49º CONGRESSO DA SOCIEDADE BRASILEIRA DE CIRURGIA CARDIOVASCULAR

12º Congresso Acadêmico em Cirurgia Cardiovascular

26 e 27 de maio de 2023 MACEIÓ-AL

SIMPÓSIO DCCVPed

MESA REDONDA

ATRESIA PULMONAR COM CIV E COLATERAIS AORTO-PULMONARES

ESTRATÉGIAS E OPÇÕES TERAPÊUTICAS

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Cirurgião Cardiovascular nos Hospitais Moinhos de Vento, Divina Providência e Instituto de Cardiologia

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HOSPITAL MOINHOS DE VENTO

Rede de Saúde Divina Providência Hospital Divina Providência

Instituto de cardiologia

Declaração de Potencial Conflito de Interesse

Nome do Palestrante: Renato A. K. Kalil

Título da Apresentação:

ATRESIA PULMONAR COM CIV E COLATERAIS AORTO-PULMONARES

ESTRATÉGIAS E OPÇÕES TERAPÊUTICAS

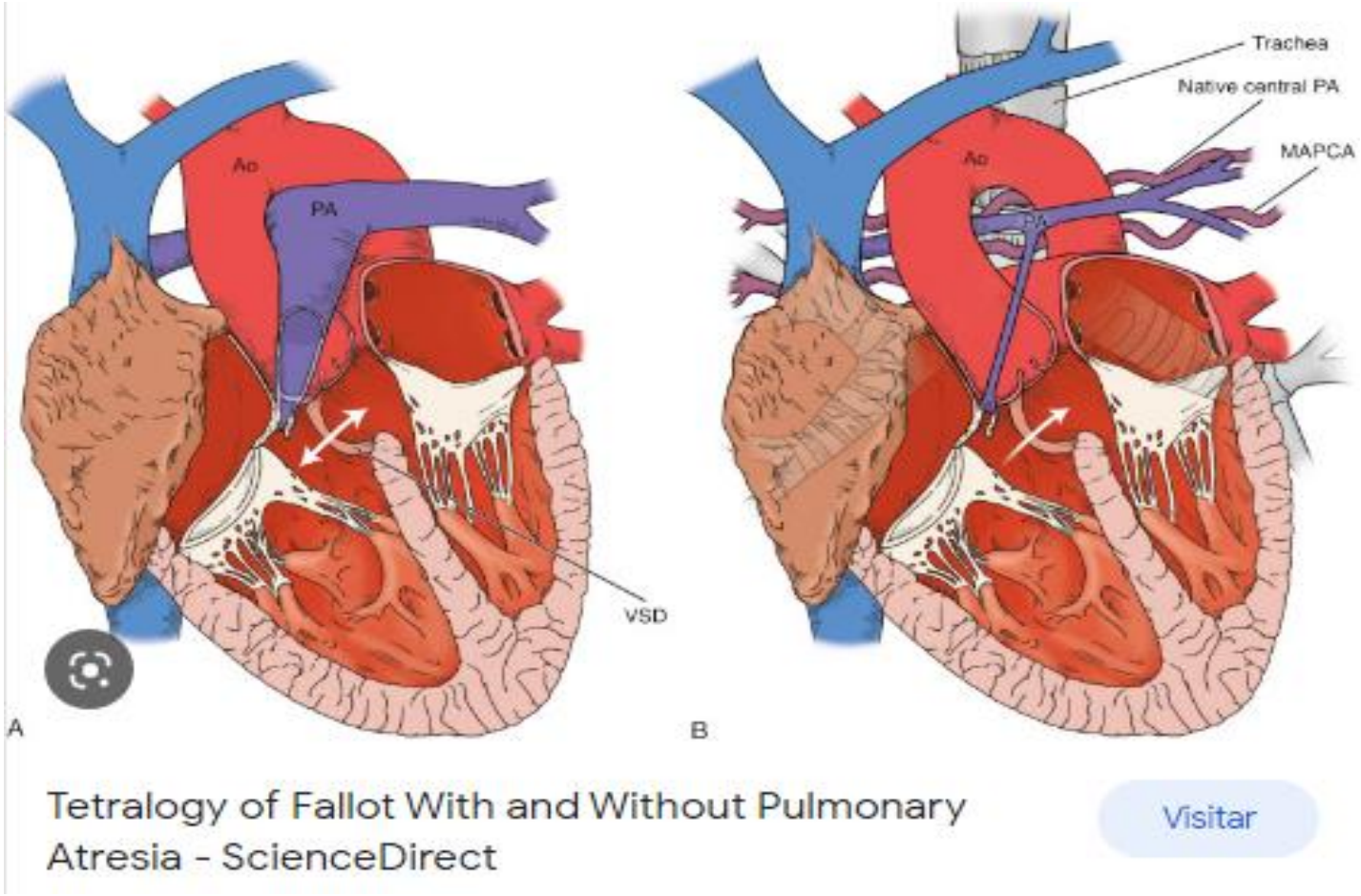
Não possuo nenhum conflito de interesse relacionado a esta apresentação

Terminologia

Tetralogia de Fallot com Atresia Pulmonar

ou

Atresia Pulmonar com CIV



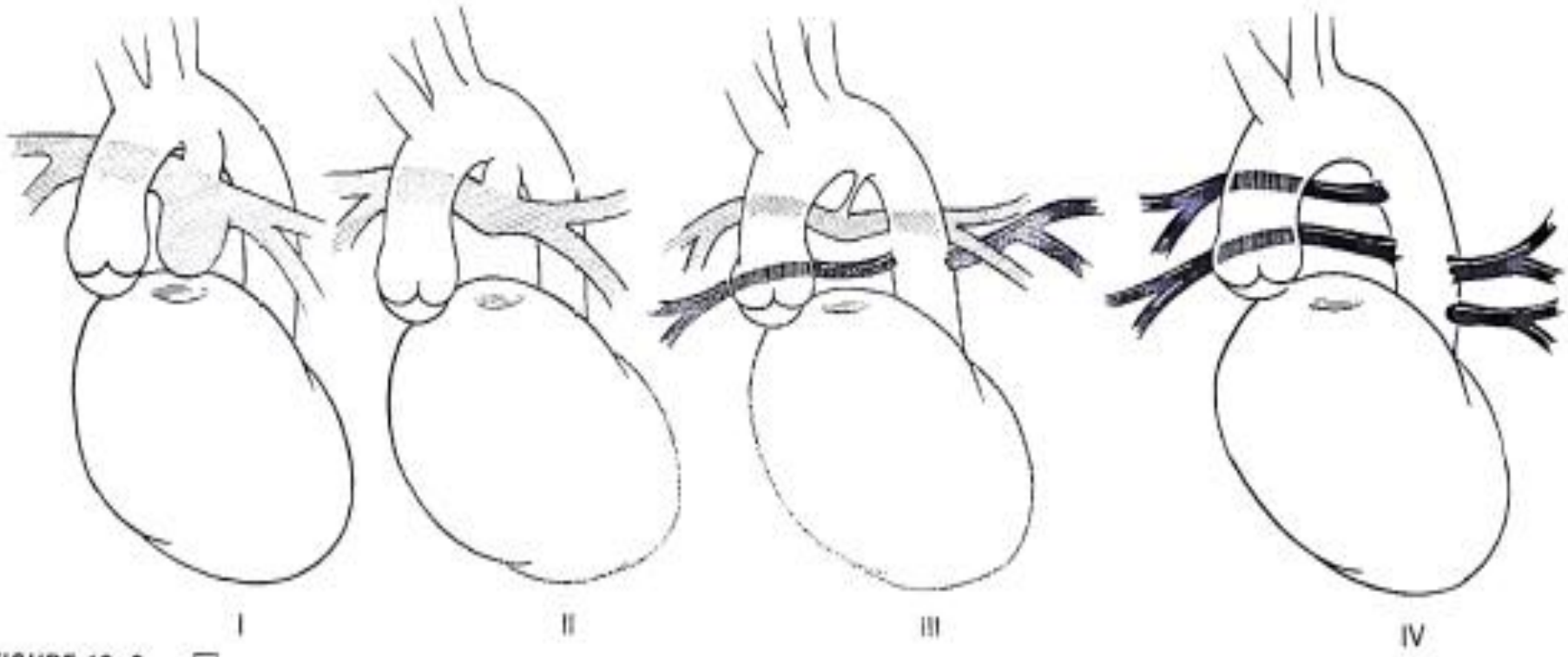


FIGURE 13–3. □

Tetralogy of Fallot with pulmonary atresia (TOF-PA) is classified into four groups. In groups I and II, the pulmonary arteries are well developed, and blood flow is supplied by a large patent ductus arteriosus. The main pulmonary artery is absent in group II. In group III, the ductus is either absent or very small. Both left and right pulmonary arteries are diminutive, connecting to variable numbers of bronchopulmonary segments; the more important sources of pulmonary blood flow are APCAs. In group IV, there are no mediastinal pulmonary arteries, and all bronchopulmonary segments are supplied entirely by APCAs.

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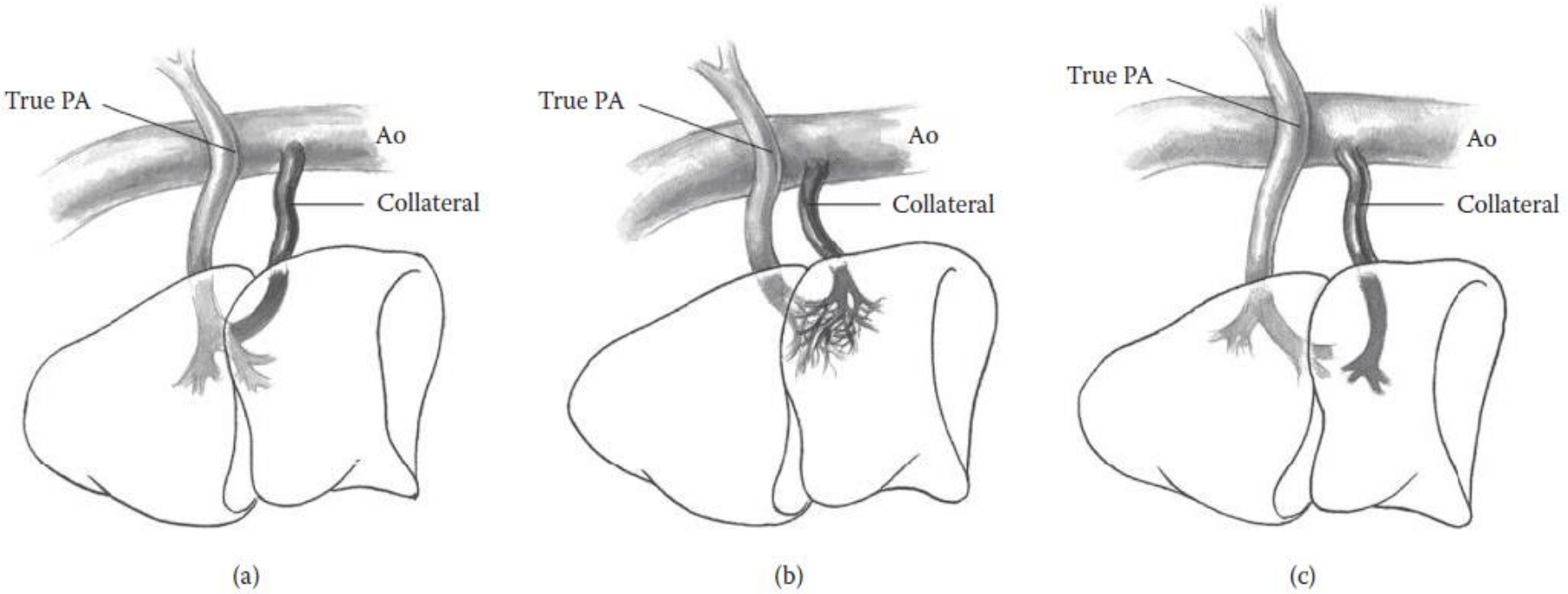

FIGURE 30.2 Aortopulmonary collateral vessels may connect to the true pulmonary arteries (PAs) at one of several levels. (a) Connection of an aortopulmonary collateral to a lobar branch pulmonary artery. (b) Very peripheral connection of a collateral to the true pulmonary circulation. (c) There is no connection between the aortopulmonary collateral and true pulmonary circulation. Ao = aorta.

Jonas R. Comprehensive Surgical Treatment of Congenital Heart Disease. 2nd ED.CRC Press. Boca Raton, FL

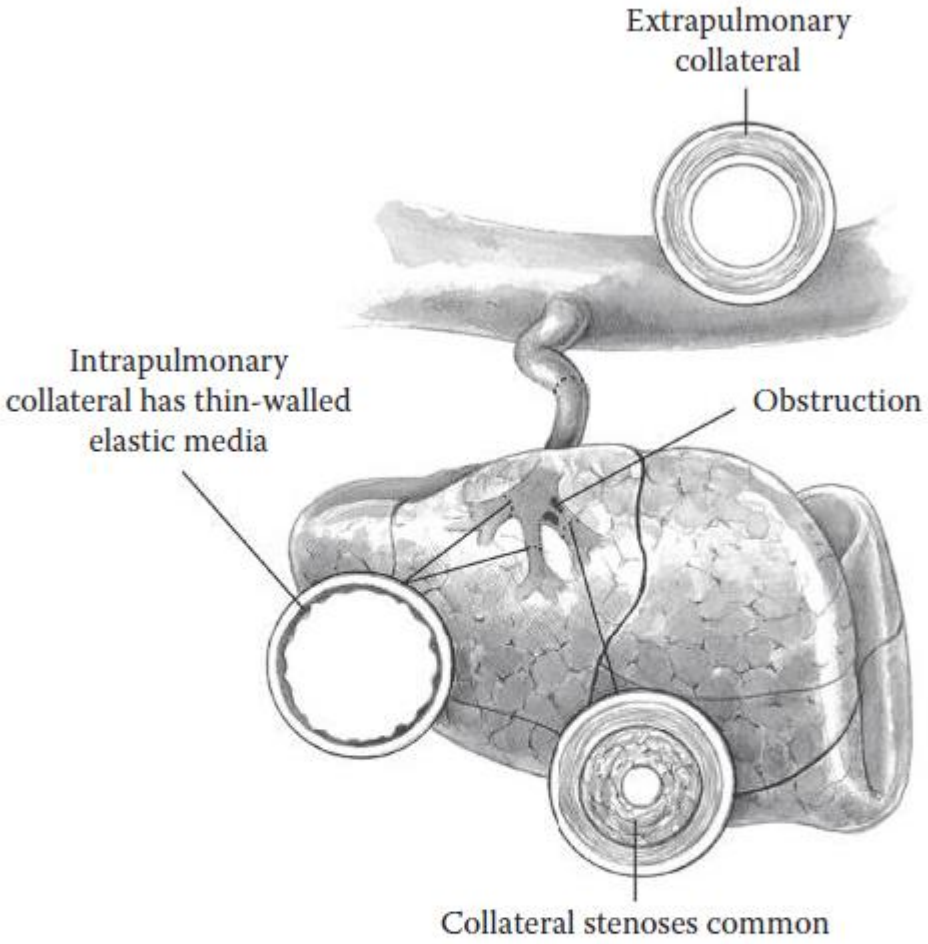

FIGURE 30.3 Aortopulmonary collaterals have the characteristics of muscular arteries until they penetrate the lung parenchyma where they assume characteristics that are more similar to pulmonary arteries. The segments of collaterals that are muscular are particularly prone to the development of severe stenoses which are often progressive.

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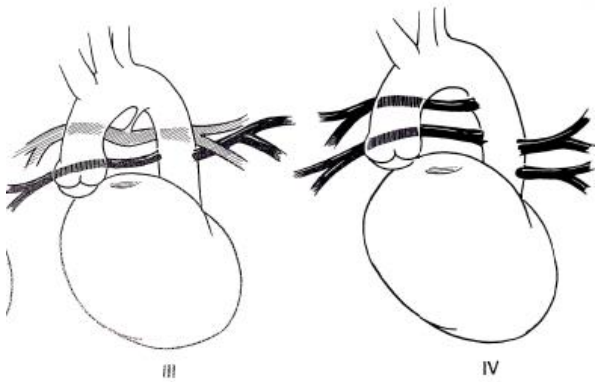
Objetivos do Tratamento

- ***Melhorar hipoxemia***
- ***Evitar e tratar congestão pulmonar***
- ***Ocluir x unificar colaterais aortopulmonares***
- ***Desenvolver as artérias pulmonares verdadeiras***
- ***Restaurar continuidade VD-AP***
- ***Tratar lesões residuais***

Indicações, táticas e momento das intervenções



Essencial o trabalho colaborativo entre cardiologistas pediátricos, intervencionistas e cirurgiões.

Criança com o espectro grave de CIV + AP e colaterais requer abordagem criteriosa e colaborativa para atingir desfechos favoráveis.

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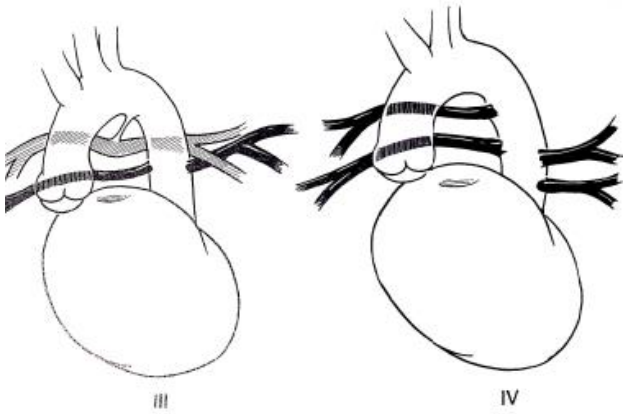
ESTRATÉGIAS DE TRATAMENTO

- **Clínico**
  - *Prostaglandina*
  - *Beta-bloqueadores NÃO*
  - *Vasoconstrictores*
  - *Digoxina + diuréticos (Insuf cardíaca)*
- **Cateterismo intervencionista**
  - *Stent no canal arterial*
  - *Oclusão de colaterais*
  - *Dilatação de estenoses*
  - *Perfuração valvar*
- **Cirurgias paliativa e corretiva**



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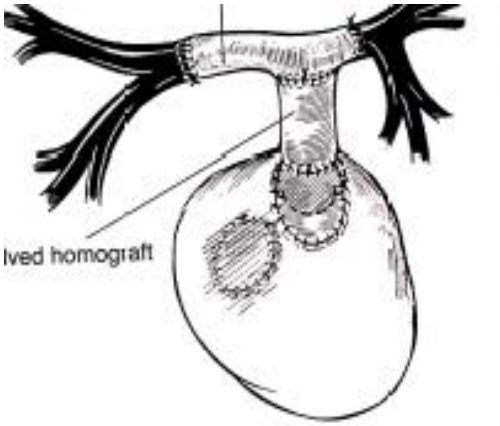
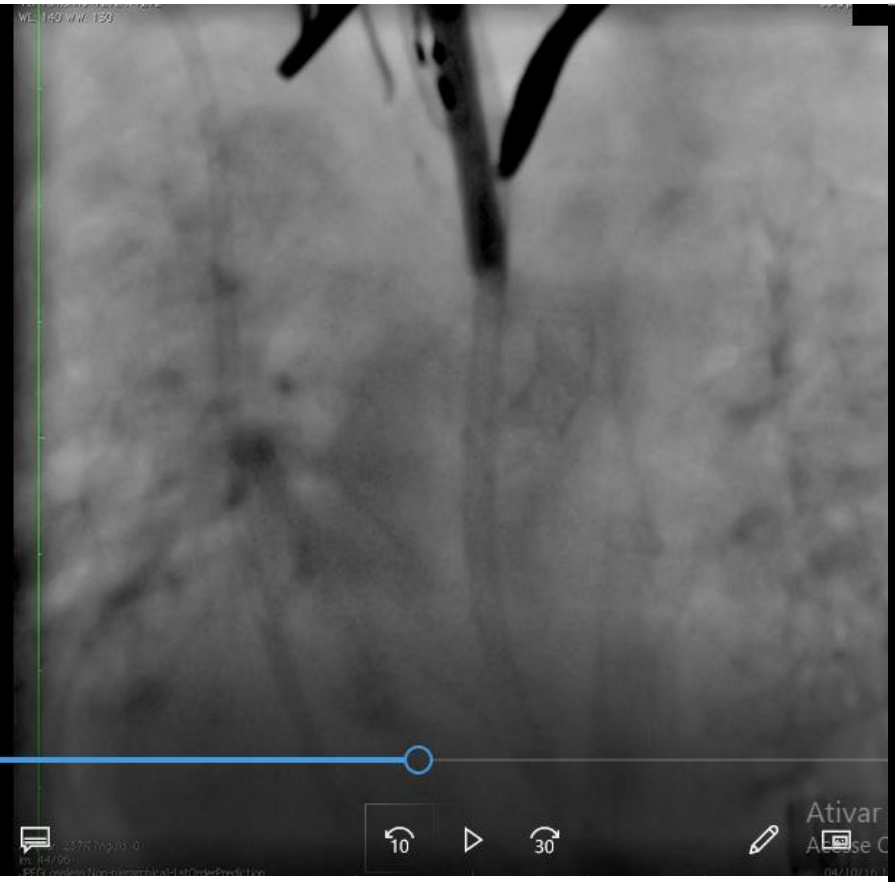
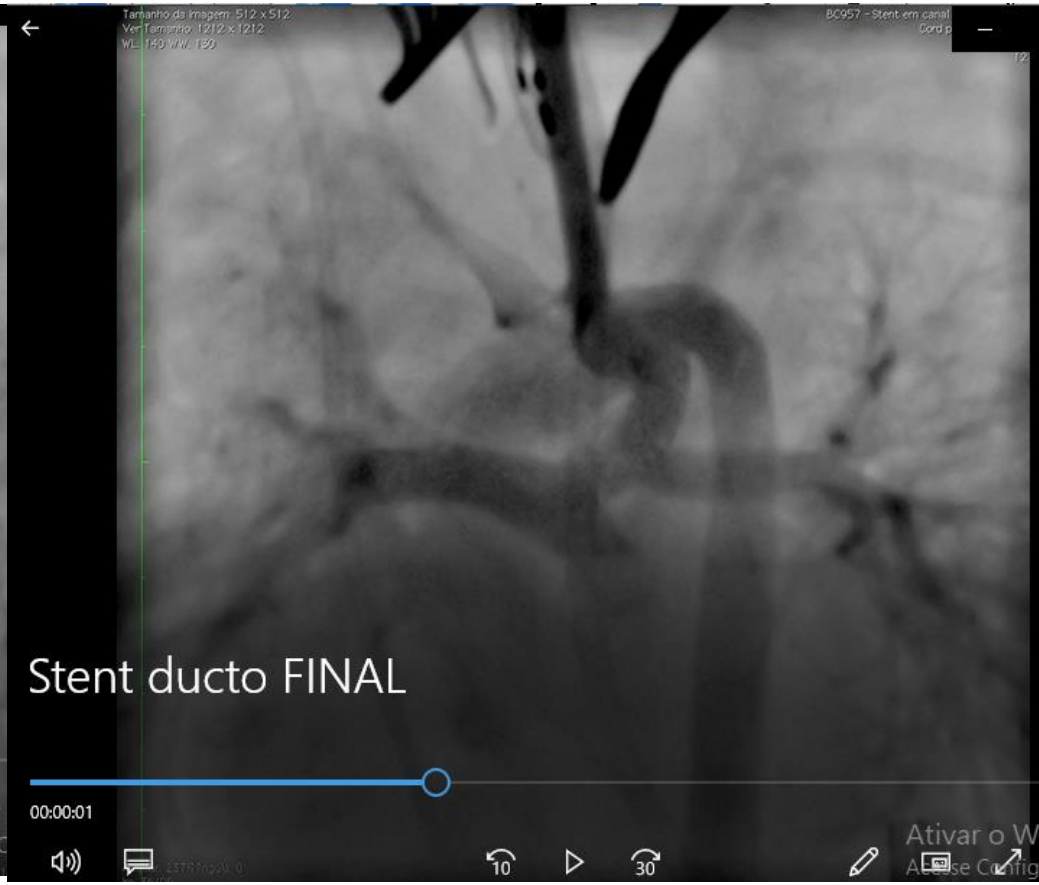


Cateterismo Intervencionista
Stent em Ducto

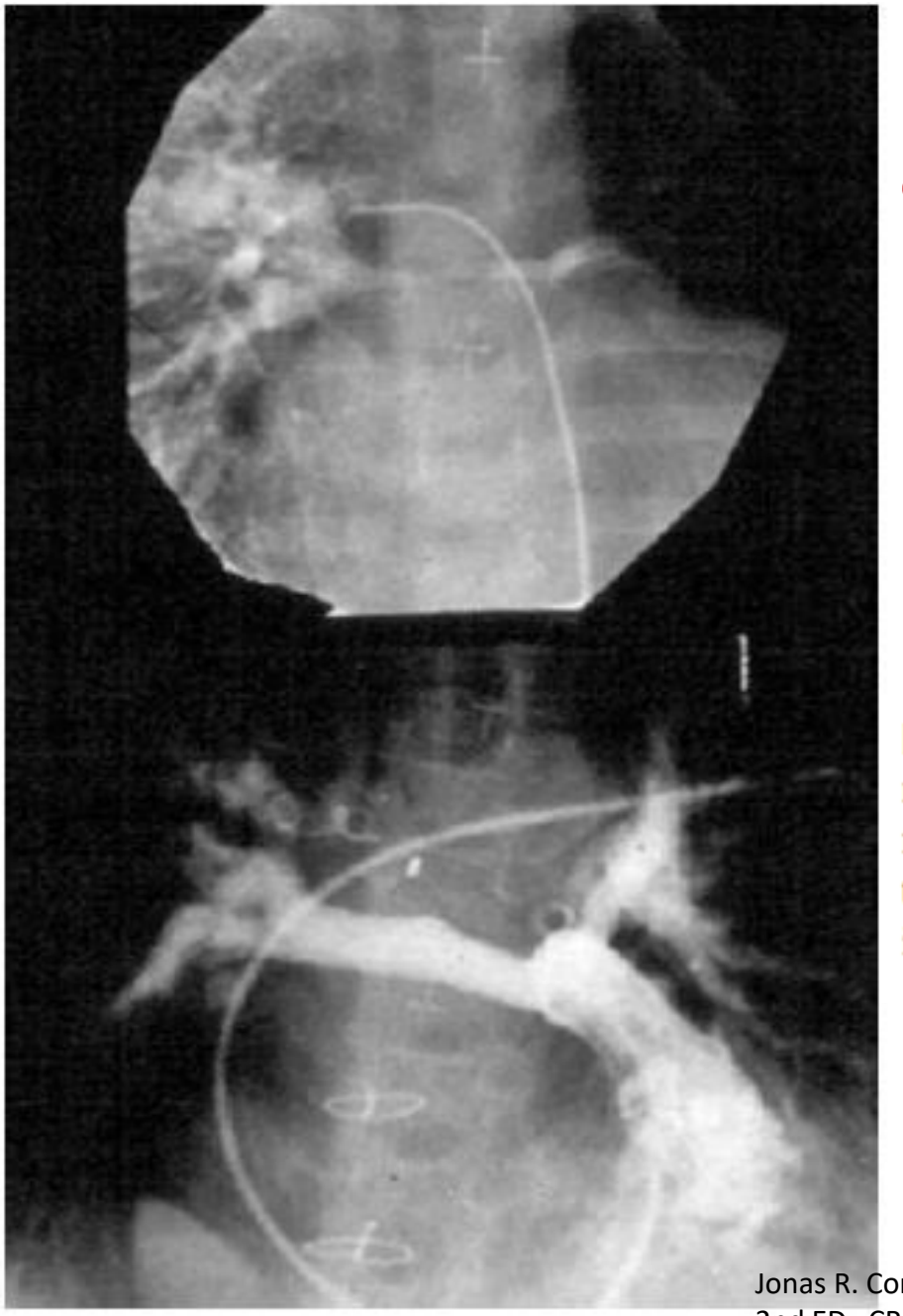




Cortesia Dr. Raul Rossi

Cateterismo Intervencionista
Stent em colateral

Cortesia Dr. Raul Rossi



Cateterismo intervencionista

Perfuração valvar

FIGURE 30.4 There is remarkable potential for tiny central pulmonary arteries to enlarge very rapidly during the first year of life following placement of a small homograft between the right ventricle and the pulmonary arteries. In this example, dramatic growth is seen 6 months postoperatively.

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Tratamento Cirúrgico

- *Anastomose sistêmico-pulmonar: benefício X distorções, sim ou não?*
- *Restauro da circulação pulmonar: Preparo das artérias pulmonares, oclusão X unificação de colaterais, estabelecer continuidade VD-AP*
- *Reparo em estágio único: na presença de artérias pulmonares viáveis e poucas colaterais*
- *Reparo em multi-estágios*
- *Escolha de condutos*

Unifocalização e correção em estágio único

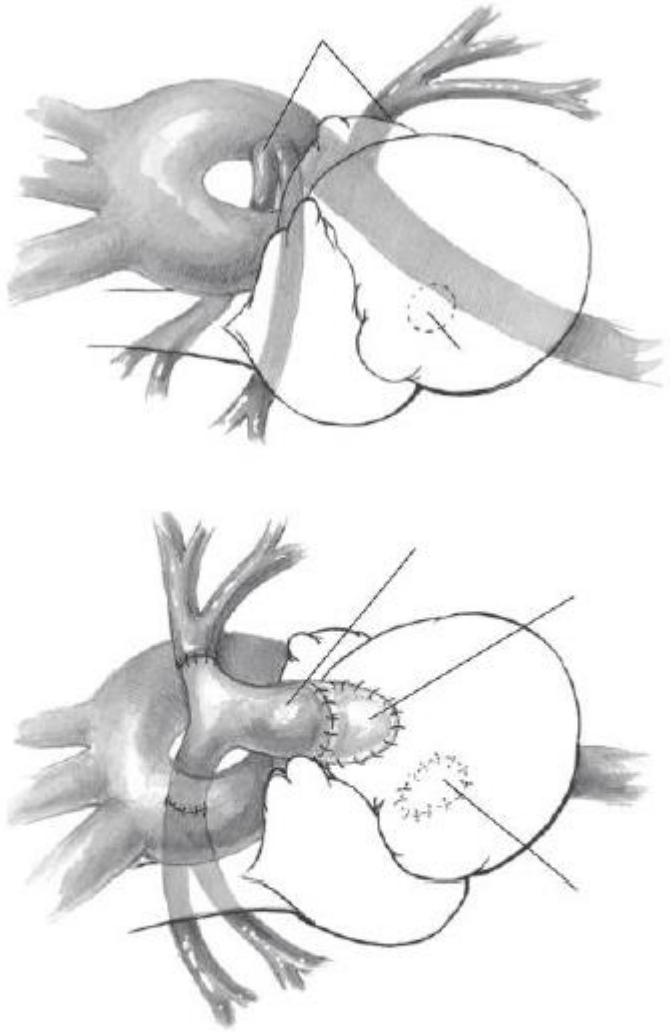

FIGURE 30.7 One-stage unifocalization may be appropriate if the true pulmonary arteries are completely absent, although this is exceedingly rare. (a) The patient has absent true pulmonary arteries and pulmonary blood flow is derived from two very large aortopulmonary collateral vessels. (b) One-stage unifocalization with end-to-end anastomoses between the collaterals and homograft branch pulmonary arteries. Ventricular septal defect (VSD) closure is possible as long as distal pulmonary resistance is not severely elevated.

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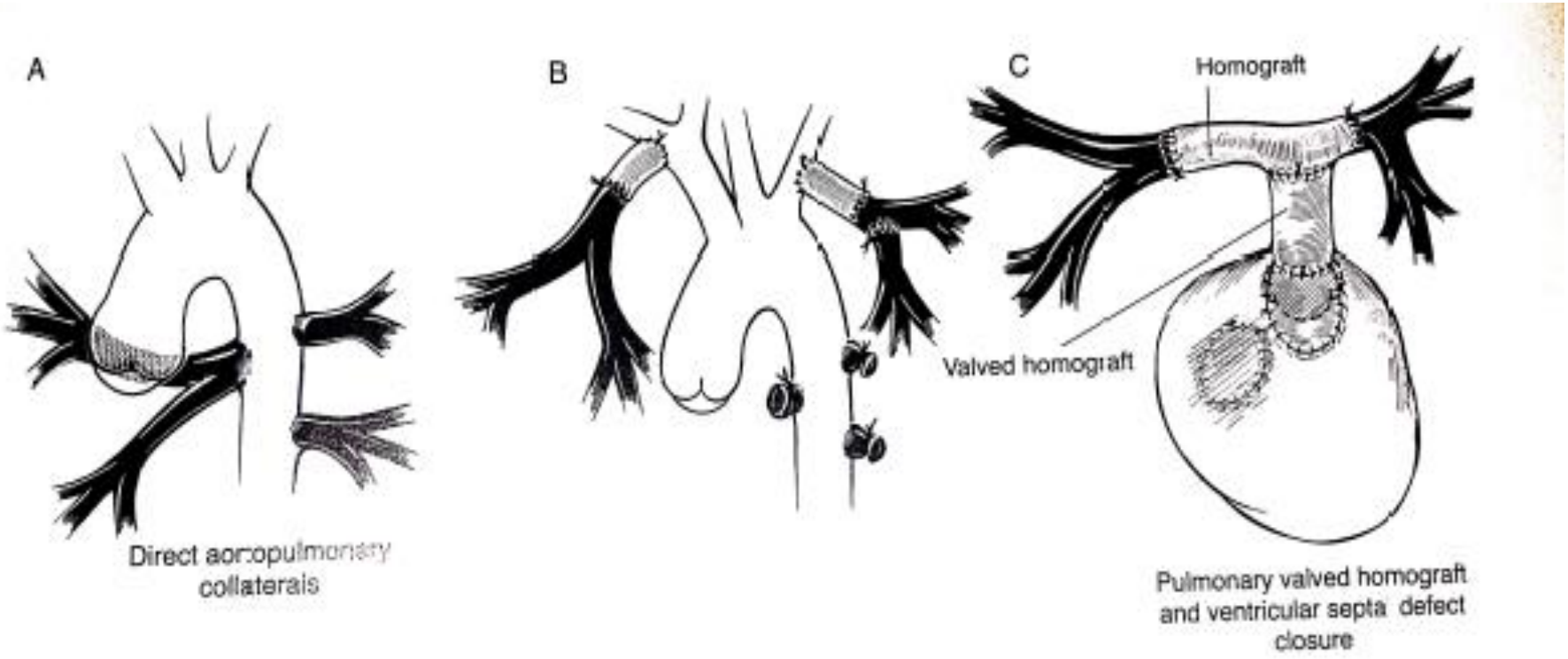

FIGURE 13–8. □

TOF-PA and absent mediastinal pulmonary arteries. *A*, The pulmonary blood supply is exclusively from APCAs. Through a lateral thoracotomy, the APCAs are detached from the descending thoracic aorta followed by interposition of a graft and anastomosis to brandhes of the ascending aorta (*B*). This procedure is repeated on the opposite side within the same hospitalization. Note the unifocalization of the left inferior APCA to the left superior APCA. Through a midline sternotomy incision, the previously positioned Gore-Tex conduits are detached and removed. The left and right distal pulmonary arteries are connected with a nonvalved aortic allograft. A valved aortic allograft is then interposed between the right ventricular outflow tract and the reconstructed left and right pulmonary arteries (*C*). The VSD was also closed during this second stage of the operation.

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Múltiplo estágio

I. Estabelecer continuidade VD-AP

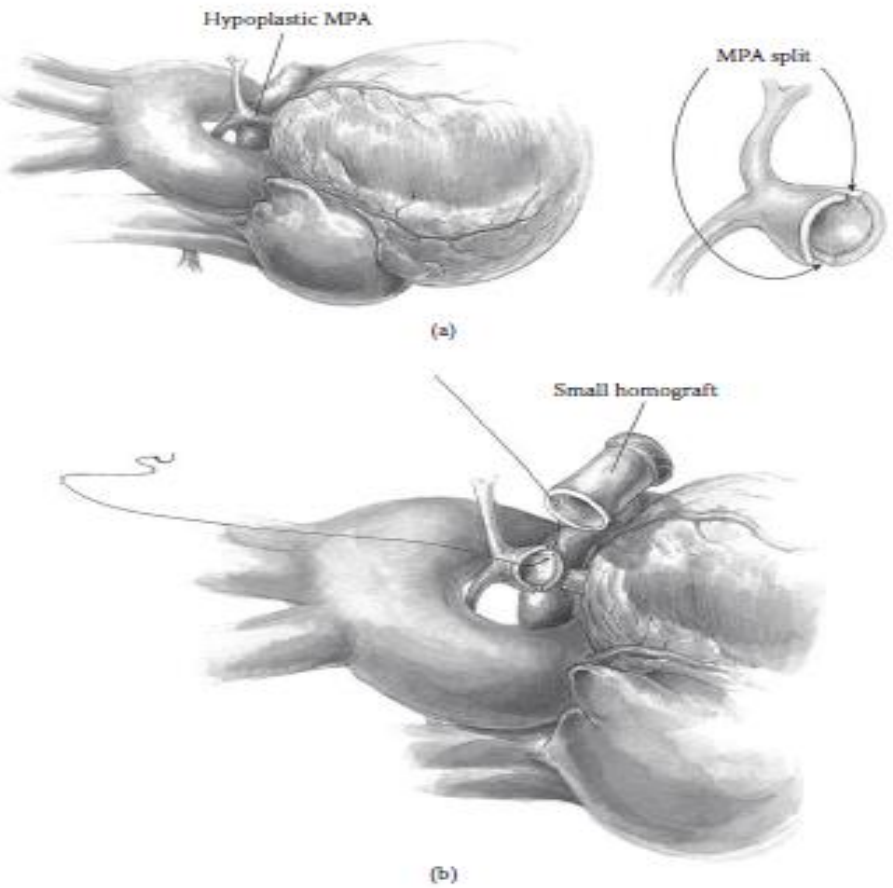

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FIGURE 30.5 Stage 1 surgery for tetralogy of Fallot with pulmonary atresia with hypoplastic central pulmonary arteries and multiple aortopulmonary collaterals. (a) The vestigial main pulmonary artery (MPA) and tiny branch pulmonary arteries are carefully dissected free. Inset: The tiny MPA is split bilaterally following proximal division. (b) A very small pulmonary homograft, for example, 6–8 mm, is thawed and cut to length. (Femoral vein homograft is ideal in this setting.) The distal anastomosis is fashioned to the vestigial MPA.

(Continued)

Múltiplo estágio

II. Cateterismo: Oclusão de colaterais e plastias por balão de estenoses

- *Direcionar o fluxo arterial pulmonar para o leito das artérias pulmonares verdadeiras*
- *3 a 6 meses p.o.*
- *Oclusão de colaterais (coils)*
- *Definição das artérias pulmonares verdadeiras*

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Múltiplo estágio

III. Unifocalização das artérias pulmonares e colaterais

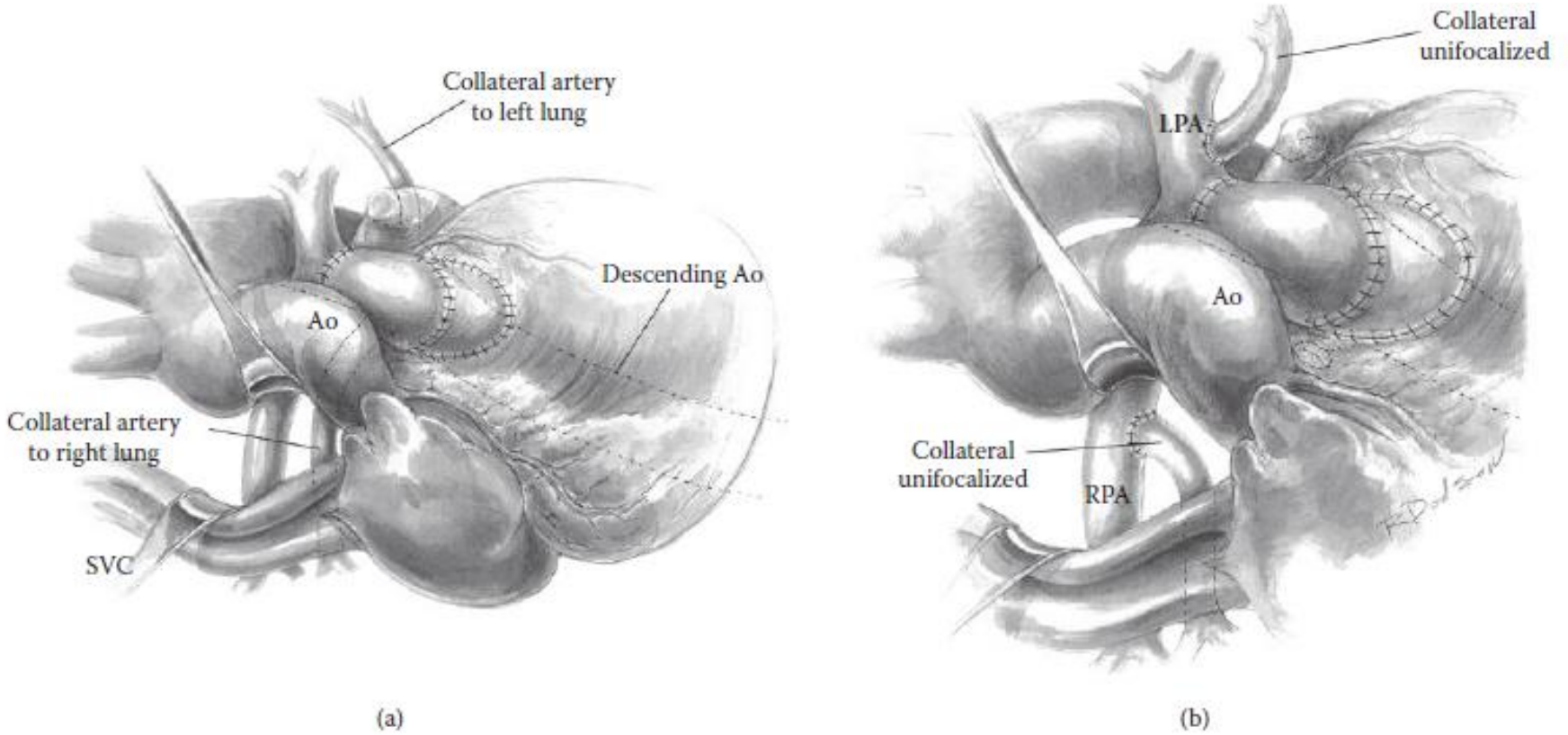

FIGURE 30.6 Unifocalization of collateral vessels to true pulmonary arteries via median sternotomy. (a) A collateral artery to the right lung is identified posterior to the transverse sinus with retraction of the ascending aorta leftwards. (b) One collateral vessel has been unifocalized to the true right pulmonary artery (RPA) and a second collateral vessel has been unifocalized to the left pulmonary artery (LPA). Ao = aorta; SVC = superior vena cava.

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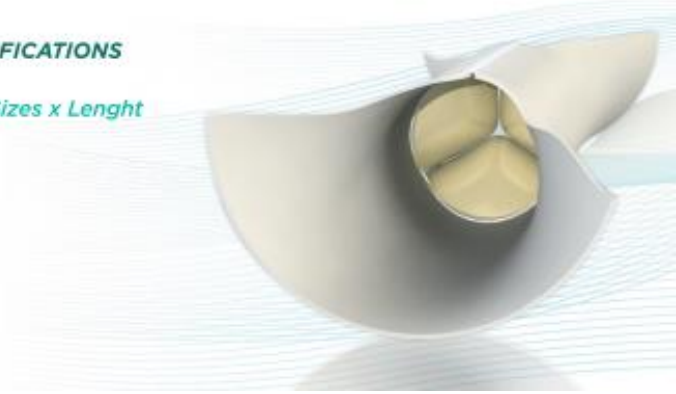
11*, 13, 15, 17, 19*, 21* mm x 120 mm

*Disponíveis sob consulta / *Avalable under resquest*



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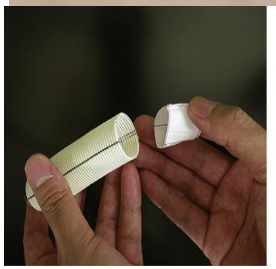

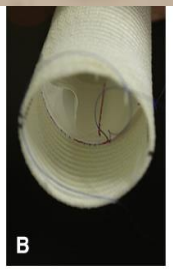

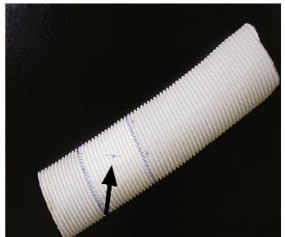

ATRESIA PULMONAR COM CIV E COLATERAIS AORTO-PULMONARES

Conclusões

- *Estratégia colaborativa, clínica, hemodinâmica, cirúrgica*
- *Manutenção de saturação aceitável, sem congestão pulmonar*
- *Desenvolvimento do leito vascular pulmonar verdadeiro*
- *Estabelecimento precoce de continuidade VD-AP*
- *Correção definitiva em momento adequado*
- *Acompanhamento e tratamento das distorções, estenoses pulmonares e outras lesões residuais*

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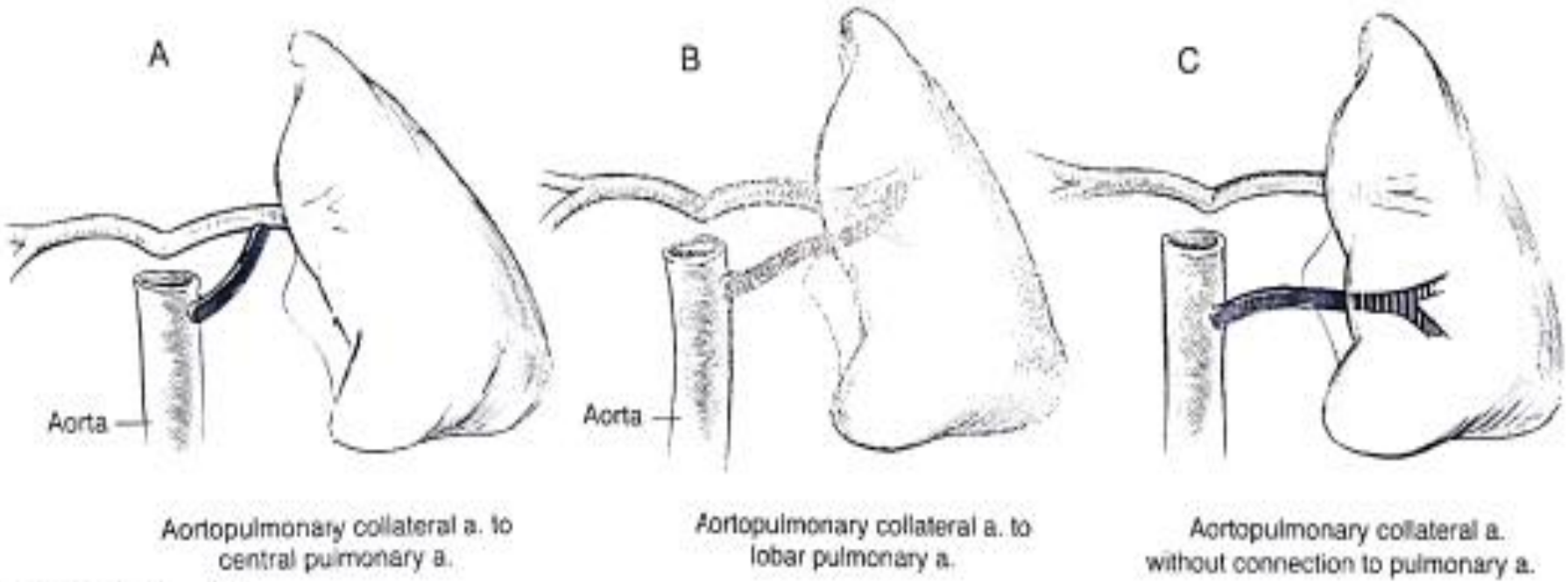

Aortopulmonary collateral a. to central pulmonary a.

Aortopulmonary collateral a. to lobar pulmonary a.

Aortopulmonary collateral a. without connection to pulmonary a.

FIGURE 13–4. □

APCAs connect to either central pulmonary arteries within the mediastinum (*A*) or lobar or segmental pulmonary arteries within the lung (*B*) or do not connect with any pulmonary artery supplying the lung independently (*C*).

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Tratamento Percutâneo
Cateterismo intervencionista

- ***Manejo do canal arterial – stents***
- ***Oclusões de artérias colaterais aorto-pulmonares***
- ***Angioplastias/Dilatação de estenoses em artérias***
- ***Perfuração valvar pulmonar***