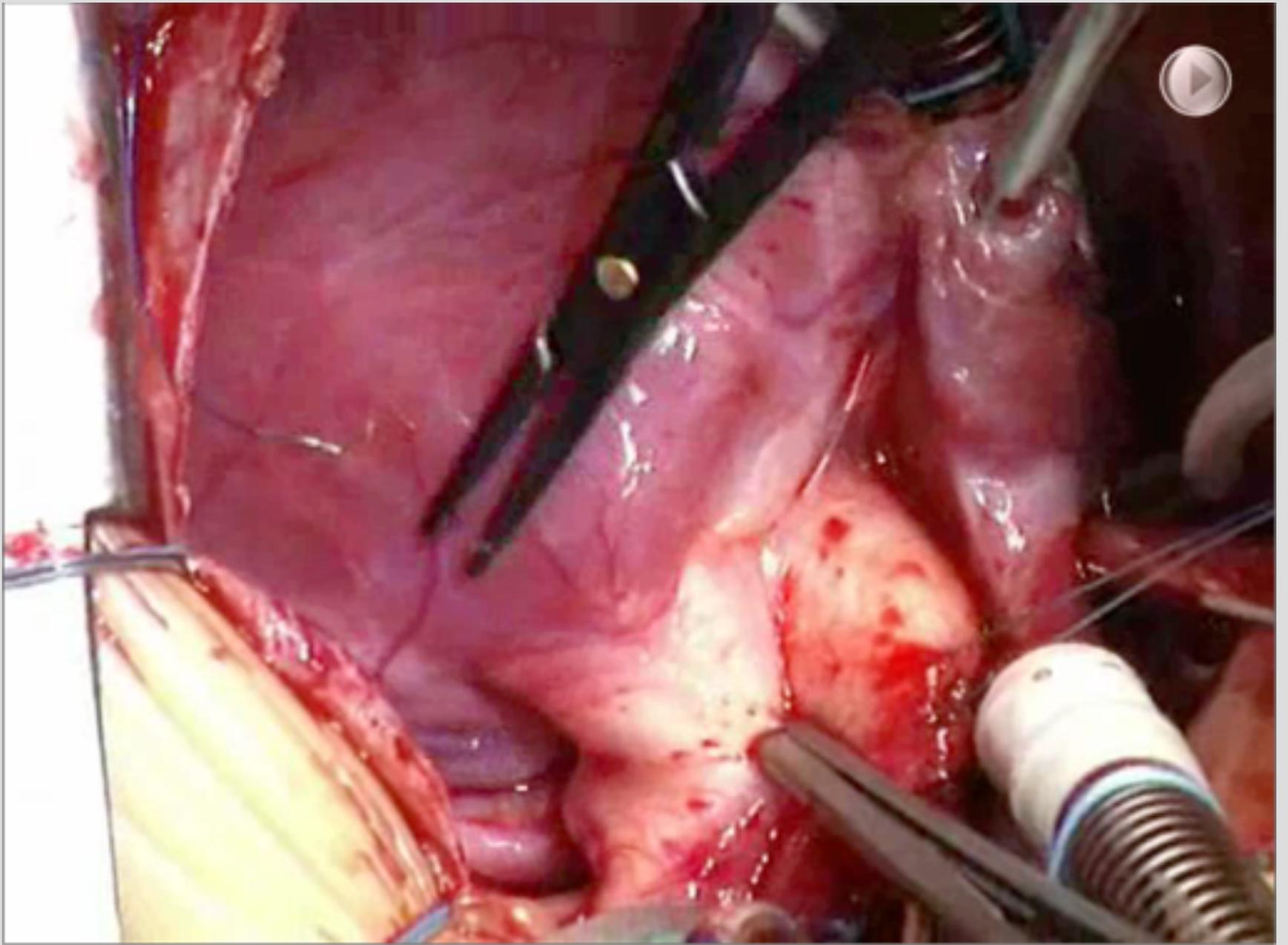


Fermeture de la CIV



Élargissement de la voie droite





Stratégie chirurgicale

atriotomie

CIV

FOP

Myomectomie infundibulaire
par voie trans-atriale

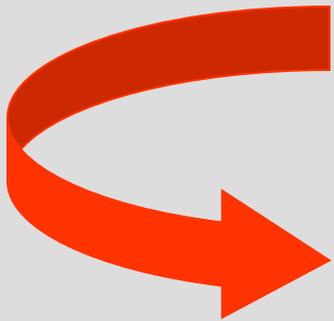
Artériotomie pulm

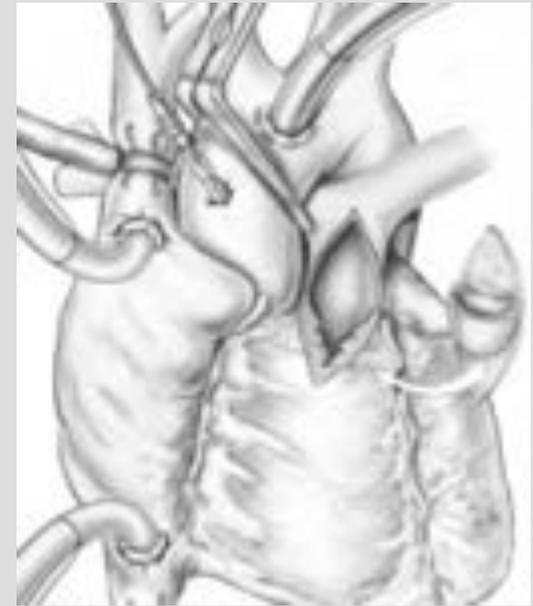
Ouverture de l'anneau pulmonaire?

commissurotomie

Patch infundibulaire

Patch trans-annulaire +/- monocusp





- Taille du patch??, ni trop large, ni trop étroit
- Âge et potentiel de croissance, degré de sténose sous-jacente

sortie de CEC et réanimation post-opératoire

Évaluation immédiate des résultats en per-opératoire (mesure des pressions, ETO, écho épicaudique) et en post-op immédiat (écho)

- Monitorage POG (et PAP?); NIRS
- Adaptation du remplissage, prévention de la surcharge pulmonaire (diurèse, inotropes)
- Prévention et traitement des poussées d' IVD

Rapport de pressions
Pressions étagées
Saturation veineuses
Retrait cathéter

3- chirurgie du Fallot « irrégulier »

Anomalie coronaire

Anomalie des branches pulmonaires

CIV multiples

CIA

Anomalie des valves atrio-ventriculaires

**!!! Bilan pré-opératoire exhaustif
obligatoire !!!**

Crosse Ao. à droite

Veine cave sup. gauche

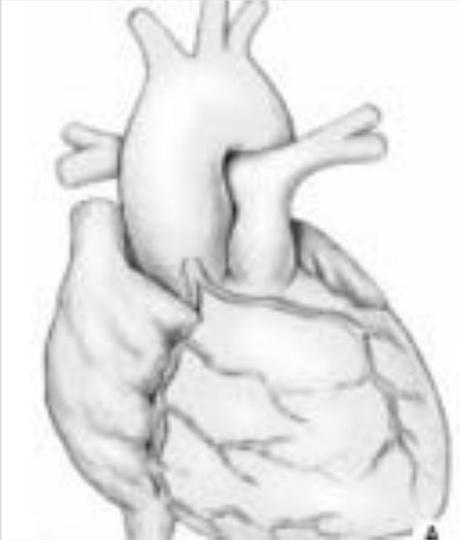
Persistance du canal artériel

Écho, KT, TDM, IRM

malposition coronaire

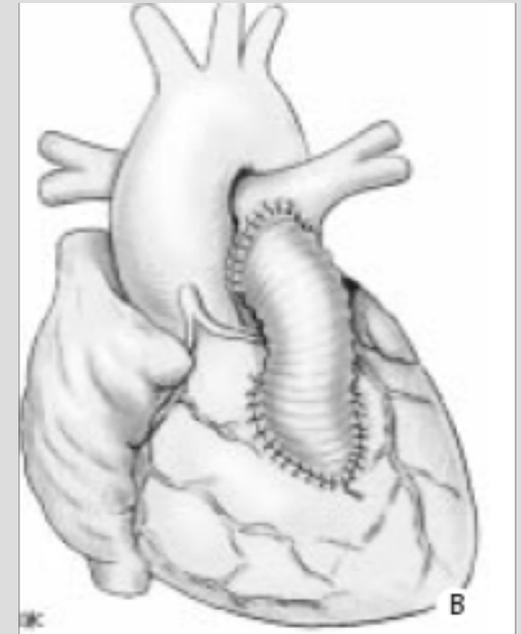
2 situations:

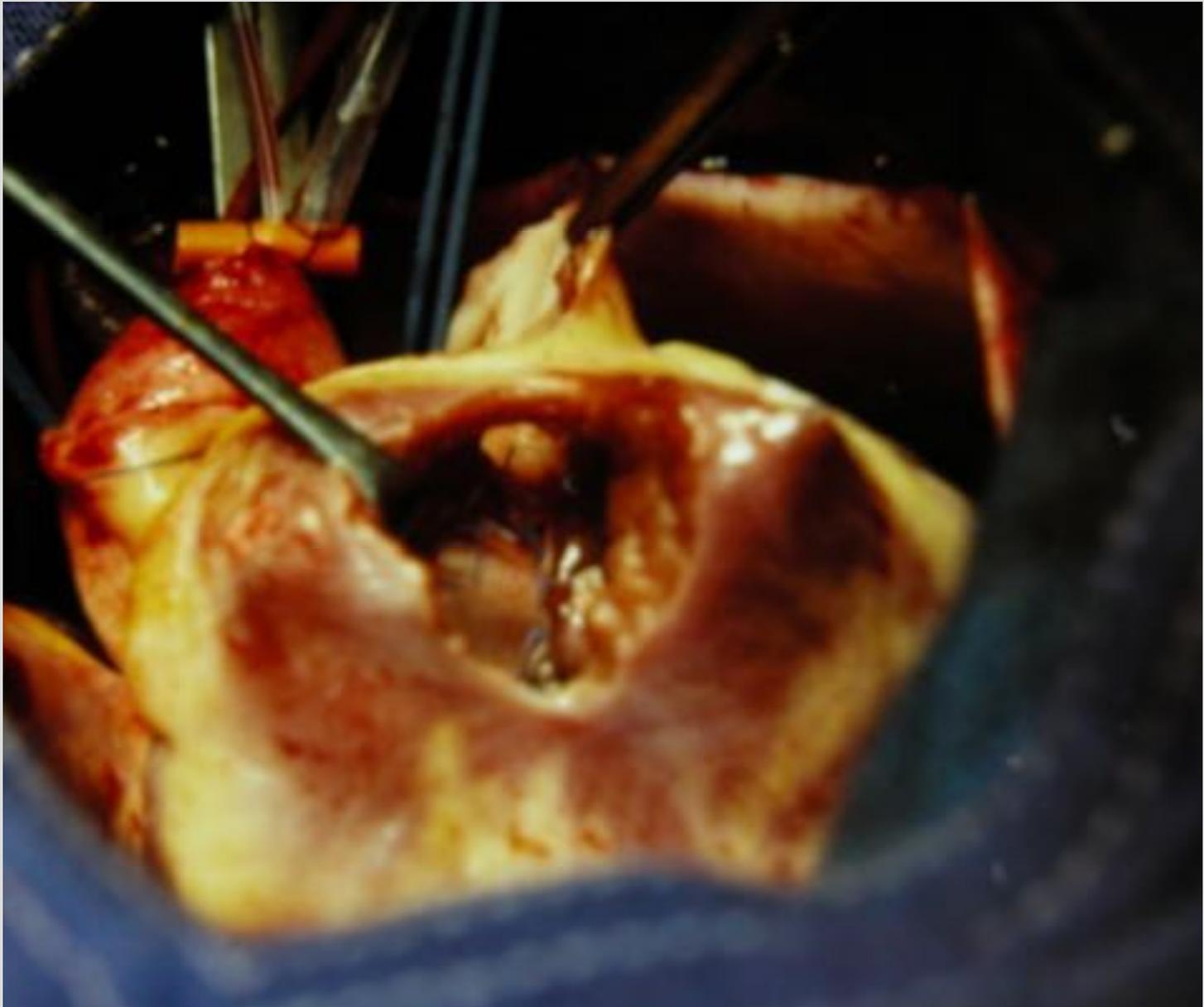
1. Découverte pré-opératoire
2. Découverte per-opératoire



2 solutions:

1. Possibilité de « contourner l'obstacle »
2. Anastomose systémico-pulmonaire ; tube valvulé VD-AP





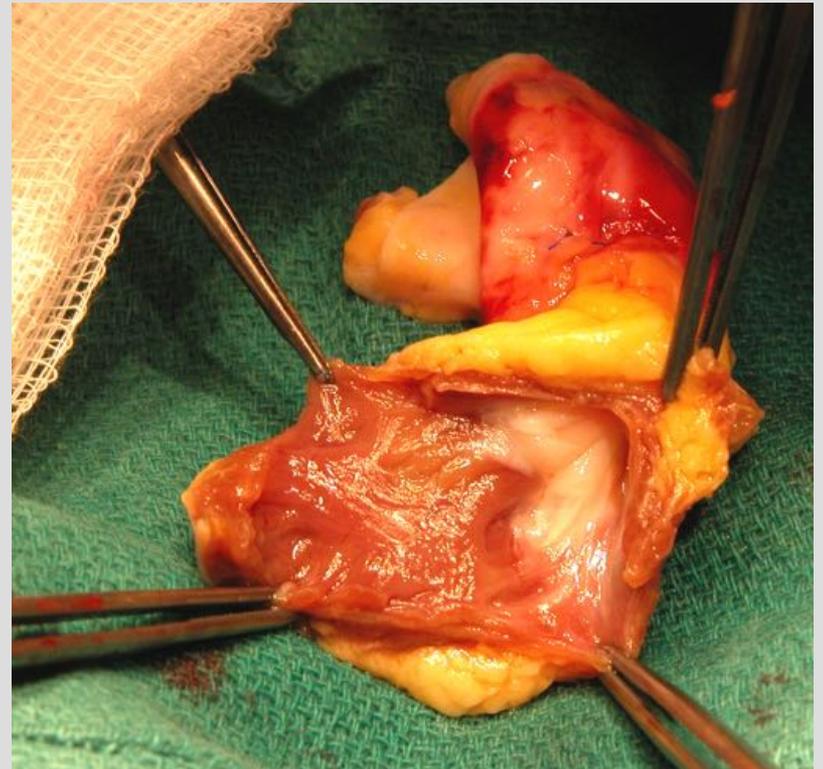
Hypoplasie des artères pulmonaires

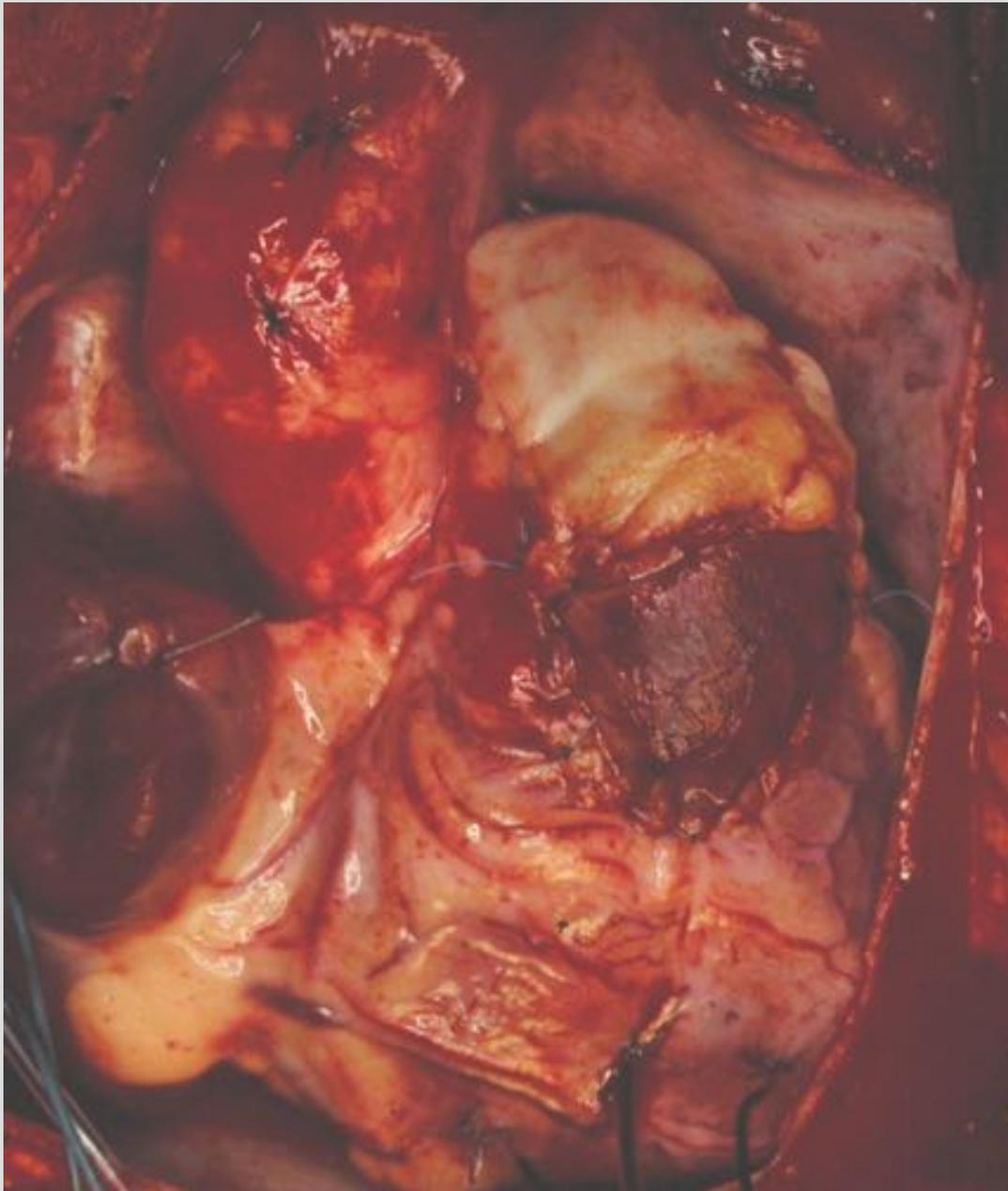
Plastie élargie:

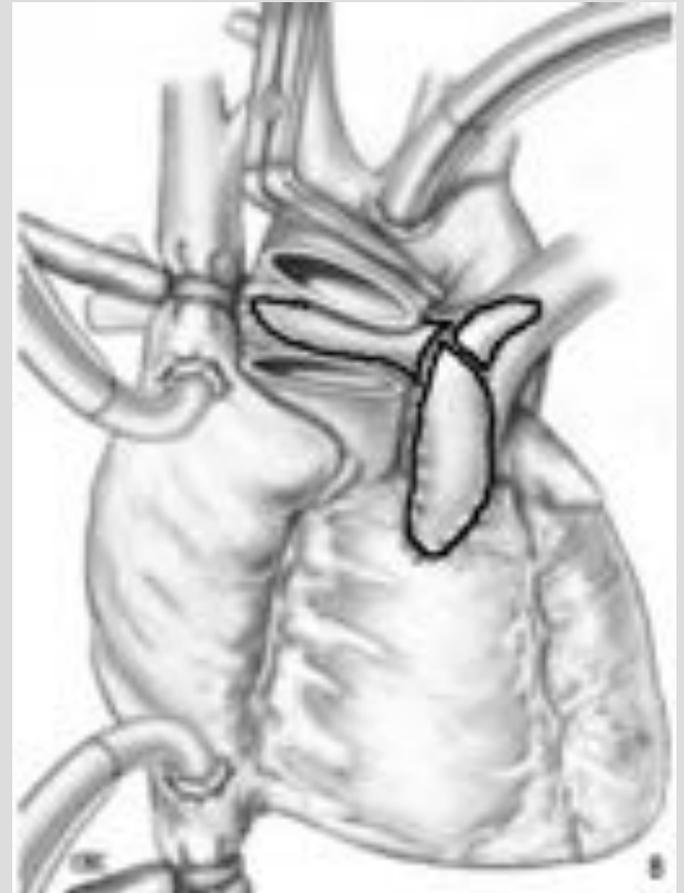
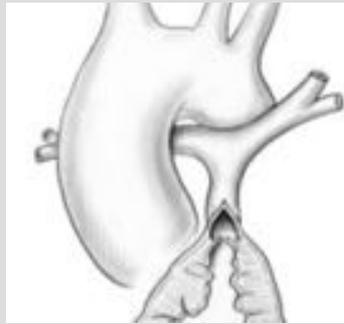
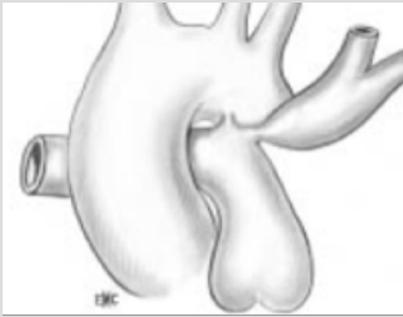
- Anneau; patch valvulé ou non
- Tronc de l' AP
- APG et/ou APD

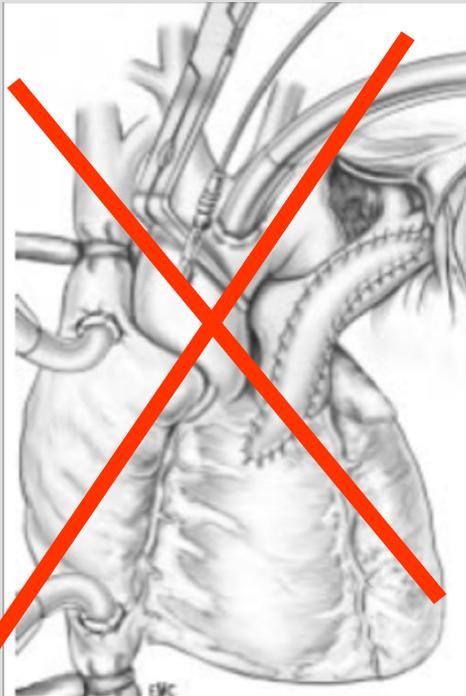
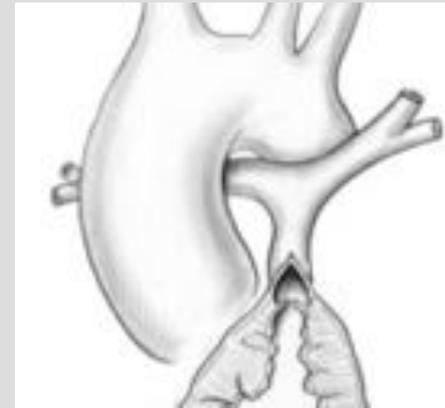
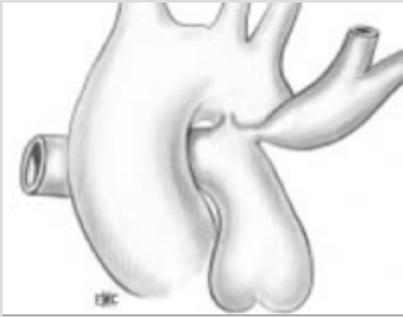
Homogrefe (complète ou patch)

stent



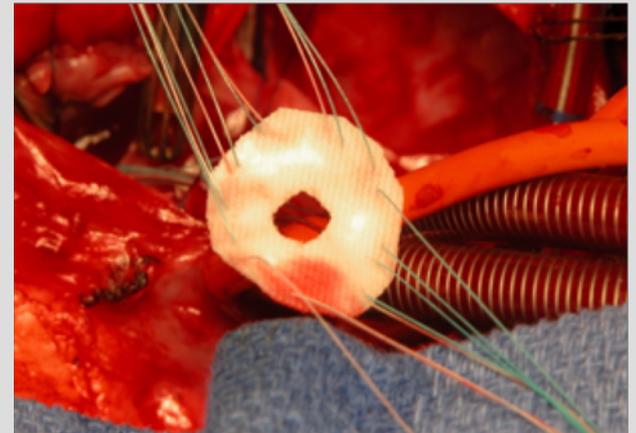


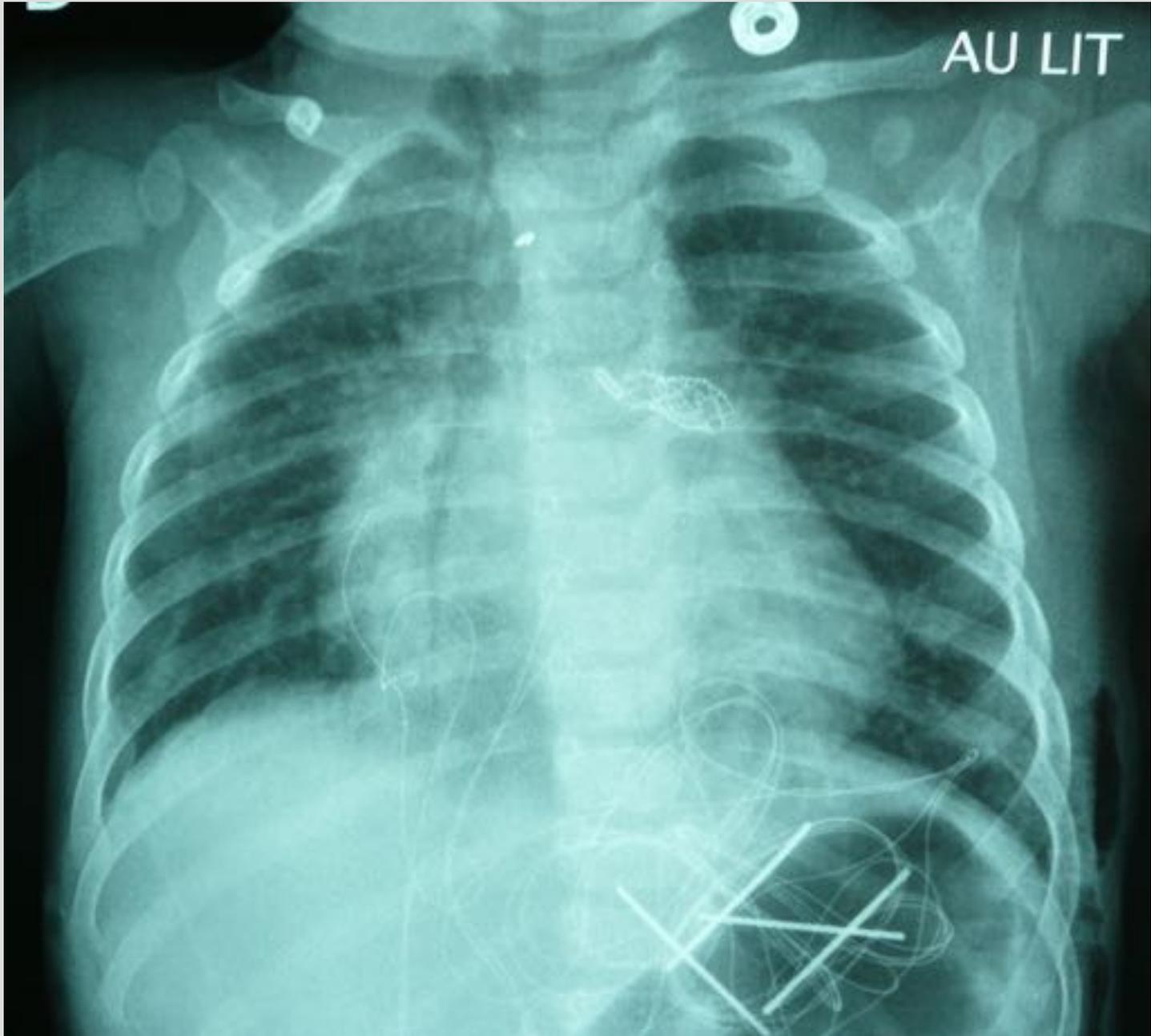




Ouverture VD AP
Sans fermeture CIV?

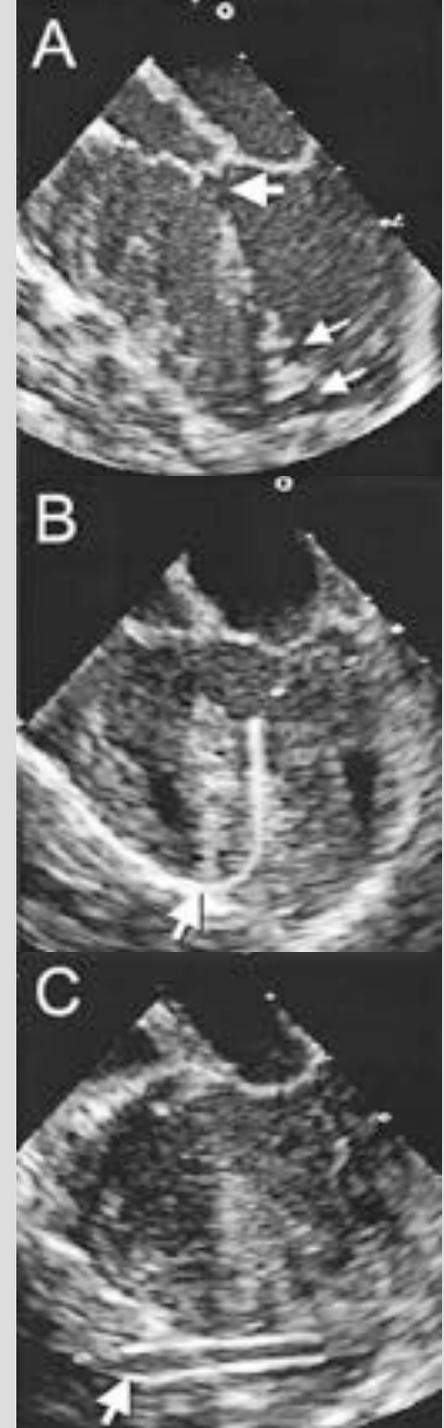
Patches don't turn corners





CIV multiples

- Fermeture « classique »
- Procédures hybrides



4-indications opératoires

Désaturation < 70 à 80 %

Intérêts d' une correction complète précoce:

- Effets cyanose chronique
- Élimine les csq d' un shunt systémico-pulm.
- Excision musculaire du VD, en diminuant l' hypertrophie du VD
- Incidence des troubles du rythme à long terme



5- autres considérations

Mortalité précoce: 1 à 5%

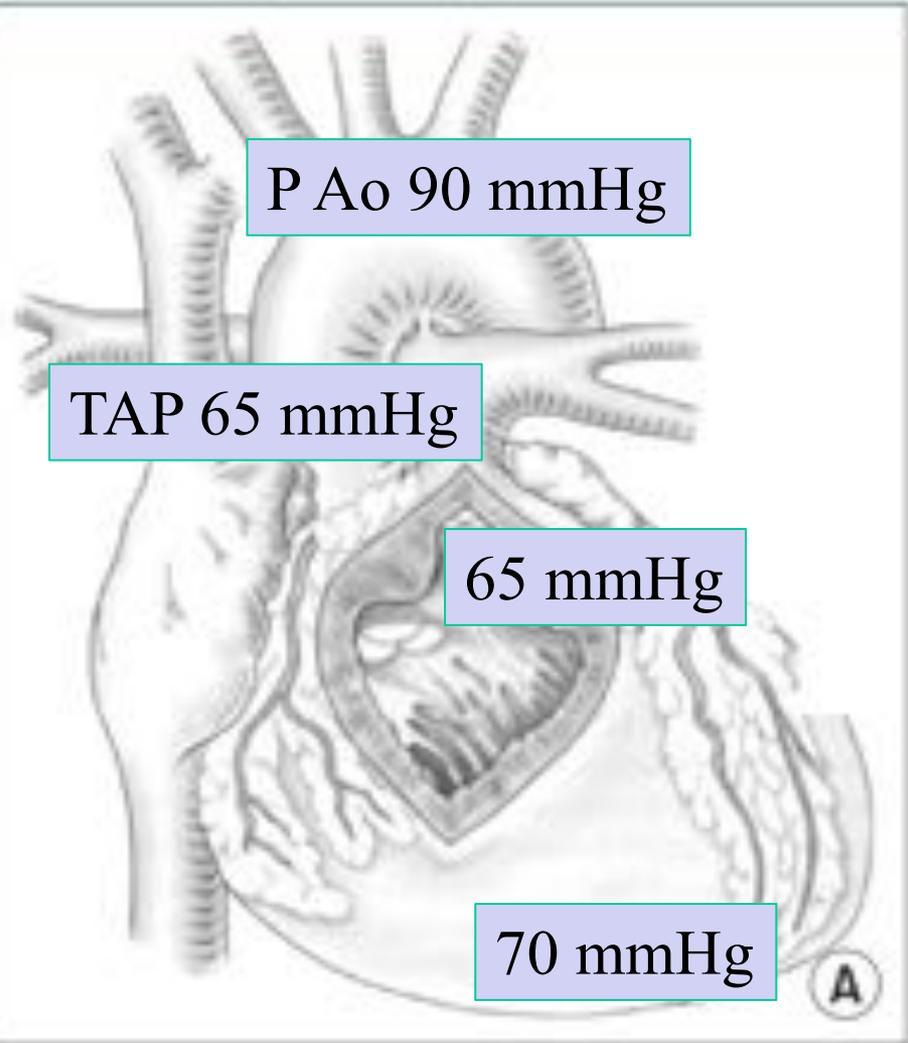
	Total (<i>n</i>)	Alive <i>n</i> (%)
TOF (All)		
< 1 month	61	60 (98)
> 1 month < 1 year	266	260 (98)
> 1 year	72	69 (96)
Total	399	389 (97)
TOF with PS		
< 1 month	37	36 (97)
> 1 month < 1 year	236	231 (98)
> 1 year	55	52 (96)
Total	328	319 (97)
TOF with PA		
< 1 month	24	24 (100)
> 1 month < 1 year	15	14 (93)
> 1 year	9	9 (100)
Total	48	47 (98)

Table 29.2 Hospital survival after complete repair for tetralogy of Fallot, University of Michigan,* January 1993–November 2004 (*n* = 399).

Complications post-opératoire immédiates

- Gradient VD-AP
 - Où? Combien????
- Lésion du tissu de conduction (BAV)
 - Séquence A-V +++
- CIV résiduelle
 - Potentiellement très grave
- CIA/FOP/Cyanose

De toute façons >>>> IVD diastolique >>>> Sd oedemato-ascitique



P Ao 90 mmHg

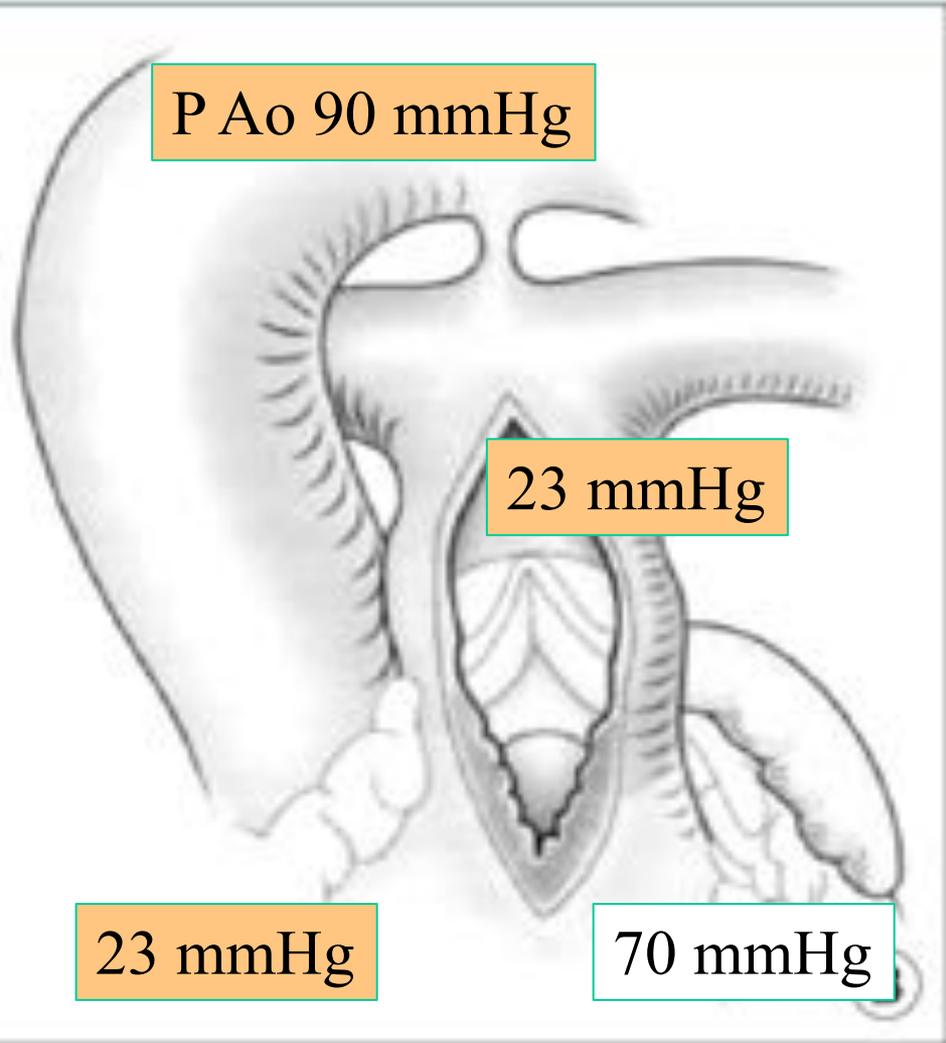
This diagram shows a cross-section of the heart and the ascending aorta. A catheter is inserted into the aorta, and another is inserted into the thoracic aorta. The heart is shown in a slightly anterior view.

TAP 65 mmHg

65 mmHg

70 mmHg

A



P Ao 90 mmHg

This diagram shows a cross-section of the heart and the aorta from a different perspective, possibly a posterior or lateral view. A catheter is inserted into the aorta, and another is inserted into the thoracic aorta. The heart is shown in a slightly posterior view.

23 mmHg

23 mmHg

70 mmHg

70 mmHg



Diagnostic and treatment

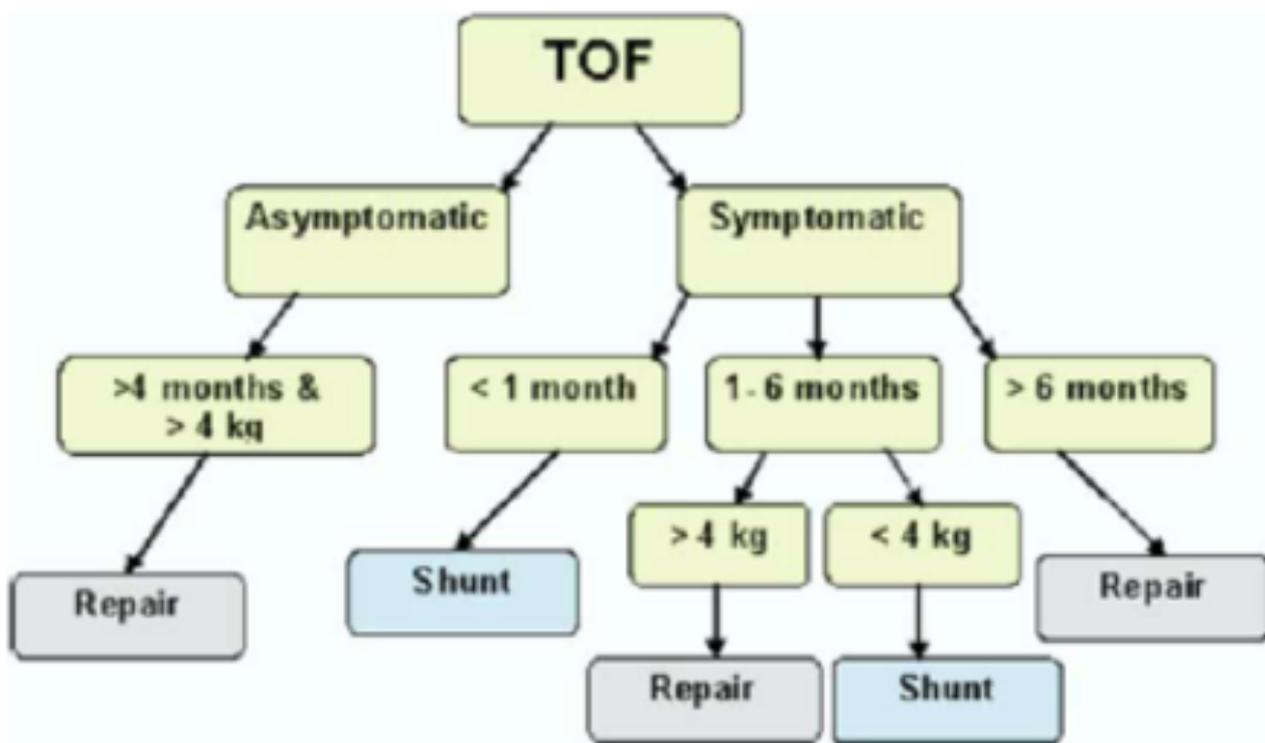


Figure 3 Flow diagram to illustrate the strategy of TOF repair.

perioperative factors on outcomes in children aged less than 18 months after repair of tetralogy of Fallot. J Thorac Cardiovasc Surg 126:703-710, 2003

REOPERATION IN ADULTS WITH REPAIR OF TETRALOGY OF FALLOT: INDICATIONS AND OUTCOMES

Table II. Major hemodynamic indications for reoperation*

Primary lesion	n	%
RVOT complications	45	75
Severe pulmonary regurgitation	24	40
Conduit failure	13	22
RVOT obstruction	5	8
Severe PR and RVOT obstruction	3	5
VSD patch leak (Qp/Qs > 1.5)	6	10
Severe tricuspid regurgitation	3	5
Patent Blalock-Taussig shunt	3	5
Others	3	5

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The Journal of Thoracic and
Cardiovascular Surgery
Volume 118, Number 2

REOPERATION IN ADULTS WITH REPAIR OF TETRALOGY OF FALLOT: INDICATIONS AND OUTCOMES

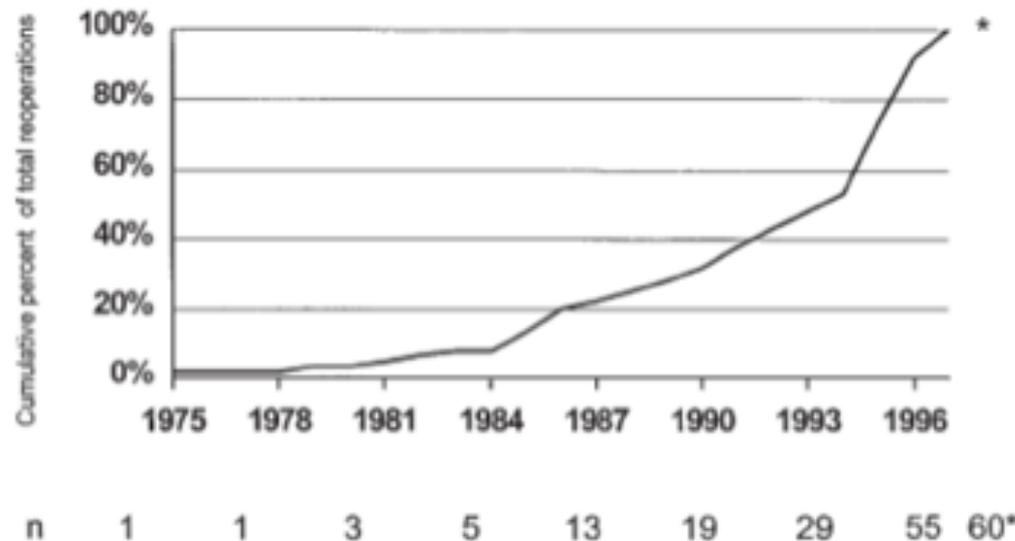
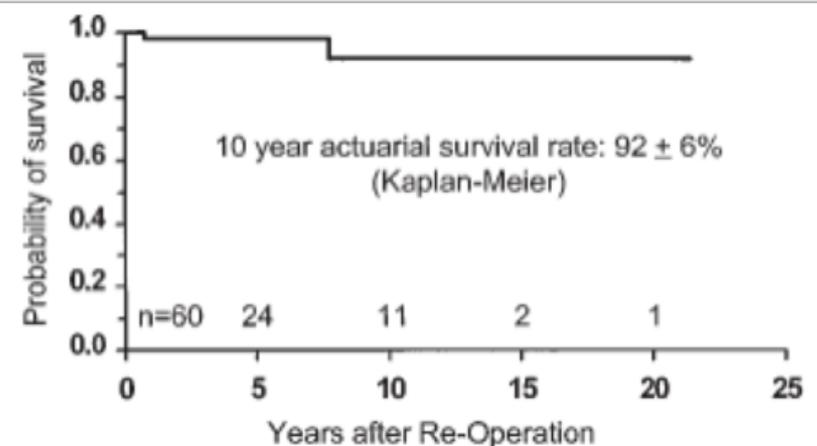


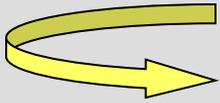
Fig 3. Cumulative percent of reoperations from 1975 until March 1997. There is a marked increase of reoperations in recent years. *N* indicates numbers of reoperations. *Asterisk* denotes March 31, 1997.



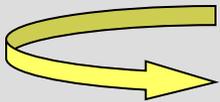
Complications tardives

- Re-sténose voie de sortie VD (infundibulum, anneau, AP)
- Insuffisance de la valve pulm.

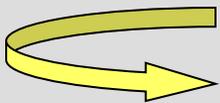
+++ Insuffisance de la valve pulmonaire +++



Dilatation du VD



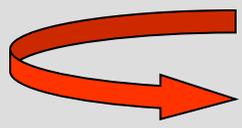
Insuffisance tricuspide



Troubles du rythme

+++ Insuffisance de la valve pulmonaire +++

3. Moyens thérapeutiques?



Valvulation pulmonaire

Chirurgicale

Percutanée

- homogreffe

Nécessité d'un « support »
tubulaire





Pediatric Cardiac
Surgery Annual

Valve-Sparing Options in Tetralogy of Fallot Surgery

Emile Bacha

Current strategies in tetralogy of Fallot repair: pulmonary valve sparing and evolution of right ventricle/left ventricle pressures ratio[☆]

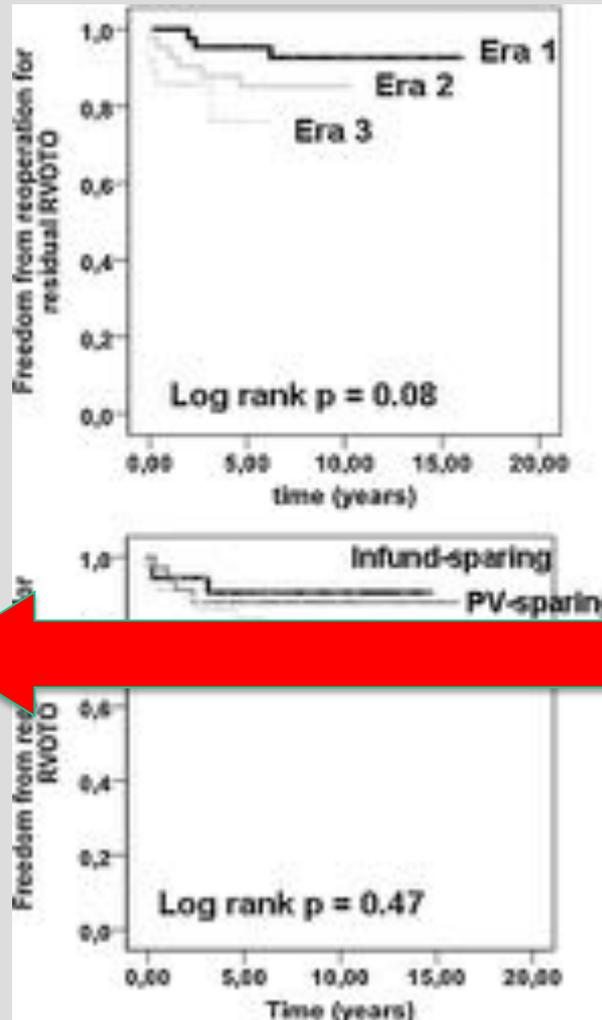
Lorenzo Boni^{a,*}, Enrique García^a, Lorenzo Galletti^a, Ana Pérez^a, Dolores Herrera^a,
Victoria Ramos^b, Stefano M. Marianeschi^a, Juan V. Comas^a

^a*Pediatric Cardiac Institute of Doce de Octubre University Hospital, Madrid, Spain*

^b*Pediatric Intensive Care Unit of Doce de Octubre University Hospital, Madrid, Spain*

European Journal of Cardio-thoracic Surgery 35 (2009) 885–890

Actuarial freedom from re-operation for RVOTO recurrence.



Re-opérations pour
sténose pulmonaire



Early valvulation
(Mise en place d'un
Conduit valvé)

Bové T et al. Eur J Cardiothorac Surg 2012;41:126-133

6- conclusion

Cardiopathie fréquente

Complexité étagée

Pronostic à 10 ans favorable

Growth Up Congenital Heart Disease

Évaluation à l'âge adulte, évaluation et traitement
des complications tardives