AORTE ET CLAMPAGE AORTIQUE

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OBJECTIFS À COUVRIR

4.2.1.5 Vascular anatomy and physiology

- 4.2.1.5.4 Describe the anatomy of the aorta, including major branches
- 4.2.1.5.5 4.2.1.5.6 Describe the vascular supply of the major organs and the four limbs

Anesthesia for Vascular Surgery

- 4.9.1.3 Physiologic consequences of aortic cross clamping including impact of level of clamping
- 4.9.1.4 Pathophysiology of atherosclerotic disease
- 4.9.1.5 Pathophysiology of the major diseases of the aorta:
- 4.9.1.5.1 Aortic aneurysm
- 4.9.1.5.2 Aortic dissection
- 4.9.1.5.3 Aortic occlusive disease
- 4.9.1.5.4 Embolic disease and ischemic limb
- 4.9.1.5.5 Connective tissue disease
- 4.9.1.5.6 Aortitis
- 4.9.1.5.7 Aortic injury after blunt trauma

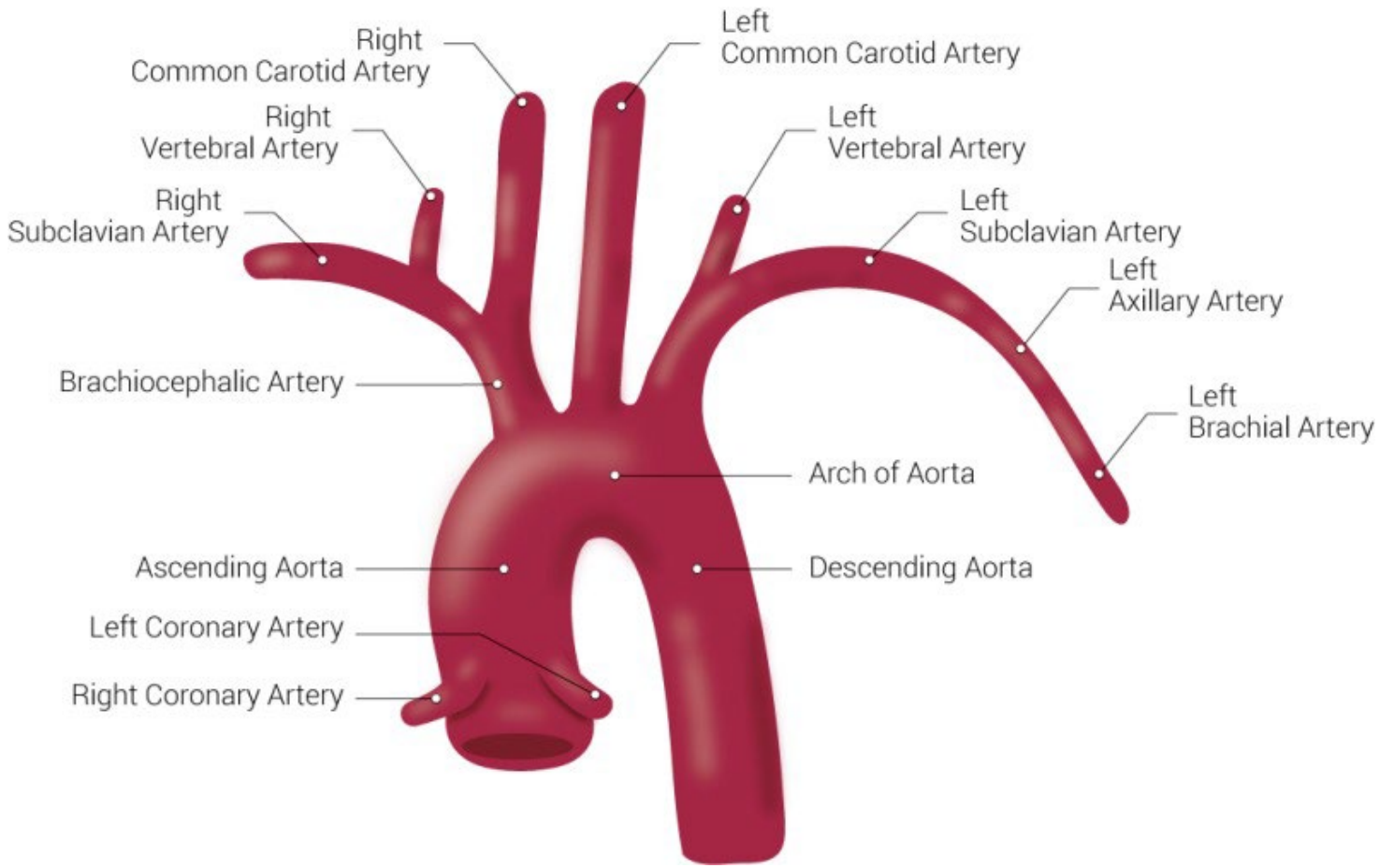
ANATOMIE AORTE

Aorte ascendante

- Valve aortique (3e CC gauche) → arche Ao (2e EIC droit)
- 5 cm de longueur
- Branches: RCA et LCA

Arche aortique

- Aorte ascendante → T4
- Branches
  - Tronc brachio-céphalique
  - Carotide commune gauche
  - Sous-clavière gauche



VARIATIONS ANATOMIQUES

Arche normale (80%)

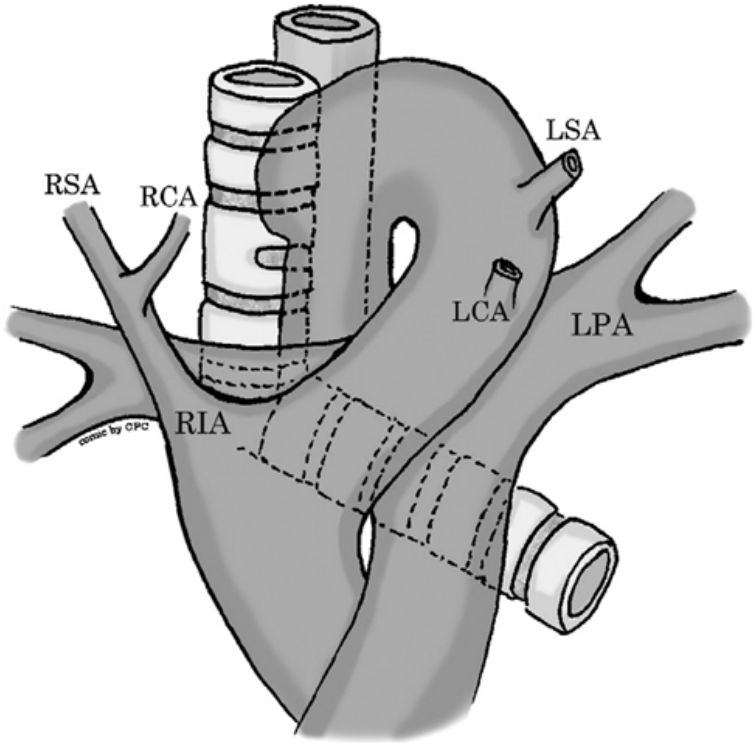


Fig. 1. The anatomy of the normal aortic arch. LCA = left carotid artery; LPA = left pulmonary artery; LSA = left subclavian artery; RCA = right carotid artery; RIA = right innominant artery; RSA = right subclavian artery. Illustration by Pei-Ching Chen.

Arche droite

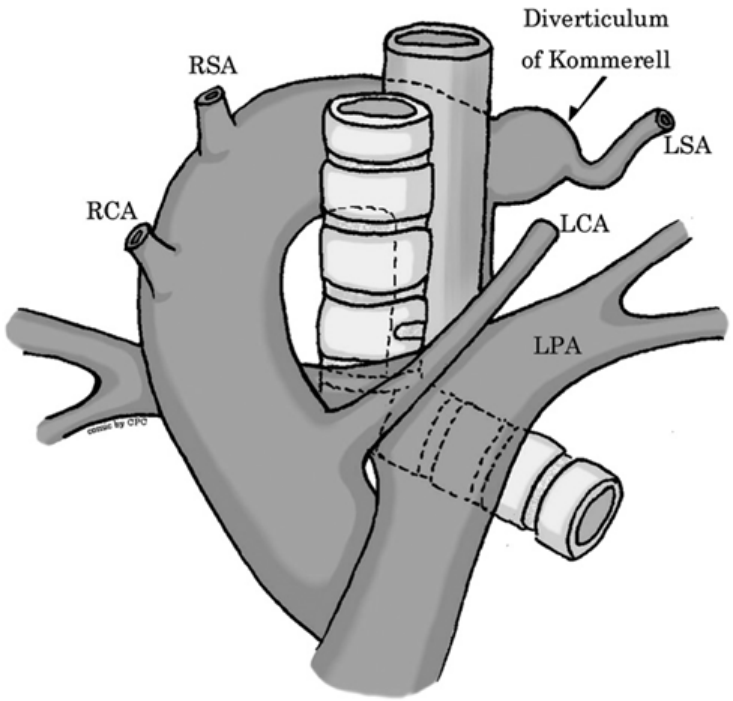
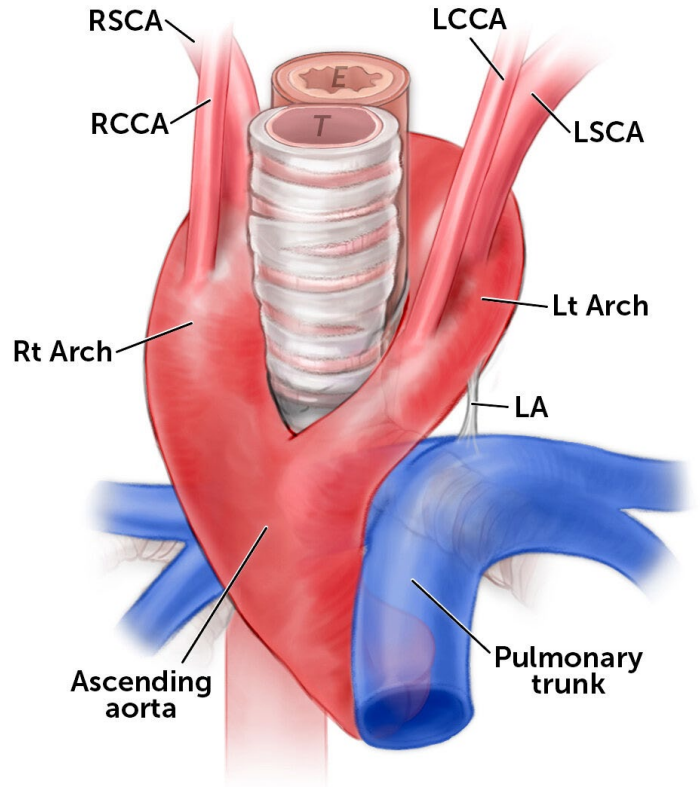


Fig. 2. The anatomy of the right aortic arch with aberrant left subclavian artery. LCA = left carotid artery; LPA = left pulmonary artery; LSA = left subclavian artery; RCA = right carotid artery; RSA = right subclavian artery. Illustration by Pei-Ching Chen.

Arche double



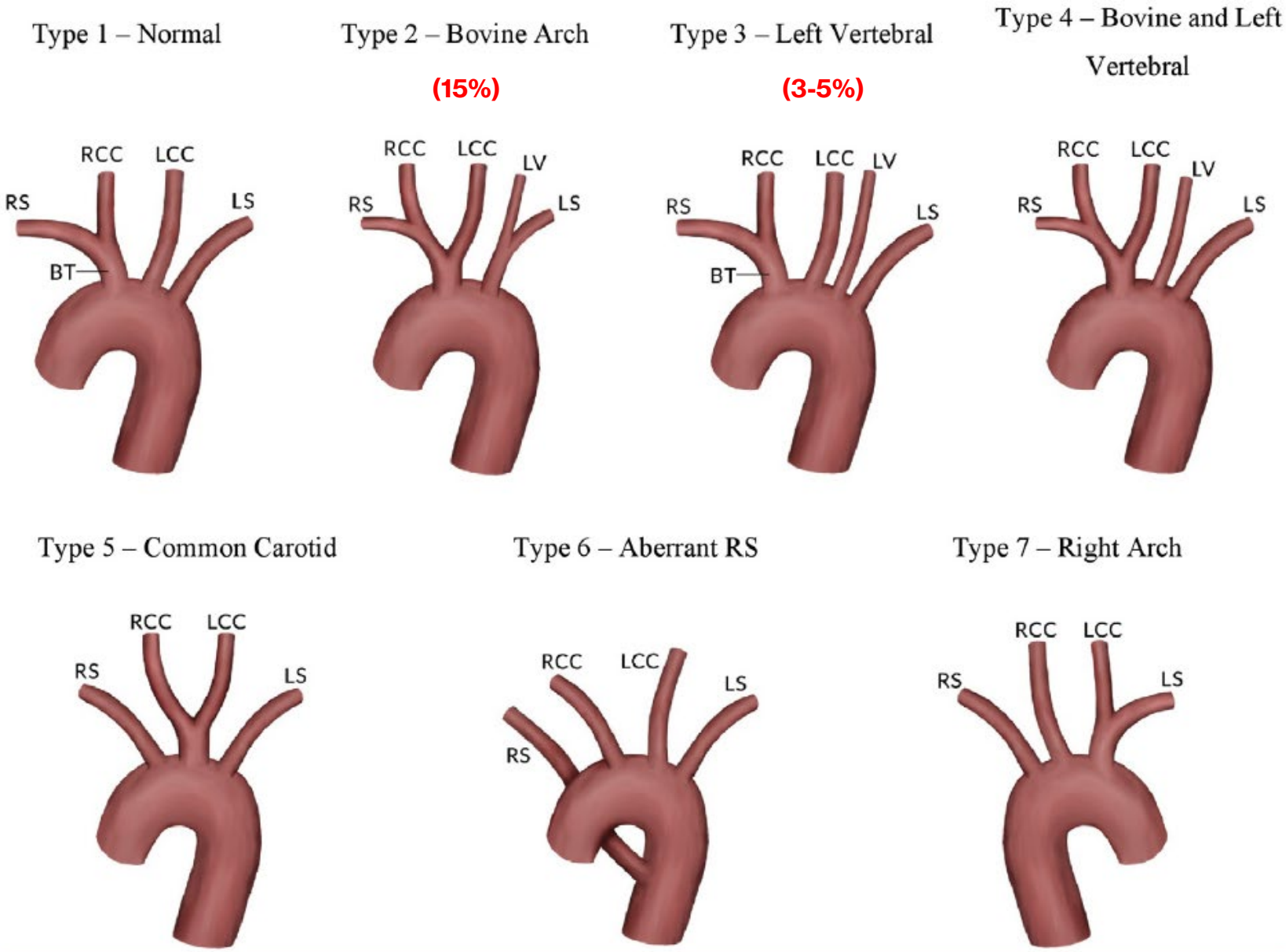


Fig 2. Variants. *BT*, Brachiocephalic trunk; *LCC*, left common carotid artery; *LS*, left subclavian artery; *LV*, left vertebral artery; *RCC*, right common carotid artery; *RS*, right subclavian artery.

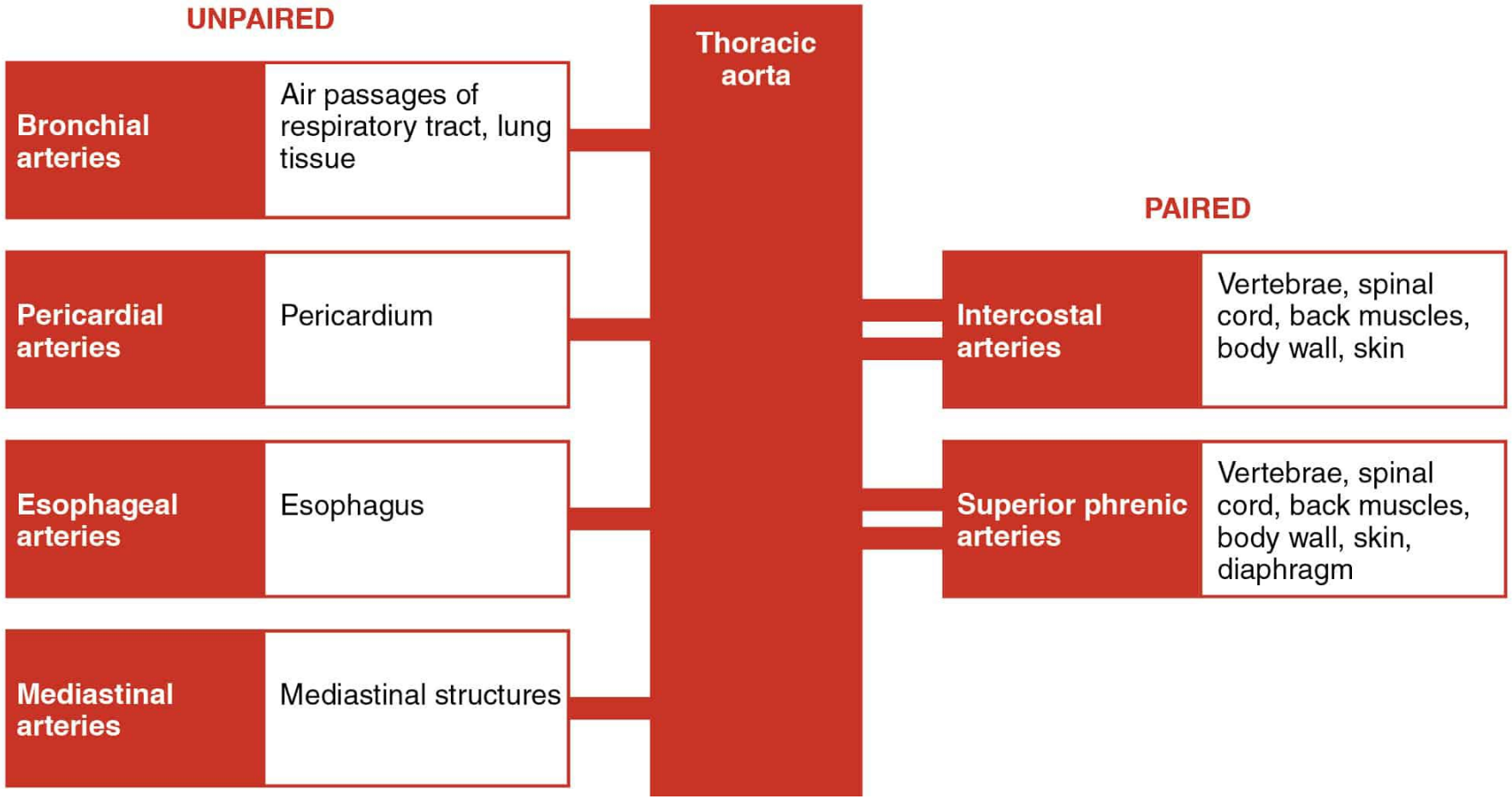
VARIATIONS ANATOMIQUES

- Compression œsophage/trachée rarement
- Augmentation complexité procédures angio-radiologiques et chirurgicales
- Augmentation du risque embolique/ischémique
- Perfusion cérébrale sélective possiblement plus difficile
- Syndromes génétiques (DiGeorge, Turner)

ANATOMIE AORTE

Aorte thoracique descendante

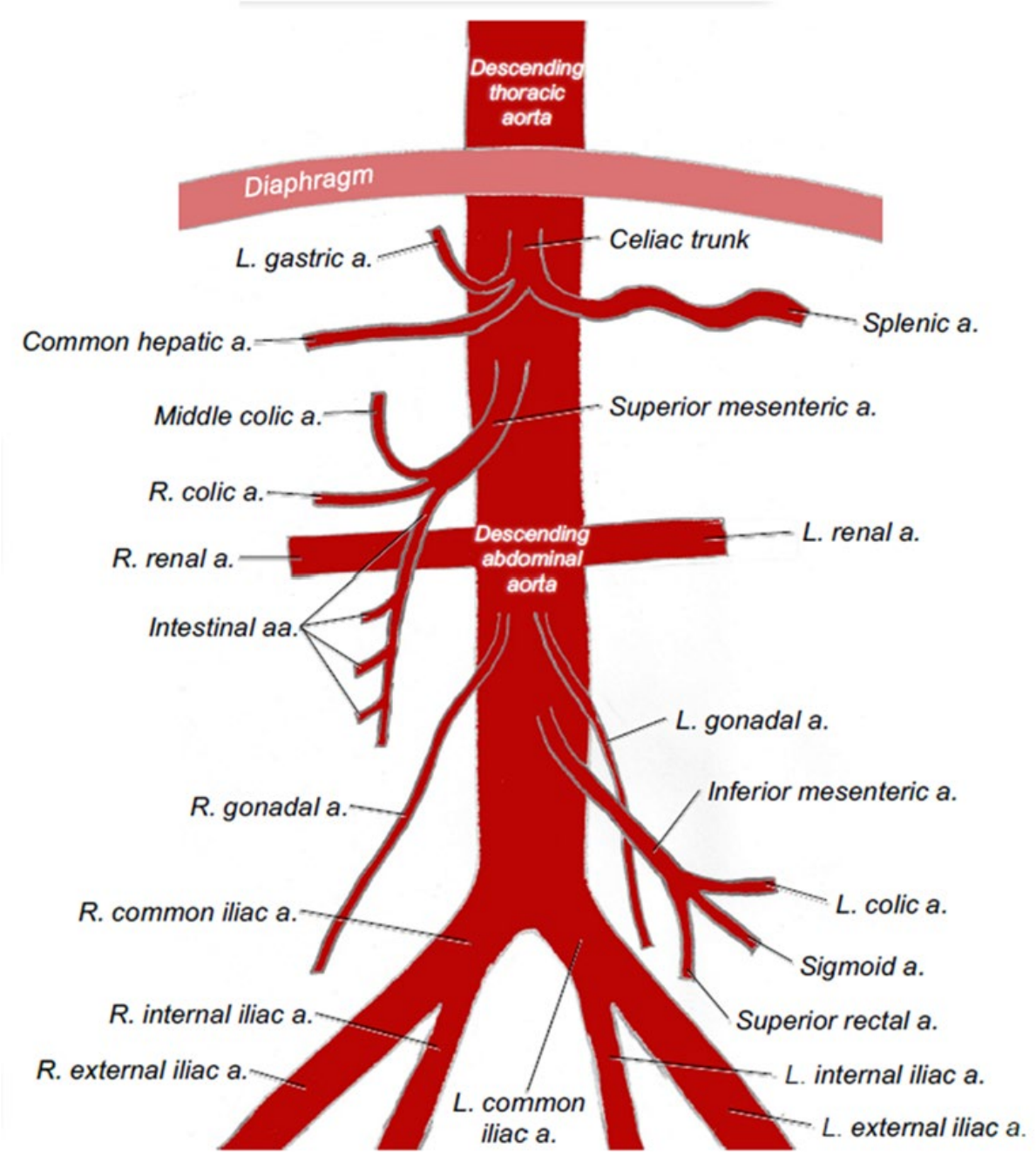
- T4 → T12



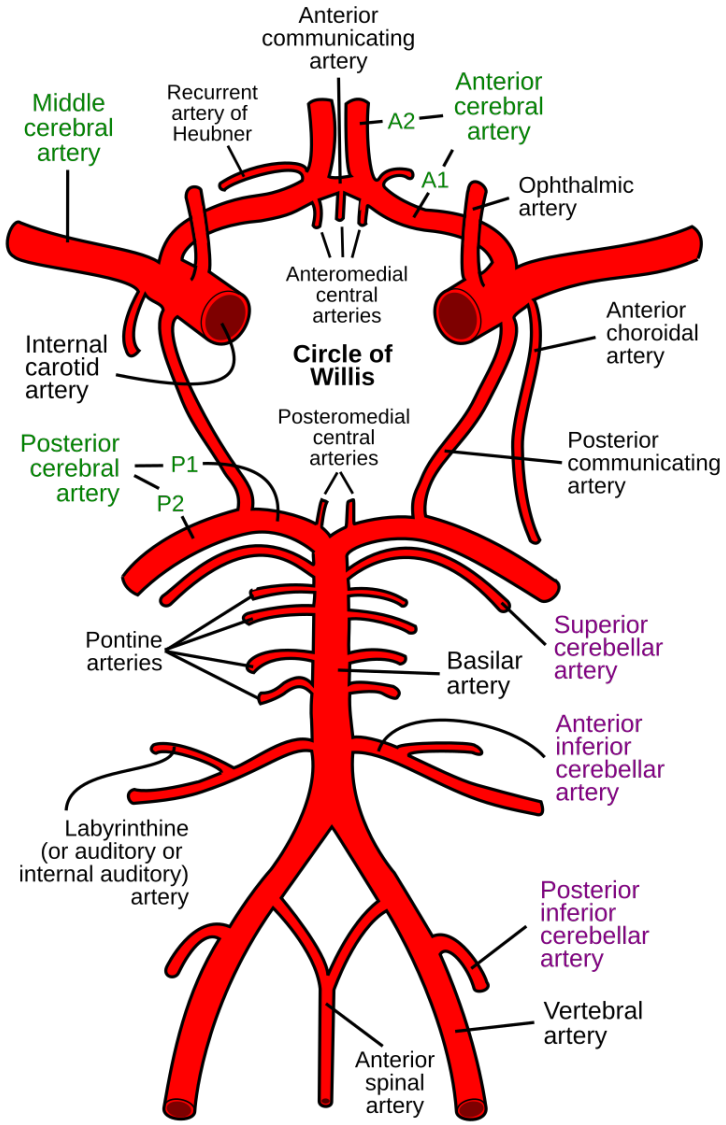
ANATOMIE AORTE

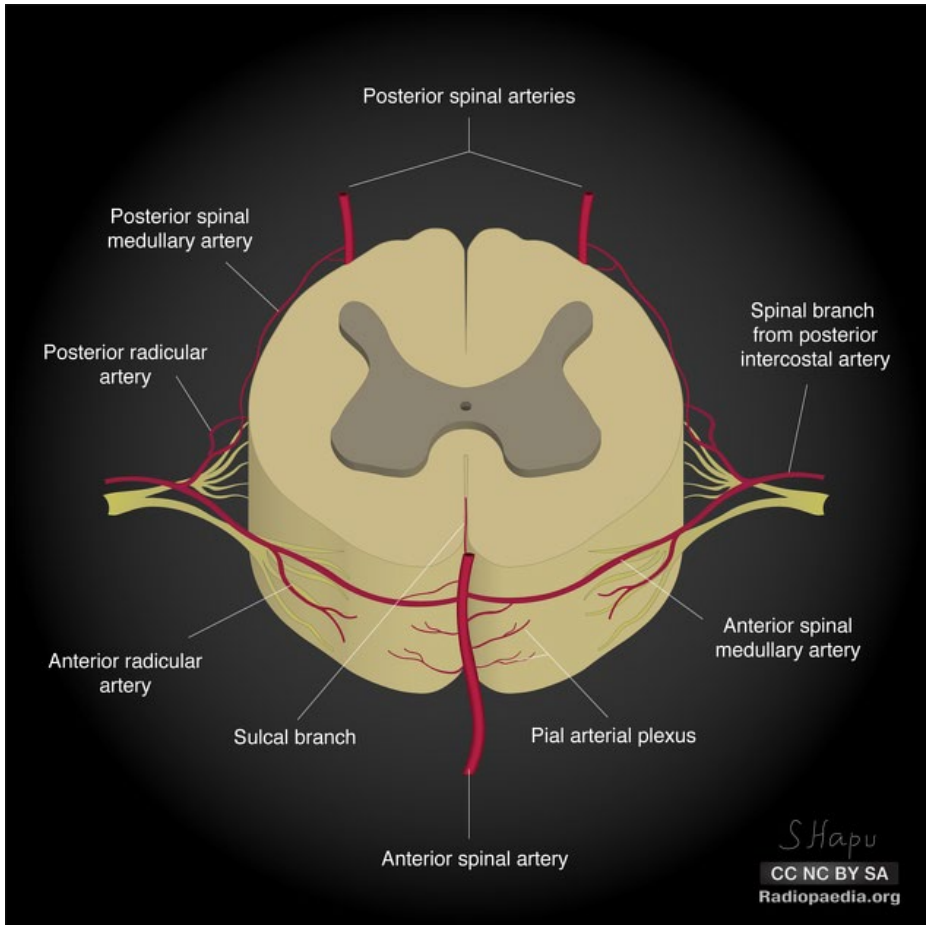
Aorte abdominale

- T12 → L4 (artères iliaques communes)
- Branches principales
  - Tronc cœliaque (T12) : estomac, foie, rate, pancréas, duodénum prox
  - AMS (L1) : duodénum distal ad 2/3 prox colon transverse
  - Artères rénales (L1-L2)
  - AMI (L3): 1/3 distal colon transverse ad rectum



VASCULARISATION SPINALE





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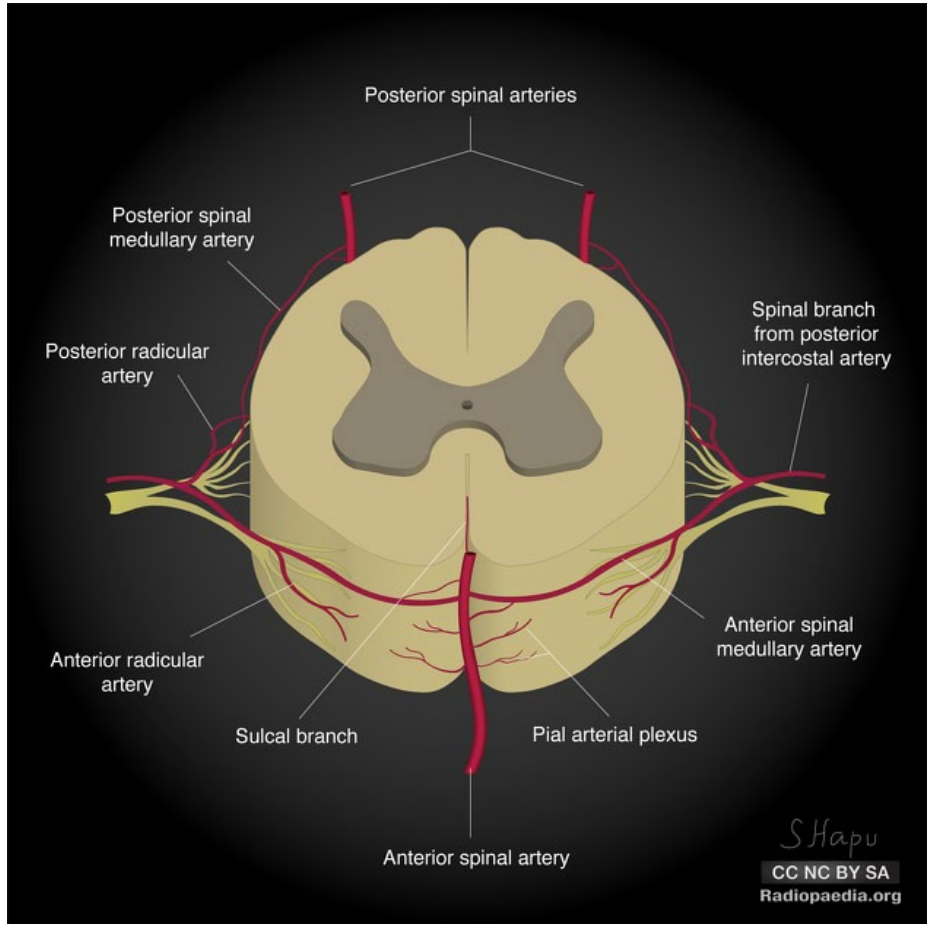
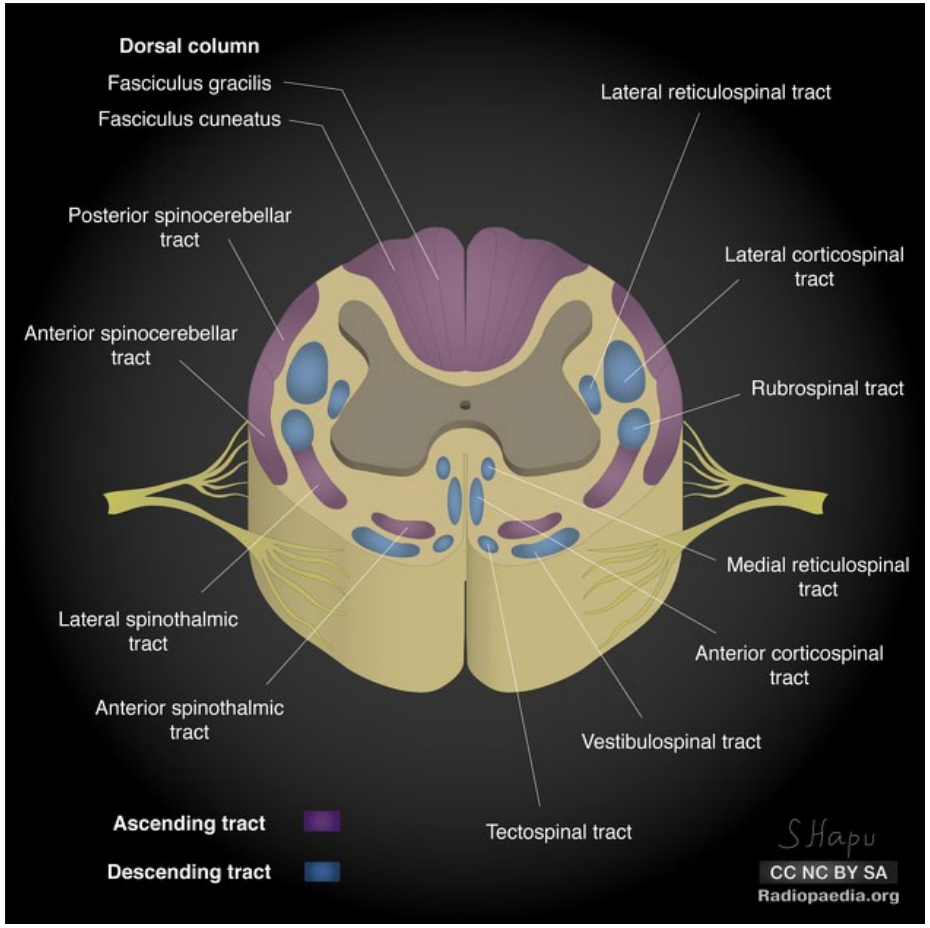
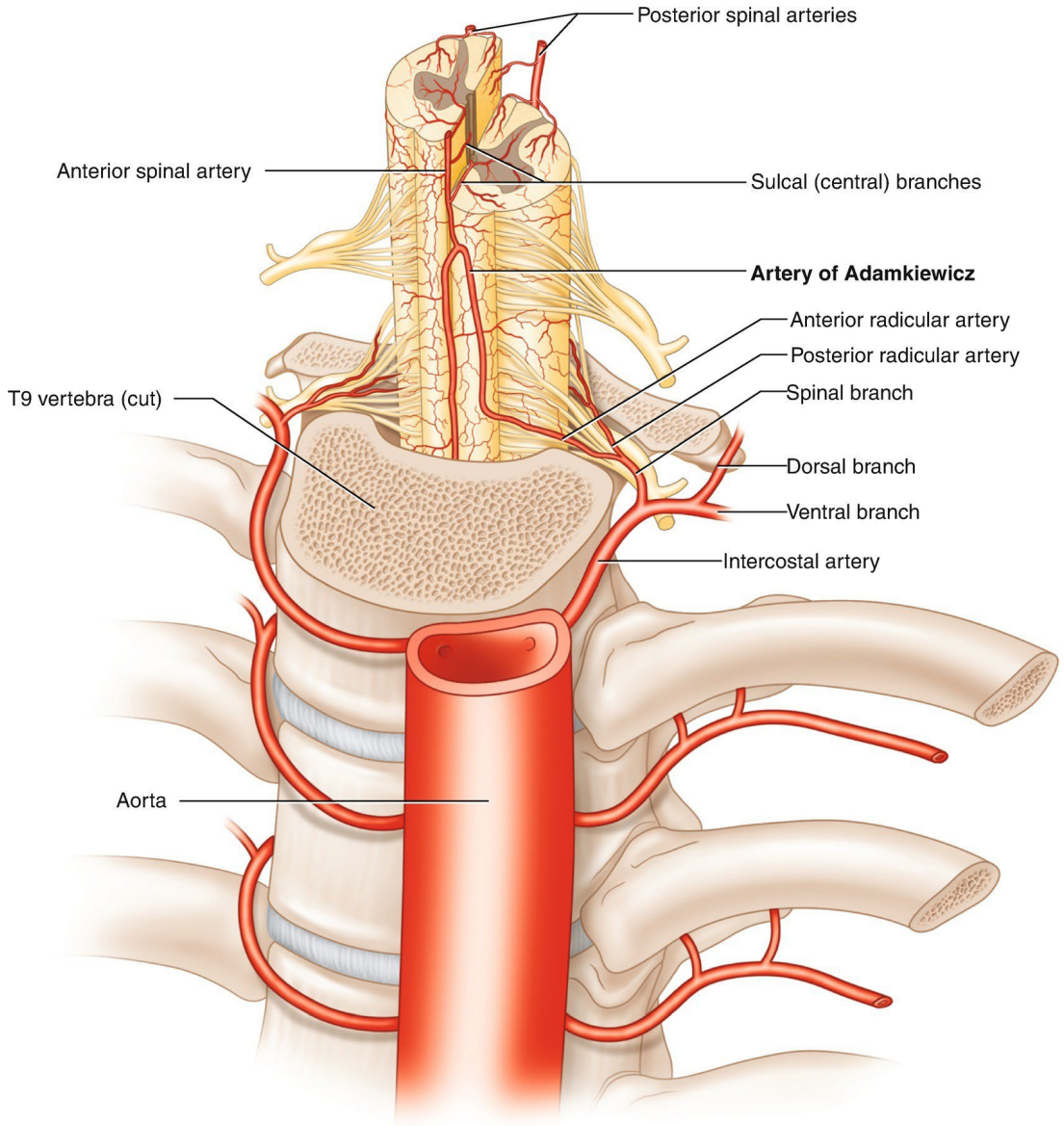




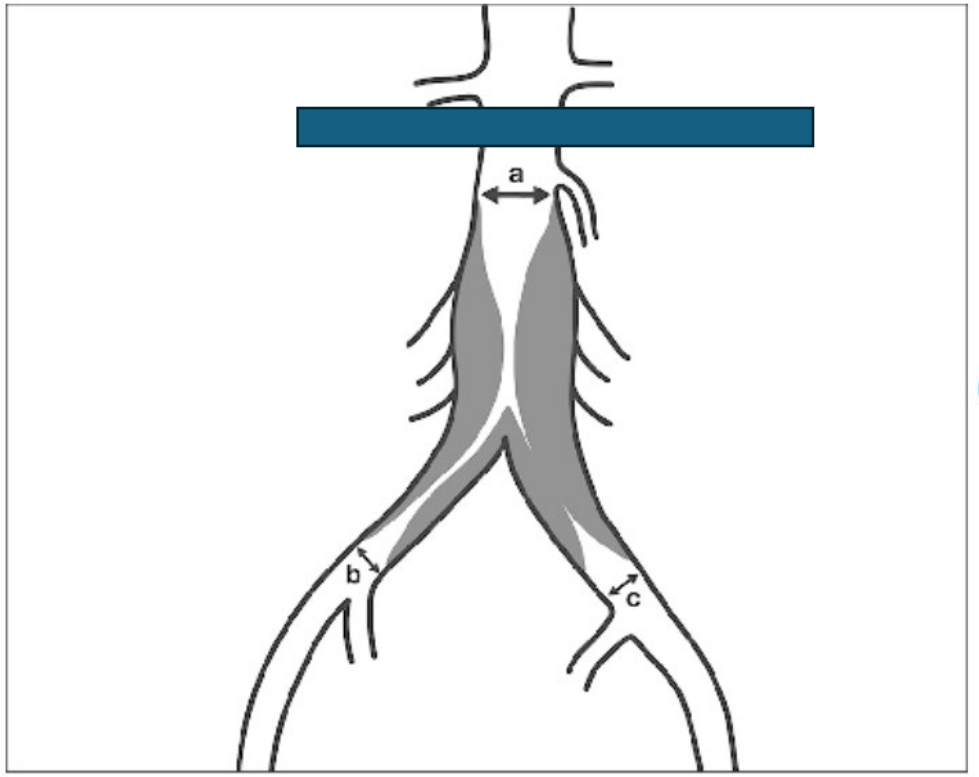
VASCULARISATION SPINALE

- 25% artères spinales postérieures
  - Artères vertébrales, PICA, artères radiculaires postérieures
- 75% artère spinale antérieure
  - Cervical: artères vertébrales
  - T-L: artères radiculaires antérieures
  - Artère Adamkiewicz (T9-L2), gauche
    - 75% T9-T12
    - Apport artériel principal 2/3 spinal distal
    - Haut risque chirurgie aorte thoraco-abdo



CHIRURGIE VASCULAIRE SUPRA-INGUINALE

- Anévrismes Ao
  - Électif et rupture
- Maladie aorto-occlusive (Leriche)
  - Ischémie MI/claudication
  - Pontage aorto-fem/iliaque, unilatéral ou bilatéral
- Syndrome aortique aigue
  - Dissection Ao
  - Hématome intra-mural
  - Ulcère AS pénétrant
- Insuffisance rénale et viscérale
  - Pontage/stent
- Infection
- Trauma



CLAMPAGE AORTIQUE

Box 52.1 Physiologic Changes with Aortic Cross-Clamping* and Therapeutic Interventions

Hemodynamic Changes

- ↑ Arterial blood pressure above the clamp
- ↓ Arterial blood pressure below the clamp
- ↑ Segmental wall motion abnormalities
- ↑ Left ventricular wall tension
- ↓ Ejection fraction
- ↓ Cardiac output[†,‡]
- ↓ Renal blood flow
- ↑ Pulmonary occlusion pressure
- ↑ Central venous pressure
- ↑ Coronary blood flow

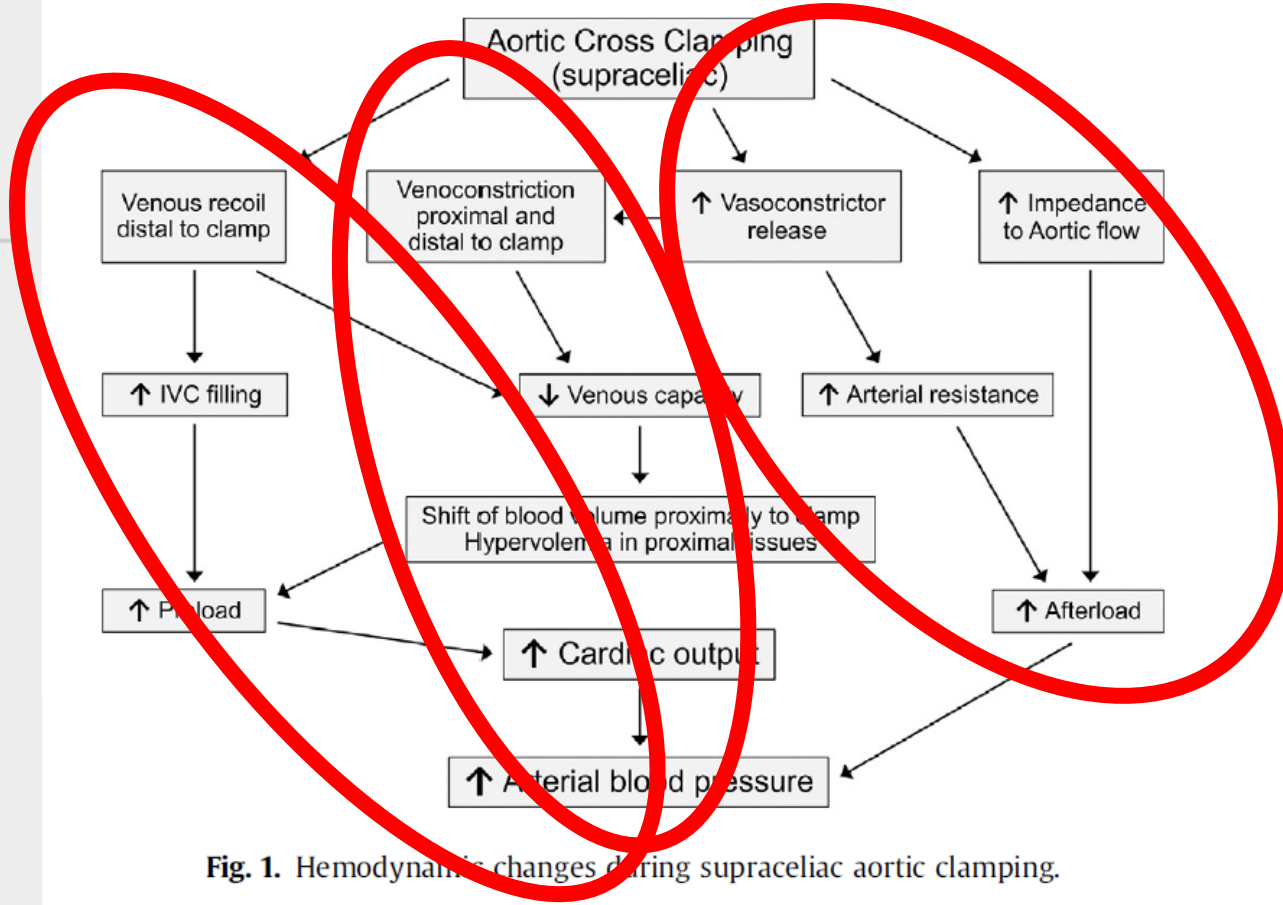
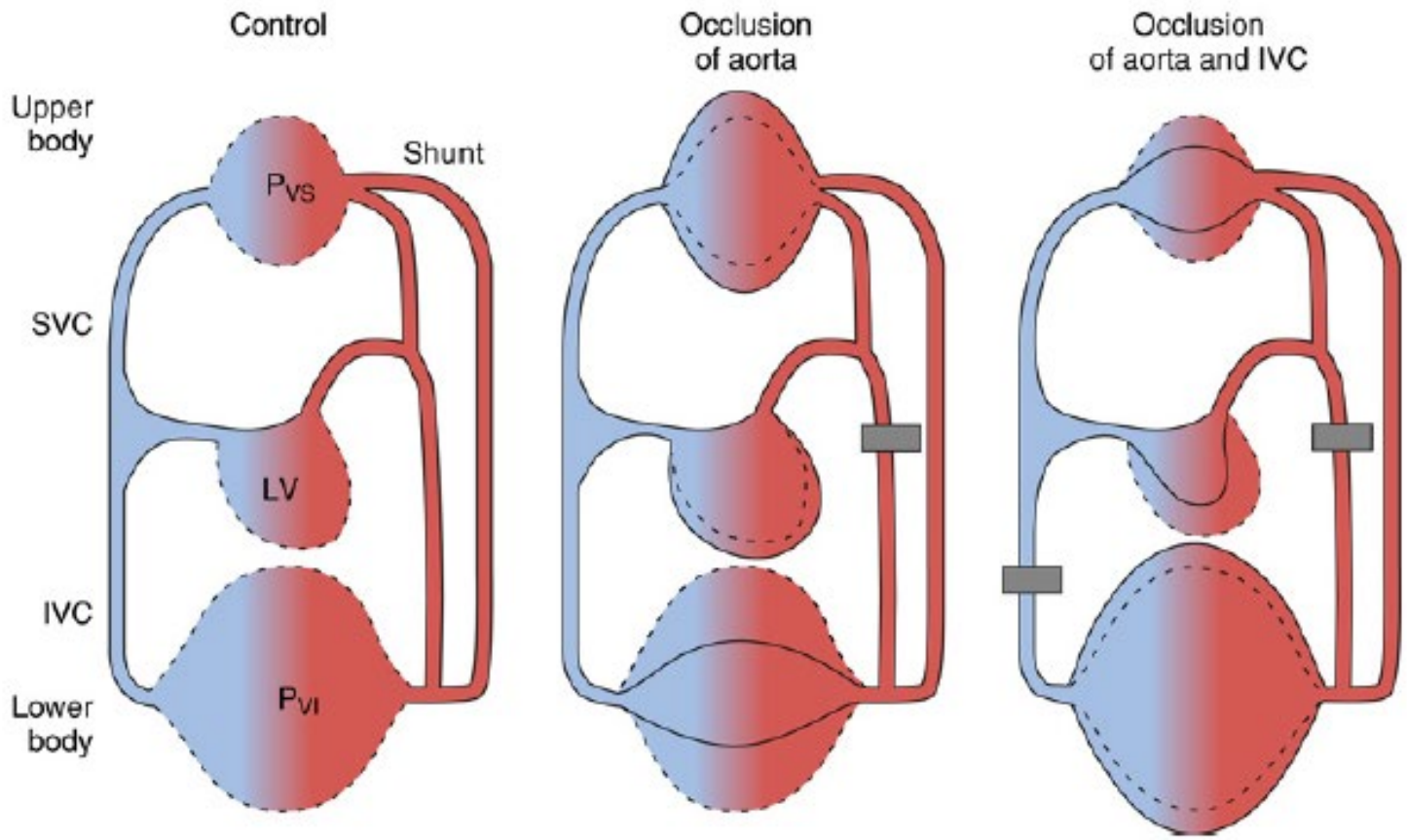


Fig. 1. Hemodynamic changes during supraceliac aortic clamping.

CLAMPAGE AORTIQUE



CLAMPAGE AORTIQUE

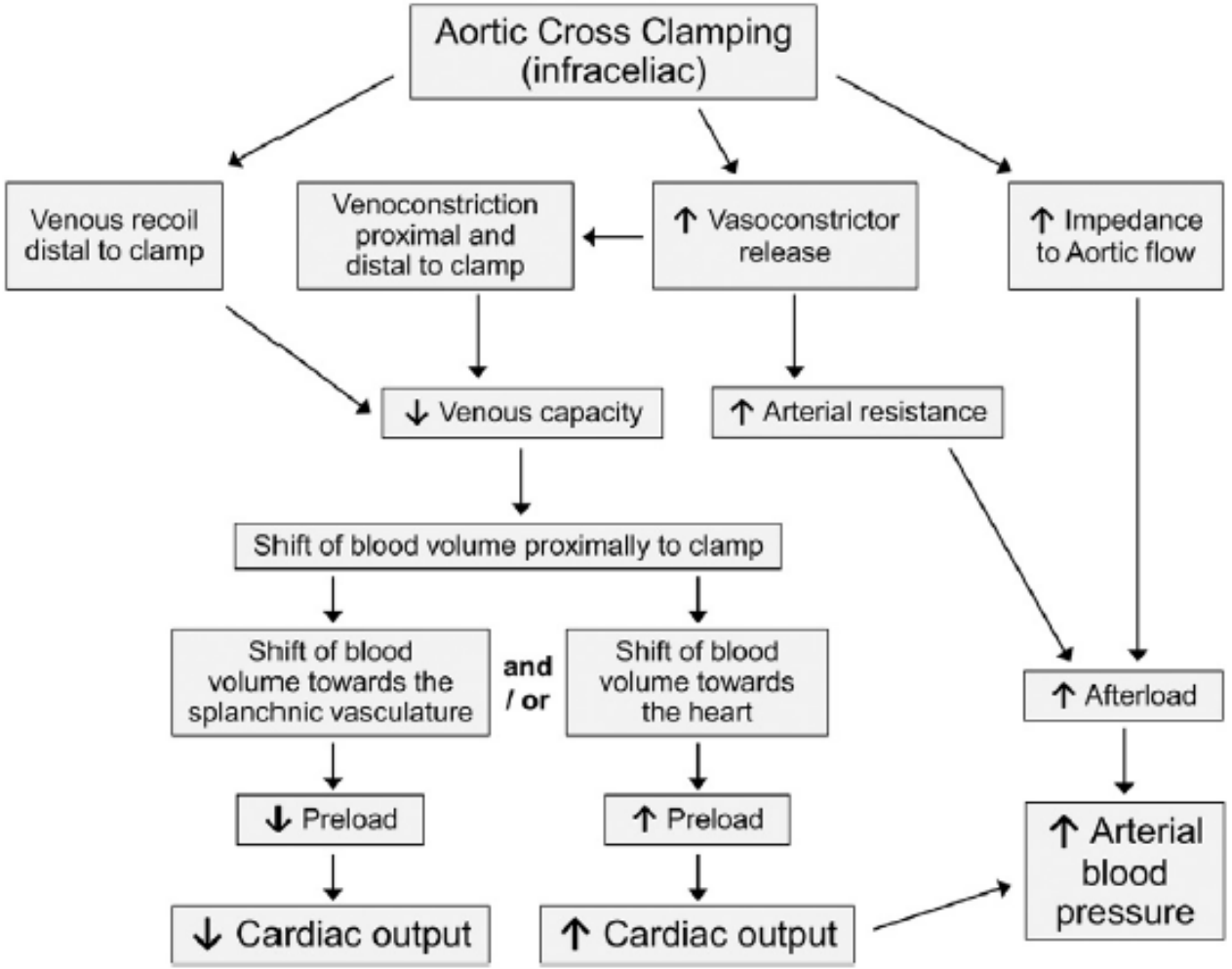
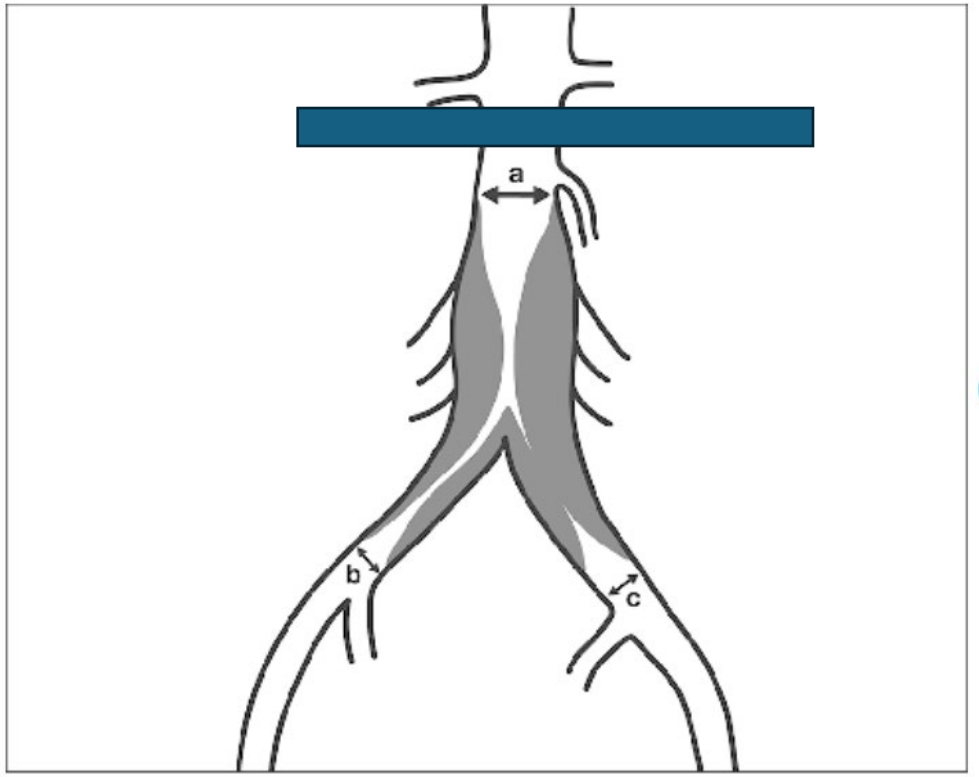


Fig. 2. Hemodynamic changes during infraceliac aortic clamping.

CLAMPAGE AORTIQUE

- Impact hémodynamique dépend:
  - Niveau du clamp (supra vs infra-rénal)
  - Fonction cardiaque pré-X et présence MCAS
  - Collatérales (anévrisme vs maladie aorto-occlusive)
  - Statut volémique (incluant saignement)
  - Réponse sympathique
  - Technique anesthésique
  - Utilisation vasodilatateurs
  - Support circulatoire
  - Médication patient



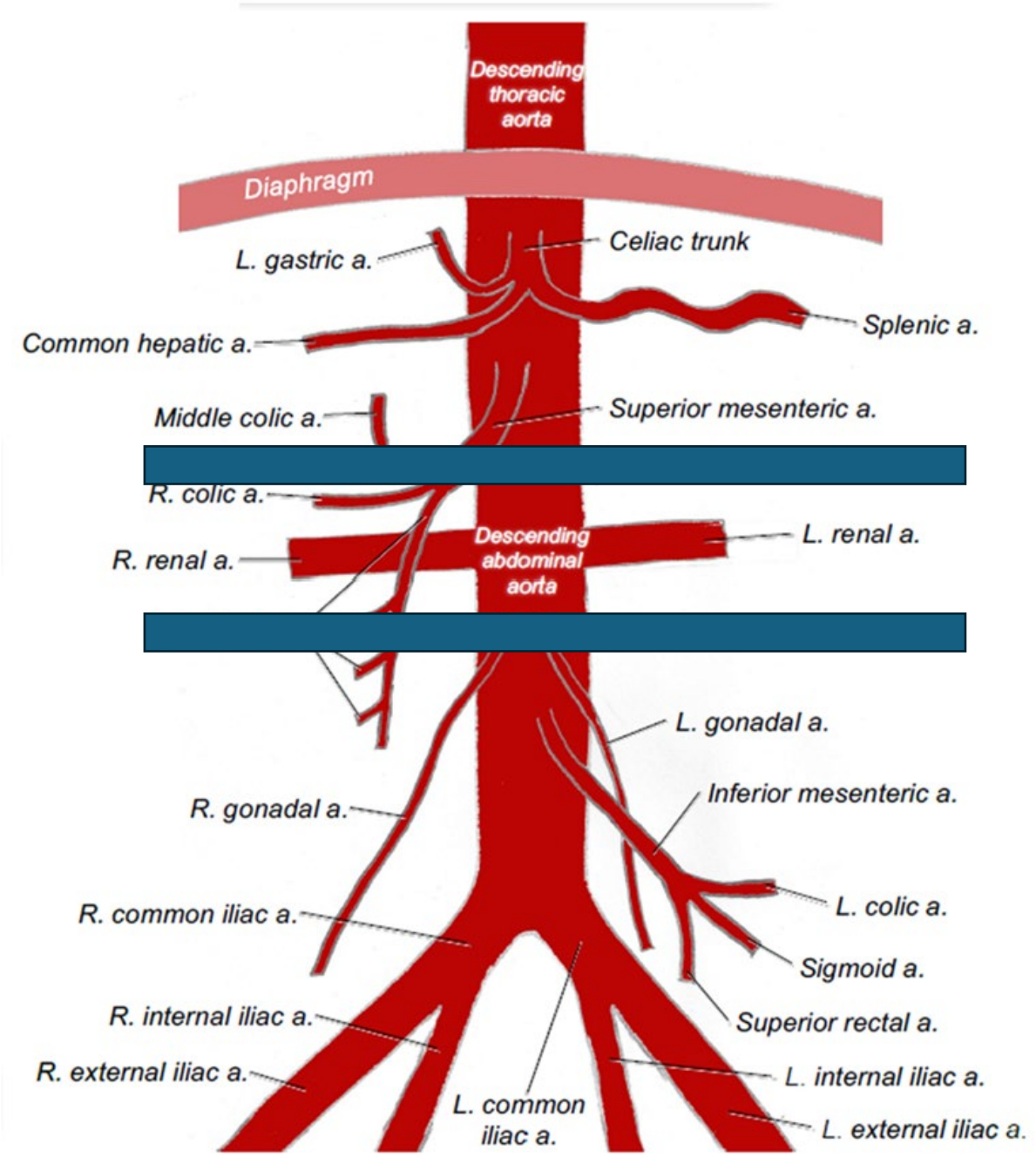
CLAMPAGE AORTIQUE

Table 40-2 Effect of Level of Aortic Occlusion on Changes in Cardiovascular Variables[a]

	% Change in Variable, by Level of Aortic Occlusion		
Cardiovascular Variable	***Supraceliac***	***Suprarenal***	***Infrarenal***
Mean arterial blood pressure	54	5	2
Pulmonary capillary wedge pressure	38	10	0
End diastolic area	28	2	9
End systolic area	69	10	11
Ejection fraction	–38	–10	–3
Abnormal motion of wall, % of patients	92	33	0
New myocardial infarction, % of patients	8	0	0

CLAMPAGE AORTIQUE

- Clampage infra-rénal
  - <30–45 minutes, bien toléré
  - Ischémie colon rare 1-5% (double perfusion SMA/IMA via collatérales)
  - Ischémie membres inférieurs rare (plutôt compartiment si clampage prolongé)
  - Insuffisance rénale (5%)
    - Embolisation plaque AS
    - Hypoperfusion per-op
    - Ischémie-reperfusion et NTA
    - FR: IRC pré-op, age, DB2, HTA, ASO Ao++
- Clampage supra-rénal
  - 20-40% IRA

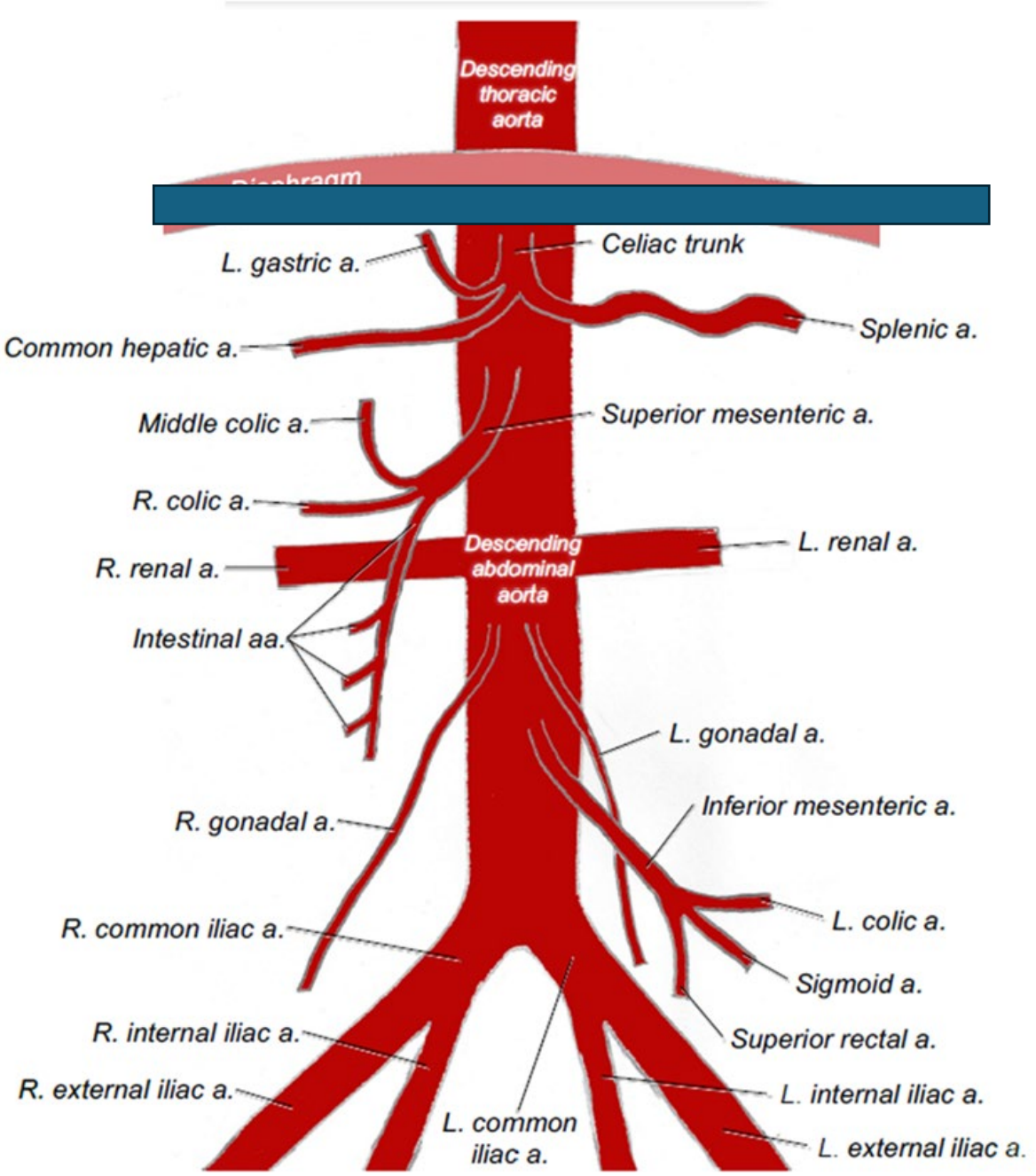


CLAMPAGE AORTIQUE

- Clampage supra-cœliaque
  - <30 minutes idéalement sinon ischémie hépatique, intestinale
  - 20-40% IRA, 5-15% dialyse

Techniques minimiser atteinte organes

- Limiter le temps de clampage
- Clampage séquentiel
- Perfusion sélective
- Support circulatoire
- Hypothermie régionale ou systémique
- Optimiser DO2 et pression perfusion (collatérales)



DÉ-CLAMPAGE AORTIQUE

- Magnitude impact hémodynamique dépend:
  - Niveau du clamp
  - Durée de clampage
  - Séquence de dé-clampage
  - Statut volémique/saignement
  - Technique anesthésique/Rx utilsés lors du clampage

Box 52.3 Physiologic Changes with Aortic Unclamping* and Therapeutic Intervention

Hemodynamic Changes

↓ Myocardial contractility
↓ Arterial blood pressure
↑ Pulmonary artery pressure
↓ Central venous pressure
↓ Venous return
↓ Cardiac output

CLAMPAGE AORTIQUE – PRISE EN CHARGE

Au clampage
• Vasodilatateurs (nitro, nitroprusside) • B-bloqueurs (esmolol, (labetalol)) • Profondeur anesthésie • Analgésie • Épidurale • Relâcher clamp PRN • Support circulatoire

Au dé-clampage
• Dé-clampage séquentiel si possible • Vasopresseurs • Volume/sang • Profondeur anesthésie • Re-clamper PRN • Traitement acidose/coagulopathie/hypocalcémie

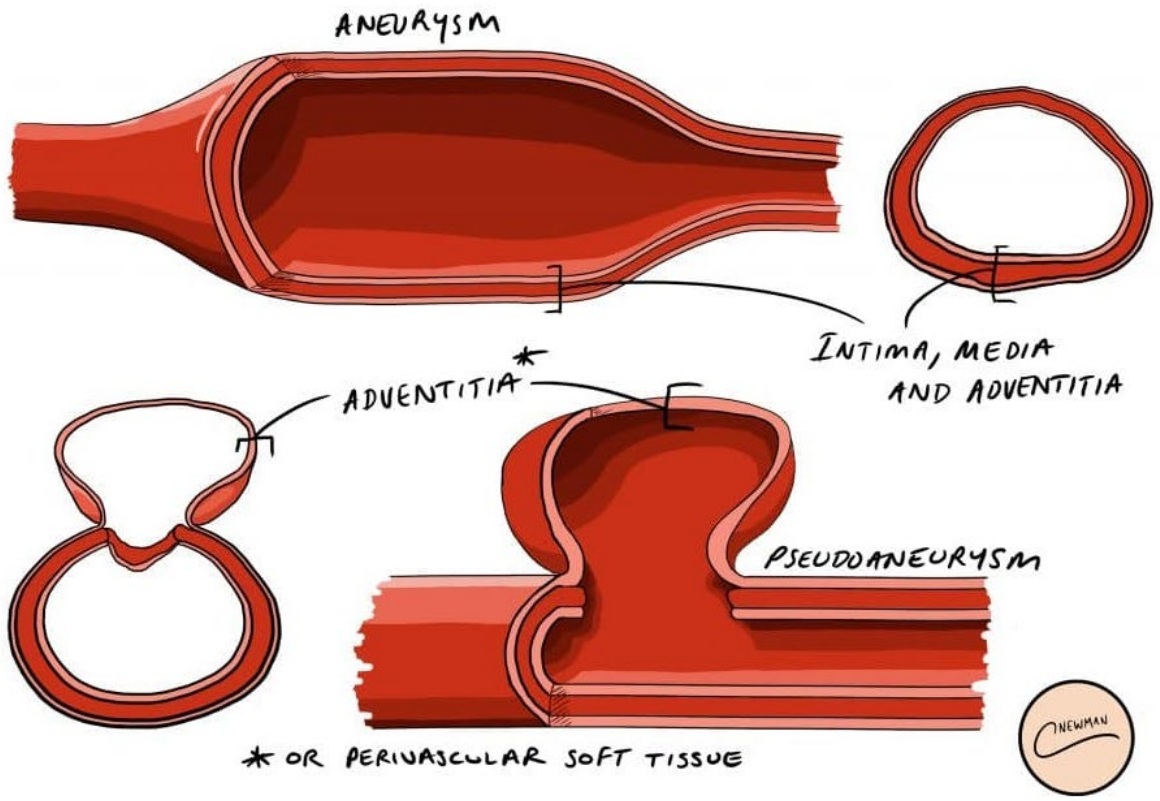
CHIRURGIE ANÉVRISME AORTIQUE

- Dilatation segment aorte 1.5x normal
  - Vrai anévrisme: 3 couches
  - Faux anévrisme: rupture contenue

TABLE 71.2 Definition of Aneurysm at Various Aortic Segments: Size and Ratio to Normal

	MEN		WOMEN	
Aortic Segment	Diameter (cm)	Ratio to Normal	Diameter (cm)	Ratio to Normal
Ascending	4.7	1.8	4.2	1.7
Descending	3.7	1.5	3.3	1.3
Infrarenal	3.0	1.1	2.7	1.0

From Wanhainen A, et al. Thoracic and abdominal aortic dimension in 70-year-old men and women: a population-based whole-body MRI study. *J Vasc Surg.* 2008;47:504–512.



CHIRURGIE ANÉVRISME AORTIQUE

Facteurs

- Âge (>65 ans)
- Homme
- Histoire famili
- Syndrome gé
  LDS, vEDS)
- Tabagisme
- HTA
- MVAS/MCAS
  - 25% patient
- Infection (myc
  inflammatoire

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TABLE 72.2 12-Month Risk of Rupture Based on Abdominal Aortic Aneurysm Diameter

AAA Diameter (cm)	Rupture Risk (%)
3.0–3.9	0.3
4.0–4.9	0.5–1.5
5.0–5.9	1–11
6.0–6.9	11–22
>7	>30

AAA, abdominal aortic aneurysms.

INDICATIONS SOP

6.5.1. Surgery for Sporadic Aneurysms of the Aortic Root and Ascending Aorta

Recommendations for Surgery for Sporadic Aneurysms of the Aortic Root and Ascending Aorta
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
1	C-LD	1. In patients with aneurysms of the aortic root and ascending aorta who have symptoms attributable to the aneurysm, surgery is indicated.[1,2]
1	B-NR	2. In asymptomatic patients with aneurysms of the aortic root or ascending aorta who have a maximum diameter of ≥5.5 cm, surgery is indicated.[3-9]
1	C-LD	3. In patients with an aneurysm of the aortic root or ascending aorta of <5.5 cm, whose growth rate confirmed by tomographic imaging is ≥0.3 cm/y in 2 consecutive years, or ≥0.5 cm in 1 year, surgery is indicated.[10-13]
2a	B-NR	4. In asymptomatic patients with aneurysms of the aortic root or ascending aorta who have a maximum diameter of ≥5.0 cm, surgery is reasonable when performed by experienced surgeons in a Multidisciplinary Aortic Team.[14-17]

6.5.2. Aortic Arch Aneurysms

Recommendations for Aortic Arch Aneurysms
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
1	C-EO	1. In patients with an aortic arch aneurysm who have symptoms attributable to the aneurysm and are at low or intermediate operative risk, open surgical replacement is recommended.
2a	B-NR	2. In patients with an isolated aortic arch aneurysm who are asymptomatic and have a low operative risk, open surgical replacement at an arch diameter of ≥5.5 cm is reasonable.[1-3]
2a	C-LD	3. In patients undergoing open surgical repair of an ascending aortic aneurysm, if the aneurysmal disease extends into the proximal aortic arch, it is reasonable to extend the repair with a hemiarch replacement.[4,5]
2b	C-LD	4. In patients undergoing open surgical repair of an aortic arch aneurysm, if the aneurysmal disease extends into the proximal descending thoracic aorta, an elephant trunk procedure may be considered.[6,7]
2b	C-EO	5. In patients with an aortic arch aneurysm who are asymptomatic but meet criteria for intervention, but have a high risk from open surgical repair, a hybrid or endovascular approach may be reasonable.

INDICATIONS SOP

6.5.3.1. Size Thresholds for Repair of Descending TAA

Recommendations for Size Thresholds for Repair of Descending TAA Referenced studies that support the recommendations are summarized in the Online Data Supplement.		
COR	**LOE**	**Recommendations**
1	**B-NR**	1. In patients with intact descending TAA, repair is recommended when the diameter is ≥5.5 cm.[1,2]
2b	**B-NR**	2. In patients with intact descending TAA and risk factors for rupture (Table 17), repair may be considered at a diameter of <5.5 cm.[2-6]
2b	**B-NR**	3. In patients at increased risk for perioperative morbidity and mortality (Table 18), it may be reasonable to increase the size threshold for surgery accordingly.[7]

6.5.4.1. Size Thresholds for Open Surgical Repair of TAAA

Recommendations for Size Thresholds for Open Surgical Repair of TAAA Referenced studies that support the recommendations are summarized in the Online Data Supplement.		
COR	**LOE**	**Recommendations**
1	**B-NR**	1. In patients with intact degenerative TAAA, repair is recommended when the diameter is ≥6.0 cm.[1-3]
2a	**B-NR**	2. In patients with intact degenerative TAAA, repair is reasonable when the diameter is ≥5.5 cm and the repair is performed by experienced surgeons in a Multidisciplinary Aortic Team.[1-3]
2a	**B-NR**	3. In patients with intact degenerative TAAA who have features associated with an increased risk of rupture (Table 19), repair is reasonable when the diameter is <5.5 cm.[4]

INDICATIONS SOP

6.5.5.3. Threshold for AAA Repair

Recommendations for the Threshold for AAA Repair Referenced studies that support the recommendations are summarized in the Online Data Supplement.		
COR	**LOE**	**Recommendations**
1	**A**	1. In patients with unruptured AAA, repair is recommended in those with a maximal aneurysm diameter of ≥5.5 cm in men or ≥5.0 cm in women.[1-6]

Recommendations for the Threshold for AAA Repair (Continued)		
COR	**LOE**	**Recommendations**
1	**B-NR**	2. In patients with unruptured AAA who have symptoms that are attributable to the aneurysm, repair is recommended to reduce the risk of rupture.[7,8]
2b	**C-LD**	3. In patients with unruptured saccular AAA, intervention to reduce the risk of rupture may be reasonable.[9]
2b	**C-LD**	4. In patients with unruptured AAA and aneurysm growth of ≥0.5 cm in 6 months, repair to reduce the risk of rupture may be reasonable.[1-5]

ANESTHÉSIE POUR CHIRURGIE AO ABDO OUVERTE

Planification préopératoire

- Comorbidités cardiovasculaires et pulmonaires
- Fonction rénale pré-op
- Gestion médicaments (anticoagulation/plaquettaire, BB, statines, ASA)
- Contre-indication épidurale
- Anévrisme vs maladie aorto-occlusive et son étendue
- Niveau du clampage (infra/supra-rénal ou supra-cœliaque)
- Intervention planifiée
  - Pontage aorto-aortique, PABF
  - Clampage séquentiel, perfusion sélective viscérale
  - Plan et séquence de dé-clampage
- USI post-op

ANESTHÉSIE POUR CHIRURGIE AO ABDO OUVERTE

Gestion per-opératoire

- 2 accès de gros calibre et/ou voie centrale
- Épidurale thoracique
- Canule artérielle
- Réchauffe soluté
- Groupé/croisé valide
- Cell-saver
- ETO si clampage supra-cœliaque
- Médicaments
  - Vasodilatateurs artériels
  - Vasopresseur
- Stratégie volémique
- Stratégie épidurale

Gestion per-opératoire

- Induction stable (MCAS, risque de rupture)
- Maintenance au choix
- Héparine pré-clampage
- ACT selon chirurgien
- Clampage
  - Diminution post-charge
  - Maintien perfusion organes à risque
- Dé-clampage
- Re-transfusion
- Protamine
- Optimisation analgésie
- Extubation

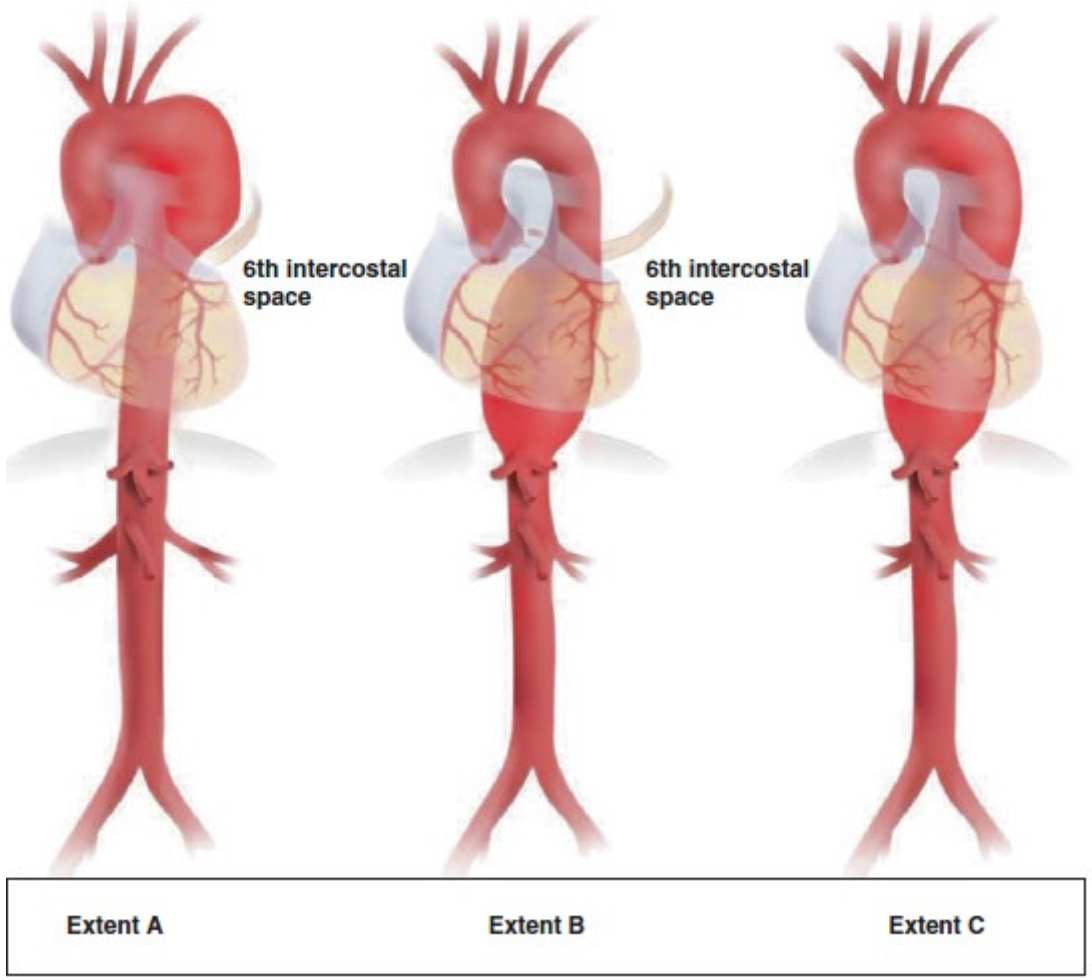
CHIRURGIE AO THORACIQUE OUVERTE

- Chirurgie très haut risque
  - Incidence 5 à 10 par 100 000 personnes/année
  - Chirurgie pour réduire risque dissection/rupture
    - ≥ 5.5 cm DTAA
    - ≥ 6.0 cm TAAA
  - Autres indications chirurgicales
    - Syndrome aortique aigue (dissection, hématome intra-mural, ulcère AS pénétrant)
    - Anévrisme mycotique, pseudo-anévrisme
    - Lésion aortique traumatique

TABLE 78.4 Etiology of Thoracoabdominal Aortic Aneurysms and the Relative Percentage Contributing to Disease[82]

- Degenerative (associated with atherosclerosis) (80%)
- Dissections (15%–20%)
- Connective tissue disorders (Marfan syndrome, Ehlers–Danlos syndrome, Loeys–Dietz syndrome)
- Infection (2%)
- Mycotic aneurysms (*Salmonella, Haemophilus influenzae, Staphylococcus* sp.)
- Syphilis
- Tuberculosis
- Aortitis (2%)
- Takayasu disease
- Nonspecific variety of giant cell aortitis
- Rheumatoid aortitis
- Ankylosing spondylitis
- Reiter syndrome
- Relapsing polychondritis
- Postoperative pseudoaneurysms (<1%)
- Associated with unrepaired and repaired aortic coarctations
- Traumatic (<1%)

ANÉVRISME AORTE THORACIQUE DESCENDANTE



ANÉVRISME THORACO-ABDO

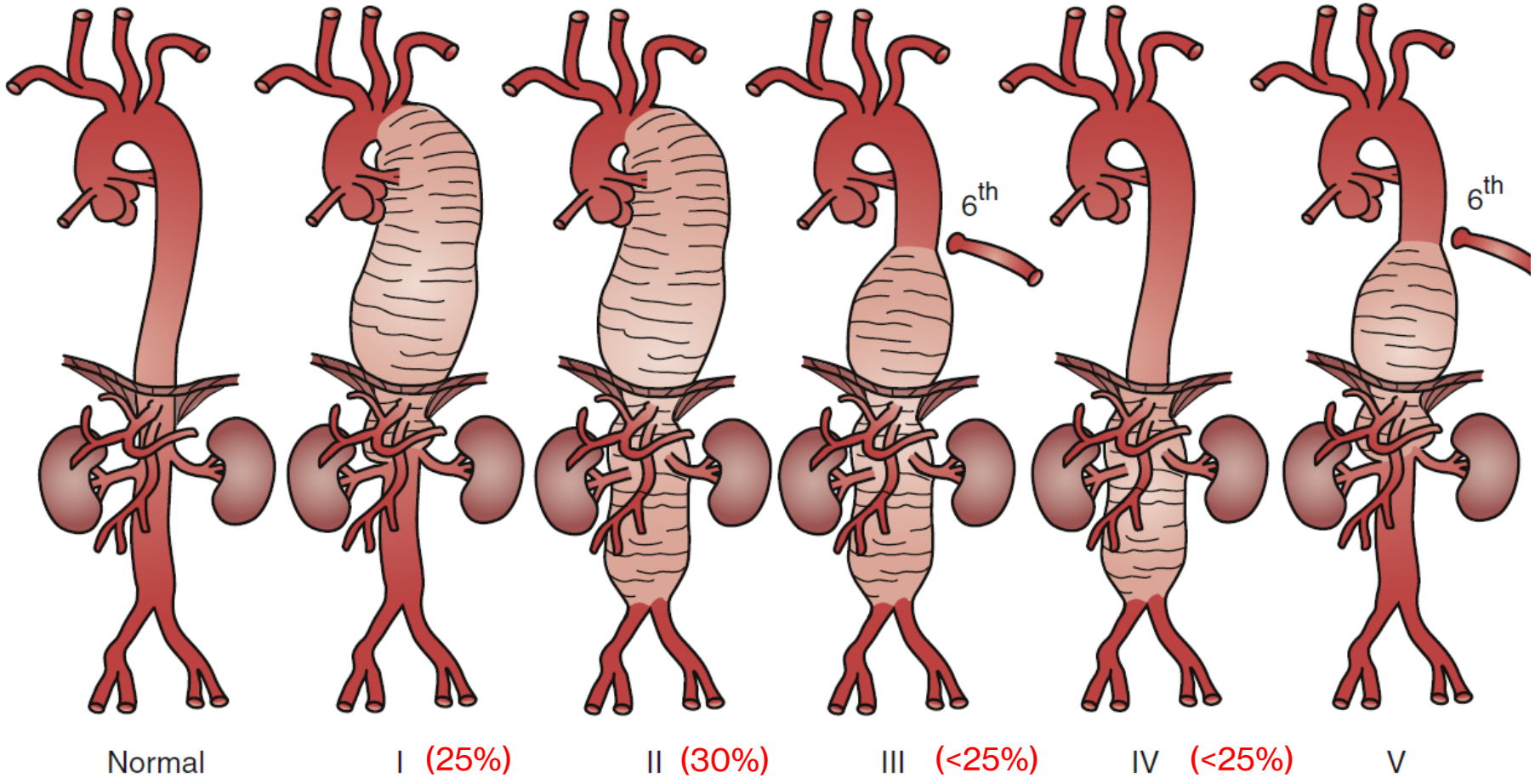
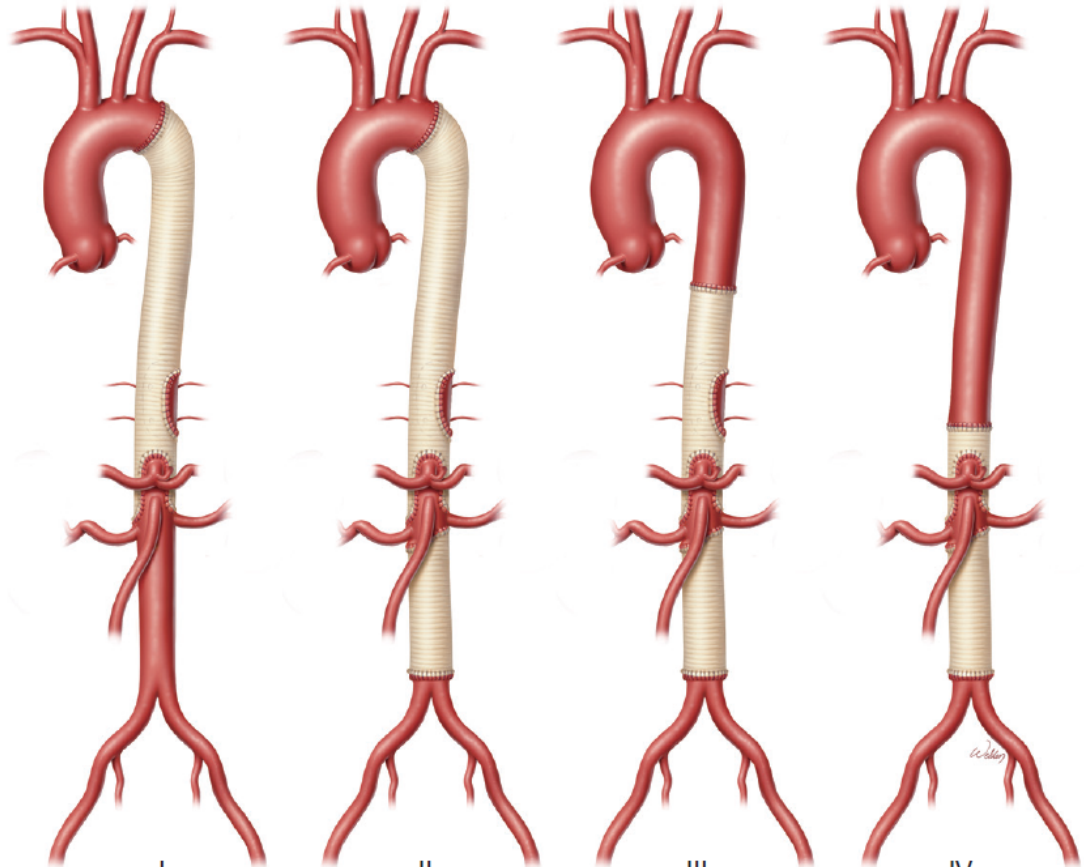


Figure 78.5 **Crawford Classification of Thoracoabdominal Aortic Aneurysms.** Type I, distal to the left subclavian artery to above the renal arteries. Type II, distal to the left subclavian artery to below the renal arteries. Type III, from the sixth intercostal space to the renal arteries. Type IV, entire abdominal aorta. Type V, below the 6 intercostal space to just above the renal arteries.



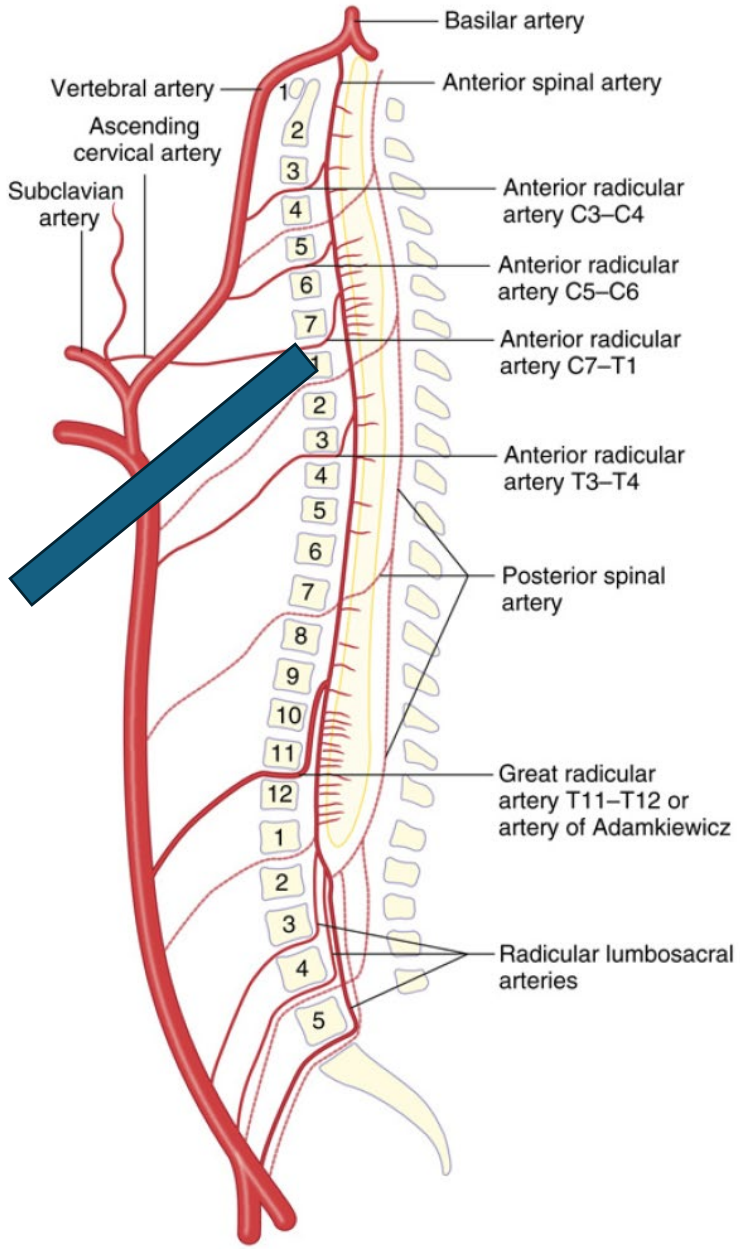
Operative mortality	5.9%	9.5%	8.8%	5.4%
Persistent stroke	2.4%	3.4%	1.1%	1.3%
Persistent spinal cord deficit	3.4%	8.0%	7.0%	2.4%
Respiratory failure with tracheostomy	8.1%	12.3%	7.0%	4.5%
Acute kidney injury with dialysis at discharge	4.9%	9.6%	7.9%	7.6%

CHIRURGIE AO THORACIQUE

Table 1 Risk factors associated with increased risk of spinal cord deficit after thoracoabdominal aortic aneurysm repair

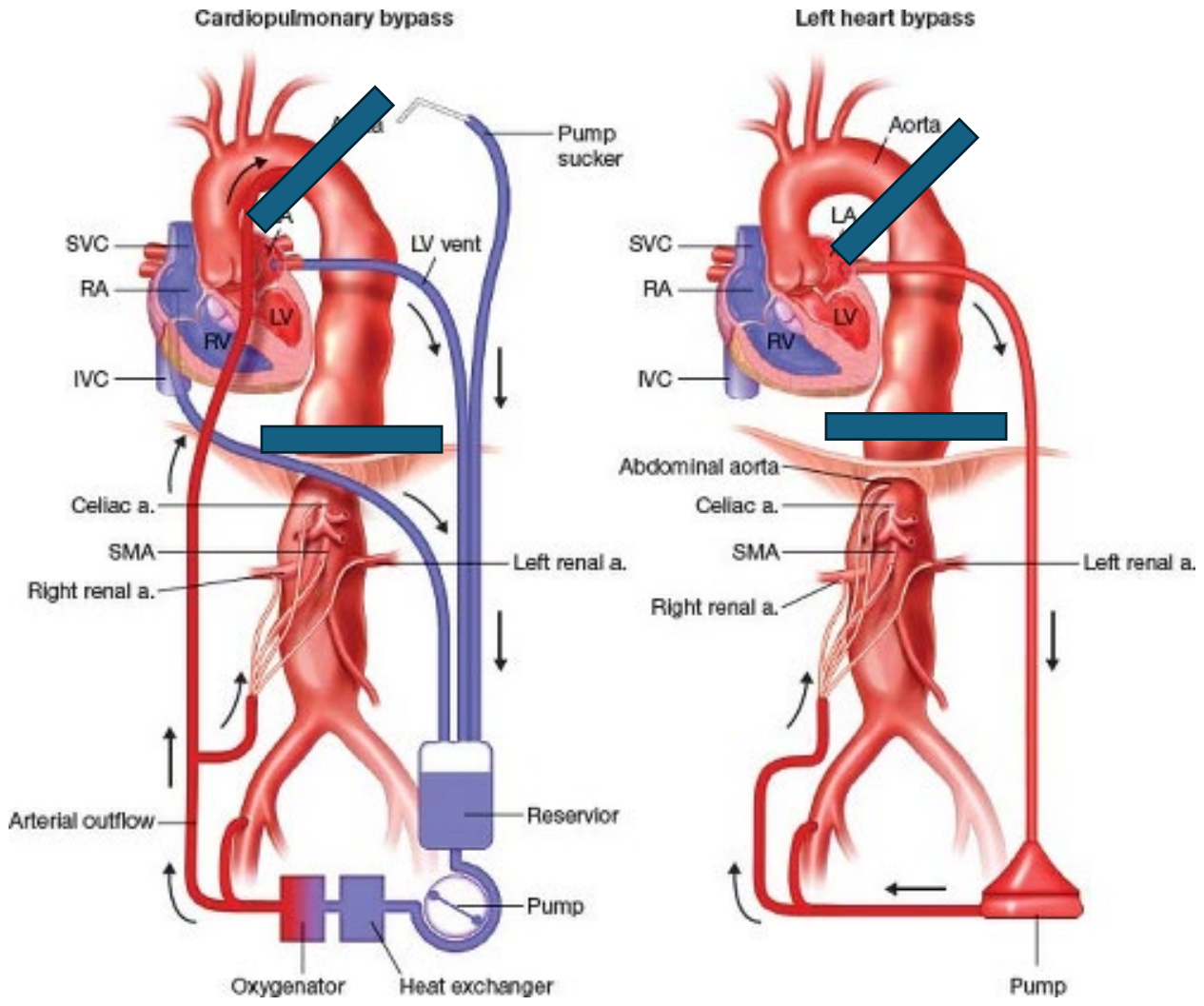
Preoperative
Advanced age
Previous abdominal aortic surgery
Chronic kidney disease
Presentation
Emergency surgery
Aortic dissection/rupture
Intraoperative
Level of aortic cross clamping; greater anatomic extent of TAAA repair
Exclusion of the hypogastric artery
Failure to reattach critical intercostal arteries
Left subclavian artery exclusion
Degree of hypothermia
Period of distal ischemia

TAAA, thoracoabdominal aortic aneurysm.



CHIRURGIE AO THORACIQUE

- Technique opératoire
  - Clamp and sew
  - Bypass partiel gauche
    - Pas besoin d'oxygénateur
    - Moins d'héparine
    - Plus simple
  - CEC ± arrêt circulatoire
    - Heparine ACT ≥ 480
    - Coagulopathie post arrêt circulatoire
    - Plus complexe
    - Généralement cas + plus complexe (ie aorte pas clampable), REDO



CHIRURGIE AO THORACIQUE

- Technique opératoire
  - Embolisation artères segmentaires pré-op
    - Optimiser réseau collatérales pré-op
  - Hypothermie légère (32-34 ºC)
    - Diminution consommation O2 5% par ºC
  - Réimplantation artères intercostales
    - T8-L2 réimplantée d'emblée ou selon imagerie/potentiels évoqués
    - Autres intercostales ligaturées pour limiter saignement et optimiser collatérales
  - Clampage séquentiel
  - Perfusion rénale et viscérale sélective
    - LR froid (4°C) ou HTK
    - Sang oxygéné par bypass partiel ou CEC

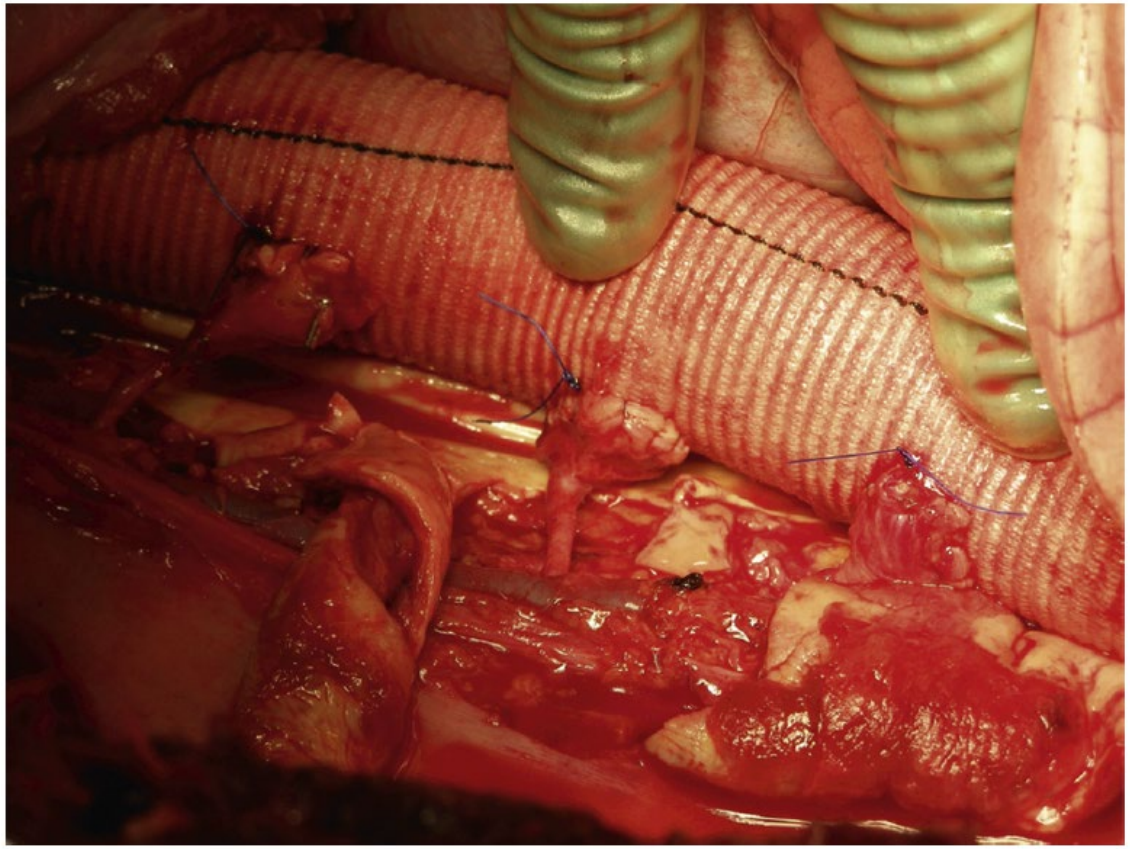


Figure 79.10 In the most extensive aneurysms with many open intercostal arteries we reattach intercostal arteries identified with preoperative spinal artery MR angiography or by patency and location between T8 and L2 at surgery, as shown in this operative photo.

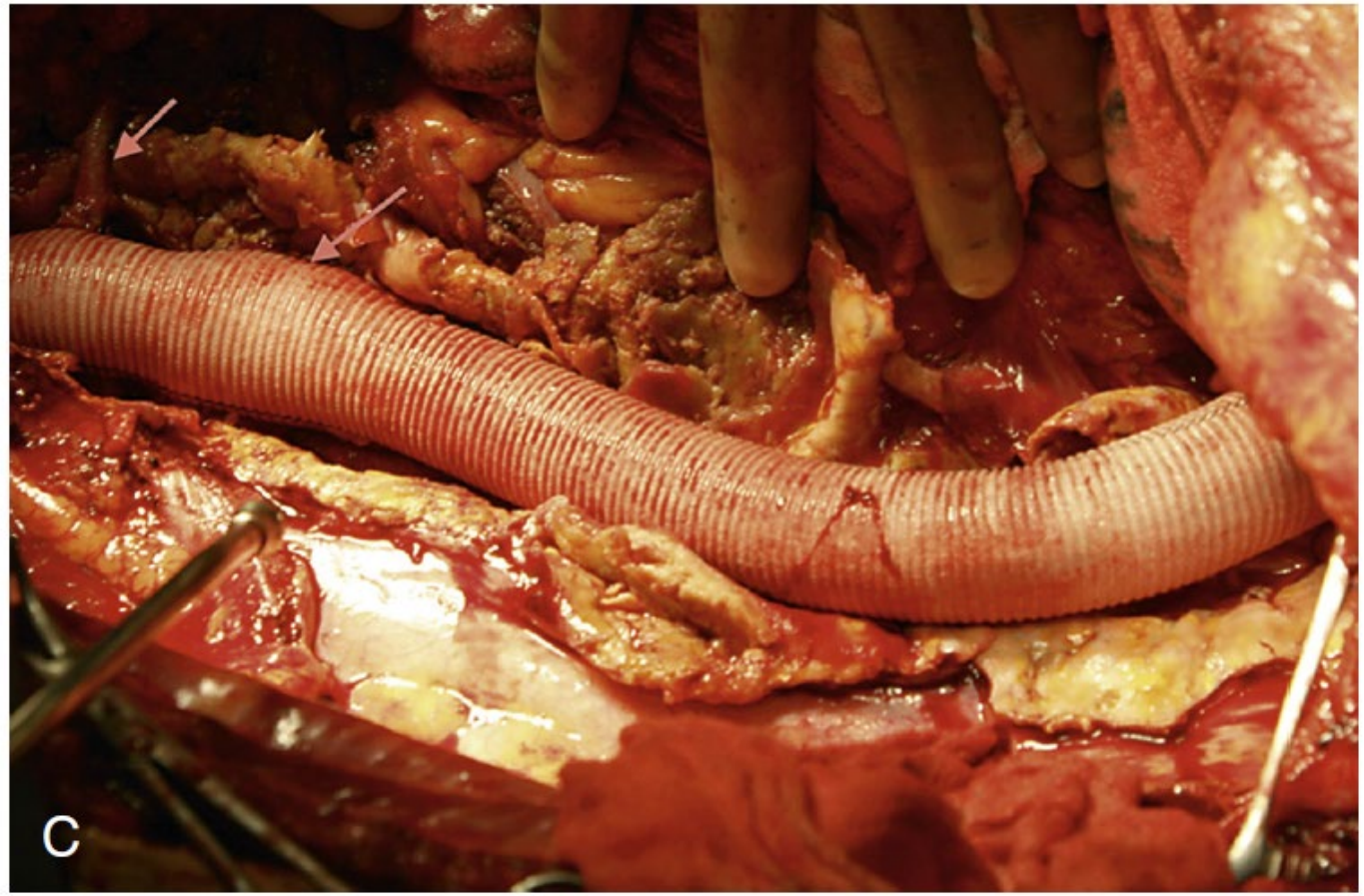


Figure 79.8 (**A**) When attaching visceral and renal arteries to the graft it is important to keep the Carrel patch as narrow (small) as possible so patch aneurysms do not form. Spacing between the vessels determines patch configuration and if the vessels are too far apart they are attached individually. (**B**) Sewing a visceral patch comprising the celiac and SMA with their balloon catheters in place. These are removed after establishing blood flow to that portion of the aorta. (**C**) Completed graft within the aneurysm sac with arrows to the visceral patch and left renal artery.

CHIRURGIE AO THORACIQUE

- Drain lombaire
  - Inséré pré-op L4-L5
  - Drainage lombaire à 10 mmHg
  - PPM 70 mmHg per-op puis selon examen neuro
  - TAM 80 per-op
  - 10-15 cc/heure, max 20 cc/h
  - Risque HSD si trop drainage
  - Maintenu 48-72h post-op USI

PPM = TAM - PIcr

Figure 4. Cerebrospinal Fluid drainage catheter insertion (a), final position (b), and draining system (c).

CHIRURGIE AO THORACIQUE

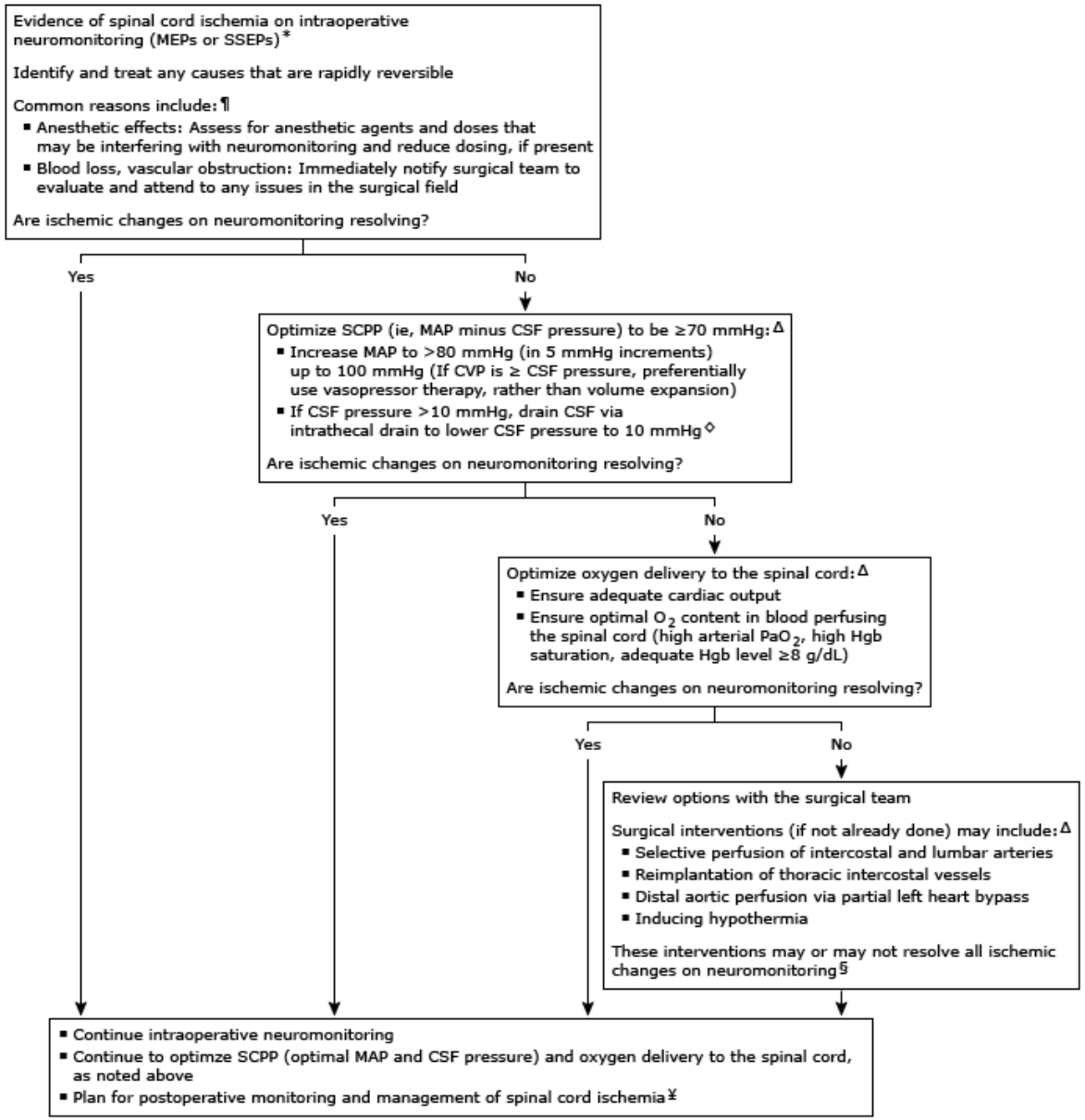
- Neuromonitoring per-op
  - Chirurgie haut risque
  - MEP et SSEP
  - TIVA, pas de curares (propofol, opioïdes, kétamine, précedex ok)
  - Affectés par hypothermie significative

Caractéristique	**SSEP**	**MEP**
Voie testée	Colonnes postérieures (sensitive)	Voie cortico-spinale (motrice)
Type de stimulation	Nerveuse périphérique	Transcrânienne
Enregistrement	Cortex sensoriel	Muscles périphériques
Changement significatif	↓Amplitude > 50% ou ↑Latence > 10%	↓Amplitude > 75–80% ou perte complète

Pertes MEPs/SSEPs

- R/O effet anesthésie
- Manipulation chirurgicale
- Augmentation TAM
- Augmenter drainage drain lombaire
- Optimiser DO2
  - Débit cardiaque
  - Oxygénation
  - Hb
- Intervention chirurgicale
  - Réimplantation artères intercostales
  - Optimiser perfusion distale/sélective
  - Hypothermie

Intraoperative spinal cord ischemia during descending thoracic aortic surgery



ANESTHÉSIE POUR CHIRURGIE AO THOR OUVERTE

Pré-op

- Isolation pulmonaire (bloqueur bronchique préféré)
- Accès veineux gros calibre
- 2 canules artérielles (radiale/fémorale)
- Voie centrale
- Swan avec débit cardiaque continu
- ETO
- Cell-saver
- Médicaments
  - Vasodilatateurs artériels
  - Vasopresseur
- Protection spinale
  - Perfusion distale
  - Drain lombaire
  - Potentiels évoqués

Per-op

- Induction titrée (éviter rupture)
- TIVA si neuro-monitoring
- LHB vs CEC
  - Maintien perfusion distale
  - Héparine et ACT selon modalité
- Maintien PPM (TAM 80, drain lombaire 10 mm Hg)
- Optimisation DO2
- Anticiper pertes sanguines massives et coagulopathie
- Éveil précoce pour évaluer fonction neuro

ANESTHÉSIE POUR RUPTURE AORTIQUE

Mortalité AAA rupturé	
Pre-hospitalière	50%
Avec chirurgie ouverte	50%
EVAR	30%

Mortalité TAAA, dTA rupturé	
Pre-hospitalière	70%
Avec chirurgie ouverte	60%
EVAR	30%

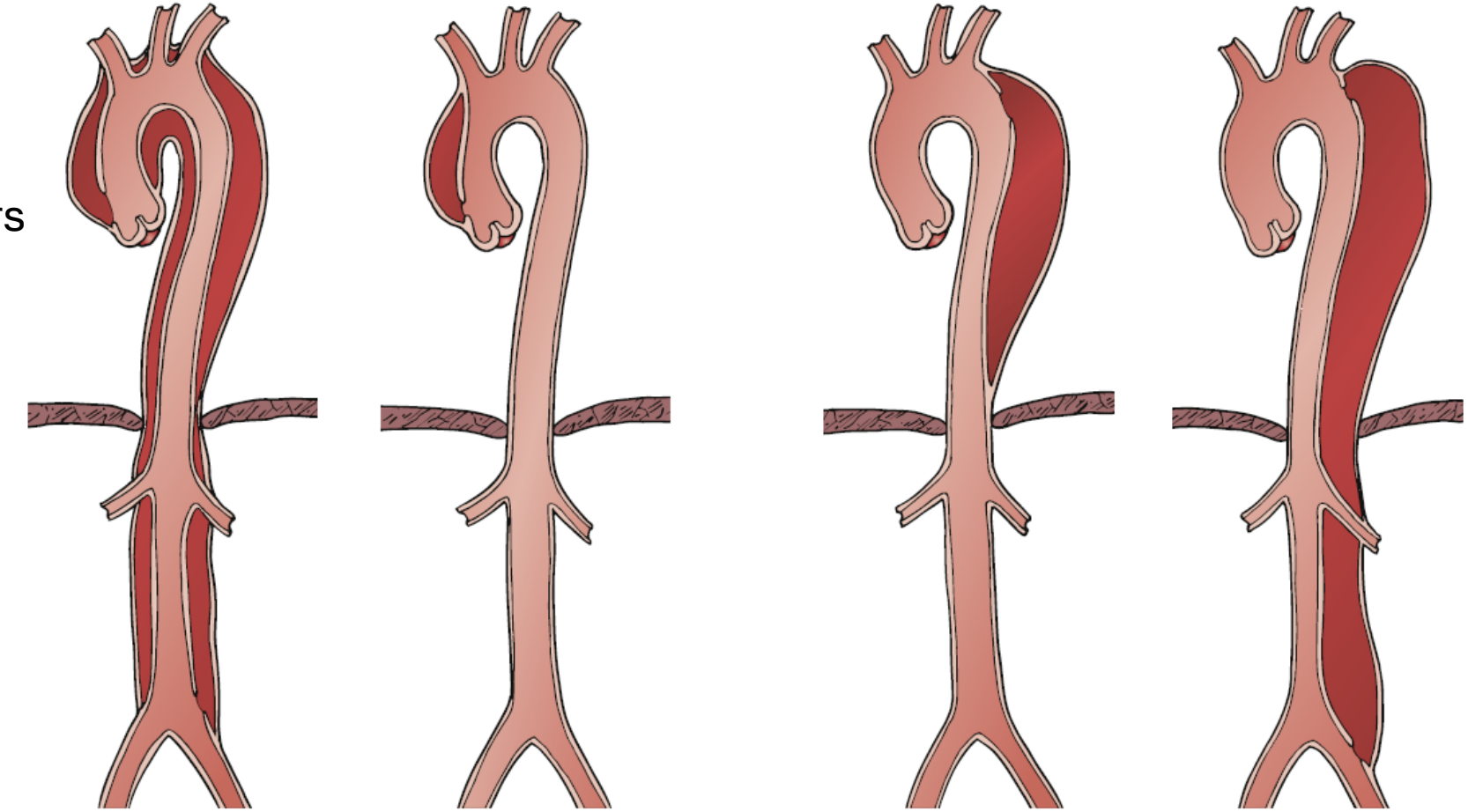
ANESTHÉSIE POUR RUPTURE AORTIQUE

- Prise en charge
  - Chirurgie urgente, pas d'optimisation possible
  - Estomac plein
  - Évaluation sommaire des comorbidités
  - 2 accès IV gros calibre + canule artérielle
  - Groupé/croisé + préparation transfusion massive
  - (Hypotension permissive)
  - Double setup (patient badigeonné, chirurgien prêt a clamper)
  - Induction + stable possible

DISSECTION AORTIQUE

Classification

- Aigue : ≤ 2 semaines
- Subaiguë : 2 sem à 90 jours
- Chronique : ≥ 90 jours



DISSECTION AORTIQUE

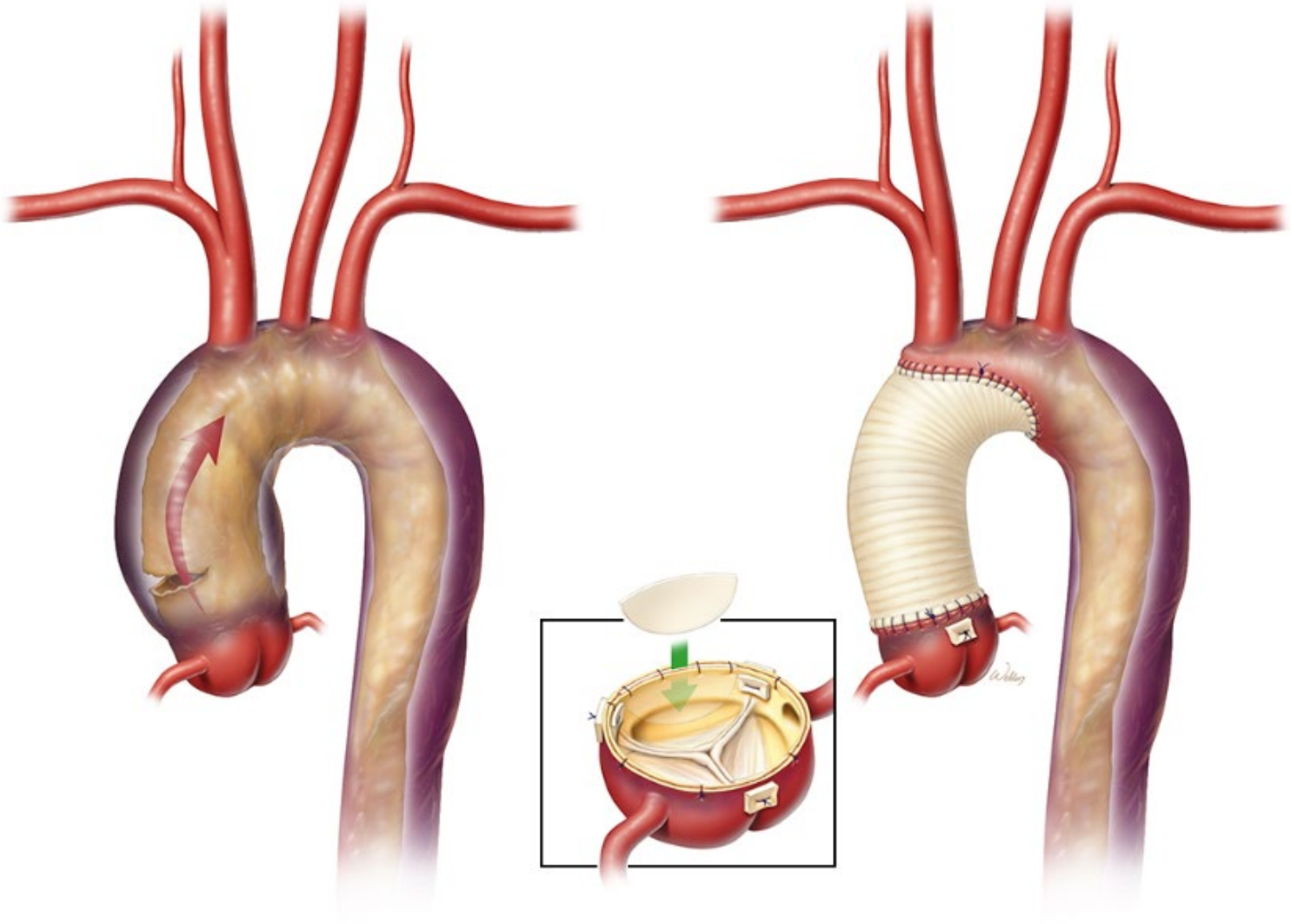
Type A

Urgence chirurgicale

1-2% mortalité/h première 24h

50% mortalité 48%

90% mortalité à 2 semaines



Présentation clinique

- Infarctus
- ACV
- Tamponnade
- IA sévère
- Ischémie membre supérieur
- Progression aorte descendante

DISSECTION AORTIQUE

Type B

Traitement médical

10% mortalité non-compliqué tx médical

50% mortalité compliqué tx médical

20-30% compliqué avec intervention

Indication d'intervention

- Malperfusion
- Rupture ou rupture imminente
- Douleur réfractaire
- Échec traitement médical (HTA non contrôlée)
- Expansion rapide (anévrisme, hématome, dissection)

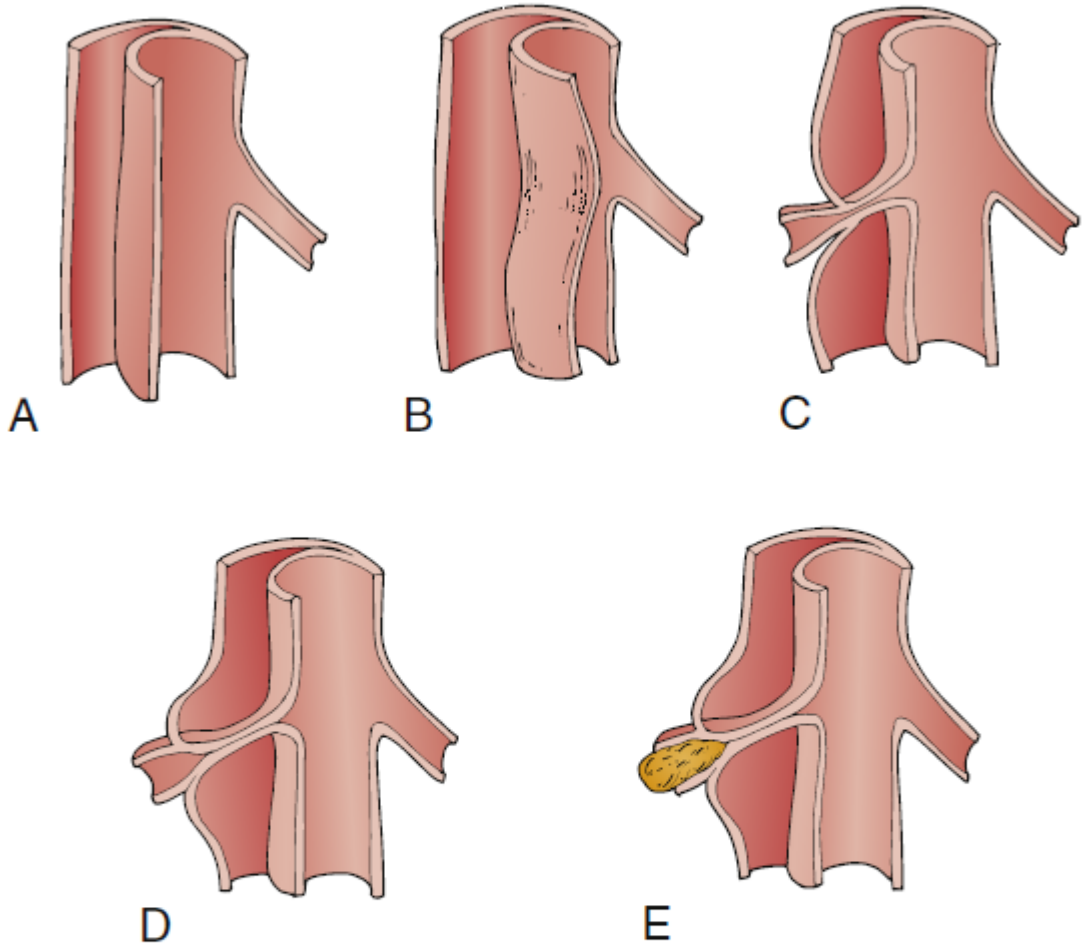


Figure 83.3 Mechanisms of Aortic Branch Obstruction in Acute Dissection. (**A, B**) In dynamic obstruction, the septum may prolapse into the vessel ostium during the cardiac cycle, and the compressed true lumen flow is inadequate to perfuse branch vessel ostia, which remain anatomically intact. (**C–E**) Near complete circumferential dissection with static obstruction – the cleavage plane of the dissection extends into the ostium and compromises inflow. Thrombosis beyond the compromised ostia may further worsen perfusion.

DISSECTION AORTIQUE

Traitement medical → ↓ dP/dt

- B-bloqueurs en premier (esmolol, labetalol)
- Vasodilatateur artériel (nipride, nicardipine)
- Analgésie
- Target: TAS 100-120, Fc ≤ 60 bpm

Considérations anesthésiques

- Monitoring invasif
- Induction titrée
- ↓ dP/dt
- Maintient perfusion organes
- Protection spinale
- Prêt a conversion urgente

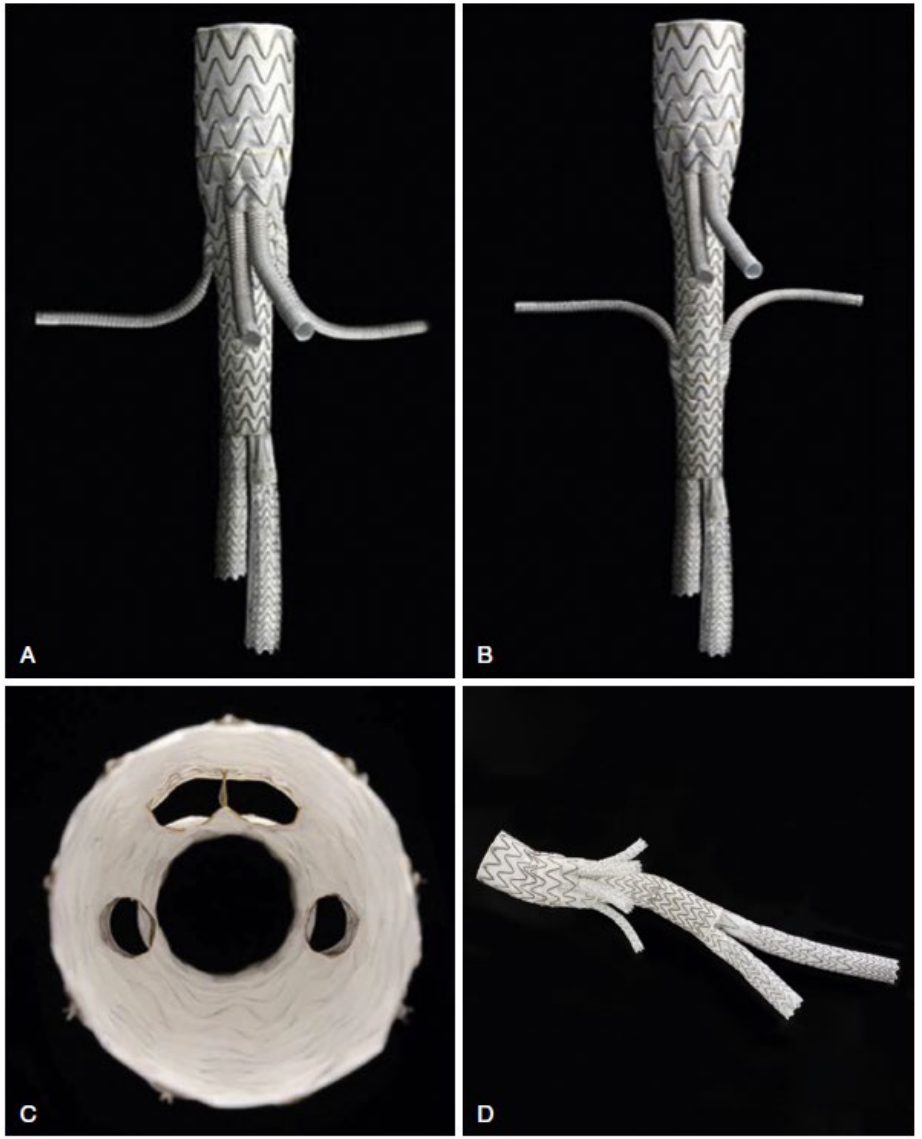
7.4.2. Management of Acute Type B Aortic Dissection

Recommendations for the Management of Acute Type B Aortic Dissection
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
1	B-NR	1. In all patients with uncomplicated acute type B aortic dissection, medical therapy is recommended as the initial management strategy.[1-3]
1	C-LD	2. In patients with acute type B aortic dissection and rupture or other complications (Table 27), intervention is recommended.[4-6]
1	C-EO	In patients with rupture, in the presence of suitable anatomy, endovascular stent grafting, rather than open surgical repair, is recommended.
2a	C-LD	In patients with other complications, in the presence of suitable anatomy, the use of endovascular approaches, rather than open surgical repair, is reasonable.[4-6,7]
2b	B-R	3. In patients with uncomplicated acute type B aortic dissection who have high-risk anatomic features (Table 28), endovascular management may be considered.[8,9]

ANESTHESIE POUR CHIRURGIE ENDOVASCULAIRE

- Indications
  - Anévrisme abdo, thoracique ou périphérique
  - Dissection type B
  - Rupture Ao
  - MVAS
  - Carotide
  - Insuffisance viscérale (rénale, mésentérique supérieure)
  - Trauma



ANESTHESIE POUR CHIRURGIE ENDOVASCULAIRE

- **Questions à se poser**
  - Indication opératoire? (anévrisme, dissection, trauma)
  - Accès? (fémoral + souvent, percutané vs cutdown)
  - Complexité et durée anticipée de la chirurgie?
  - Risque de conversion tomie?
  - Patient (coopération, capacité de se coucher à plat, anxiété, préférence)
  - CI rachis?
  - Besoin d'apnée prolongée?
  - Besoin de pacing rapide?
  - Protection spinale? (ie drain lombaire)

- **Objectifs**
  - Conditions optimales au chirurgien
  - Confort du patient
  - Maintenir perfusion organes cibles
  - Normothermie
  - Surveiller pertes sanguines (souvent masquées)
  - Éveil rapide pour éval neuro si AG

1. **Locale + sédation**
2. **Rachis**
3. **AG**

Toutes acceptables

CHIRURGIE VASCULAIRE INFRA-INGUINALE

- Indications chirurgicales
  - Ischémie critique MI
  - Claudication intermittente
  - Anévrismes/pseudo-anévrismes
  - Trauma
  - Thrombo-embolique

- Chirurgies
  - Pontage femoro-poplité/tibial, fem-fem
  - Endartériectomie
  - Endovasculaire
  - Hybride

Considérations anesthésiques

- Comorbidités du patient
- Chirurgie urgente
- Anticoagulation/anti-plt
- Estomac plein
- AG vs locale/sédation vs rachis

TRAUMA AORTIQUE (BLUNT AORTIC INJURY)

Considérations particulières

- Décélération rapide
- Lésion distale sous-clavière gauche
- 80-85% patients mourir sur scène
- Prise en charge selon ATLS (multiples lésions)

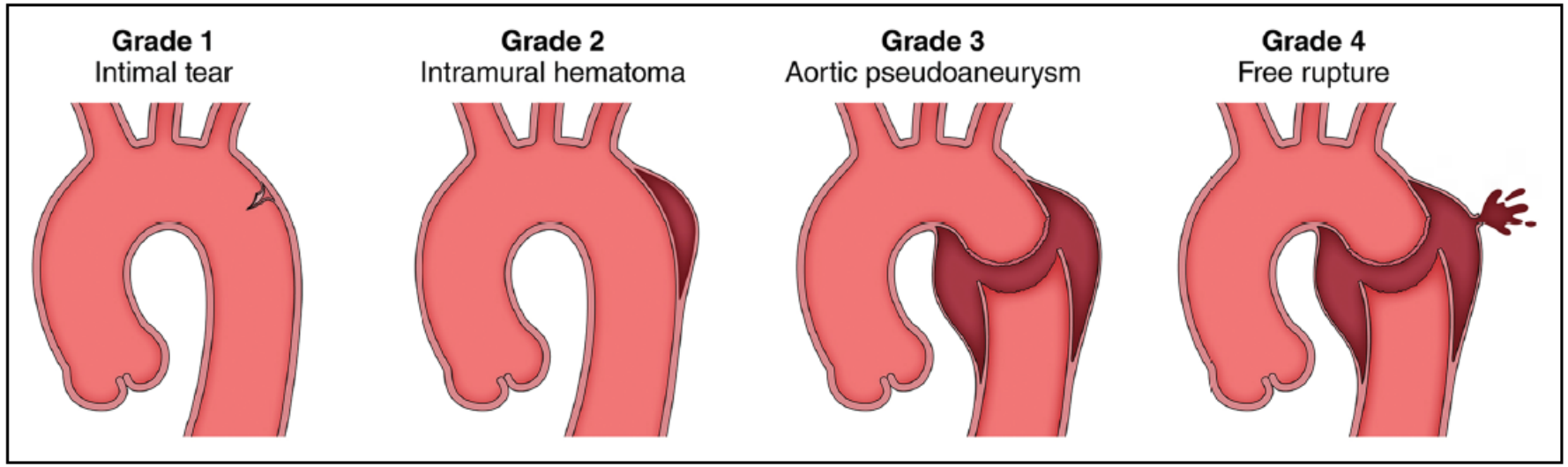


Figure 23. Classification System for BTTAIs.
Aortic injuries are classified according to severity, based on the findings of diagnostic imaging. **Grade 1,** intimal tear. intimal flap, or both. **Grade 2,** intramural hematoma. **Grade 3,** aortic wall disruption with pseudoaneurysm. **Grade 4,** aortic wall disruption with free rupture. BTTAI indicates blunt traumatic thoracic aortic injury. Adapted from Azizzadeh et al,[2] Copyright 2009, with permission from Elsevier, Inc. and the Society for Vascular Surgery.

TRAUMA AORTIQUE (BLUNT AORTIC INJURY)

Prise en charge

- Grade 1 : tx medical (↓ dP/dt)
- Grade 3-4: TEVAR
- Grade 2: si high-risk features

Table 32. High-Risk Imaging Features of BTTAI

Posterior mediastinal hematoma >10 mm[8]
Lesion to normal aortic diameter ratio >1.4[8]
Mediastinal hematoma causing mass effect[6]
Pseudocoarctation of the aorta[6]
Large left hemothorax[6]
Ascending aortic, aortic arch, or great vessel involvement[9]
Aortic arch hematoma[7]

BTTAI indicates blunt traumatic thoracic aortic injury.