L'aorte abdominale et ses branches

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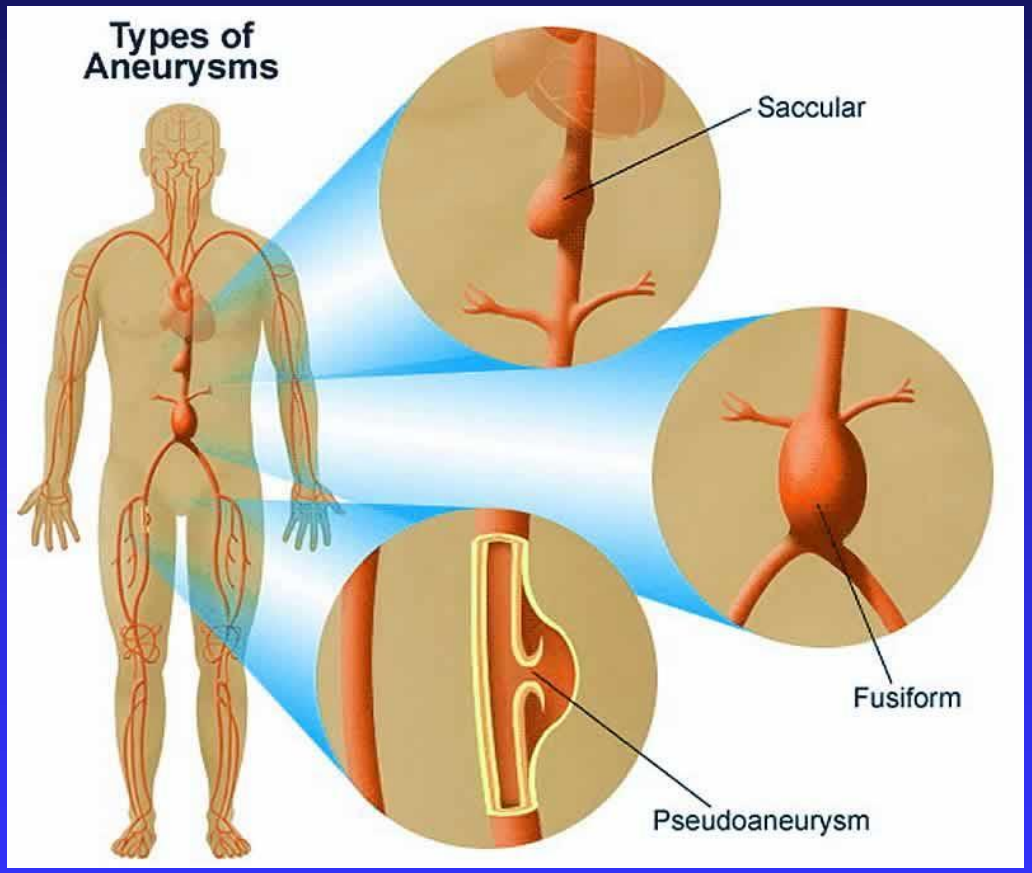
Aorte Abdominale

- Anévrisme aorte abdominale:
  - Définition et Étiopathogénie
  - Imagerie médicale, suivi, principe de traitement
  - EVAR
  - Pathologies non athéromateuses: aortites
  - (Dissection aortique).
- Anévrismes des branches de l'aorte abdominale
- Divers:
  - Dissections, ligament arqué, dysplasie fibro-musculaire artères rénales.

Définition anévrisme



> 50% Φ nl

Epidémiologie AAA

- AAA sous rénal 95% des cas
- Prédominance masculine, surtout après 65 ans
- FDR: HTA, tabac, terrain polyvasculaire associé
- **Incidence de rupture:**
  - **4% si < 5 cm**
  - **20 % si > 7 cm**

Etiopathogénie

- Hypothèse protéolytique:
  - Diminution élastine > dilatation
  - Diminution collagène > rupture
  - Activité enzymatique élevée: élastase, collagène
- Hypothèse hémodynamique
- (déficience en cuivre, surcharge en calcium)

Etiopathogénie

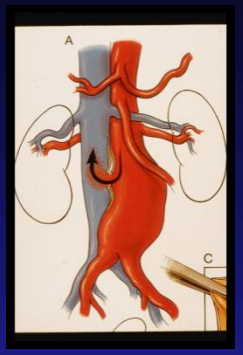
- AAA non spécifiques: 95%
  - Origine athéromateuse: souvent évoqué, actuellement abandonné
  - Hypothèse génétique: multifactorielle
  - formes familiales,
  - anomalies génétiques: chrom 2,15,16,X
  - marqueurs génétiques: gr 0, rh-, MN et Kell=, Haptoglobine 2-1

- AAA “spécifiques” < 5%:
  - Marfan, Ehler-Danlos
  - Takayasu
  - Syphilis, infféctieux

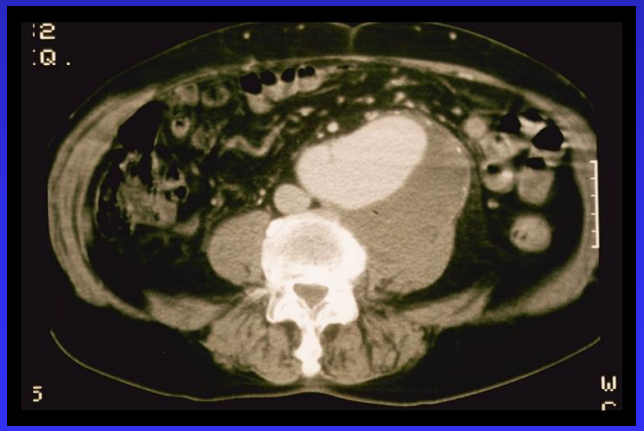
Complications AAA (1)

- **Compression:**
  - Os (érosion, uretère (dilatation d'amont), VCI (varices, thrombose), nerfs (plexus lombaire), tube digestif (exceptionnel)
- **Thrombose:**
  - Chronique: syndrome de Leriche
  - Aiguës= ischémie des 2 membres inf.
- **Embolies:**
  - Fibrino-cruoriques (=ischémie aiguë)
  - Cristaux cholestérol= "blue toe syndrom"
- **Ischémie:** obstruction ostiale art. viscréales et rénales
- **Rupture:**

Complications AAA: rupture (2)

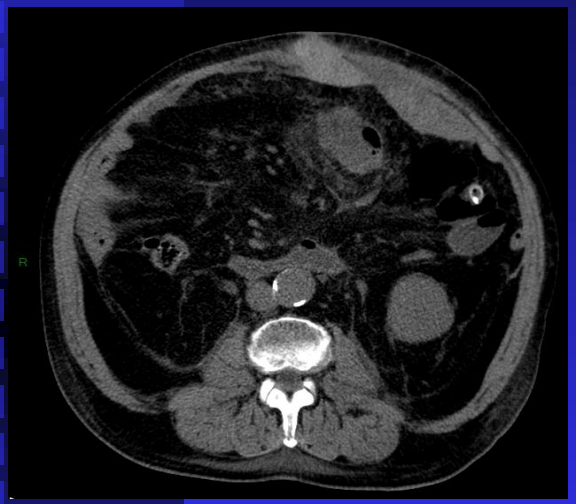


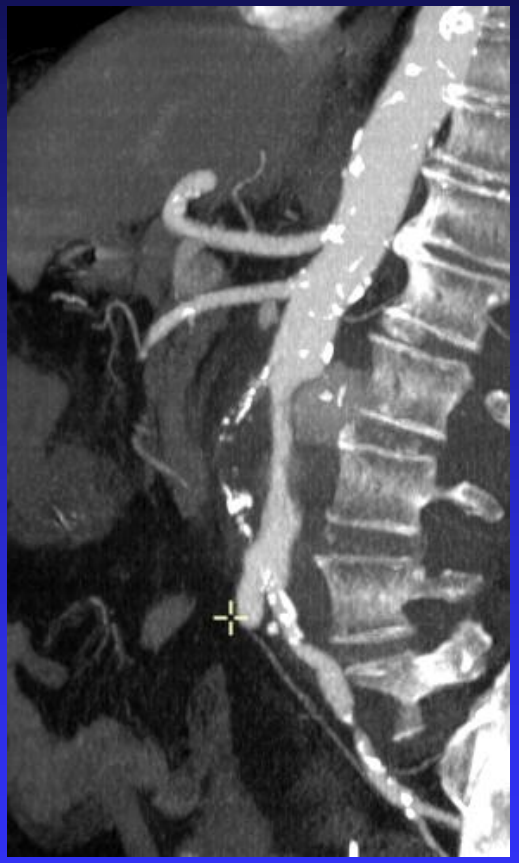
- Douleurs:
  - Distension pariétale brutale, pseudo-colique néphrétique, cruralgie
  - Anévrisme infalammatoire ou fissuré
- Rupture:
  - Rétro-péritonéale: 80%
  - Intra-péritonéale: 15%
  - Tube digestif, VCI: 5%



Risque de rupture

1. Croissance rapide : >1cm/an
2. Sexe féminin : rupture ratio 3♀ / 1♂
3. Tabagisme actif : risque relatif 1.5 à 2.4 x plus
4. Hypertension
5. **Histoire familiale : parenté au premier degré**
6. BPCO
7. Morphologie de l'AAA : sacculaire plus à risque





03/2010

07/2013

Risque de rupture en fonction du diamètre

Diamètre (cm)	Risque relatif :
<4	0.01
4.0 – 4.9	0.5 – 3
5.0 – 5.9	**3 – 15**
6.0 – 6.9	10 – 20
7.0 – 7.9	20 – 40
>8	30 – 50

Brown LC, Powell JT, Risk factors for aneurysm rupture in patients kept under ultrasound surveillance. UK small aneurysm trial participants. Ann Surg 1999; 230: 289-296.

Brewster DC, Cronenwett JL, Hallett JW, Johnston KW, Krupski WC, Matsumara JS. Guidelines for the treatment of abdominal aortic aneurysms. Report of a subcommitee of the Joint Council of the American Association for Vascular Surgery and Society of Vascular Surgery. J Vasc Surg 2003; 37: 1106-1117.

Recommendations	Class[a]	Level[b]	Ref.[c]
Population screening for AAA with ultrasound:			
• is recommended in all men >65 years of age.	I	A	357,367
• may be considered in women >65 years of age with history of current/past smoking.	IIb	C	
• is not recommended in female non-smokers without familial history.	III	C	
Targeted screening for AAA with ultrasound should be considered in first-degree siblings of a patient with AAA.	IIa	B	338,339
Opportunistic screening for AAA during TTE:			
• should be considered in all men >65 years of age.	IIa	B	346,347
• may be considered in women >65 years with a history of current/past smoking.	IIb	C	

Dépistage AAA:

- Homme > 65 ans
- Femme > 65 ans + tabagisme (ancien ou actif)

Eur heart J, ESC guidelines 2014

Recommendations	Class[a]	Level[b]	Ref.[c]
In patients with abdominal aortic diameter of 25–29 mm, new ultrasound imaging should be considered 4 years later.	IIa	B	367
Surveillance is indicated and safe in patients with AAA with a maximum diameter of <55 mm and slow (<10 mm/year) growth.[d]	I	A	340,373
In patients with small (30–55 mm) AAAs, the following time interval for imaging should be considered:[d] • every 3 years for AAA of 30–39 mm diameter. • every 2 years for AAA of 40–44 mm diameter. • every year for AAA >45 mm[e] diameter.	IIa	B	365
Smoking cessation is recommended to slow growth of the AAA.	I	B	351
To reduce aortic complications in patients with small AAAs, the use of statins and ACE-inhibitors may be considered.	IIb	B	355,345
AAA repair is indicated if: • AAA diameter exceeds 55 mm.[f] • Aneurysm growth exceeds 10 mm/year.	I	B	373,363
If a large aneurysm is anatomically suitable for EVAR, either open or endovascular aortic repair is recommended in patients with acceptable surgical risk.	I	A	397,398
If a large aneurysm is anatomically unsuitable for EVAR, open aortic repair is recommended.	I	C	
In patients with asymptomatic AAA who are unfit for open repair, EVAR, along with best medical treatment, may be considered.[g]	IIb	B	388,399

- *AAA surveillance:*
  - 25-29 mm > 4 ans
  - 30-39 mm > 3
  - 40-44 mm > 2
  - > 45 mm > 1 an
- *Traitement si:*
  - > 55 mm
  - croissance > 10mm/an
- *EVAR ou chirurgie ou trait. méd.:*
  - Risque chirurgical
  - Morphologie de l'AAA.

Eur heart J, ESC guidelines 2014

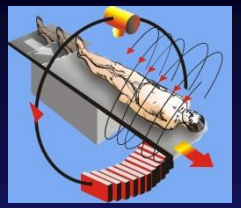
Indication thérapeutique

- AAA rompu: urgence +++
- Anévrisme infecté: résection-pontage
- AAA non compliqués: diam > 50 mm, ou augmentation de 5 mm en 6 mois
- Résultats: mortalité
  - 2-5% si chirurgie élective
  - 25-50% en urgence.

Imagerie diagnostique

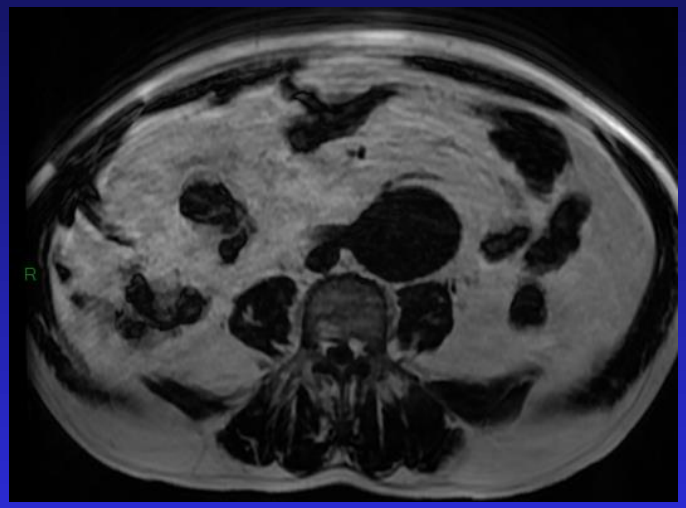
- ASP face profil
- Echographie +++
- TDM +++
- IRM (peu utilisé)
- Artériographie (abandonnée, sauf si traitement percutané).

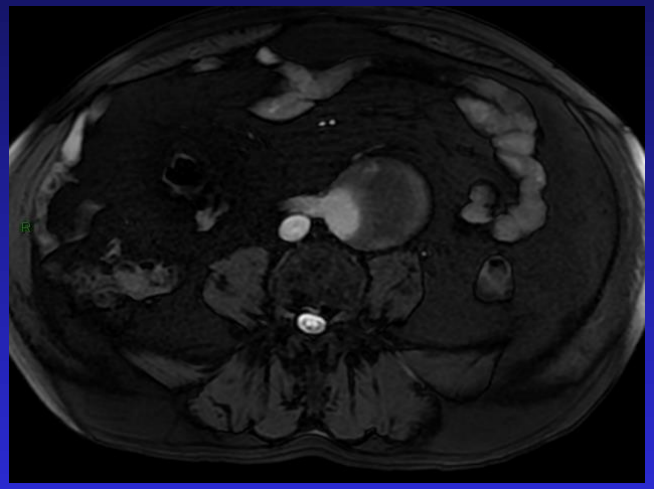
Angio-CT



IRM aorte abdominale

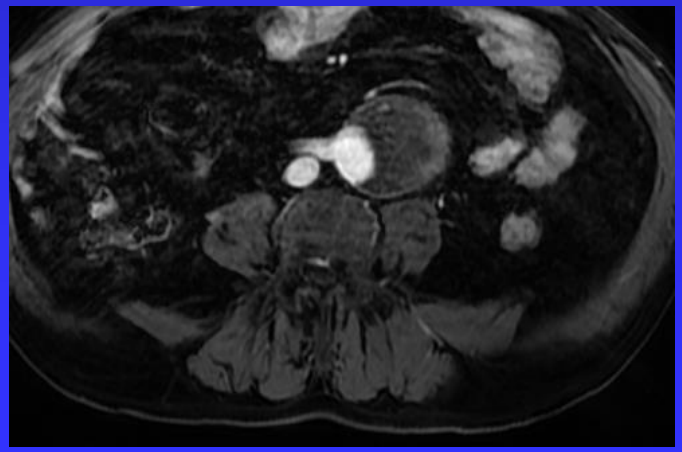
T1





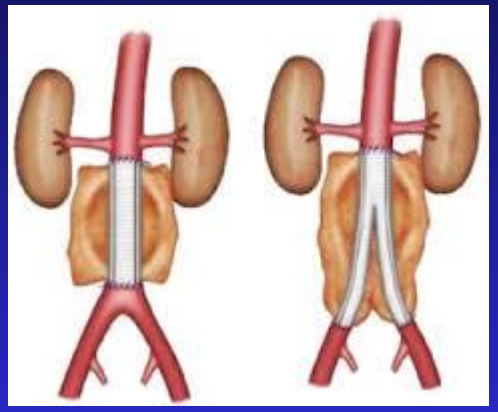
Fiesta

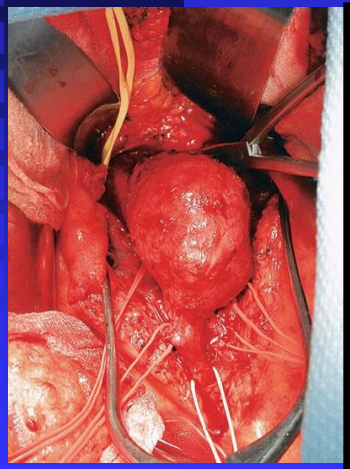
Lava

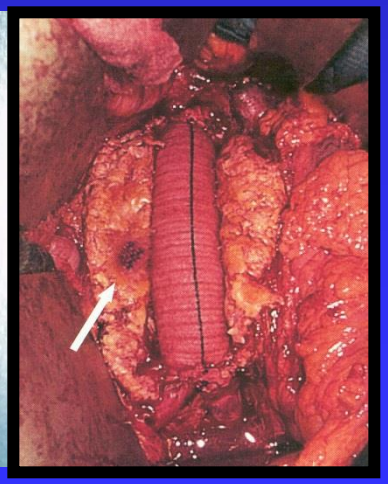


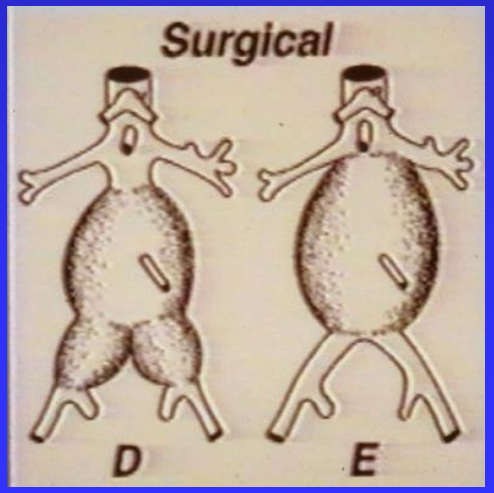
Traitement chirurgical

- “mise à plat-greffe prothétique
- Exclusion-pontage (rarement)
- Résection-pontage ou homogreffe (infection)





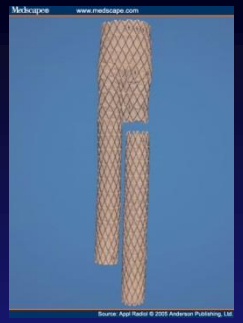




Endoprothèse aortique

STENT GRAFT aortique

- TEVAR =
  - Thoracic Endovascular Aortic Repair
- EVAR =
  - Endovascular Aortic Repair
  - Indication: comorbidité majeure
  - Dépendant de la morphologie AA.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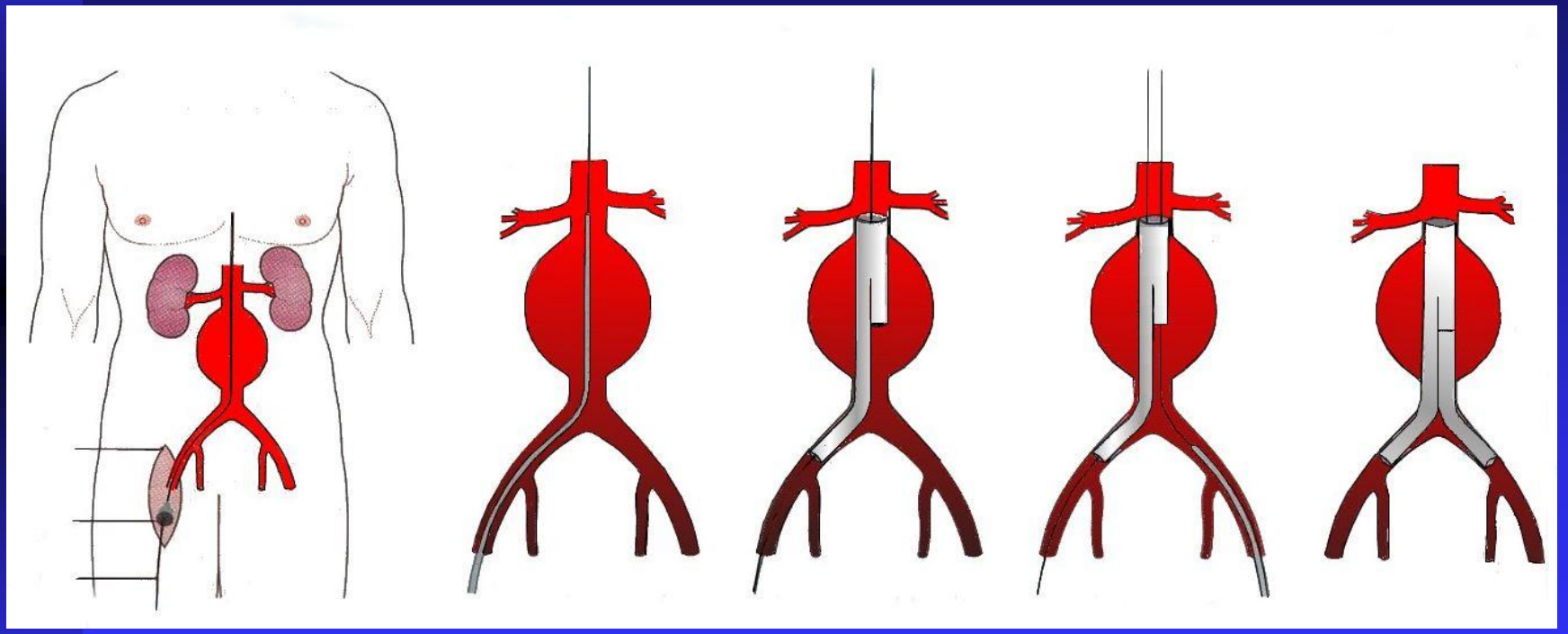
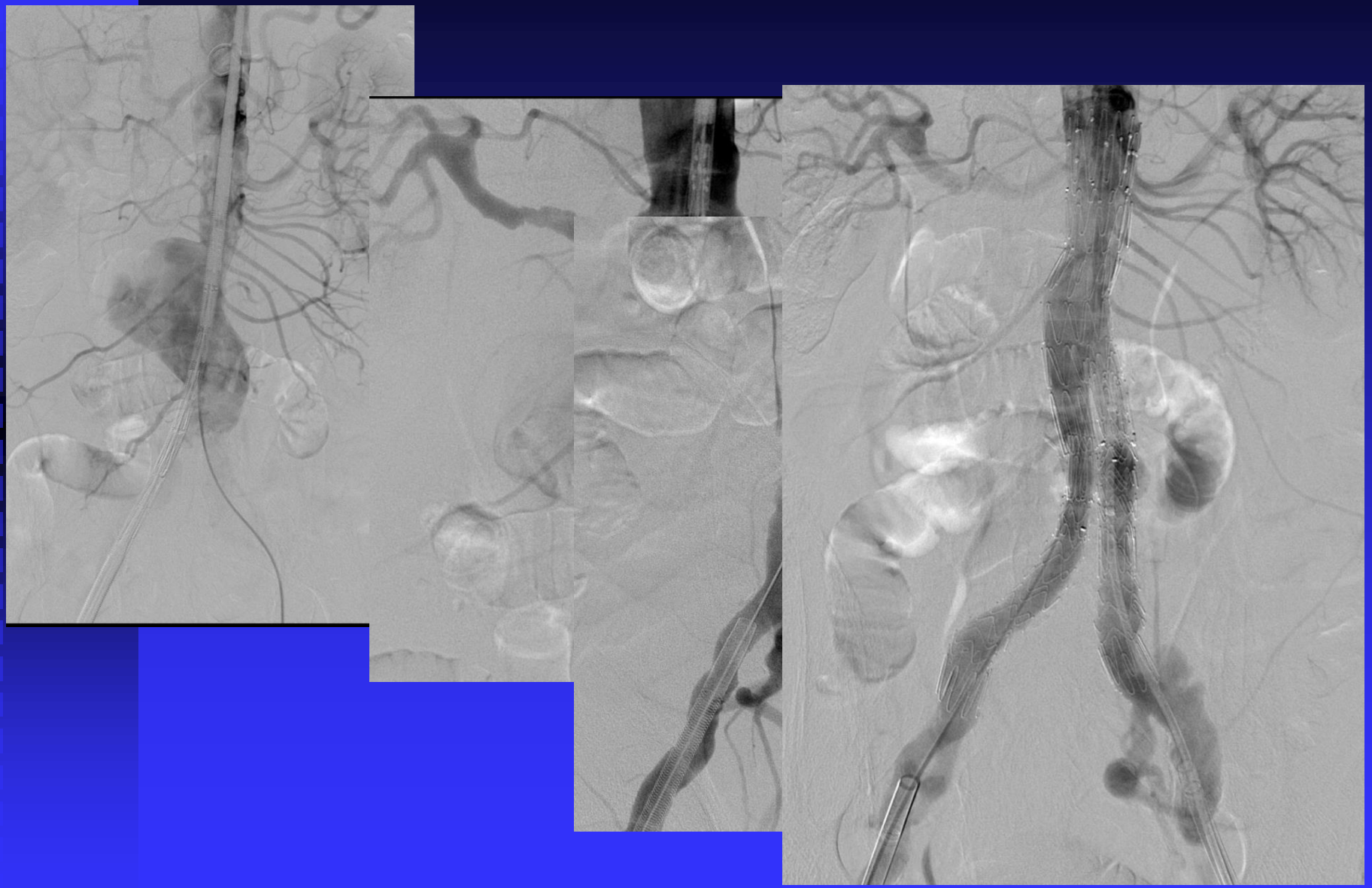
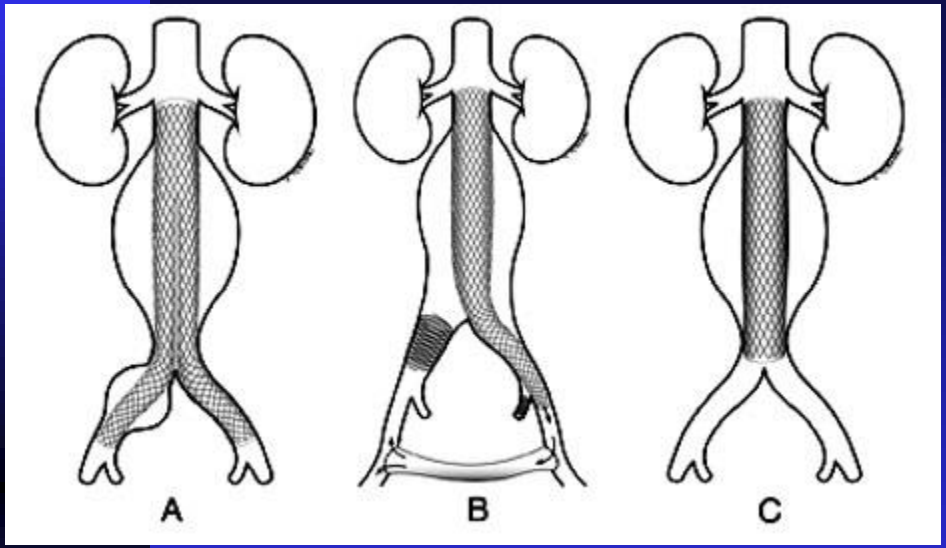


Technique déployement





A = aorto-biliaque
B= aorto-monoiliaque = pontage fem-fem
C= aortique

	Anatomical location	Diameter units	Format
a	Aortic diameter at proximal implantation site	mm	CT
b	Aortic diameter, 15mm inferior to proximal implantation site	mm	CT
c	Aortic neck length (≥15mm)	mm	Angio/MPR/MMS
d	Maximum outer aneurysm diameter	mm	CT
e	Minimum diameter of distal neck	mm	CT
f	Right common iliac diameter	mm	CT
g	Left common iliac diameter	mm	CT
h	Proximal aortic neck angle (≤60)	mm	Angio/MPR/MMS

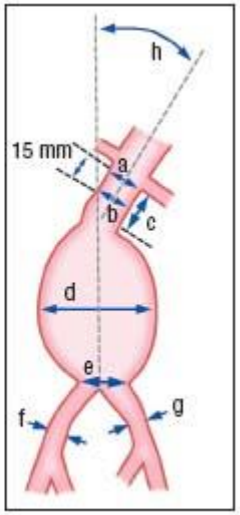


FIGURE 2. Measurements needed for EVAR planning from W.L. Gore Excluder graft.

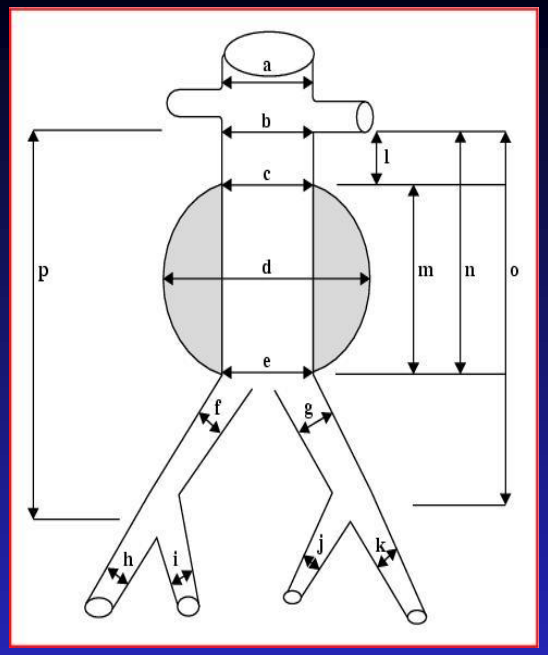
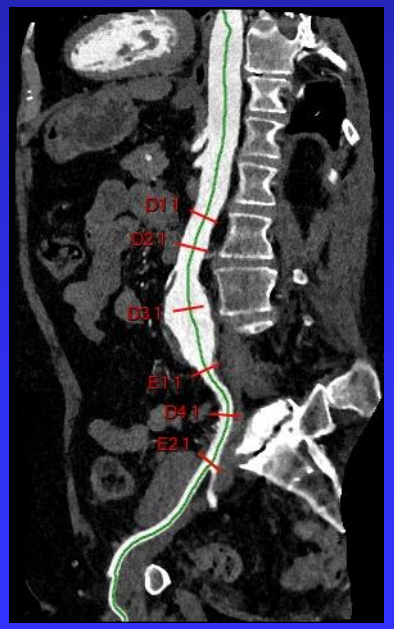
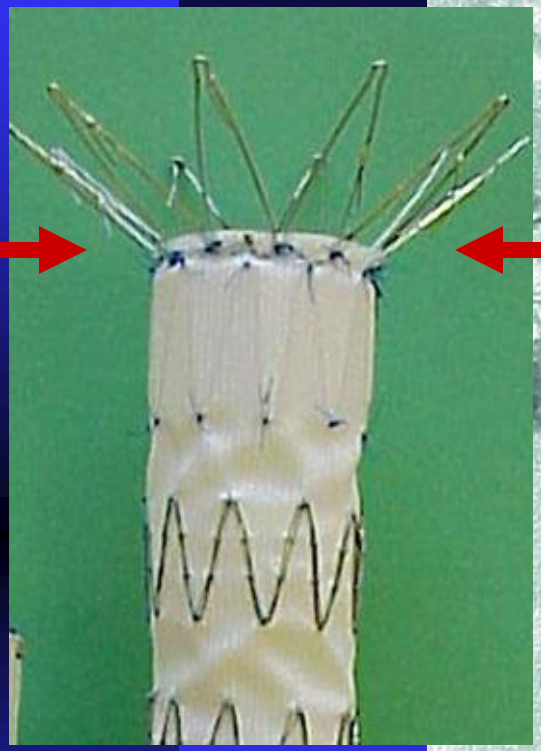
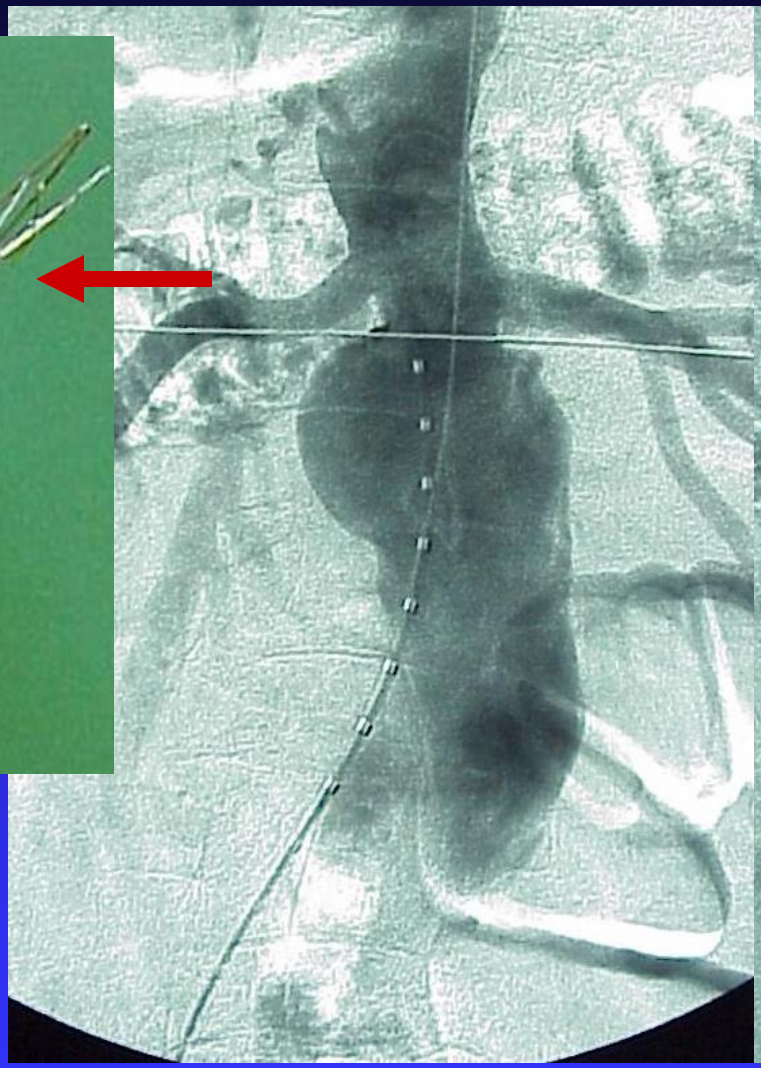


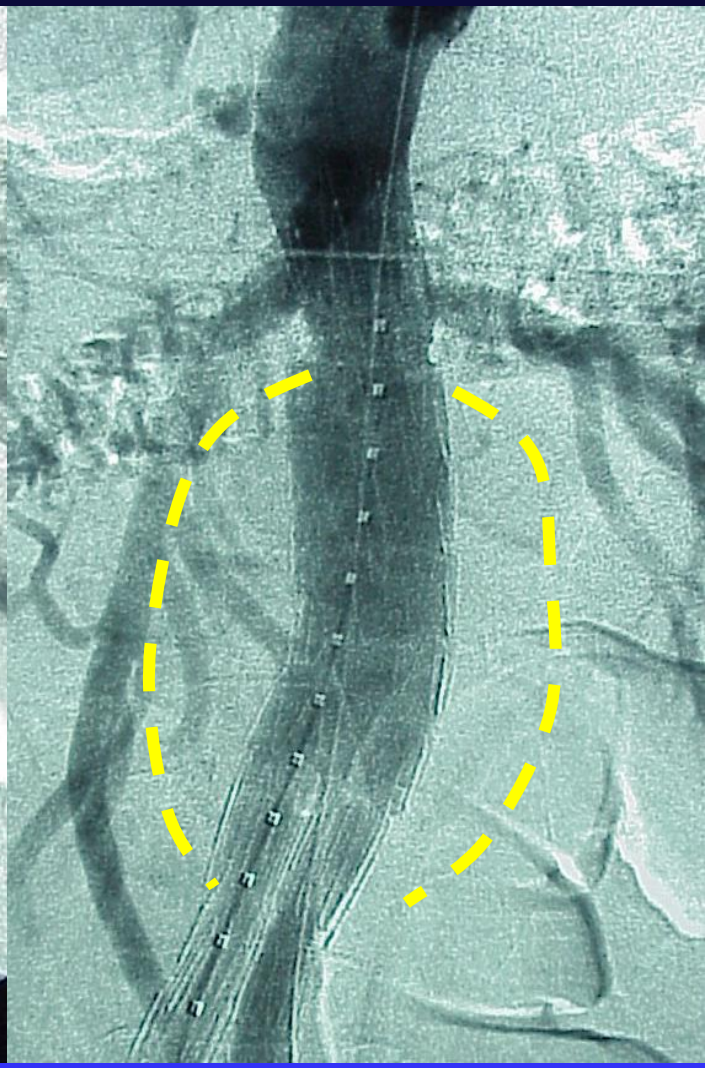
Table 1. The suitable anatomical requirements for endovascular aneurysm repair.

Anatomical characteristics	Size
Proximal aortic neck length	>15 mm
Proximal aortic neck diameter	<32 mm
Proximal aortic neck angulation	<60 degrees
External iliac diameter	>7 mm
Iliac bifurcation angulation	<90 degrees

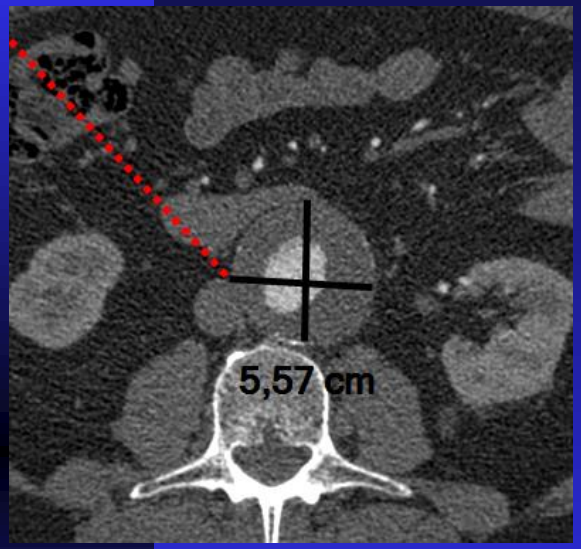


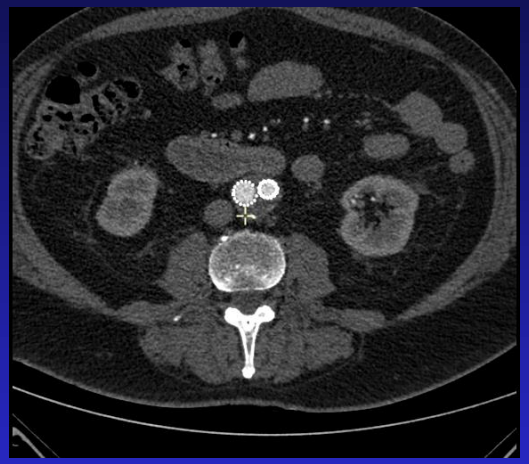


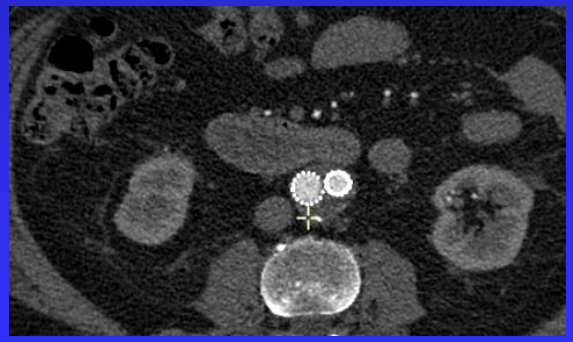




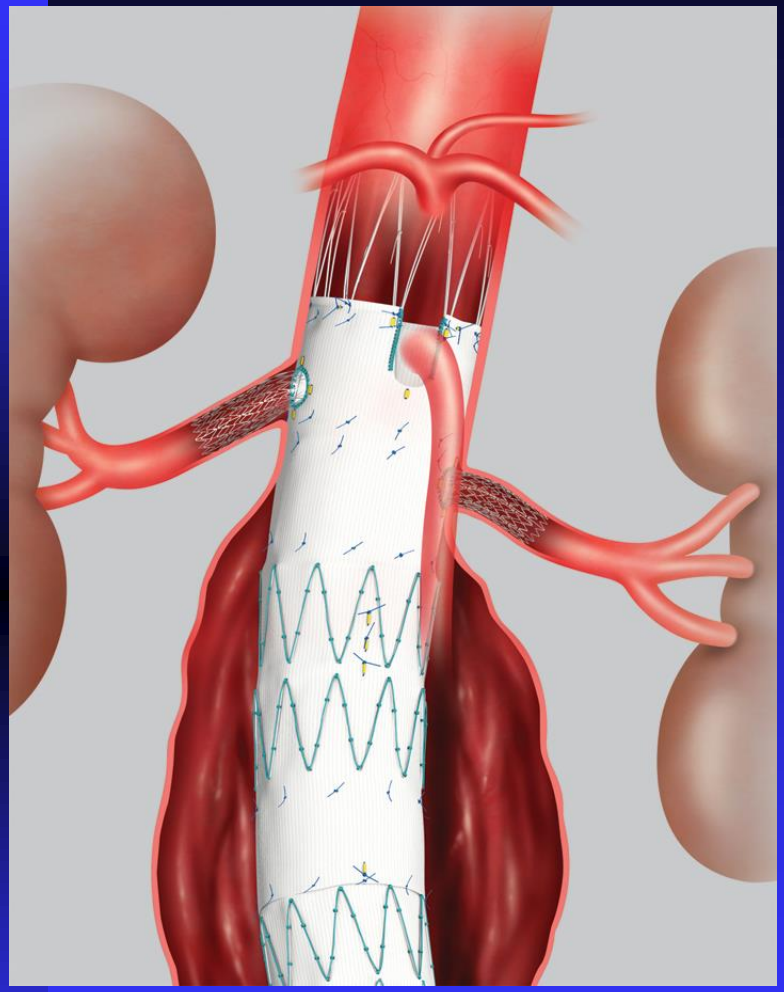
But: occlusion du sac anévrismal périprothétique, involution



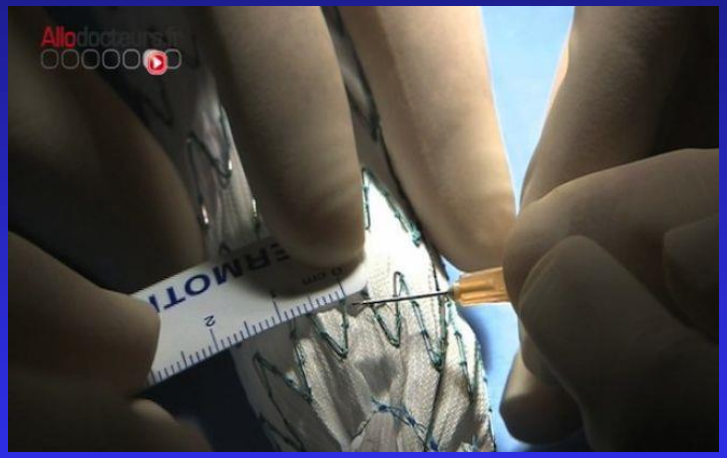


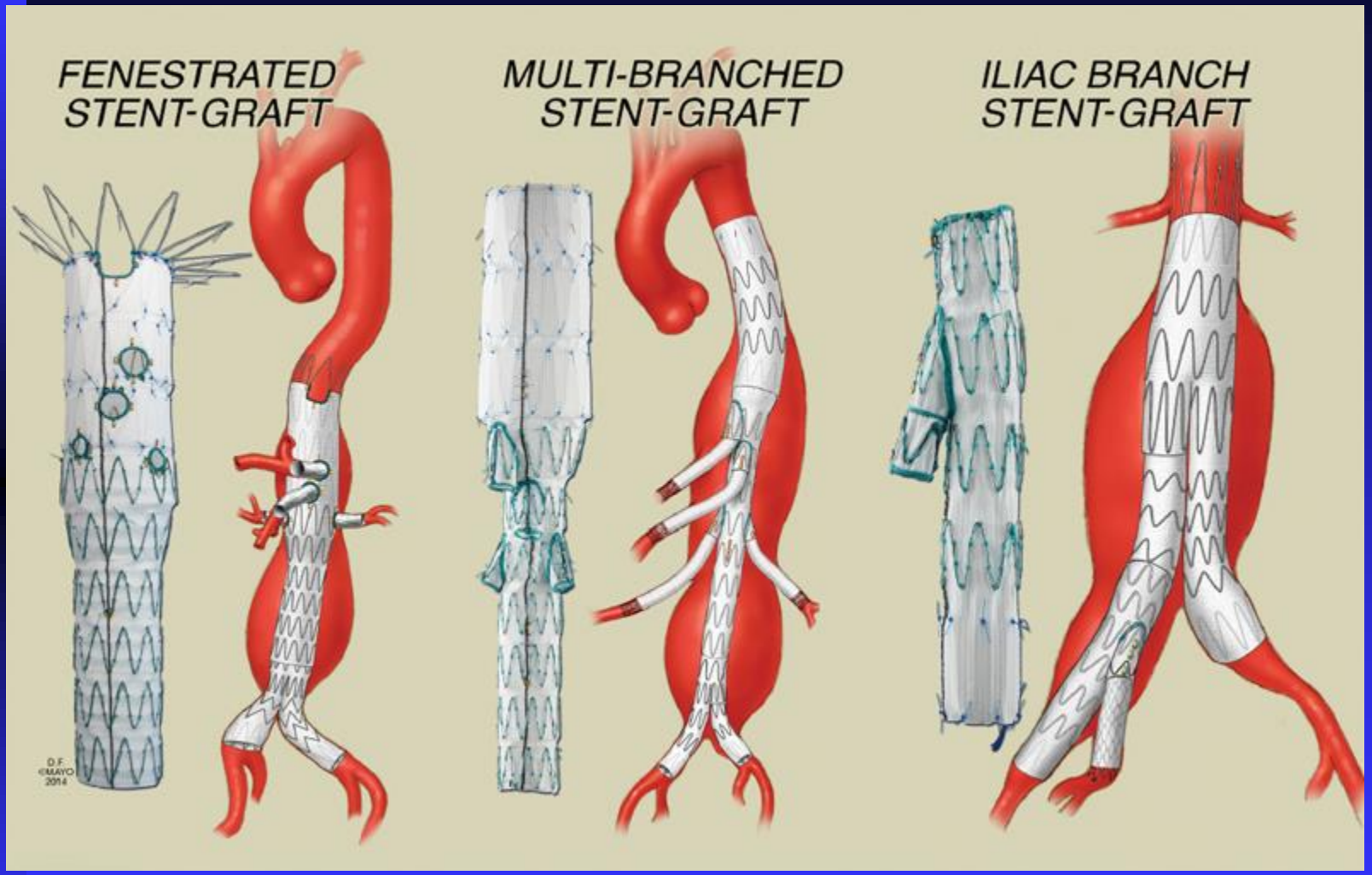


Contrôle 1 et 3ans



Stent graft “fénestré”




FENESTRATED
STENT-GRAFT
MULTI-BRANCHED
STENT-GRAFT
ILIAC BRANCH
STENT-GRAFT
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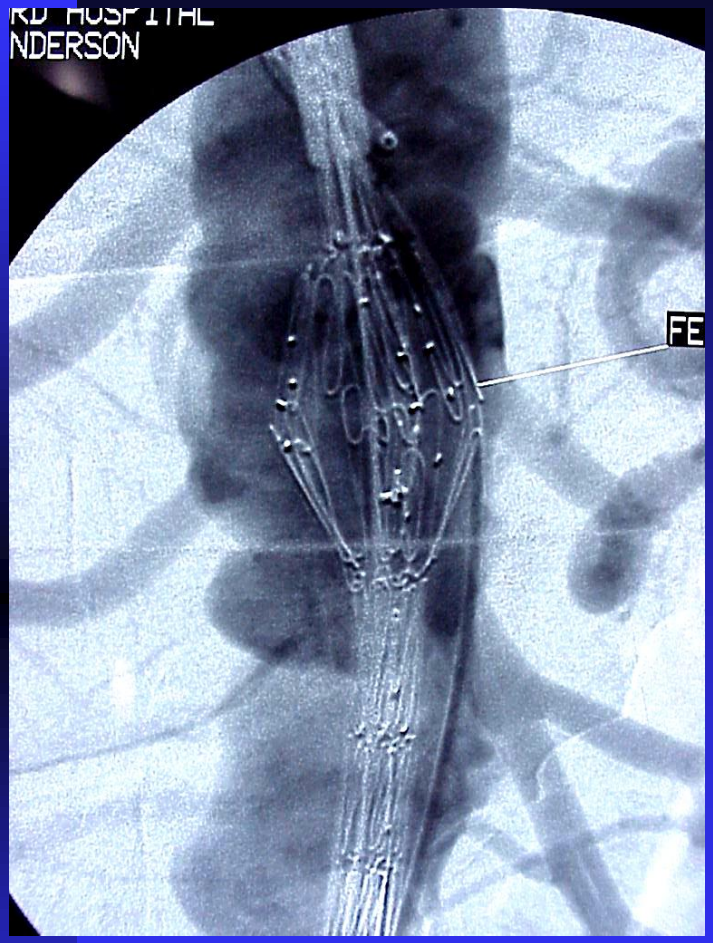
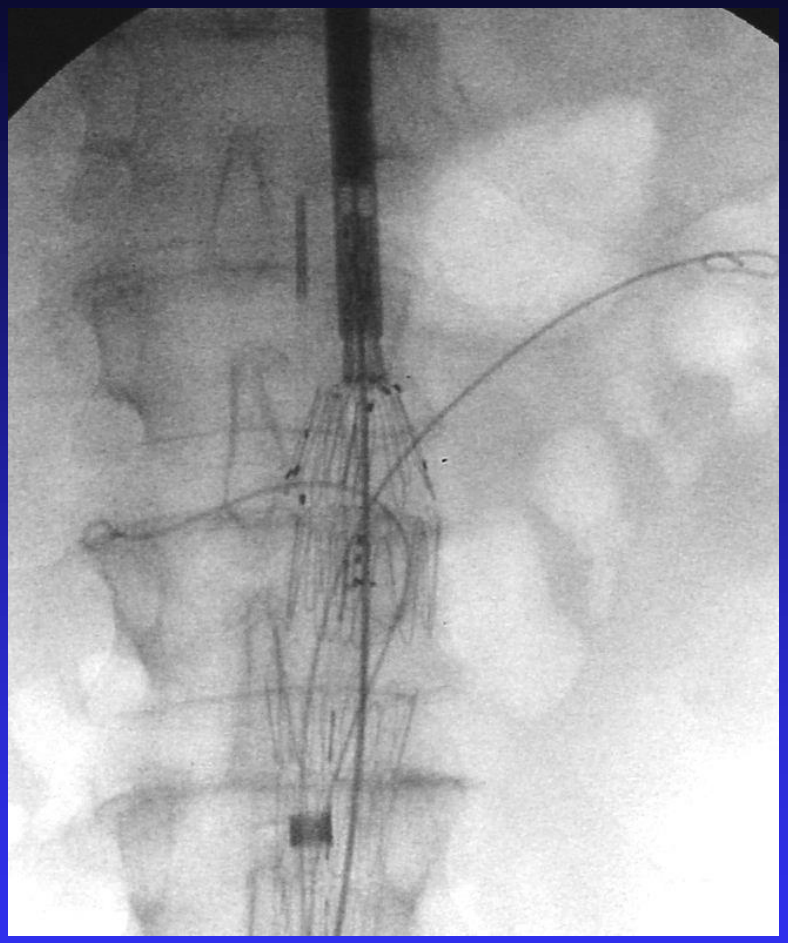
Proximal Graft Implantation

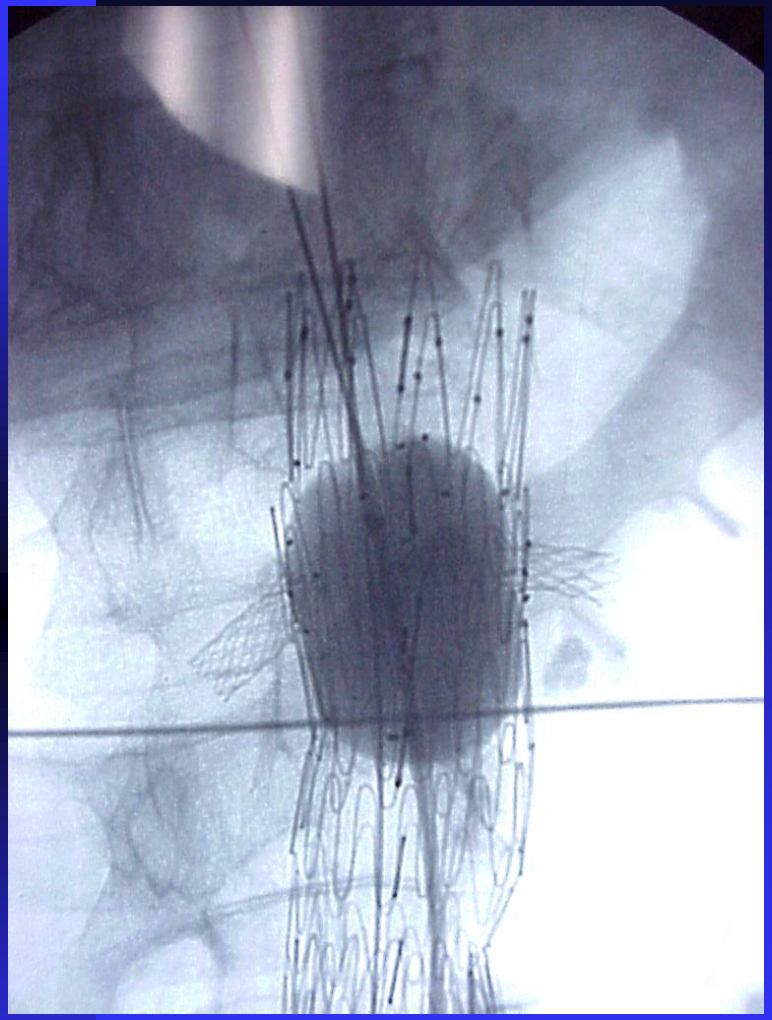


Fenestrations align with target vessels

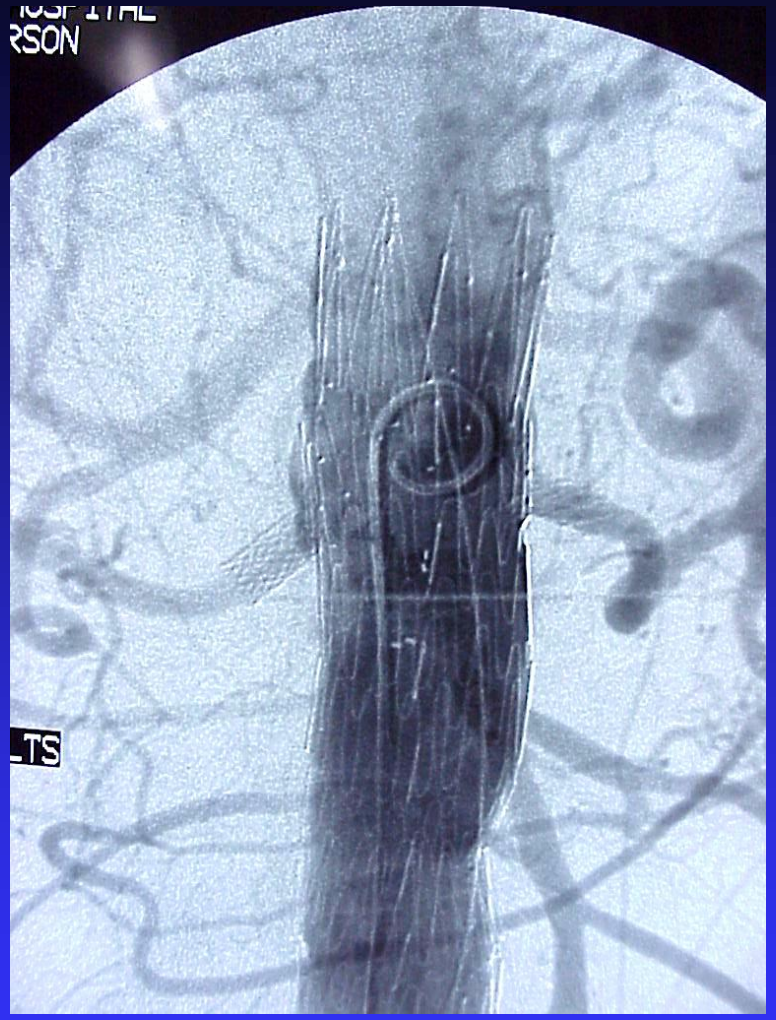


Catheterise Renals through Fenestrations

Proximal Graft Implantation

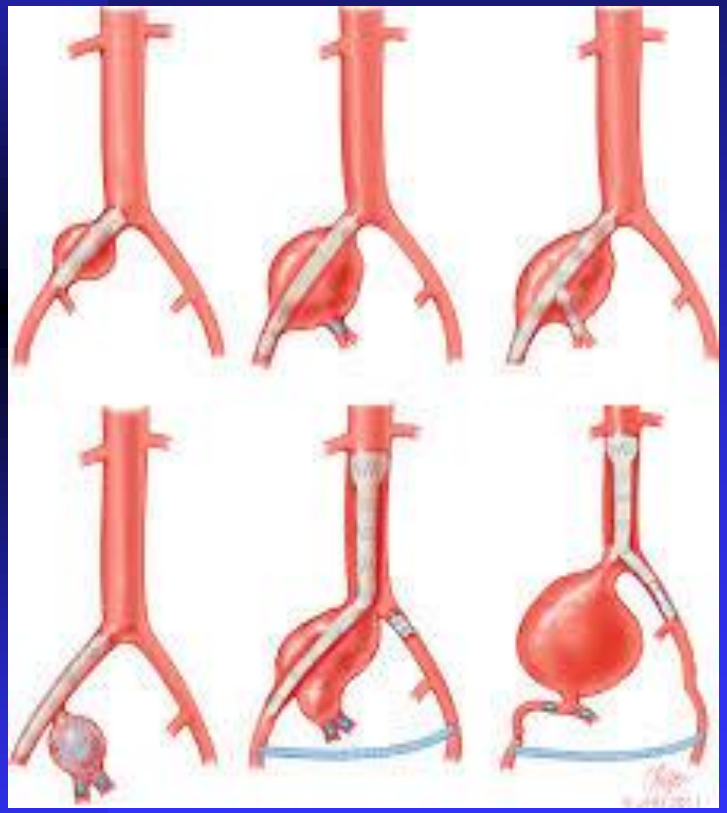


Molding



Proximal Graft implantation complete

Anévrismes iliaques



70-80% anévrismes multiples
Il. Commune: 70%
Il int.: 20%
Il externe: 10%

- Risques embolisation ou occlusion il. internes:
  - Claudication fessière (30-40ù)
  - Paraplégie
  - Ischémie colique
  - Ischémie d'organe pelvien
  - Ischémie glutéale.

“ENDOFUITE” (endoleak)

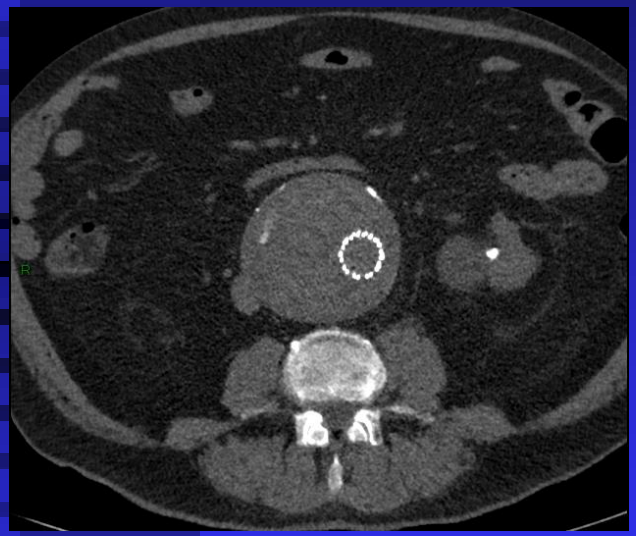
- Définition: persistance de flux sanguin en dehors de l’endoprothèse au sein du sac anévrismal
- Technique de référence:
  - TDM tri-phasique
- Autres techniques d’imagerie:
  - US +/- contraste:
    - Si CT négatif (typeV) ou suivi > 1an.
    - Avantage: limite irradiation
  - IRM:
    - limite irradiation
    - Coût, disponibilité, artéfacts, résolution….
  - Artériographie: à visée thérapeutique.

MDCT: protocole suivi EVAR

- Acquisition triphasique:
  - à blanc: ***calcifications***
  - phase artérielle: ***perméabilité***
  - phase veineuse: ***endofuite***

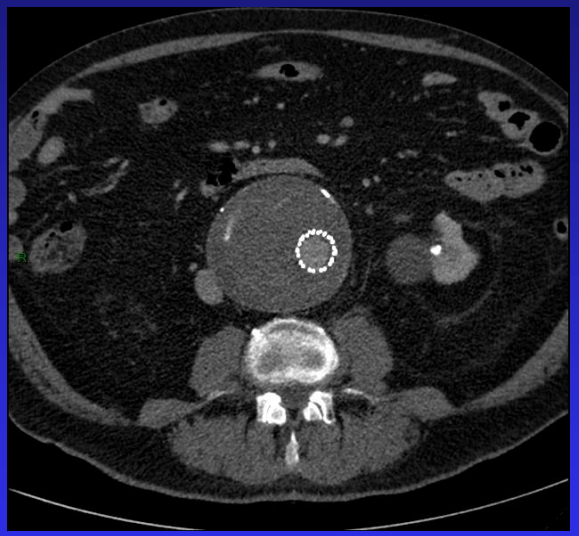
- 2,5 mm -1,25mm / 120kV : 180 mAs
- Ioméron 400: 100 ml à 3-4 cc/s
- Zone de couverture: TC-AFC
- Reconstructions: MPR / VRT / MIP / curviligne.

Intérêt d'une phase de contraste spontané (calcification)

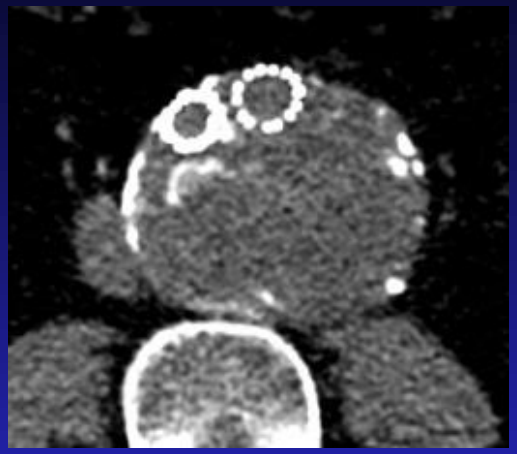


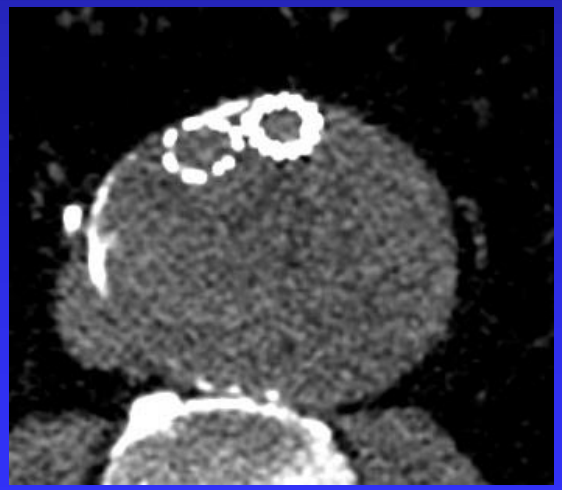
Constraste spontané

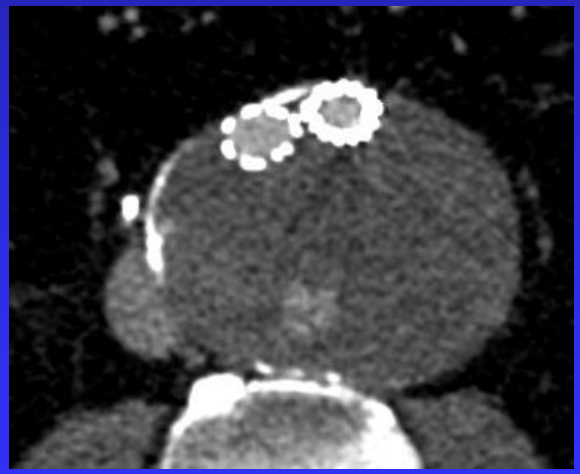
Phase artérielle



Phase tardive







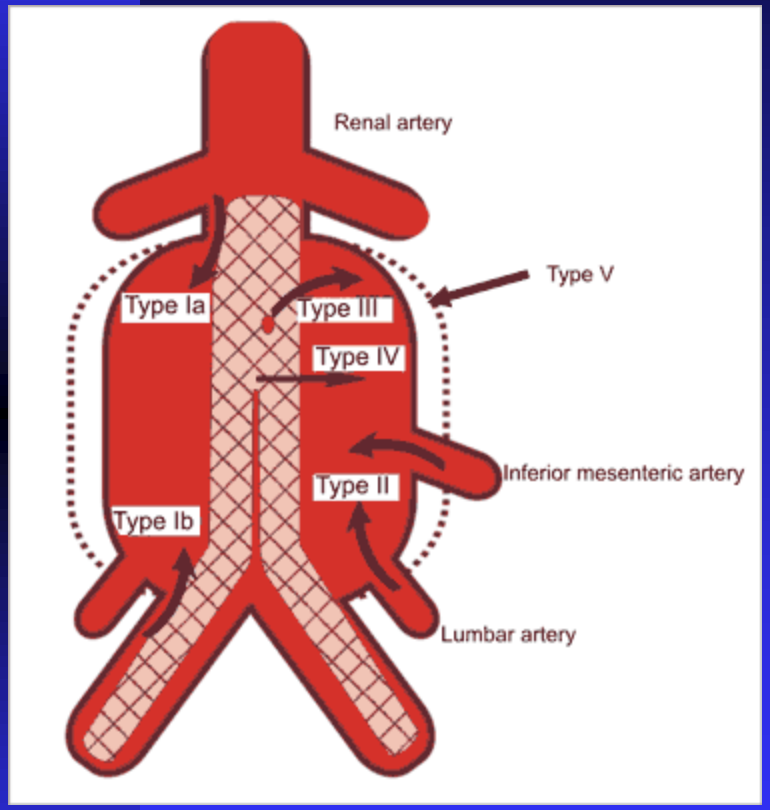
Sans PCI

Avec PCI

MDCR (2):

- Gold standard
- Permet:
  - Détection des complications précoces
  - Analyse perméabilité
  - Mensuration du sac résiduel
  - Détection des endofuites.

Endofuite (“endoleak”)

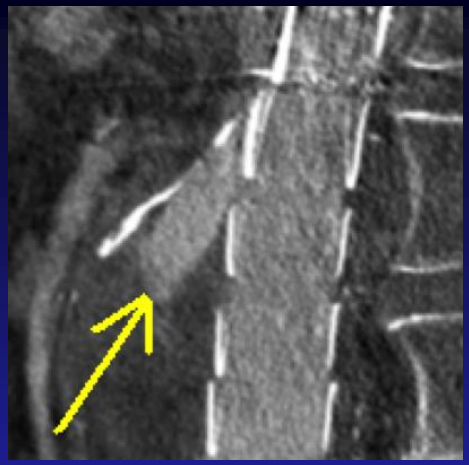


Endoleak Type	Description
Type I	Endoleak related to the graft device itself.
Type II	Endoleak due to retrograde flow from collateral branches
Type III	Endoleak due to fabric tears, graft disconnection, or disintegration.
Type IV	Flow through the graft presumed to be associated with graft wall "porosity"
Endotension	Persistent or recurrent pressurisation of the sac with no evidence of endoleak.

- Type 1: 6%
- Type 2: 5%
- Type 3: 6%
- Type 4: ?
- Type 5: 3%

Diagn |& Interv imag 2016: 97,19-27

Type I:



Défaut d'apposition proximal ou distal:

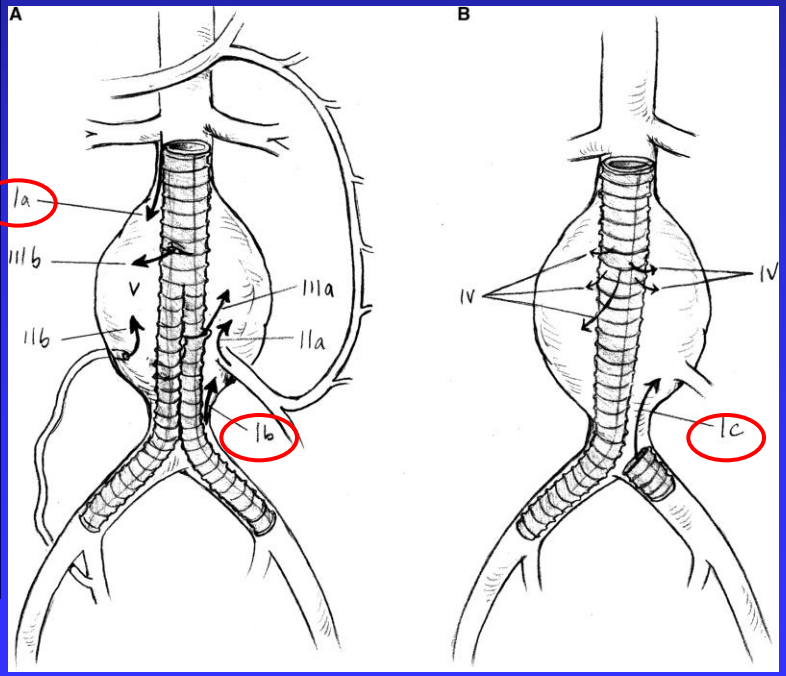
- défaut technique: diamètre suboptimal
- défaut anatomique: zone d'amarrage courte, irrégulière, ulcérée, angulée
- Migration caudale

1a: proximal

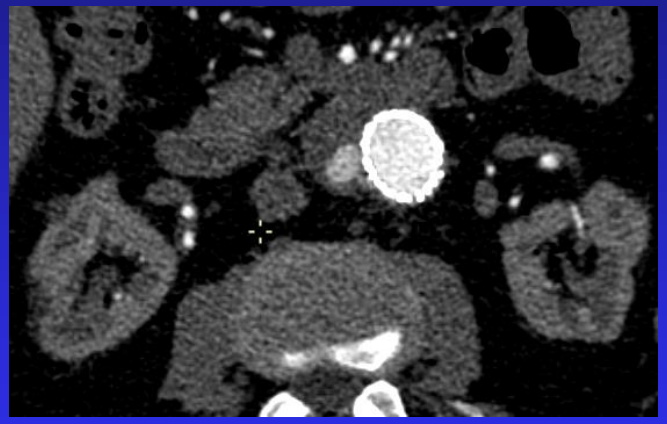
1b: distal

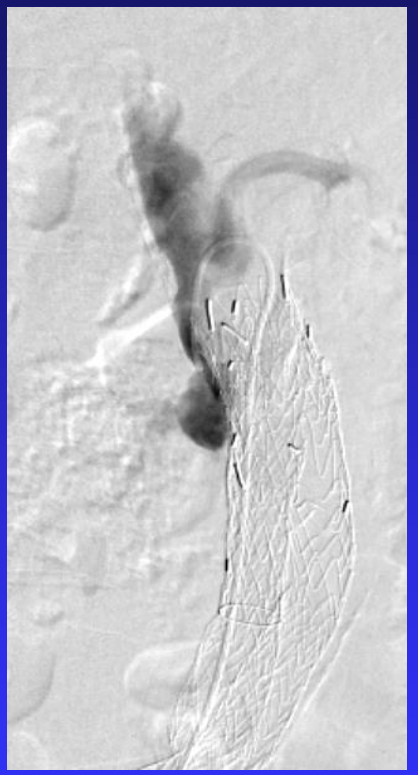
1c: zone d'exclusion par "plug"

1d: "gouttière" le long extensions d'une prothèse fenestrée.

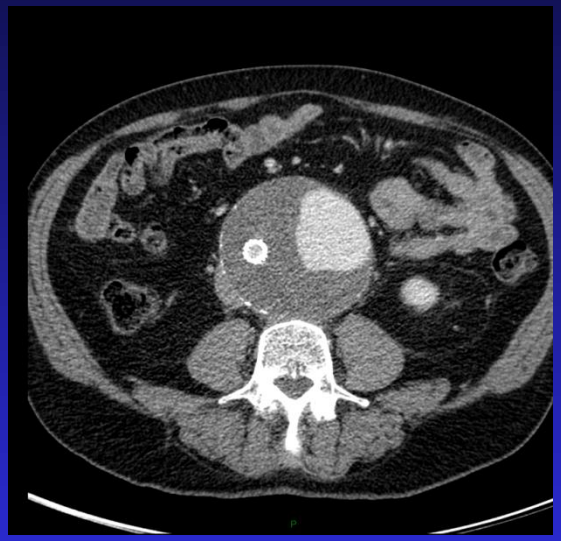


Type Ia:

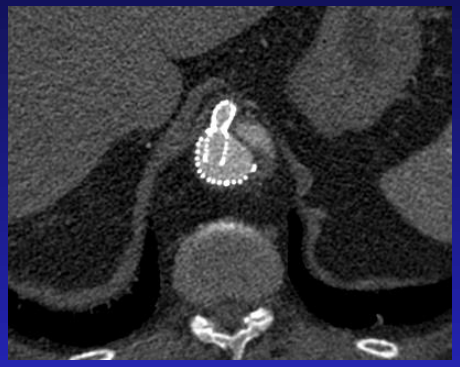


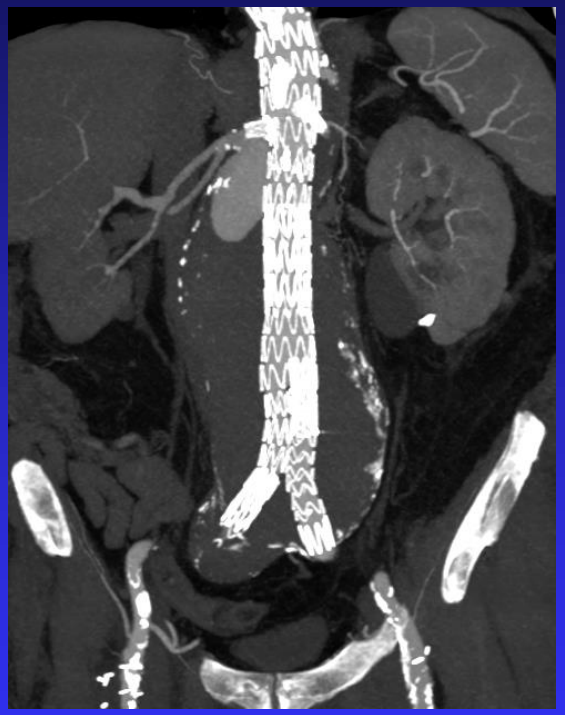


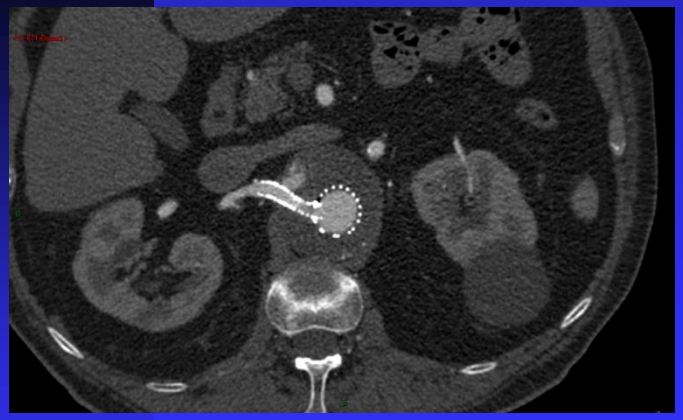
Type 1b



Endofuite prothèse fenestrée (1d)



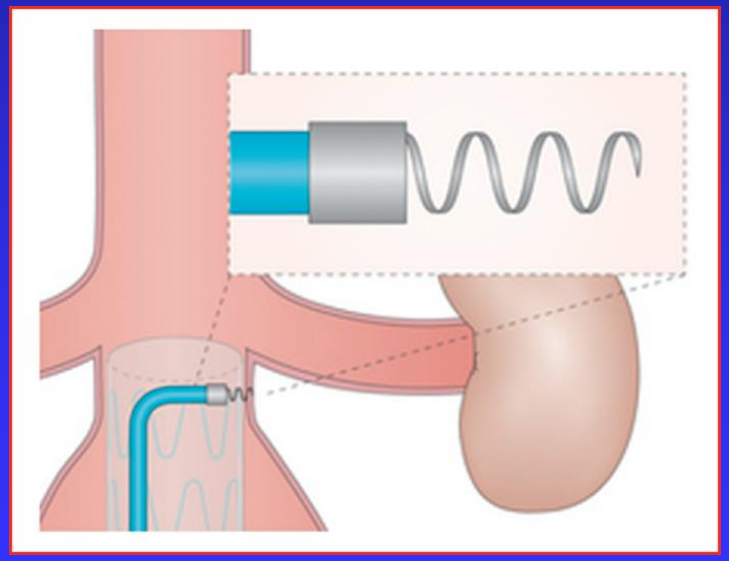


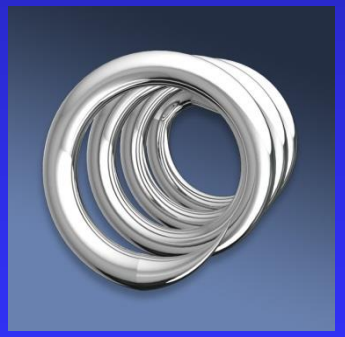


Type I >>> traitement rapidement

- Addition prothèse

- Matériel de fixation
- (Embolisation: coils + agent liquide)



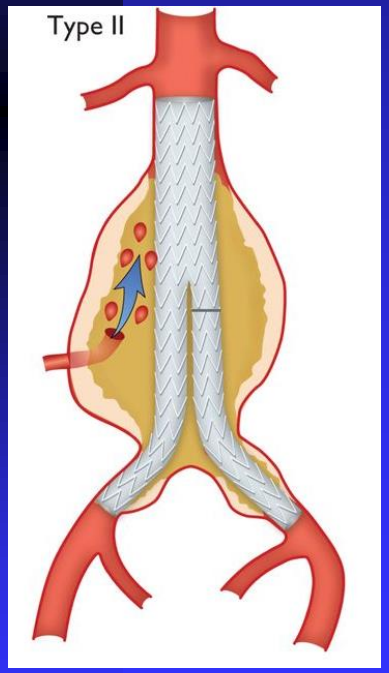


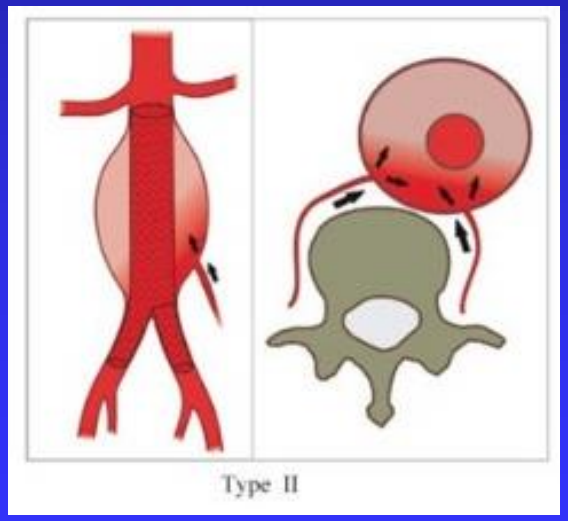
Aptus™
Heli-FX EndoAnchor™ system
Medtronic

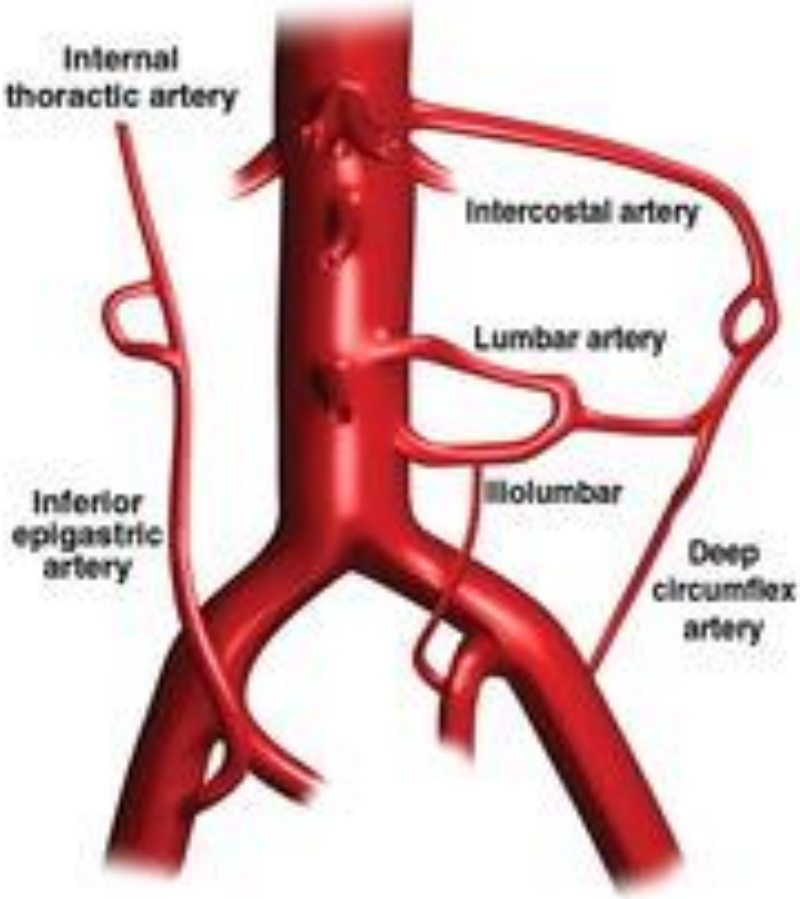
Type II:

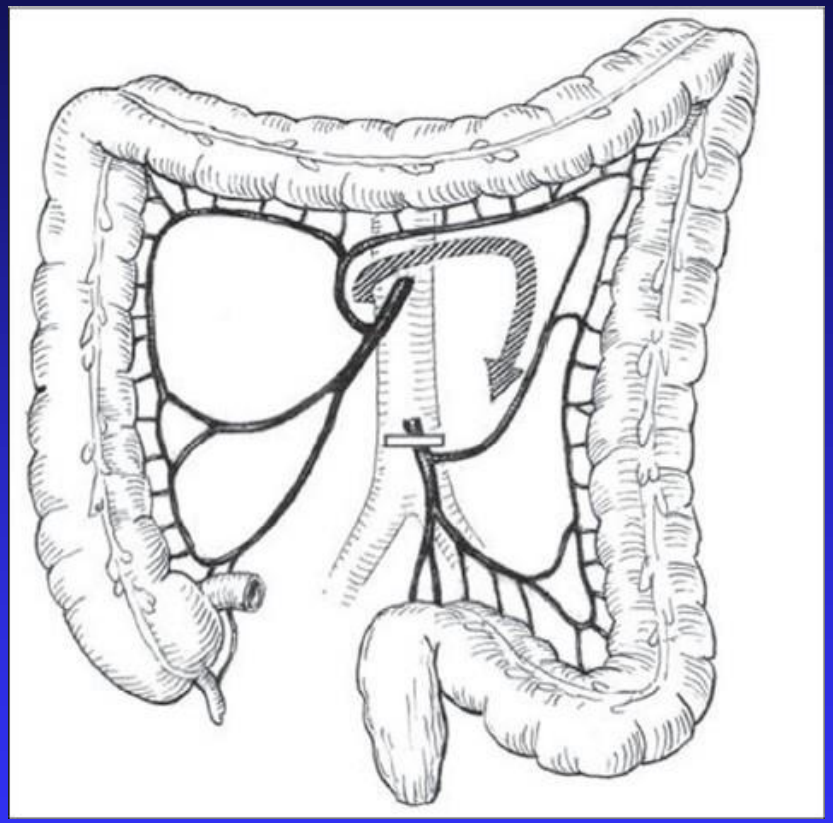
Réinjection du sac anévrismal par une “branche artérielle”:

- **AMI et / ou branches ilio-lombaires**
- Type le plus fréquent
- Prise de contraste périphérique focale intra-sac:
  - Antérieur: AMI (A)
  - Postéro-latéral: artères lombaires (B)
- Traitement si augmentation du sac anévrismal.

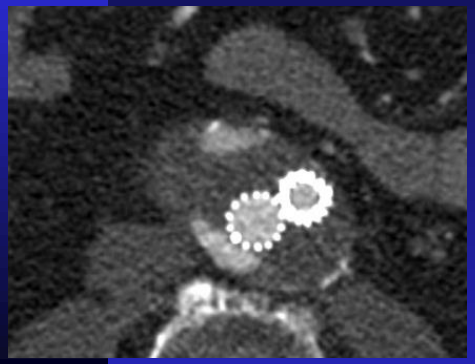


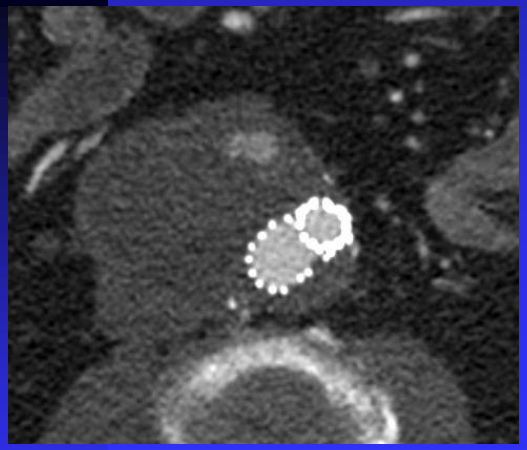


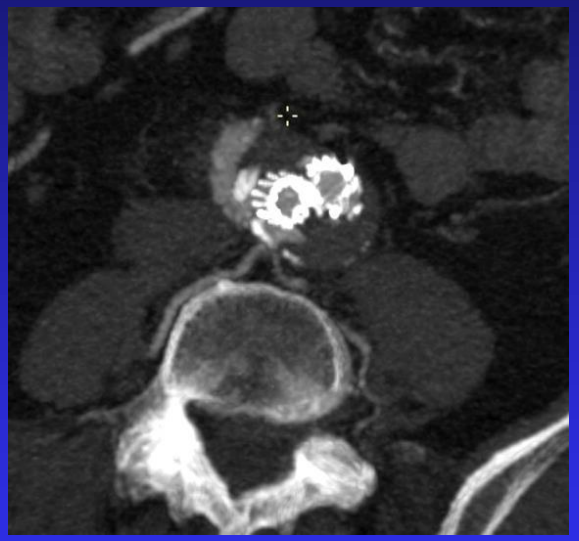

Internal thoracic artery
Intercostal artery
Lumbar artery
Iliolumbar
Inferior epigastric artery
Deep circumflex artery



Endofuite de type ?



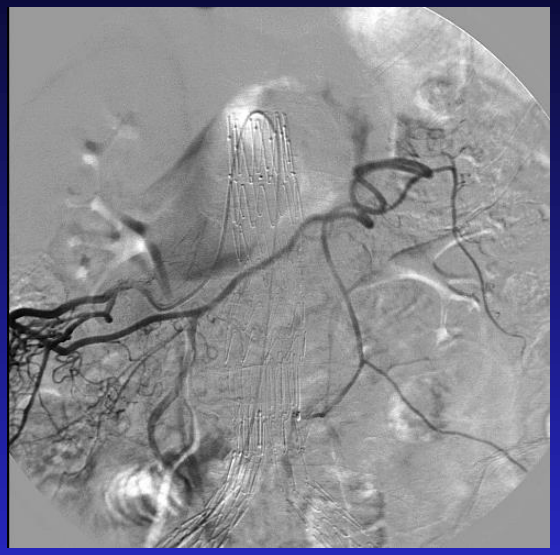


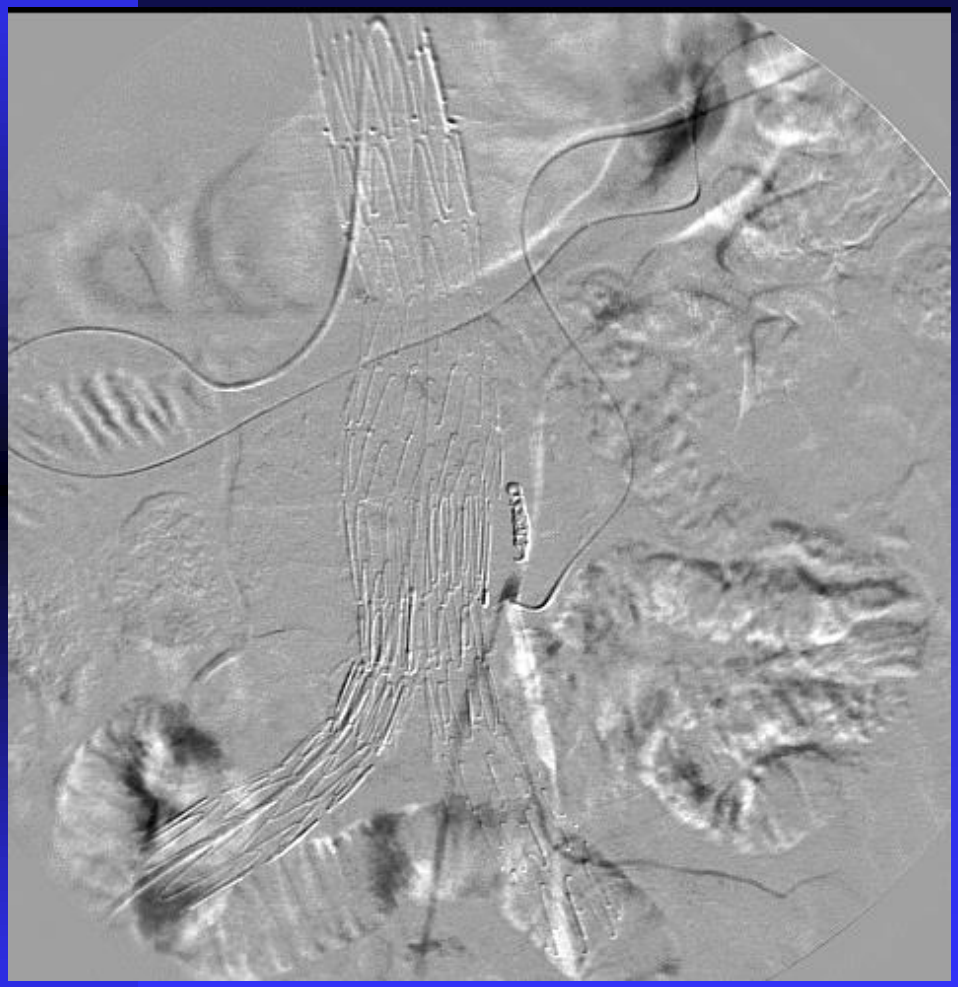


Traitement du type II: “RI”

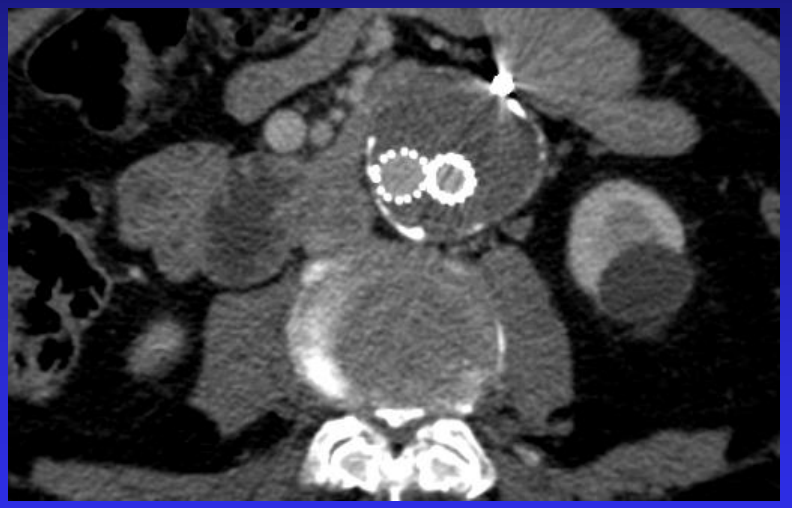
- Surveillance
- Embolisation transartérielle:
  - AMI via arcade de Riolan
  - Artères ilio-lombaires via l’artère hypogastrique
- Ponction percutanée du sac:
  - Embolisation par coils/colle/Onyx
  - Voie translombaire
  - Voie transabdominale
  - Voie transcave
- Rarement chirurgical: ligature laparoscopique, chir.classique.

Endofuite II : coils

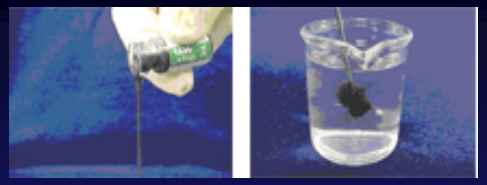


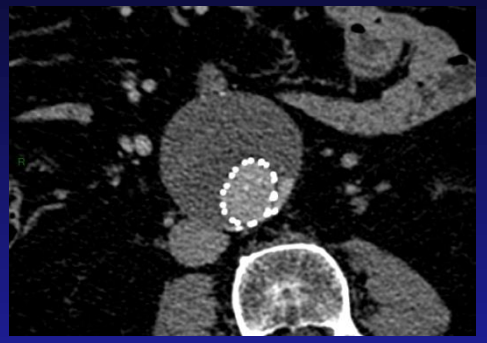


CT à 3 mois

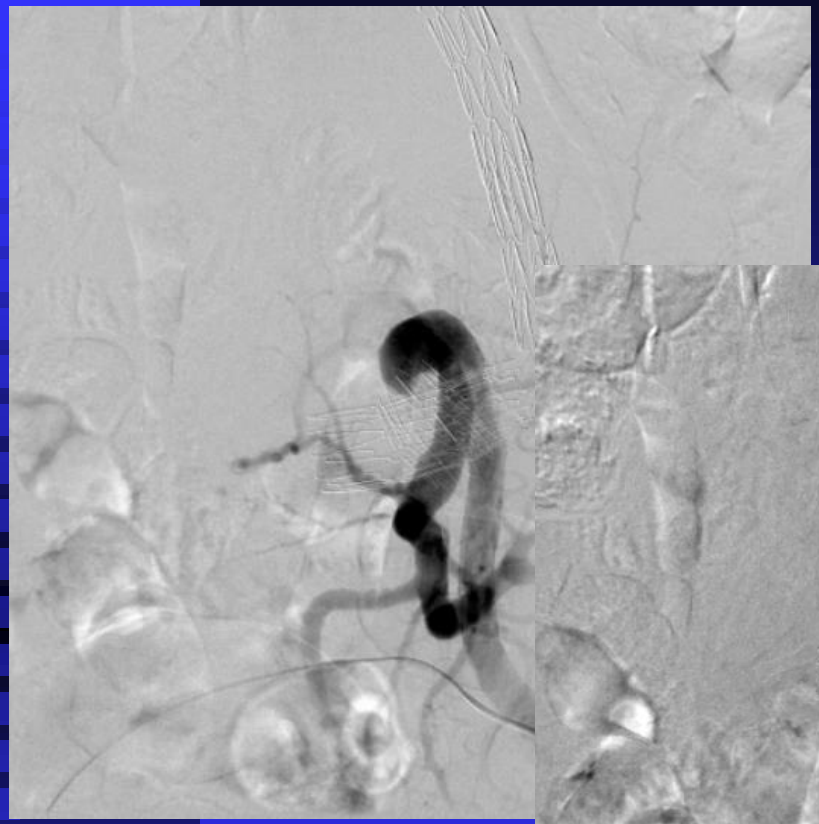


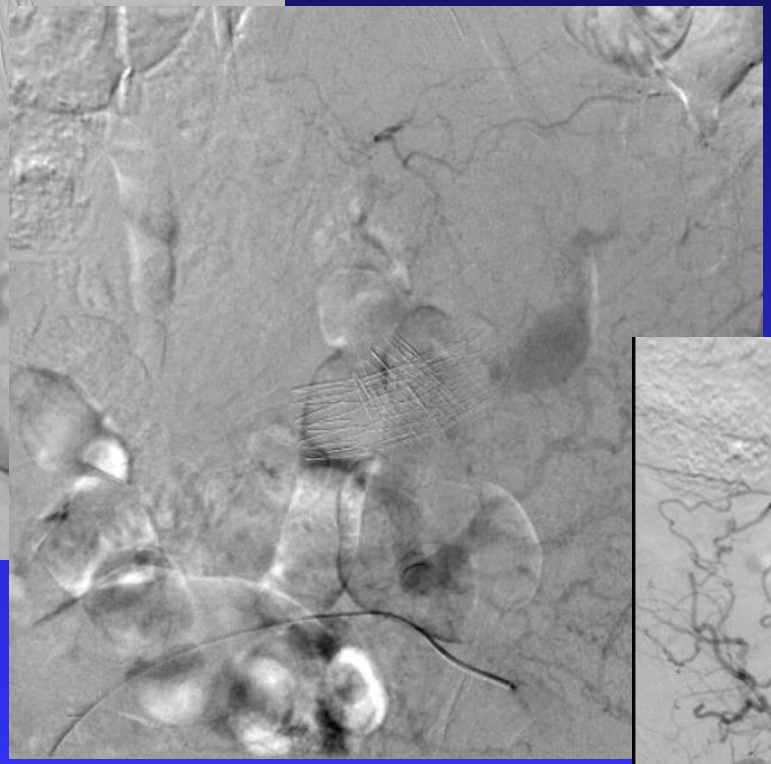
Endofuite II: Onyx

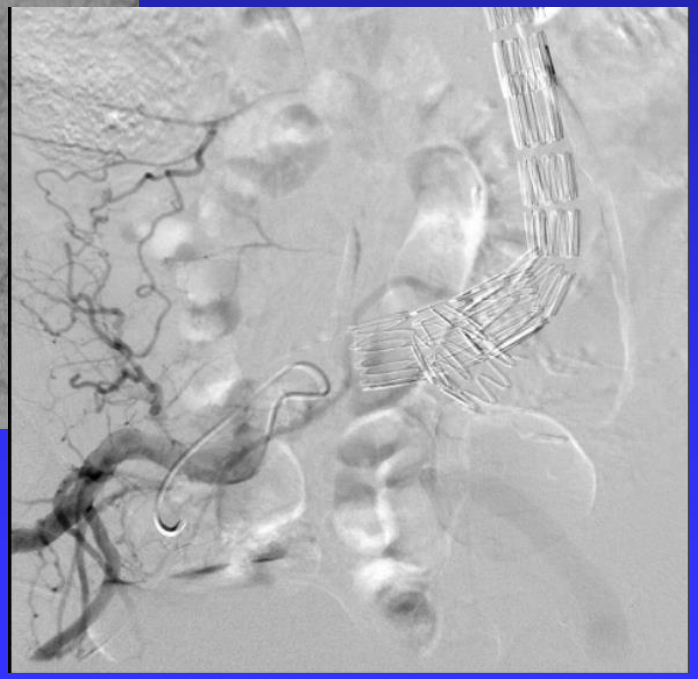


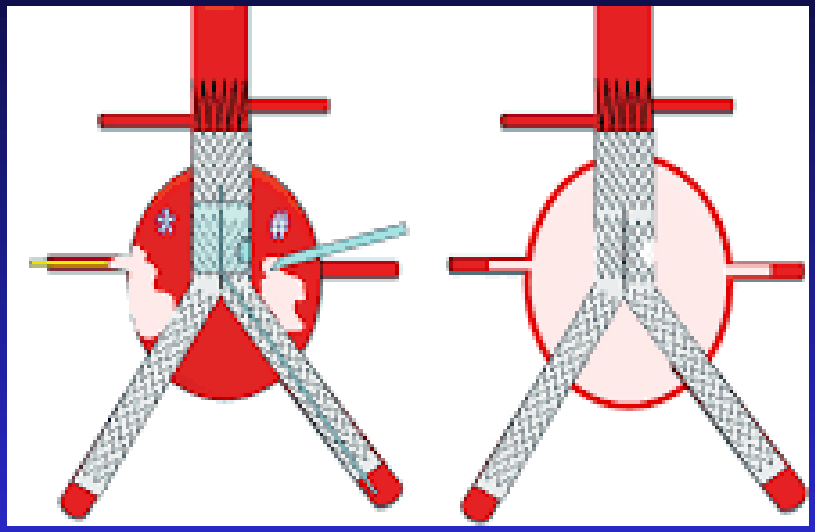


Difficulté abord ilio-lombaire

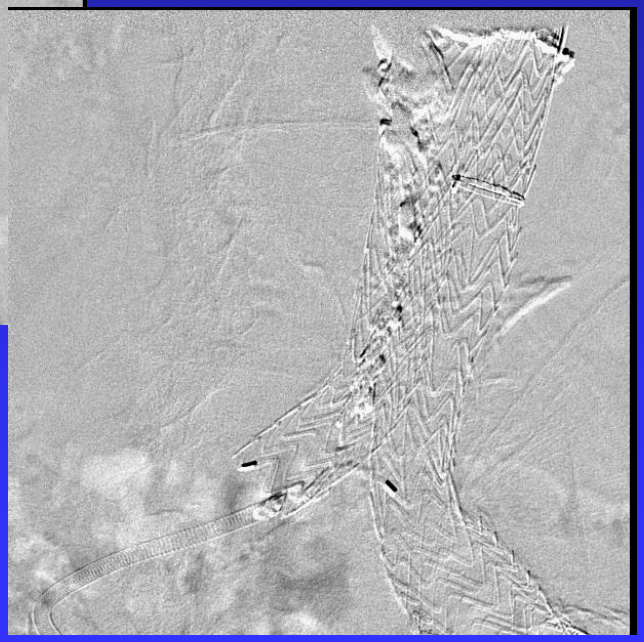




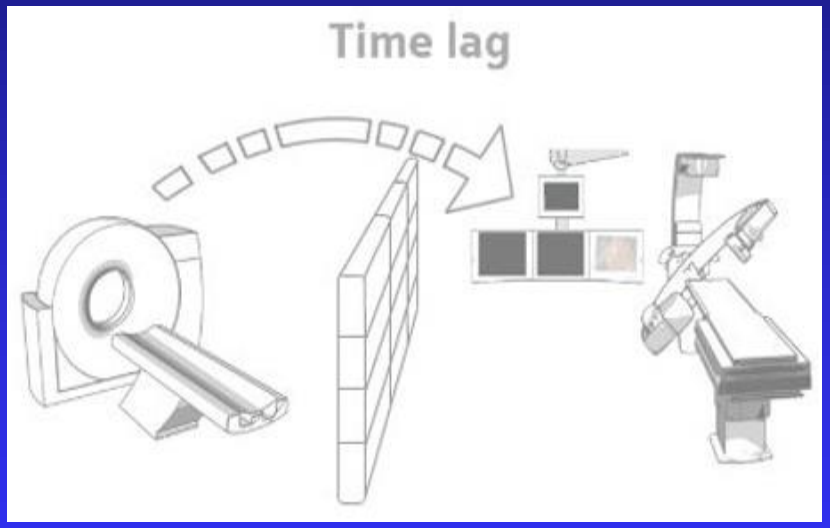


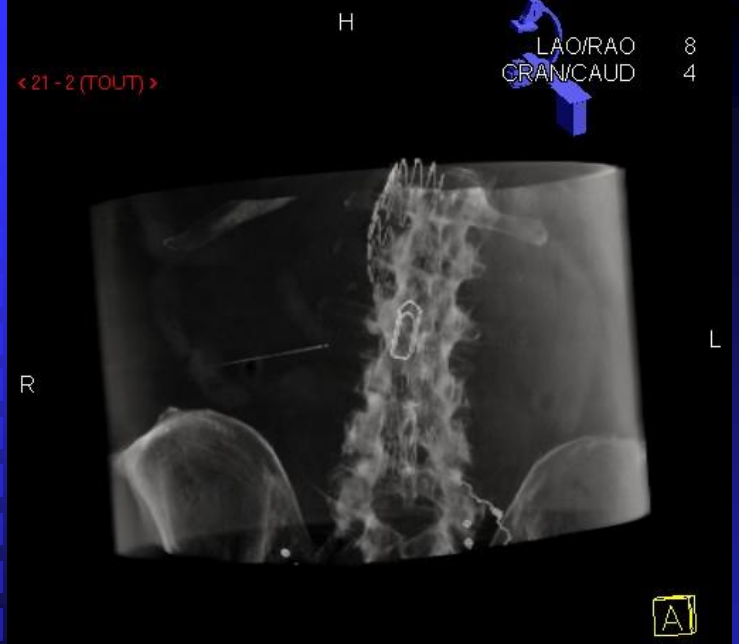


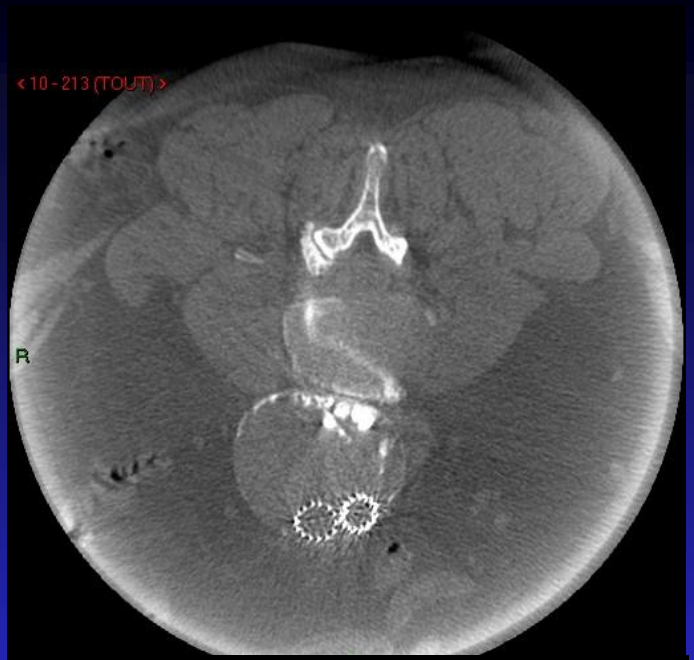
Passage entre
stent et paroi
>>> Onyx



Dyna-CT ?




H
LAO/RAO 8
CRAN/CAUD 4
< 21 - 2 (TOUT) >
L
R
A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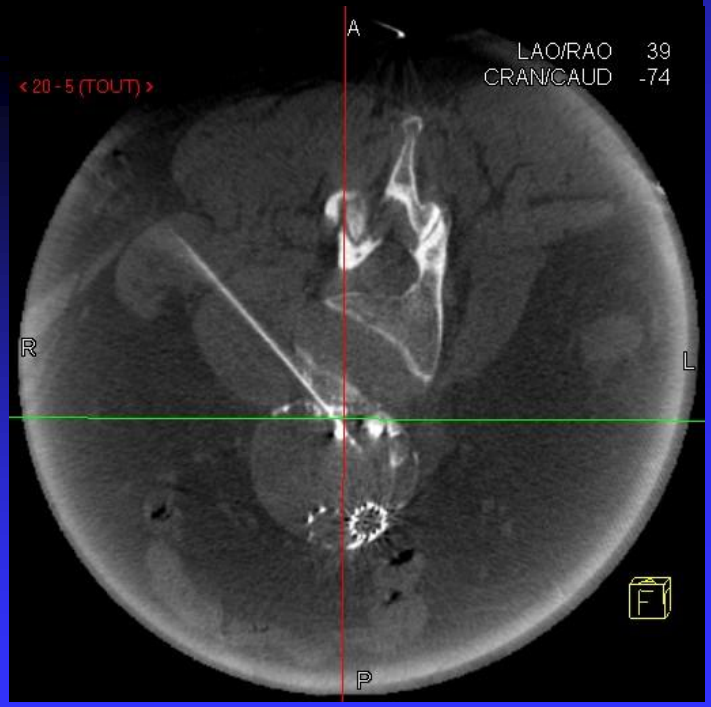
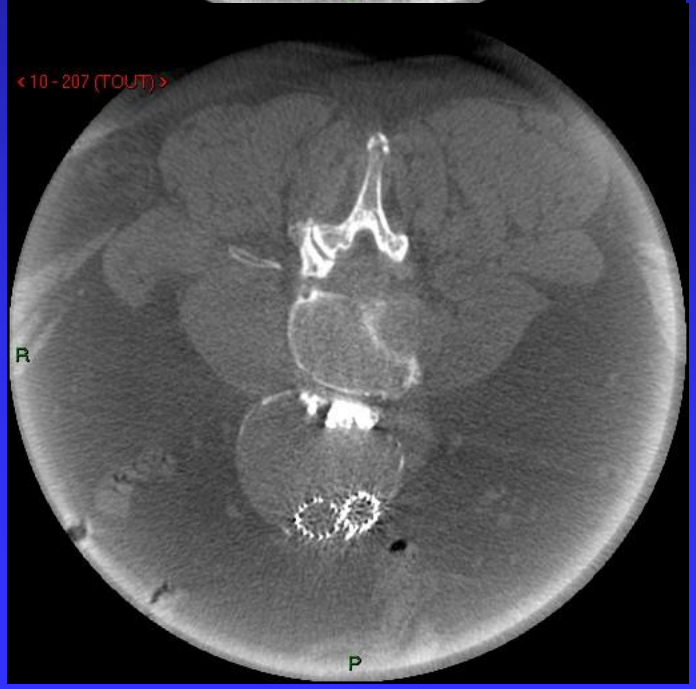
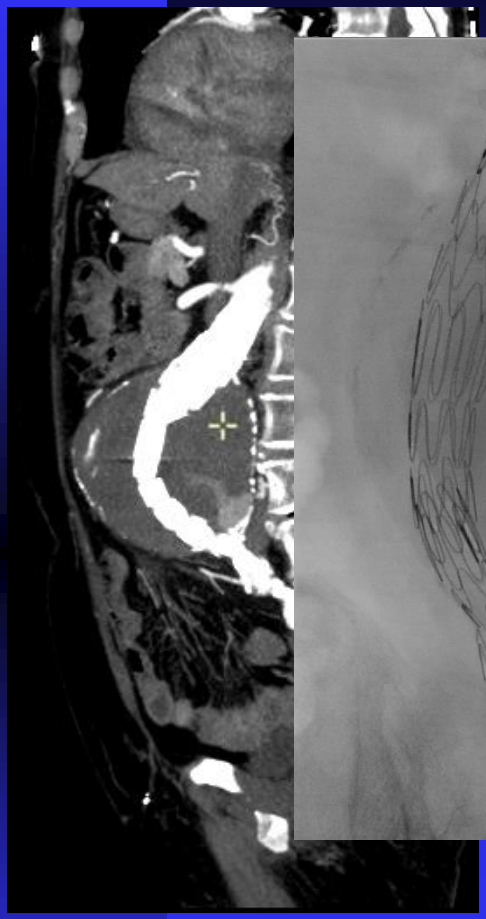
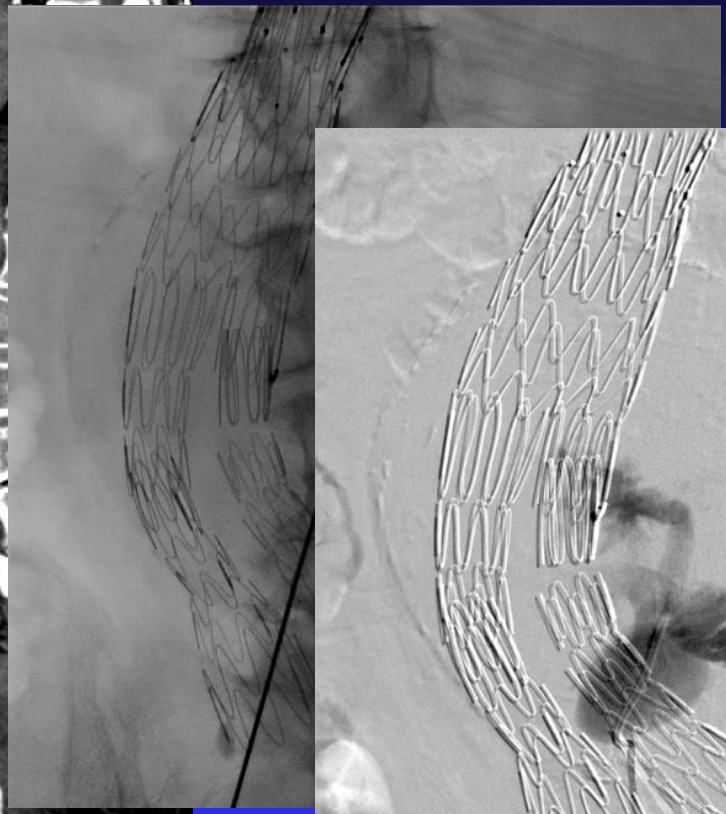
R

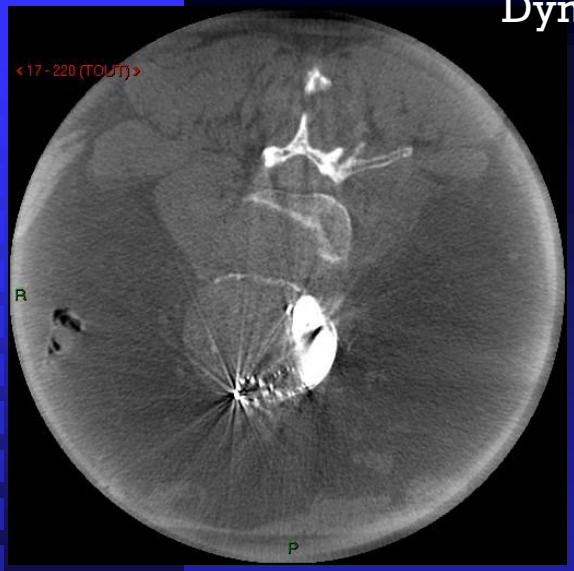

A
LAO/RAO 39
CRAN/CAUD -74
< 20 - 5 (TOUT) >
R
L
F
P

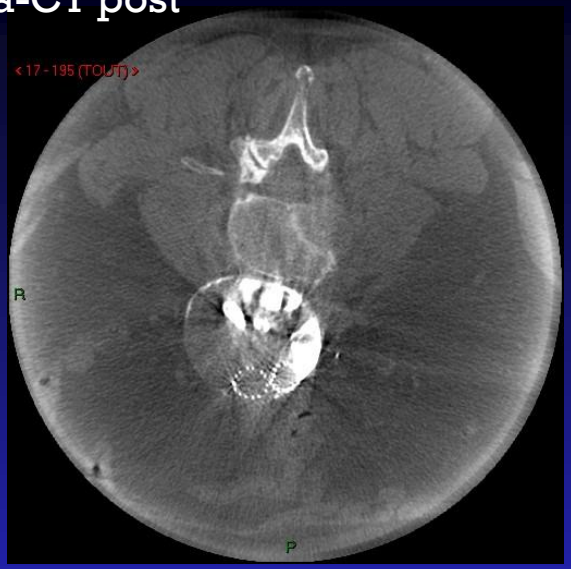

< 10 - 207 (TOUT) >
R
P

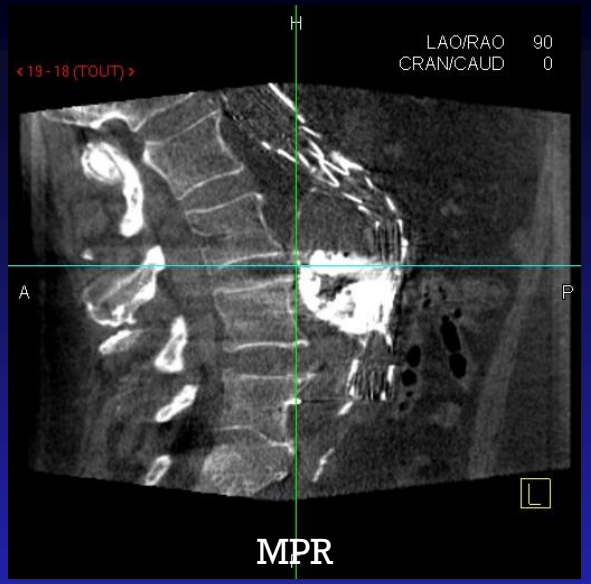




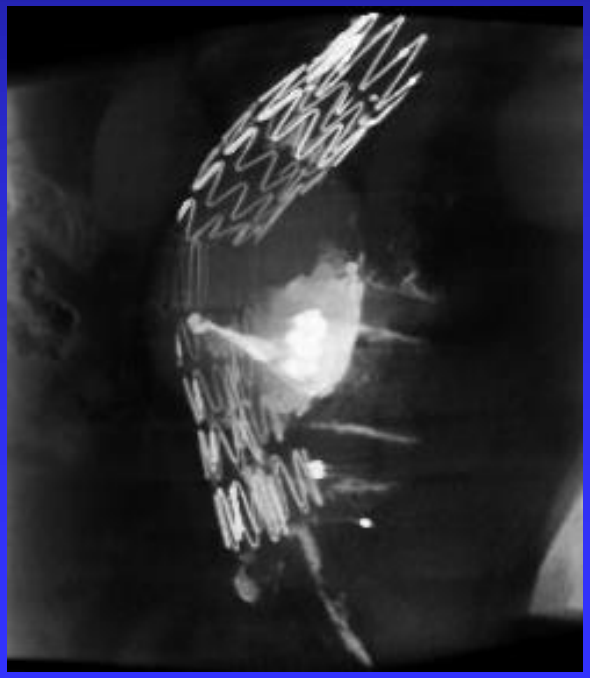
Dyna-CT post

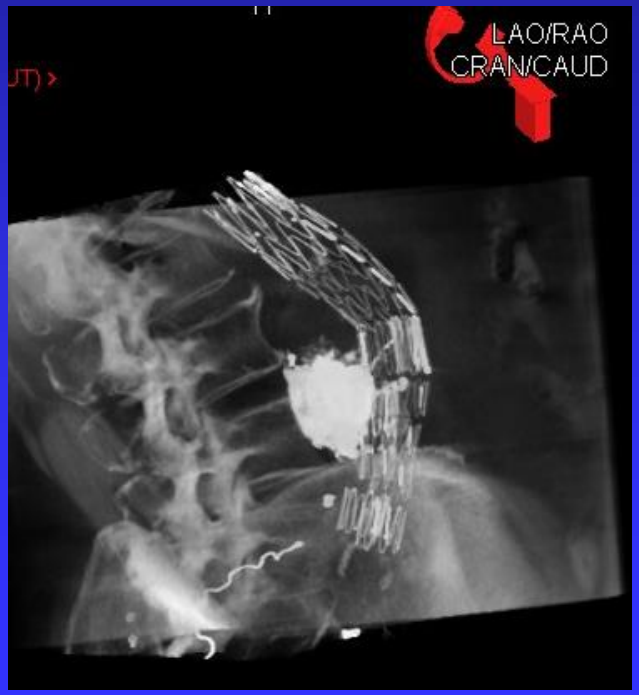






MPR



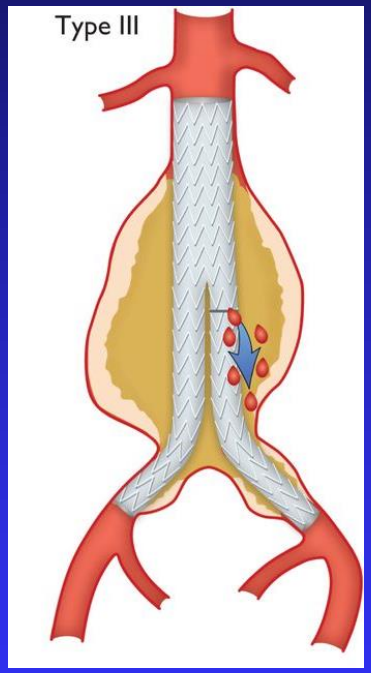


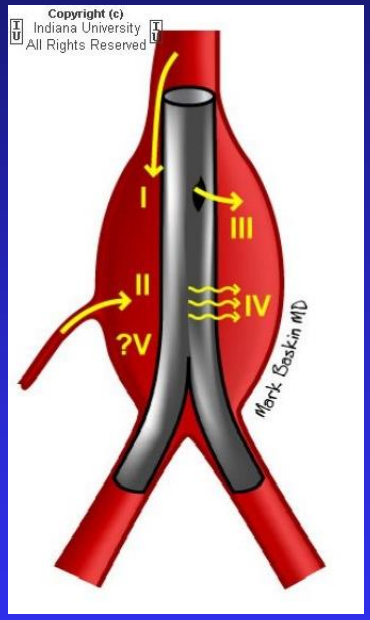
Endofuite II: conclusion

- Endofuite: 10-30%
- Type II: la plus fréquente, non urgent
- Risque de rupture:
  - si croissance
  - 05-2,4%
- Accès transfémoral (AMI, ilio-lombaire) < ponction directe:
  - Succès 65-100%
  - Agents liquides > coils
  - 2-20% de re-intervention
- Chirurgie: 8-10%
- Perspectives: prothèse Nellix (Endologix), dénudation endothéliale pdt la mise en place (RF).

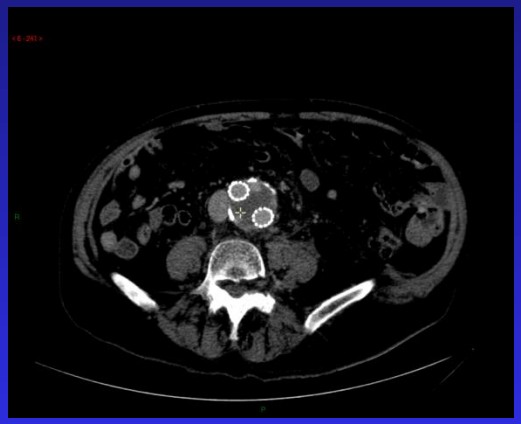
Type III:
défaut de fabrication, déchirure, déconnexion, fracture

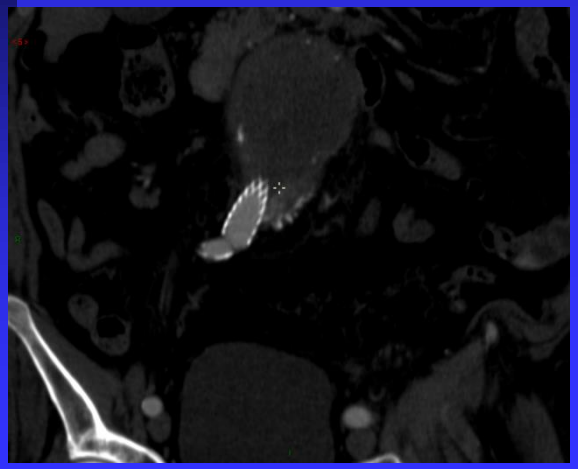
- Exceptionnel
- Fuite immédiatement adjacente à la prothèse
- Absence d'opacification AMS et a. lombaires
- 3a: trou dans la prothèse
- 3b: fuite entre 2 composants
- 3c: défaut dans le matériel
- Traitement urgent: stent couvert, rarement chirurgie.

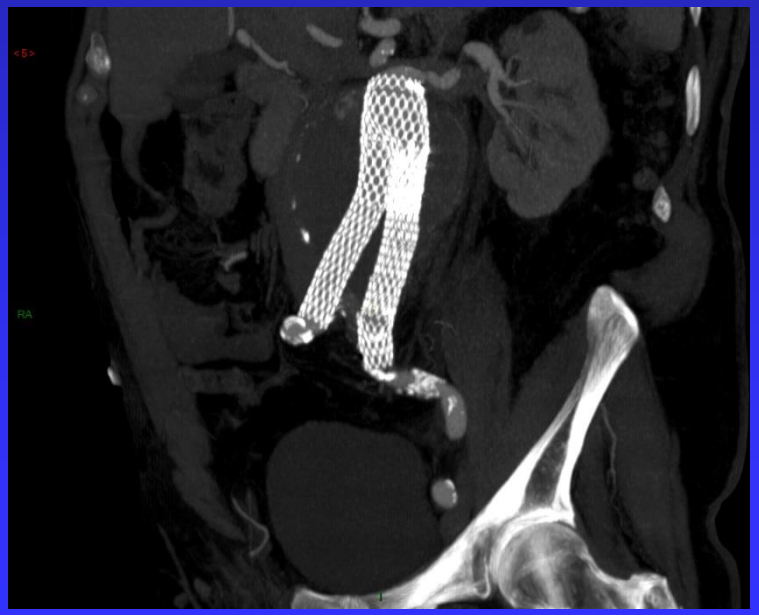




Type I et/ou III

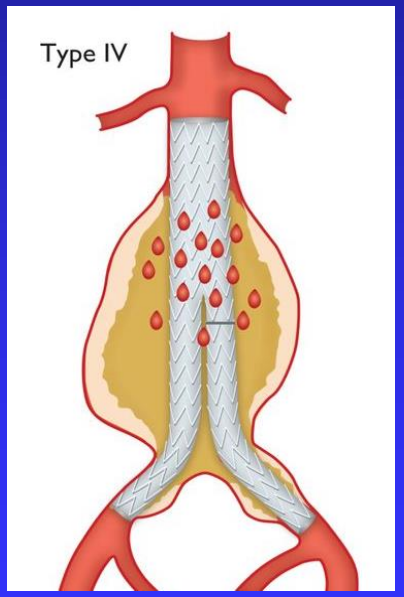






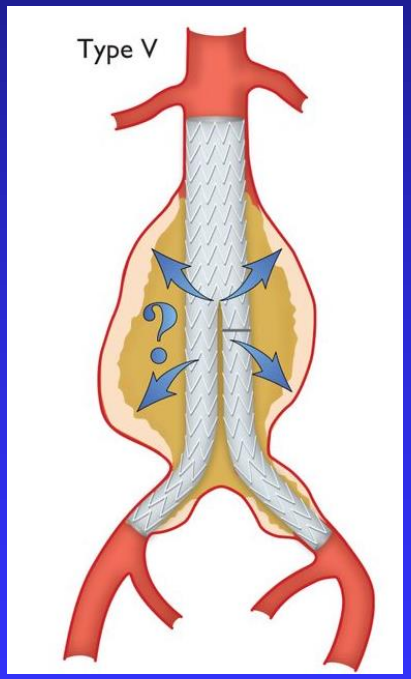
Type IV: porosité excessive

- Zone de suture tissu - stent
- Détection angiographique: fin de procédure généralement
- Évolution: tarissement spontané
- Surveillance

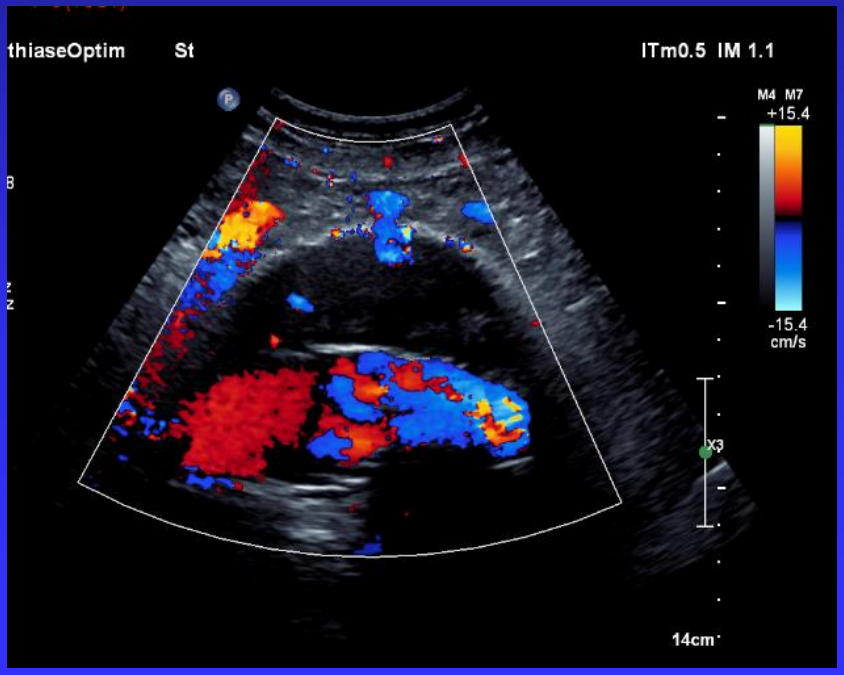


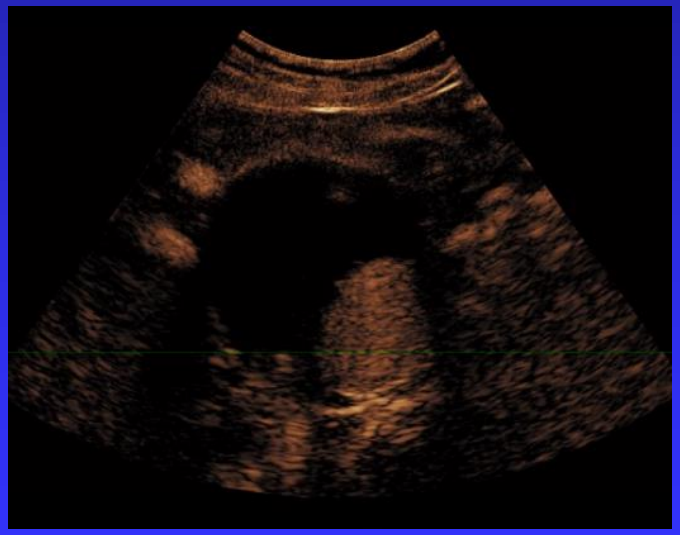
Type V: “endotension”

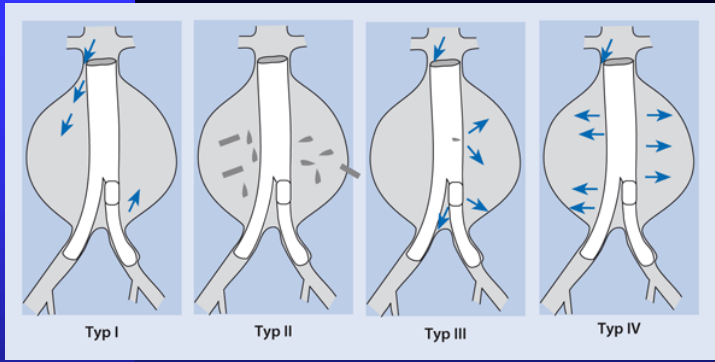
- Augmentation de taille du sac anévrismale
- Pas de fuite identifiable
- Traquer la fuite:
  - Écho de contraste
  - IRM
  - Angiographie
- Dernier recours: chirurgie.



Sonovue
(Bracco)





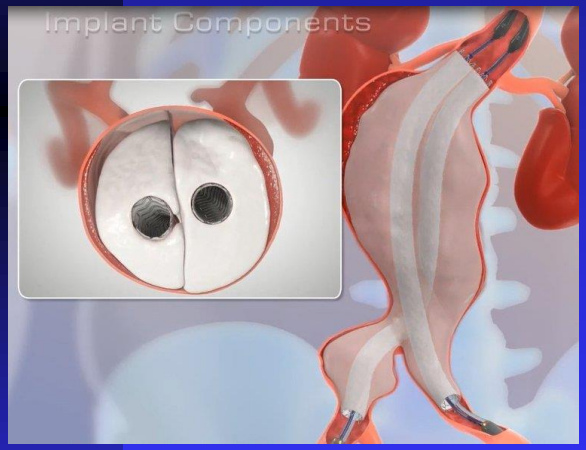


- TDM fuite
  - Type I et III
    - Trait. urgent: Risque de rupture
  - Type II
    - Traitement si augmentation du sac
  - Type IV
    - Résolution spontanée
  - Type V
    - Diagnostic . d'exclusion: Chirurgie ?

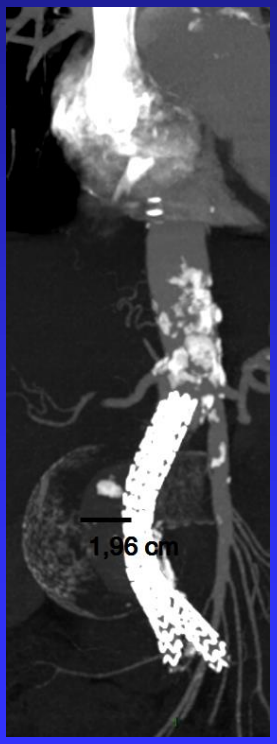
Connaitre le type de prothèse

Prothèse Endologix:
“Endobag” rempli avec un polymère

Prothèse Endologix



A blanc !!!

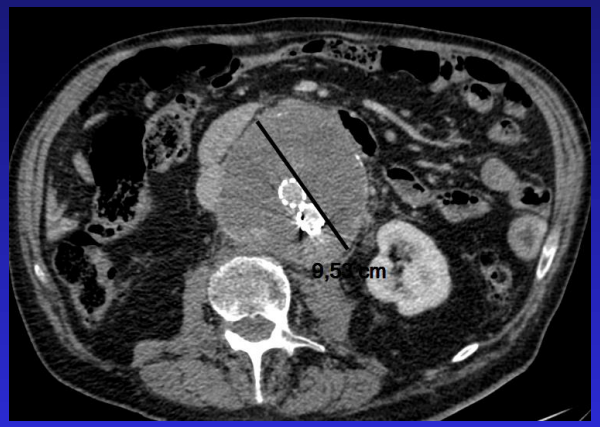


Suivi EVAR: conclusion

- Angio-CT tri-phasique
- RX ou CT à blanc: structure (“kinking”, dilatation, fracture, dislocation)
- + US:
  - Nombreux avantages
  - Direction du flux
  - CE-US
- (IRM)
- Divers: capteur de pression miniaturisé (), dosage d-dimers
- Place importante de la RI dans le traitement des endofuites.

Rythme de surveillance ?

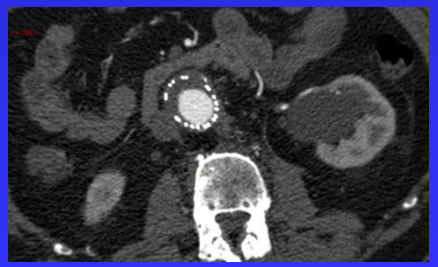
- Classique:
  - @ 1,3,6,12 mois
  - Puis annuellement



- 1 mois - (6 mois si anl) - 1 an
- Puis annuellement:
  - Ct sans PC (“structure) + US-constraste

Complications EVAR:

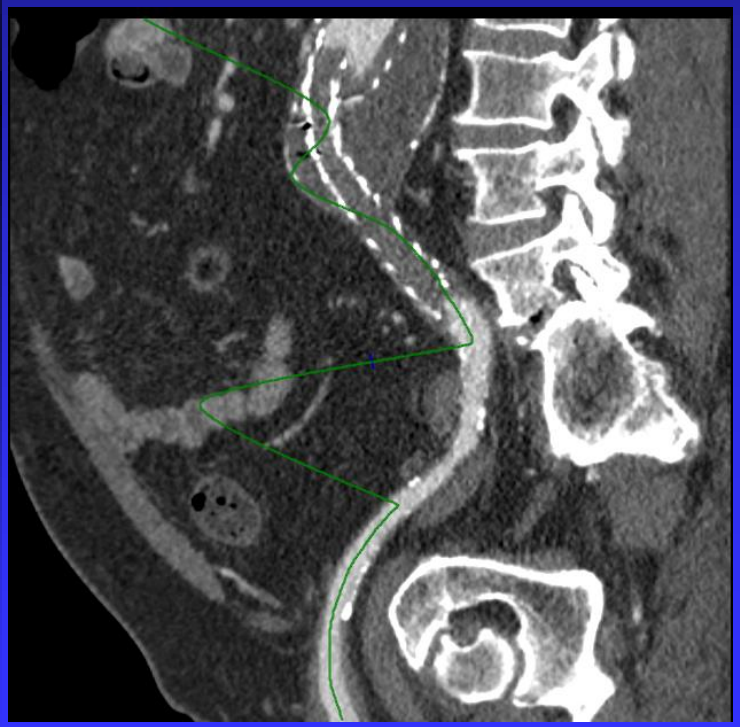
- Plaies creux inguinal (hématome, infection, lymphocèle): 1-10%
- Lésion artérielle: thrombose, dissection, pseudoanévrisme 3%
- Néphropathie (IRA) sur PCI: 6,7%
- Ischémie colique: 1-3%
- Ischémie médullaire: 0,21% (Eurostar, sur 2862 pat.)
- Occlusion artère rénale: <5%
- Occlusion d'une branche iliaque: …jusqu'à 40%;
- Infection: 0,5-1%

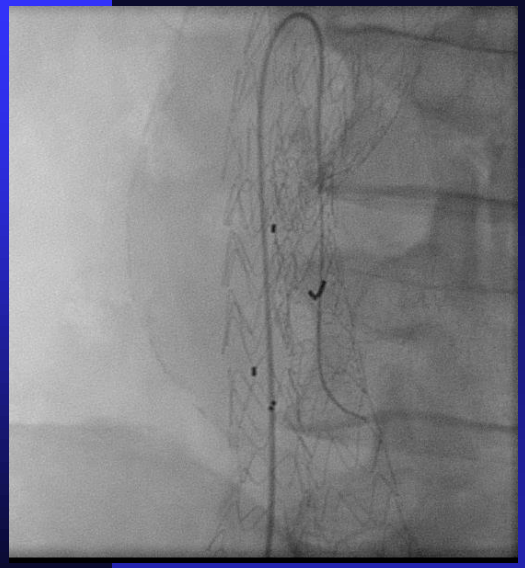


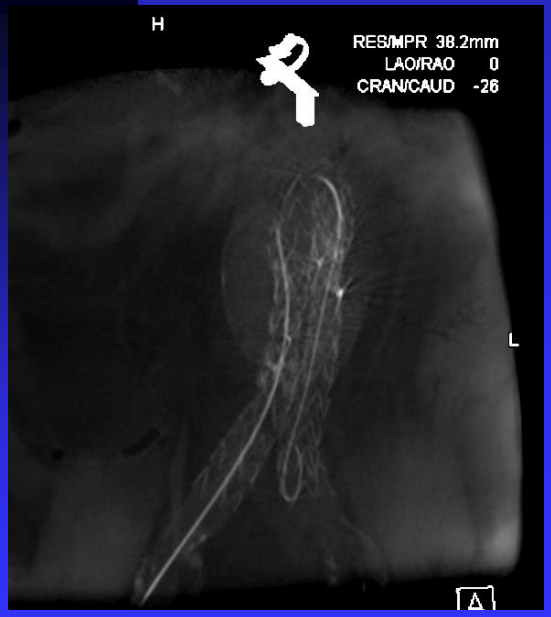
Thrombus intra-graft

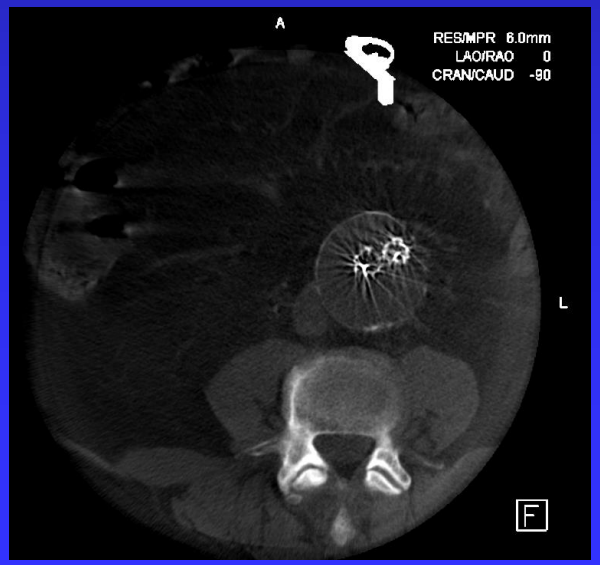
Malleux G. Sem Intervent Radiol 26,1,2009.

Thrombose



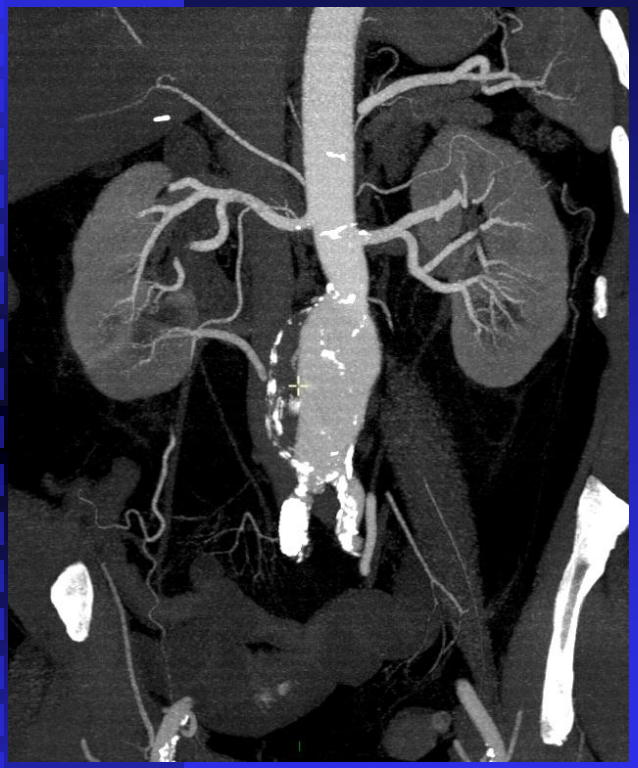


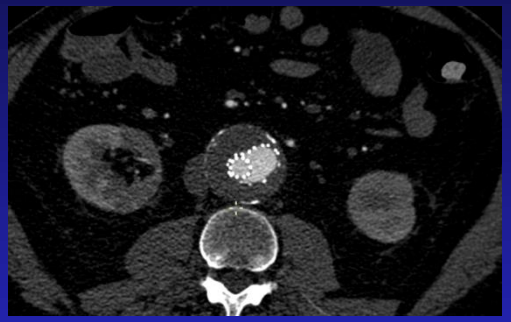


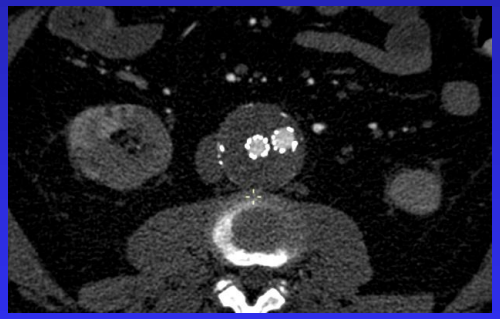


Thrombolyse +stent

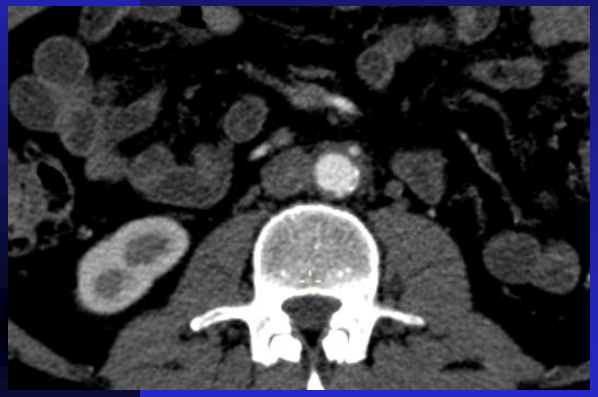
Occlusion artère rénale



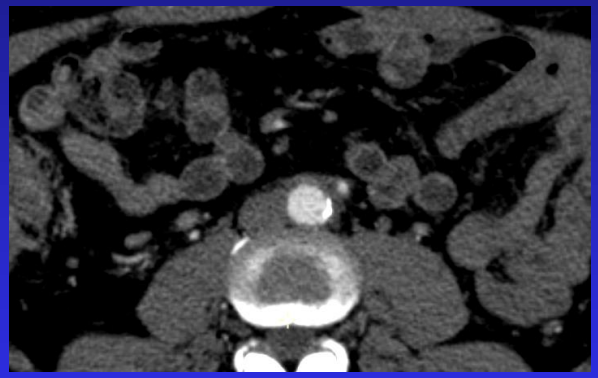


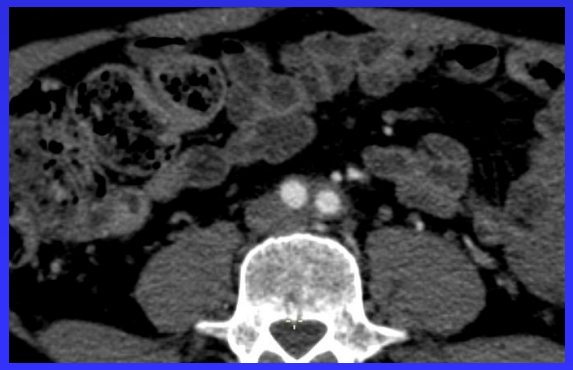


AORTITES



2006





“Aortites” non-infectieuses (1)

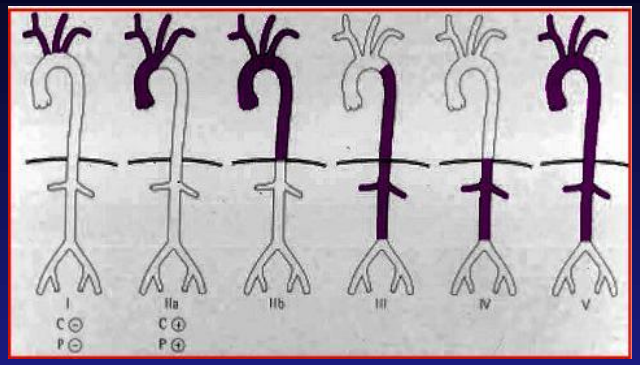
- **Larges vaisseaux:**
  - Artérite à cellule géantes
  - Mal. Takayasu
  - LED (lupus)
  - Arthrite rhumatoïde
  - Spondyklarthrite ankylosante
  - Syndrôme de Reiter
- **Petits et moyens vaisseaux:**
  - Artérite de Wegener
  - Polyartérite noeuse
  - Maladie de Behçet
- **Idiopathiques:**
  - Aortite idiopathique: 2/3 femmes, >90% AA thoracique et/ou abdominal
  - Anévrisme aortique inflammatoire (5-25% des AAA)
  - Péri-aortite = Fibrose idiopathique rétropéritonéale
- **(Aortite radio-induite: Ao thoracique)**

Radiographics, vol 31, n°2, p 435-51.

“Aortites” infectieuses (2)

- Bactériennes:
  - Streptocoque (pyogène, pneumoniae),
  - Salmonellose, Staphylocoque: 40%
- Syphilitiques (S. tertiaire): aorte asc. (60%), arche (30%).
- Mycobactériennes: myco. Tbc (Tbc résistante au trait. , + HIV), anévrismes mycotiques (pseudo, rupture)
- Virales: HIV
- Terrain favorisant: athéromatose, anévrisme pre-existant, diabète, néoplasie, alcoolisme, traitement immunosuppresseur, cortico-stéroïdes, dispositif endovasculaire ou chirurgie…

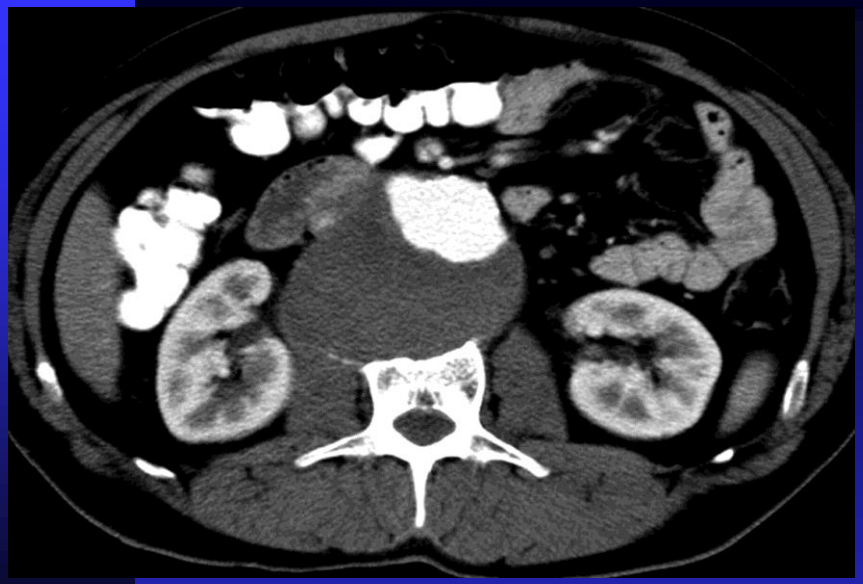
Artérite de Takayasu

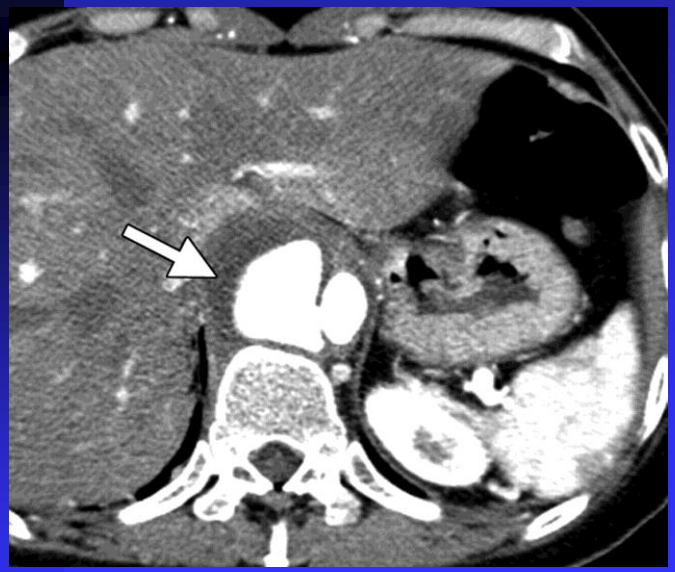


- Maladie auto-immune
- Destruction média: sténose > anévrisme
- Femme > homme, début 20-40 ans
- Asie du Sud-Est, Inde, Amérique du Sud
- Rare en occident: 1-2 nouveaux cas / an / million d'habitants
- Artérite inflammatoire de l'aorte et de ses branches: art. pulmonaires et coronaires, ao abdominale > ao thoracique descendante > arche !
- Signes visuels (uvéite, épisclérite), cutanés (ulcère, erythème noueux), douleurs musculaires …
- Cause d'HTA réno-vasculaire:
  - Associé à une sténose aortique: 70%
  - PTA: succès technique 85%
  - Resténose --->> 25%

Maladie de Behçet:

- Origine?:
  - Immunitaire
  - Génétique: “route de la soie”
    - Moyen-Orient, Japon, Turquie: 1:230 à 1:1000
      - (Europe occidentale: 1:40000)
- Diagnostic clinique:
  - Aphtose muqueuse (“bipolaire”, génitale)
  - Cutané (érythème noueux)
  - Oculaire: uvéite, vascularite rétinienne
  - Arthrites
  - Neurologique (crise E, méningite…)
  - **Artérite inflammatoire (5-40%):**
    - Pseudo-anévrismes sacculaires, multiples dans 20% des cas.





Behçet
Pseudo-anévrisme

Published in: Carlos S. Restrepo; Daniel Ocazionez; Rajeev Suri; Daniel Vargas; *RadioGraphics* **2011,** 31, 435-451.
DOI: 10.1148/rg.312105069
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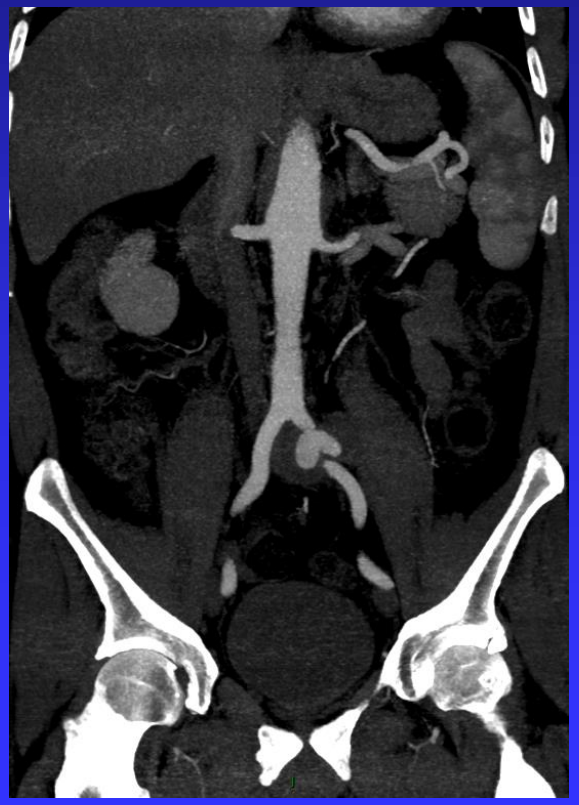
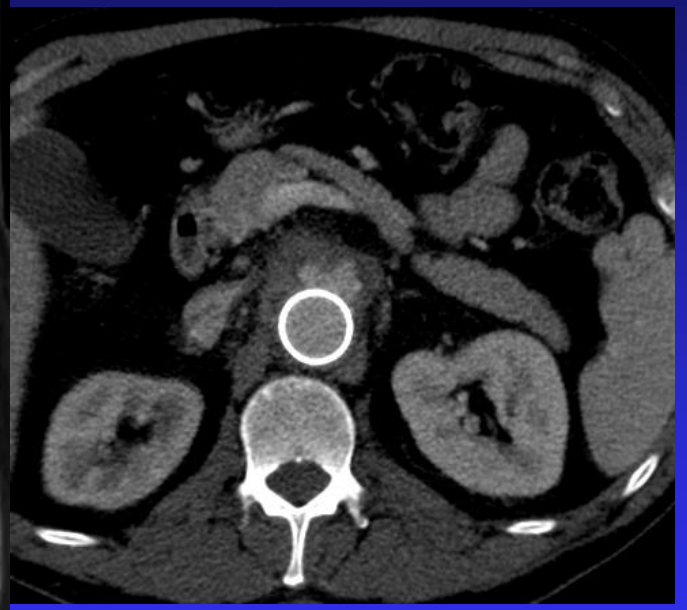
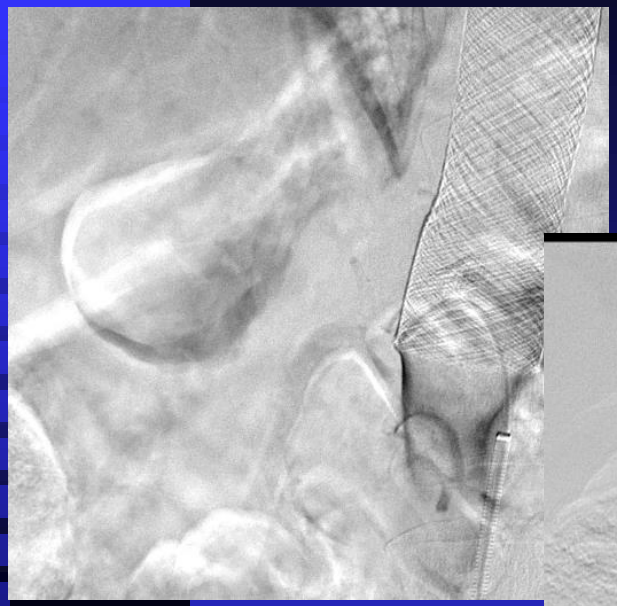
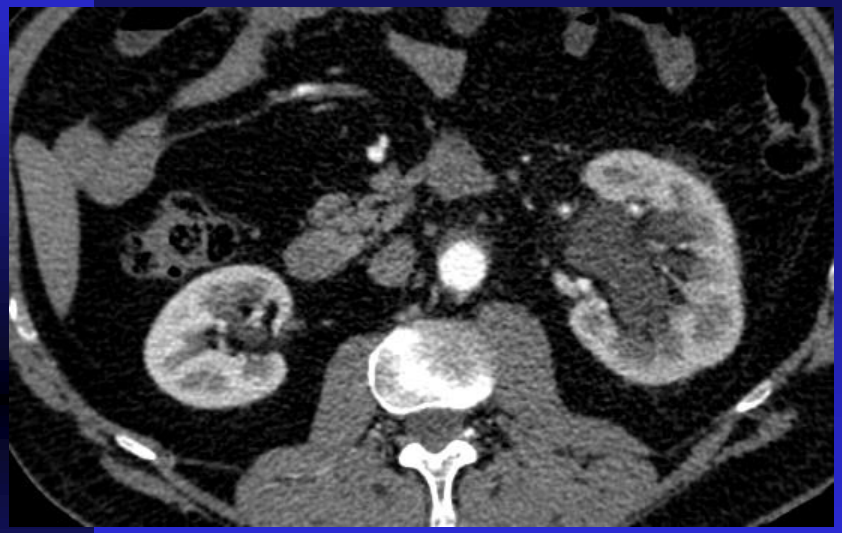
C.A. : m, 42 ans.

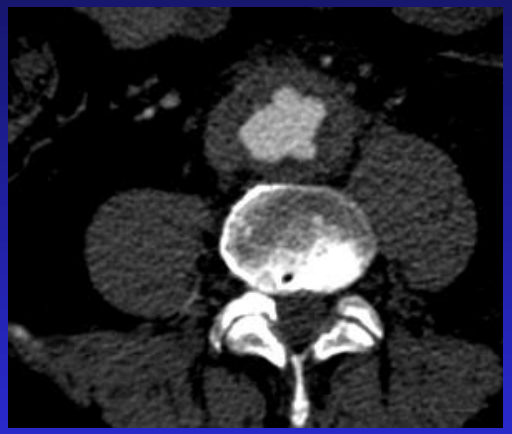




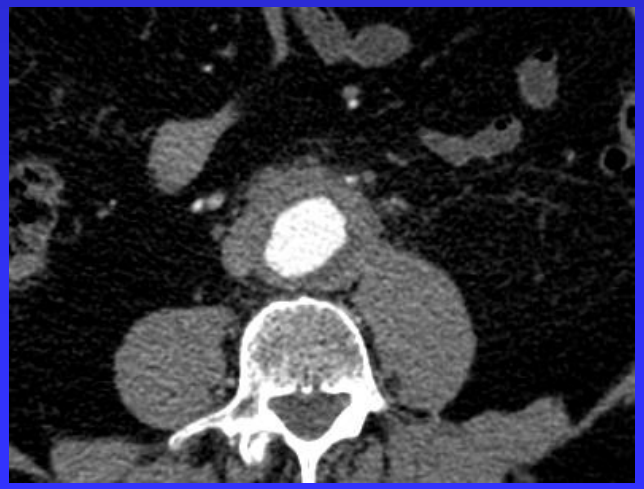


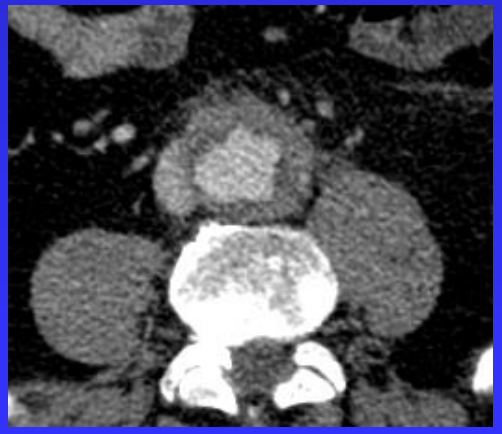
Aortite ou péri-aortire chronique ou AAA inflammatoire ?





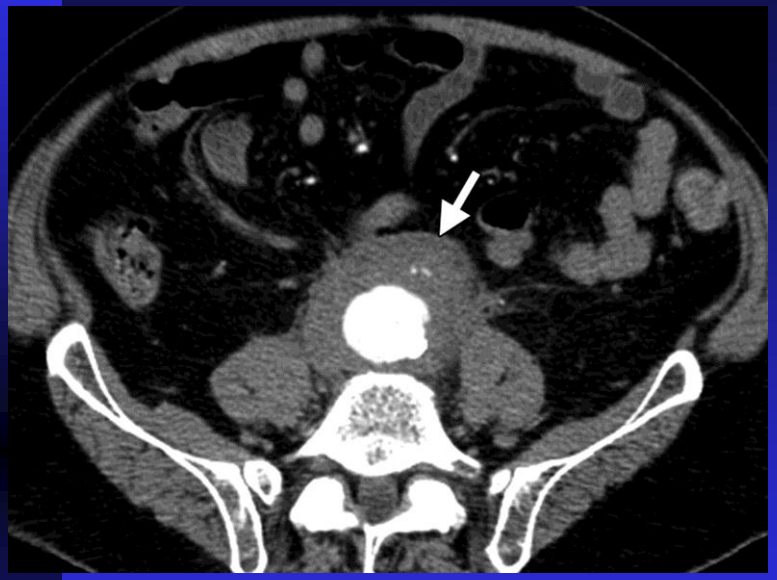
Phase artérielle

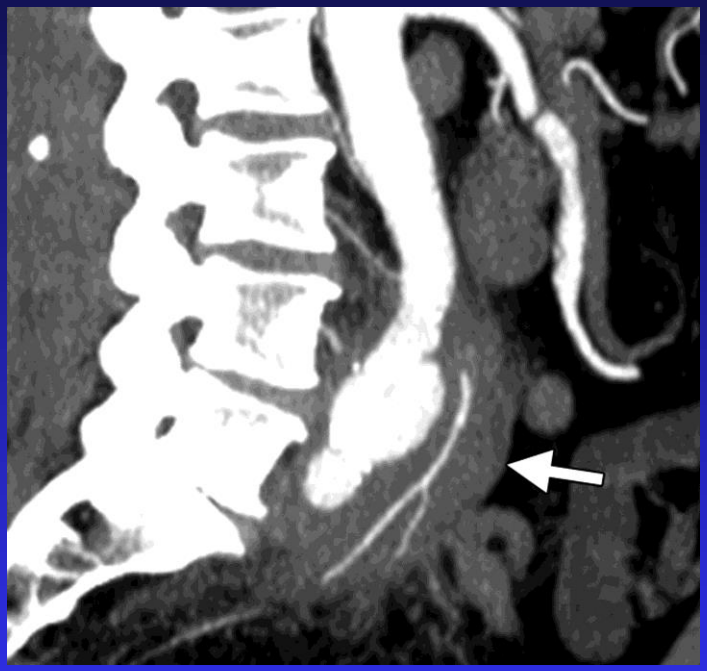


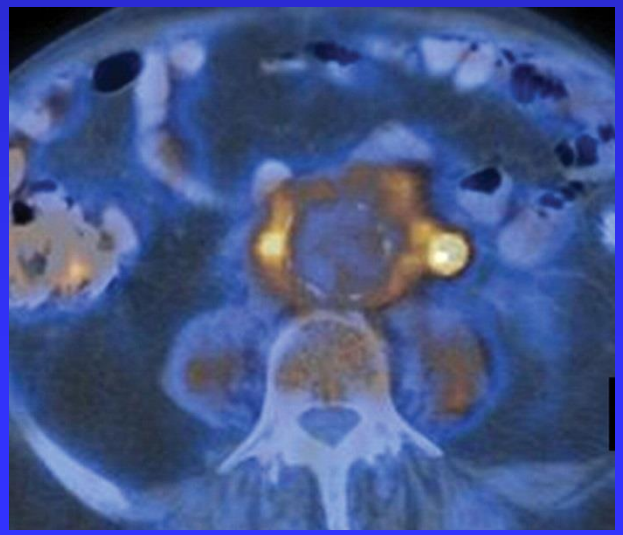


@ 70 ‘’

A.A. inflammatoire idiopathique







FDG-PET

Intérêt: extension inflammation, adhérences (uretères, sigmoide, vx) planification chirurgie à risque

Published in: Carlos S. Restrepo; Daniel Ocazionez; Rajeev Suri; Daniel Vargas; *RadioGraphics* **2011,** 31, 435-451.
DOI: 10.1148/rg.312105069
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Fibrose rétro-péritonéale: étiologies

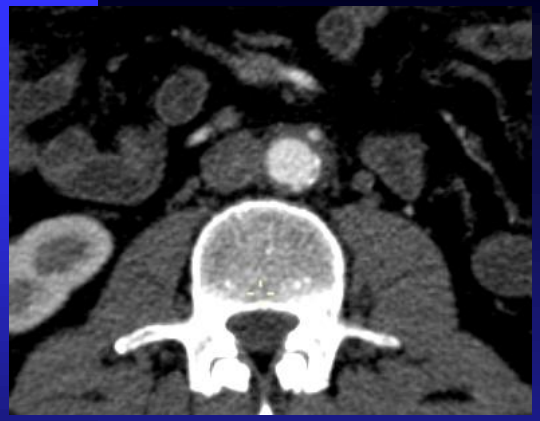
- Idiopathique (70%) – secondaire (30%):

- Néoplasie: métastases, tumeur rétropéritonéale, t. carcinoïde
- Traumatisme rétropéritonéal: hémorragie, entérite, diverticulite perforée, irradiation, opération…
- Agent infectieux: infection urogénitale, histoplasmose
- Médicaments: méthysergide, ergotamine, méthyldopa, hydrazaline, β-bloquant (?)
- Divers: vascularite, panniculite mésentérique, fibrosclérose.

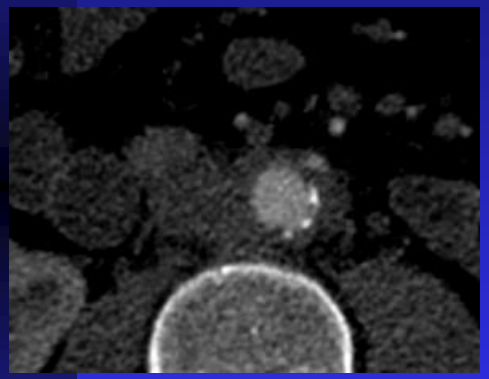
Fibrose rétro-péritonéale: pathologies associées

- Maladies fibrosantes:
  - cholangite sclérosante, thyroidite de Riedel, fibrose pulmonaire
- Collagénoses et vascularites:
  - PAN, maladie Horton, Takayasu, sclérodermie, LED, syndrome de Sjörgen, spondylarrthrite
- Maladies granulomateuses:
  - sarcoïdose, cirrhose biliaire primitive
- Autres:
  - uvéite, GN extramembraneuse, syndrome d'hyperéosinophilie, drépanocytose, syndrome de Marfan, cryoglobulinémie.

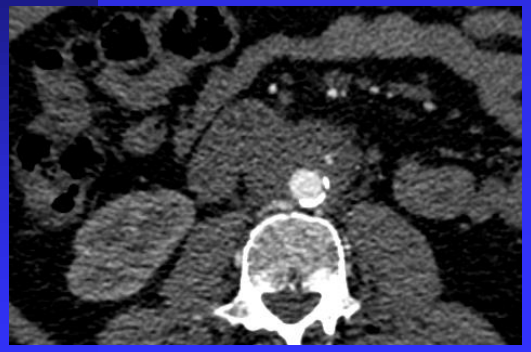
Péri-aortite idiopathique ?



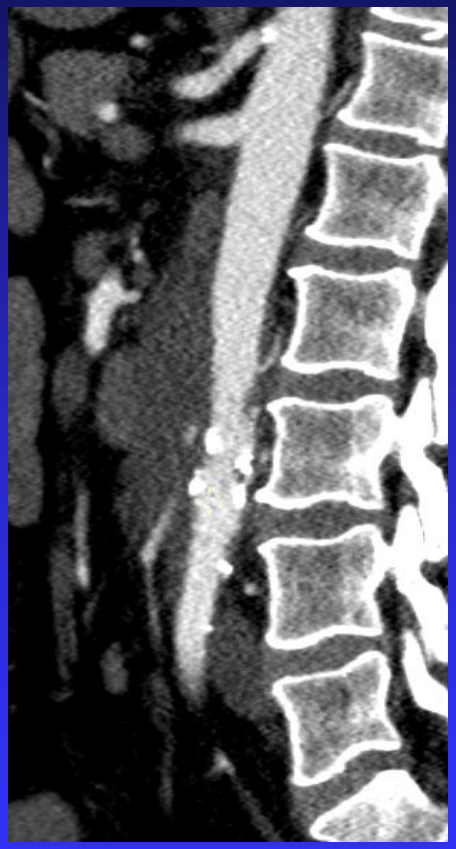
2006



2007



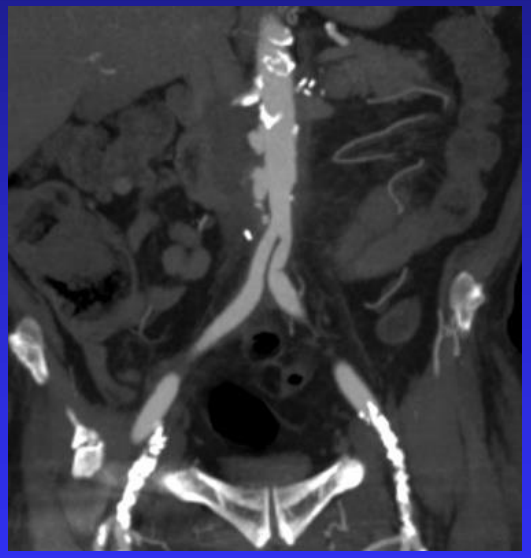
2013



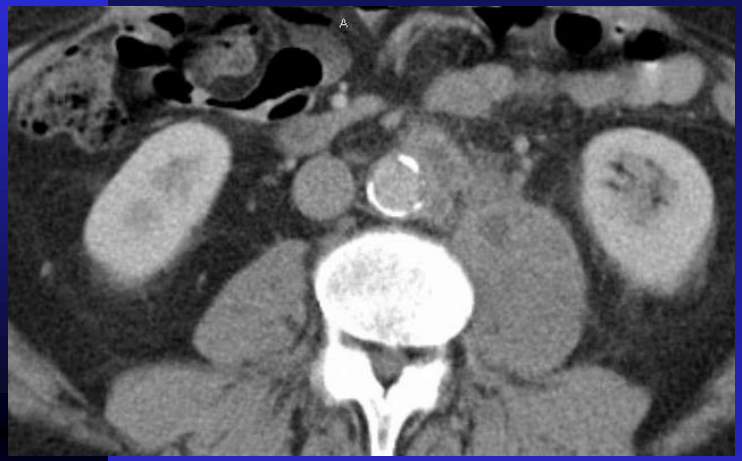
ANEVRYSMES INFECTIEUX « mycotiques:

- **Contexte particulier:**
  - Température, altération EG
  - Douleurs abdominales
  - Anév. de croissance rapide
  - Pas d'athéromatose
  - Hyperleucocytose, hémocultures

- **Traitement chirurgical:**
  - exérèse de tous les tissus infectés
  - reconstruction ex situ ou reconstruction in situ
  - veines autologues ou homogreffes (évite prothèse).



Infection prothèse > pseudo-anévrismes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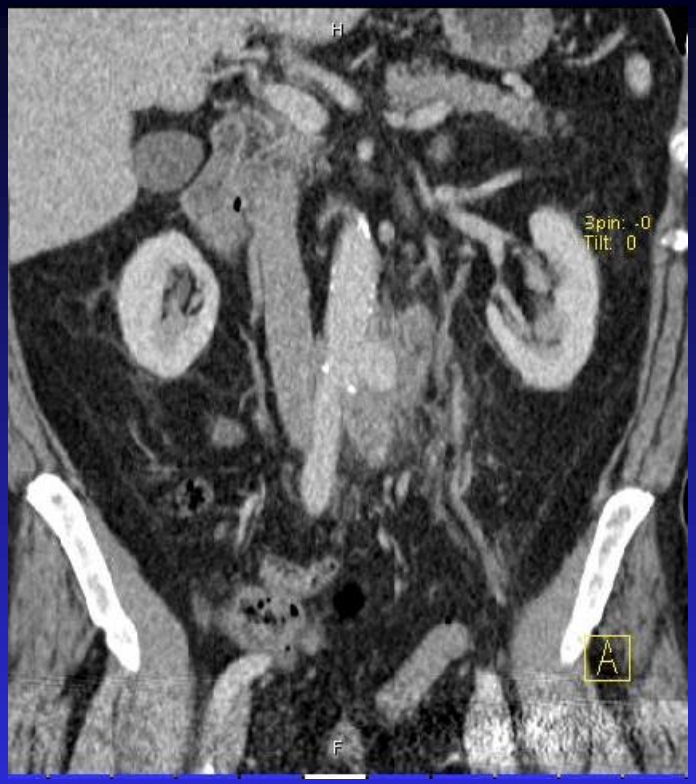
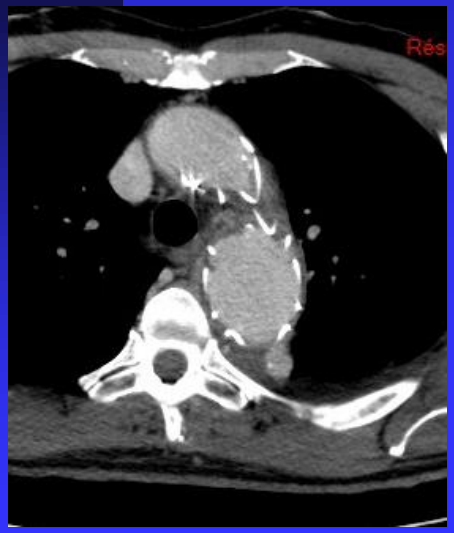
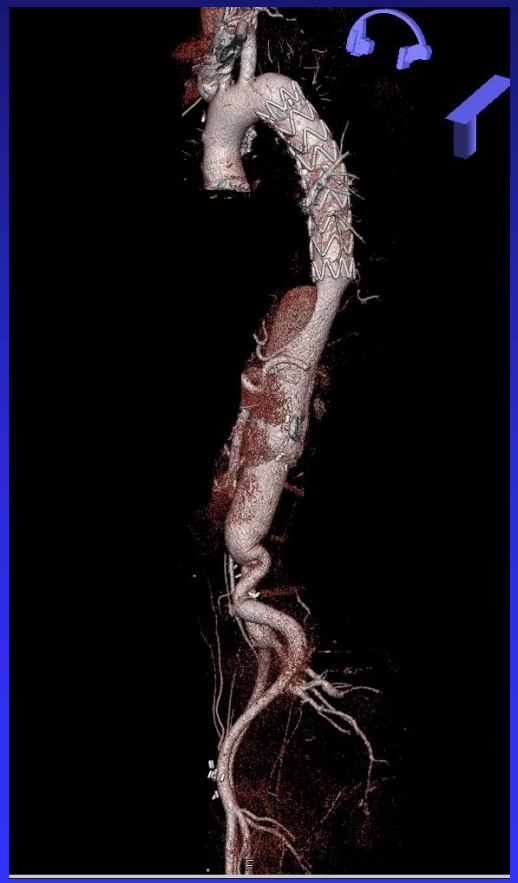

H
Spin: -0
Tilt: 0
A
F

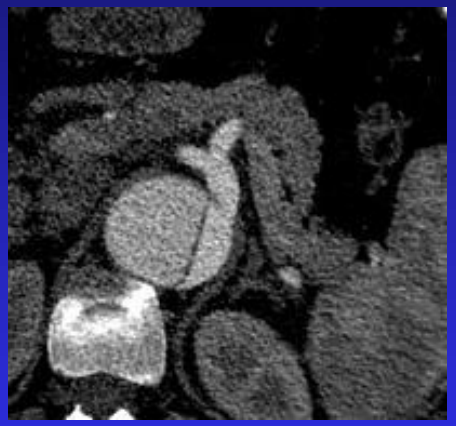

A

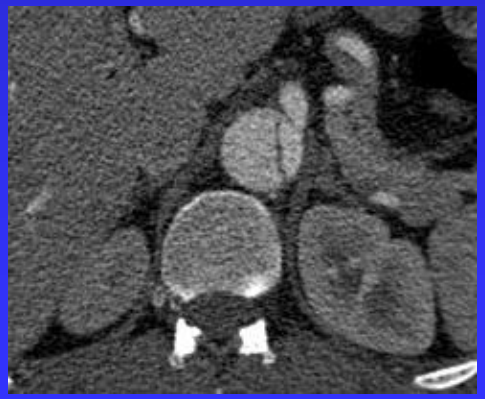

A

DISSECTION Aorte abdominale

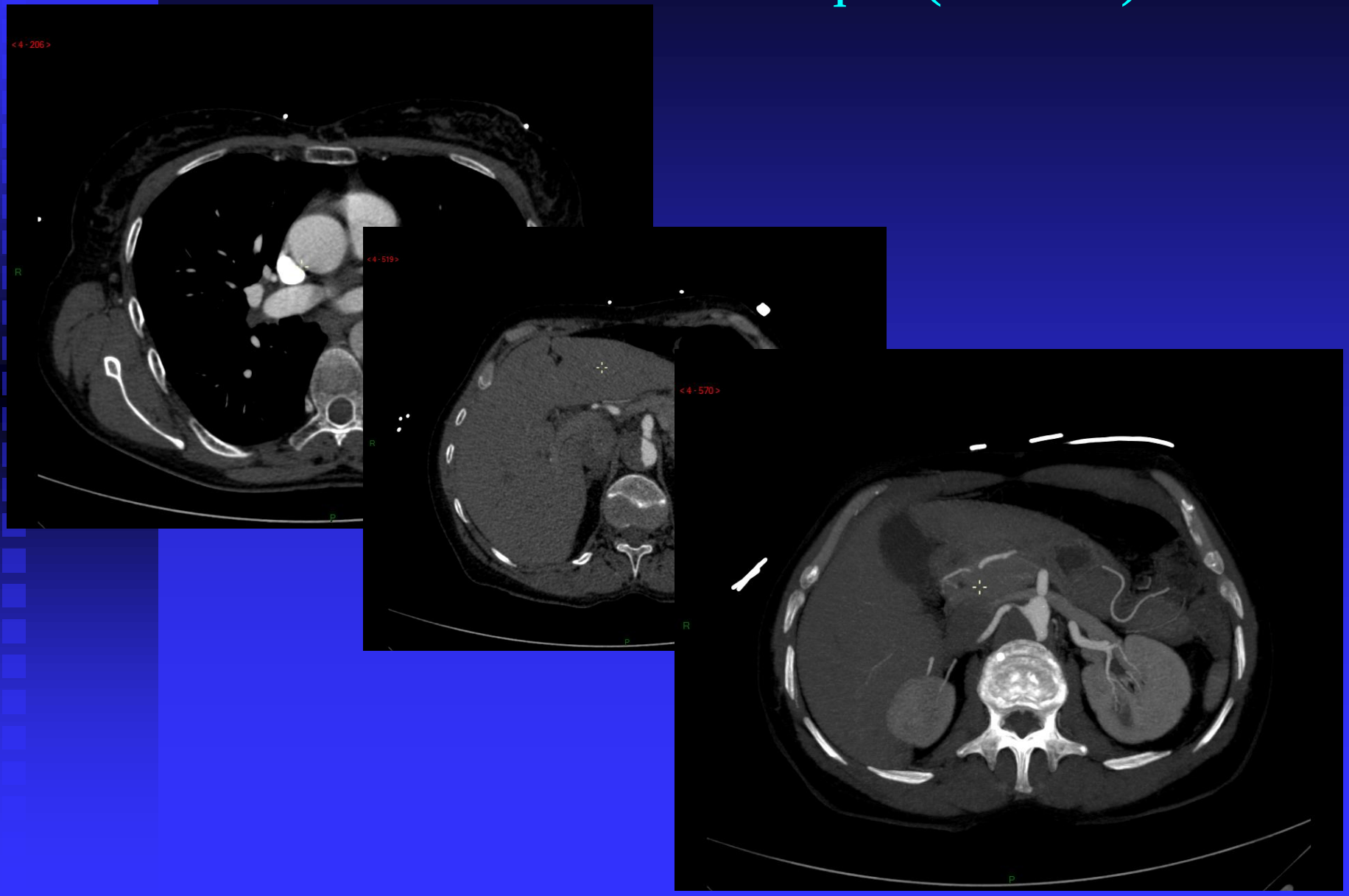






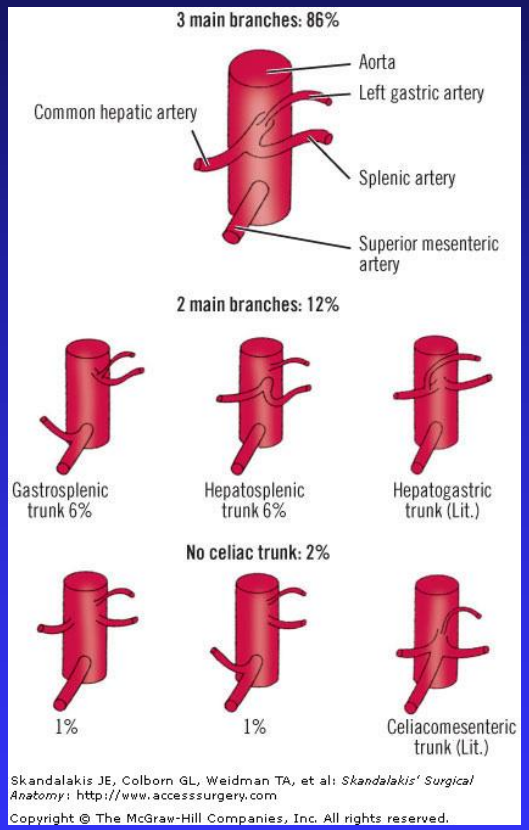


Extension dissection aortique (I ou III)



BRANCHES AORTE ABDOMINALE

- Variantes:
  - Tronc gastro-splénique: 5-8%
  - Art. hép droite abérrante: 12-20%
  - Art hép gauche abérrante: 3% (provient gén. de l'art gastrique gauche)
  - Absence art hépatique commune (tronc commun avaec AMS): 12%
  - Artère rénale surnuméraire: 24%.



Anévrismes viscéraux

- Définition anévrisme:
  - 1,5 x calibre normal de l'artère
- Prévalence: 0,1-2% séries autopsiques
- Site:
  - Splénic: 60-75%
  - Hépatic: 10-20%
  - Mésentérique: branche pancréatico-duodénale
  - Rénal: 0,3-1%.

Anévrismes viscéraux et rénaux: Options thérapeutiques

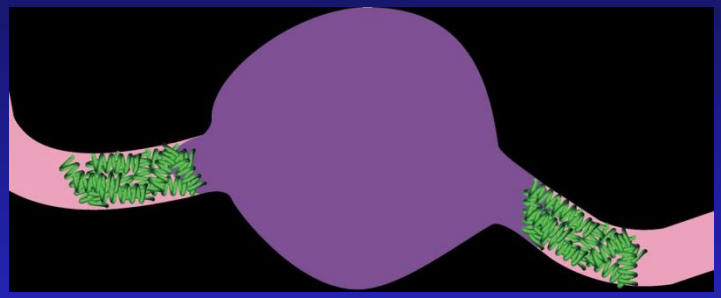
- Observation: contrôle facteurs de risque et tension artérielle
- Endovasculaire (RI).

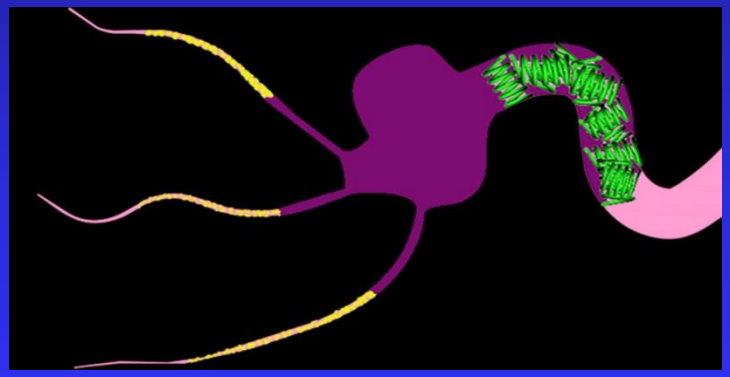
- (Chirurgical):
  - ligature
  - résection et anastomose artérielle
  - Splénectomie, néphrectomie, autotransplantation rénale

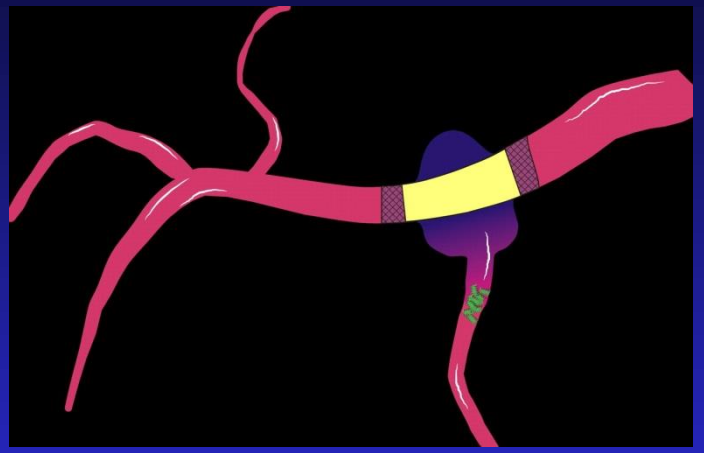
Techniques endovasculaires

- En fonction accessibilité (anatomie), taille du vaisseau porteur, préservation perfusion…
- Embolisation:
  - Coils, plugs, agents liquides (thrombine, Glubran, Onyx), (particules)
- Endoprothèses:
  - stent + coils
  - Stentgraft (endoprothèse couverte).

Traitement par embolisation:







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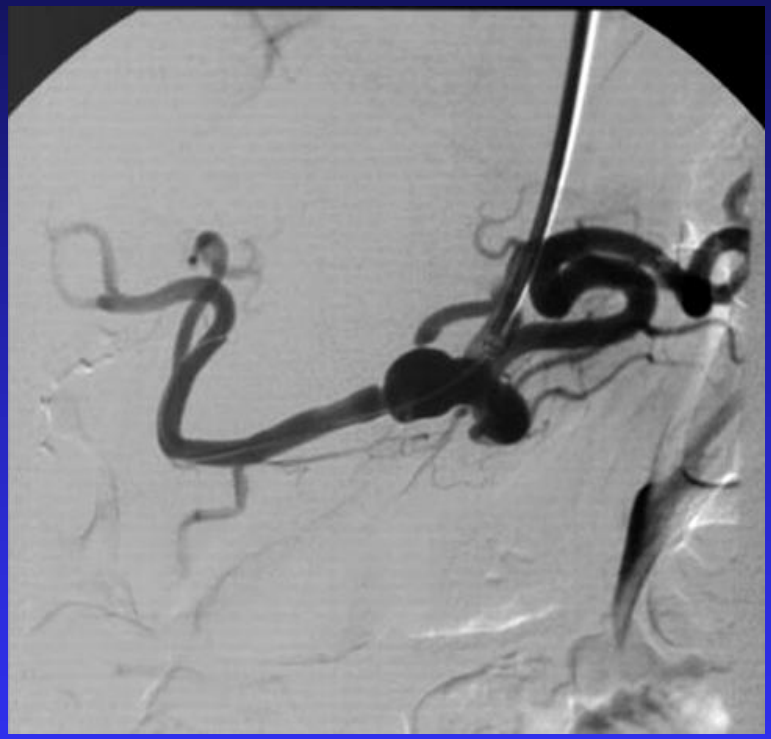
Anévrisme hépatique

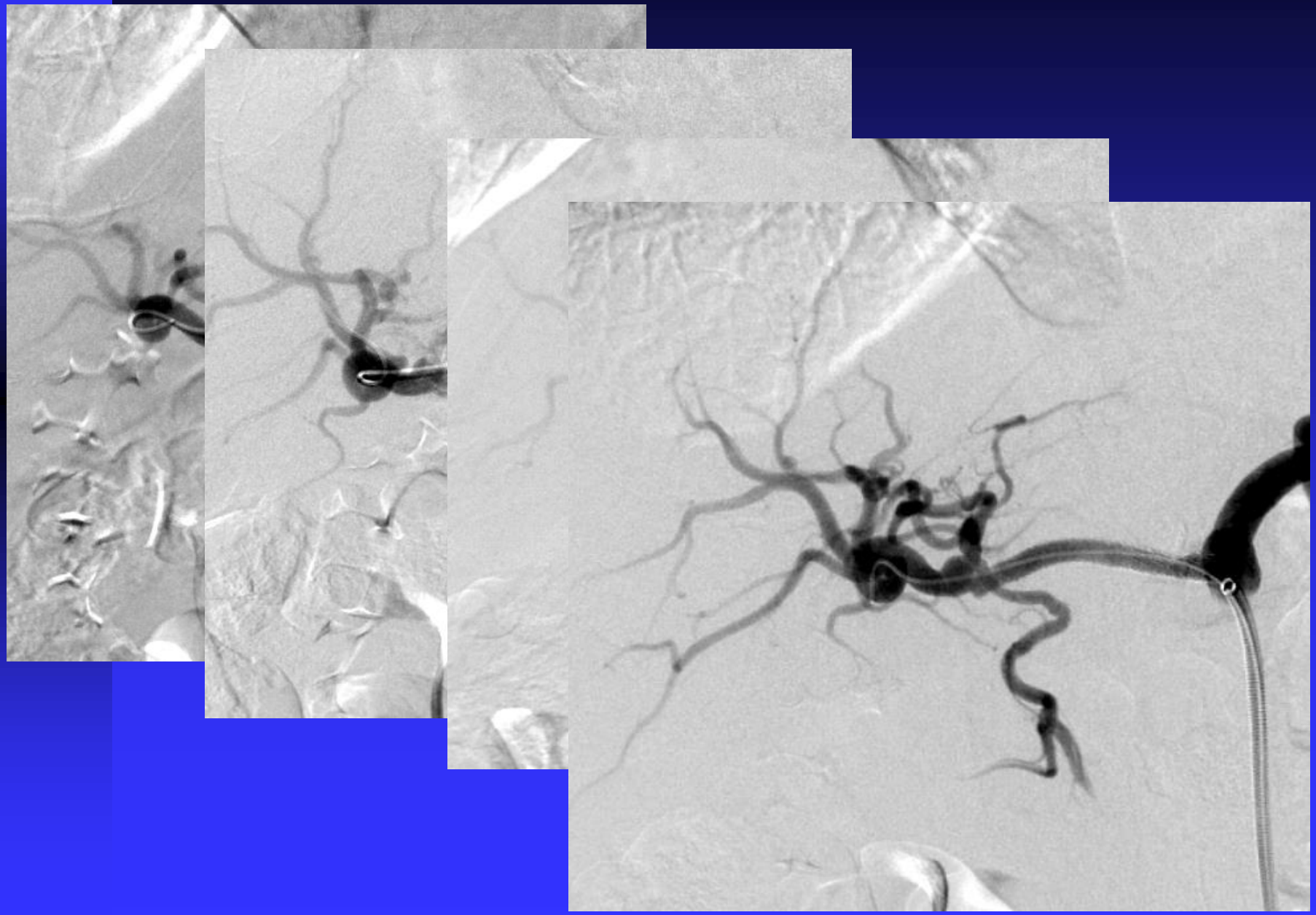
- 50% sont des “pseudo-anévrisme”
- Vrais anévrismes sont extra-hépatiques
- Symptomatiques: hémopéritoine ou hémobilie dans 20%.
- Indication traitement:
  - symptomatique
  - > 2 cm.

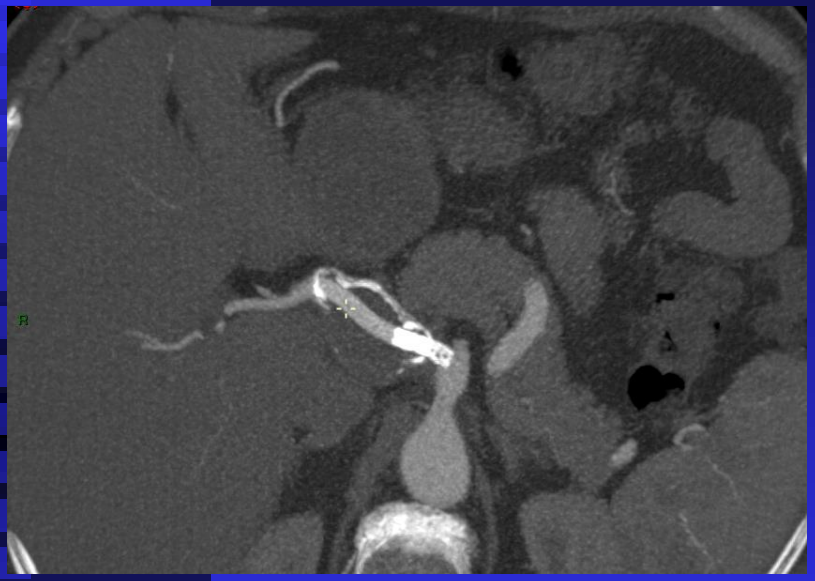
Anévrisme tronc coeliaque



Artério voie humérale (7F)

Embolisation a splénique et stent couvert tronc coeliaque





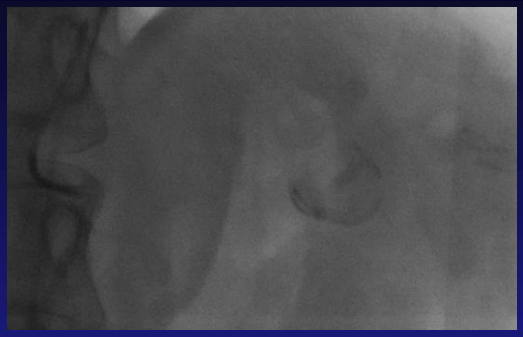
CTA @ 3 ans

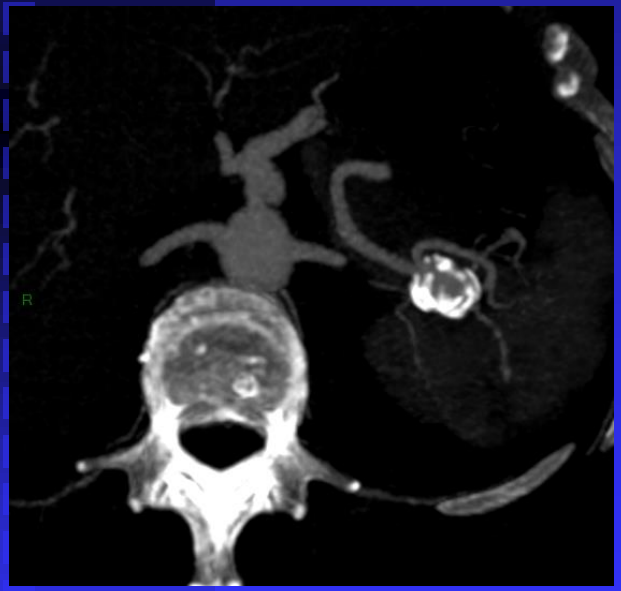
Anévrisme splénique

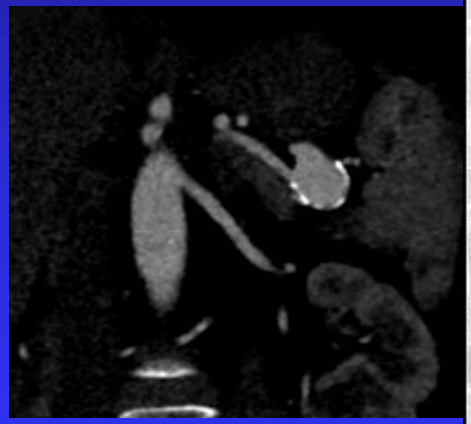
- Femme, 60 aine: multipare, HTA, obèse.
- Découverte fortuite: 90%
- Angio-CT
- Artériographie uniquement lors du traitement.
- Mortalité importante pendant une grossesse (mère: 20%, foetus: 90%)

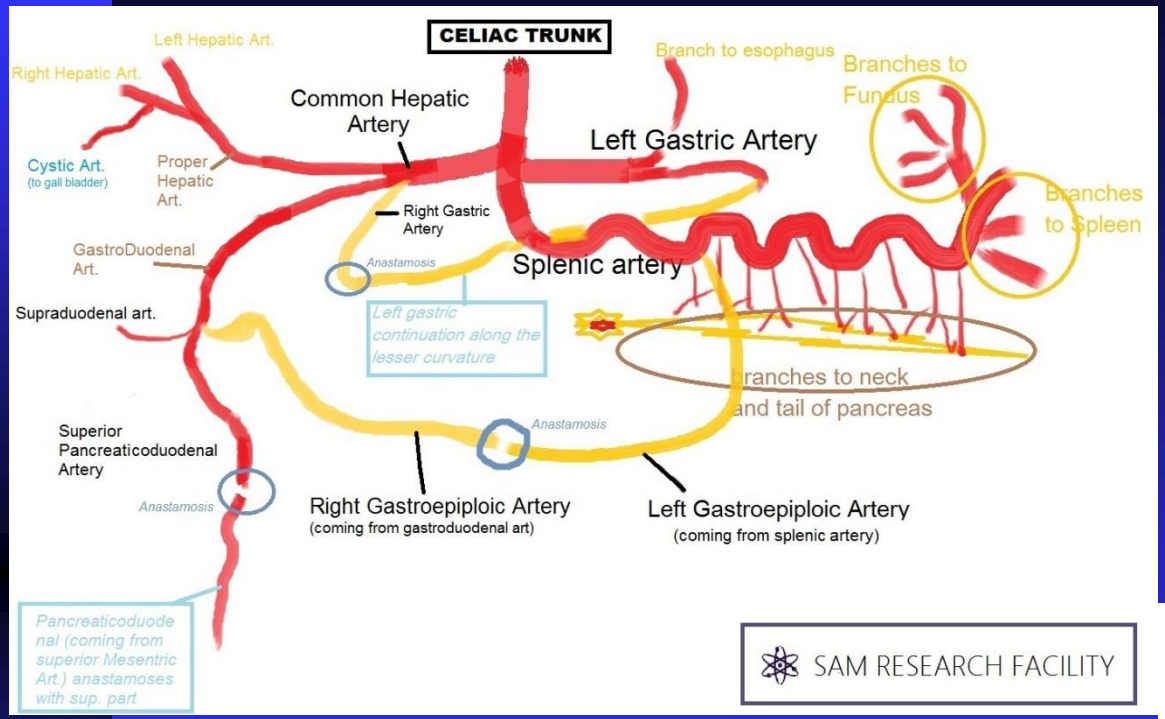
- Indications de traitement:
  - Femmes jeunes: non ménopausees, désir de grossesse, découverte lors grossesse
  - A.S. symptomatiques
  - > 2 cm.

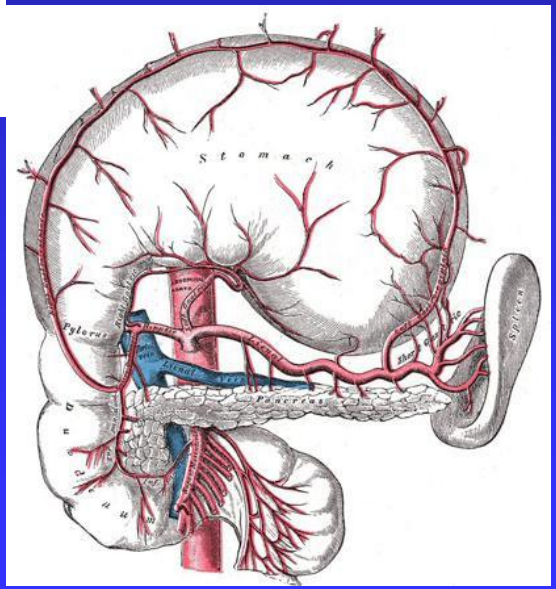
Anévrisme splénique (1)





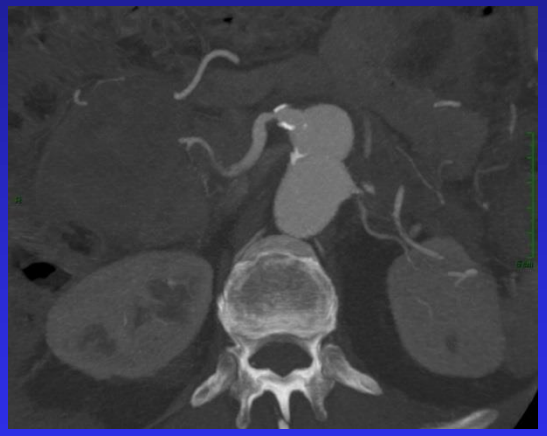



CELIAC TRUNK
Left Hepatic Art.
Right Hepatic Art.
Common Hepatic Artery
Branch to esophagus
Branches to Fundus
Left Gastric Artery
Cystic Art.
(to gall bladder)
Proper Hepatic Art.
Right Gastric Artery
Branches to Spleen
GastroDuodenal Art.
Anastamosis
Splenic artery
Supraduodenal art.
Left gastric continuation along the lesser curvature
Branches to neck and tail of pancreas
Anastamosis
Superior Pancreaticoduodenal Artery
Anastamosis
Right Gastroepiploic Artery
(coming from gastroduodenal art)
Left Gastroepiploic Artery
(coming from splenic artery)
Pancreaticoduodenal (coming from superior Mesentric Art.) anastamoses with sup. part
SAM RESEARCH FACILITY


Stomach
Pylorus
Spleen

Anévrisme splénique (2)

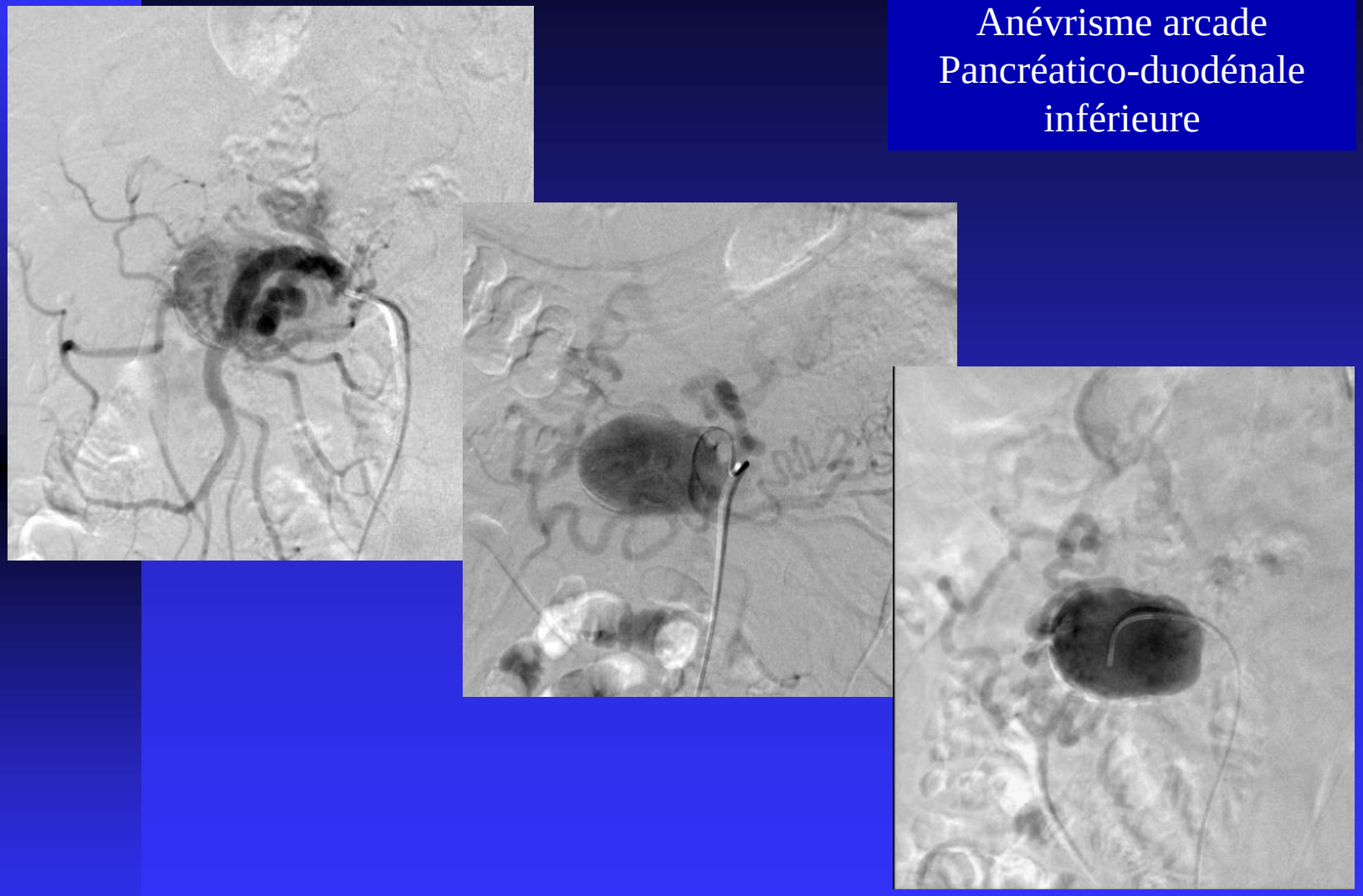
Anévrisme mésentérique sup.

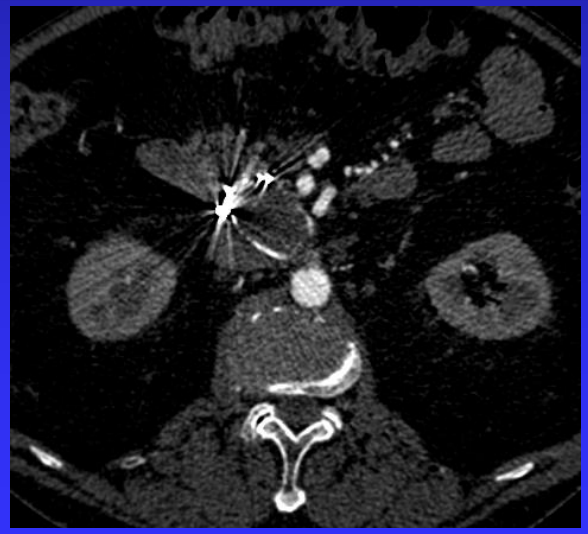


Traitement ?

Chirurgical

Anévrisme arcade
Pancréatico-duodénale
inférieure





Contrôle à 2 ans

Ligament arqué médian (T12):

- 10-24% patient
- Implantation trop basse
- Union du pilier droit (L1-L4) et gauche (L1-L2)

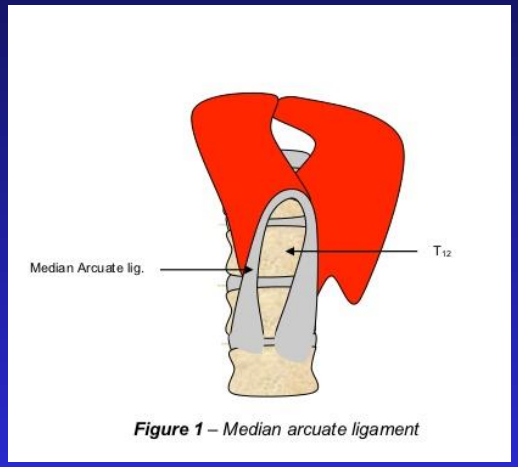
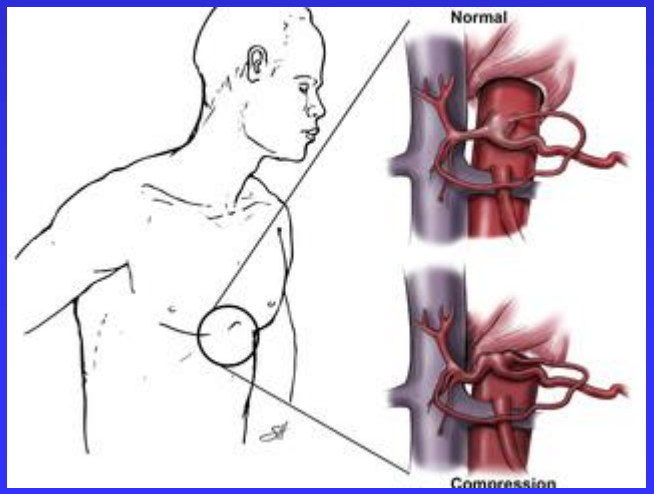
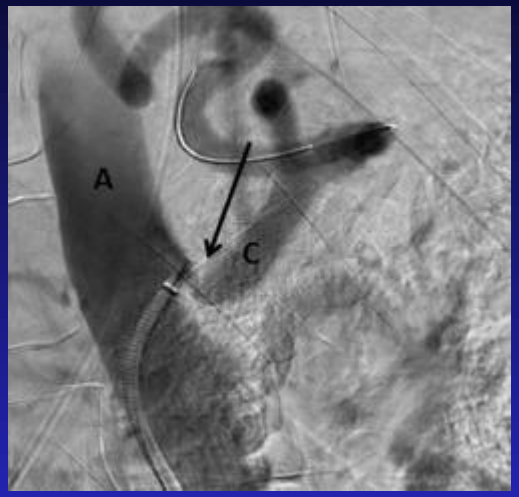
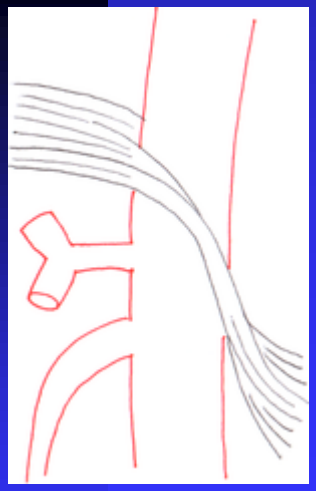


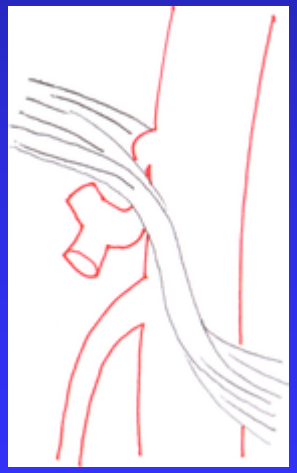
Figure 1 *– Median arcuate ligament*

- Compression extrinsèque
- Série autopsique ligament arqué:
  - TC à distance: 14,5%
  - TC touche: 42,2%
  - TC croise: 43,3%
- Femmes 20-40 ans
- Douleur post-prandiale, épigastrique

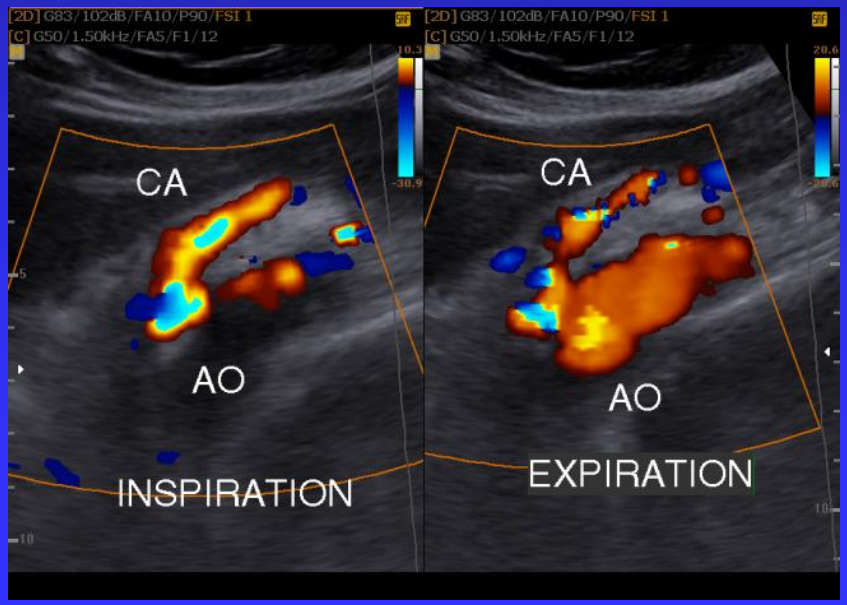


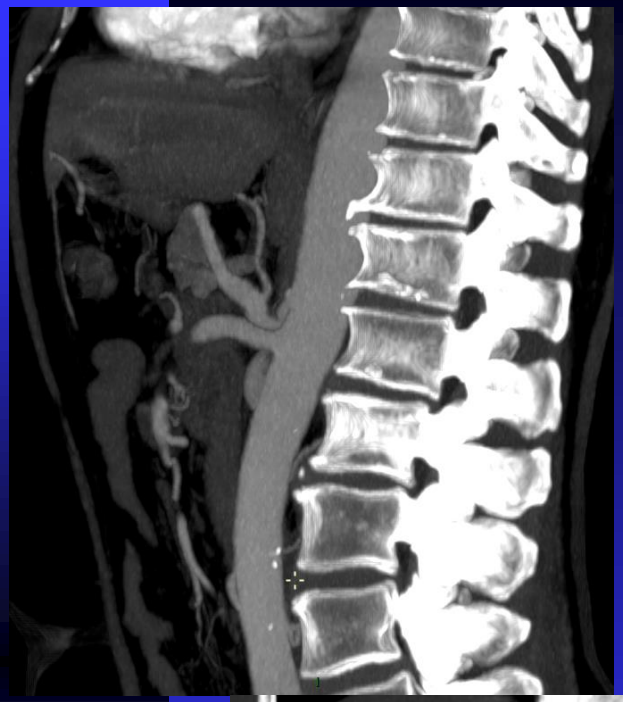


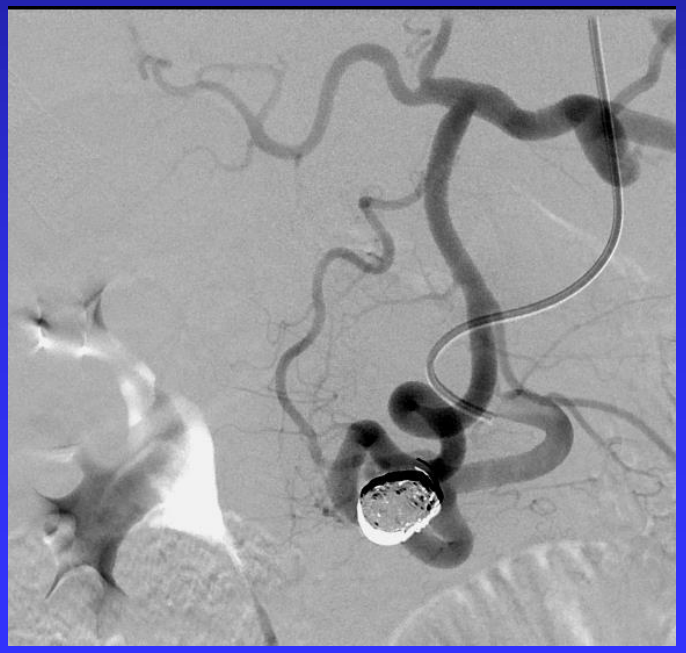




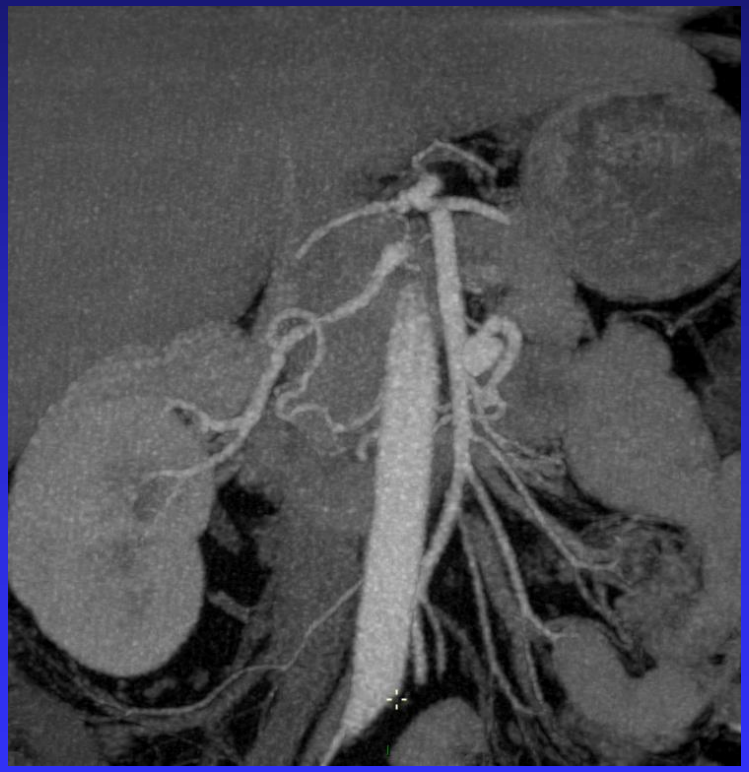
Expiration (contraction partie tendineuse des piliers)

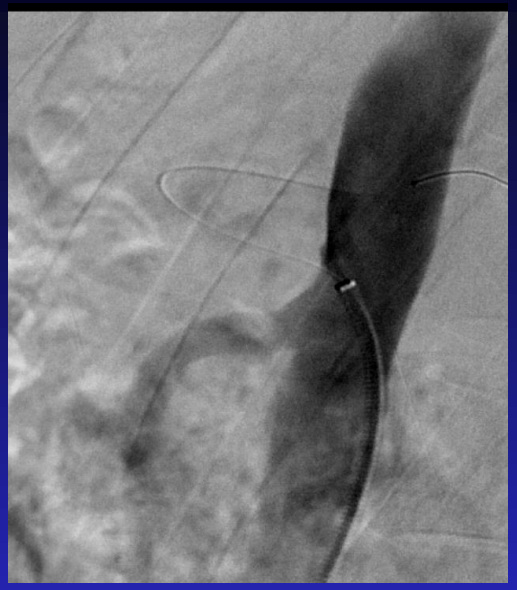


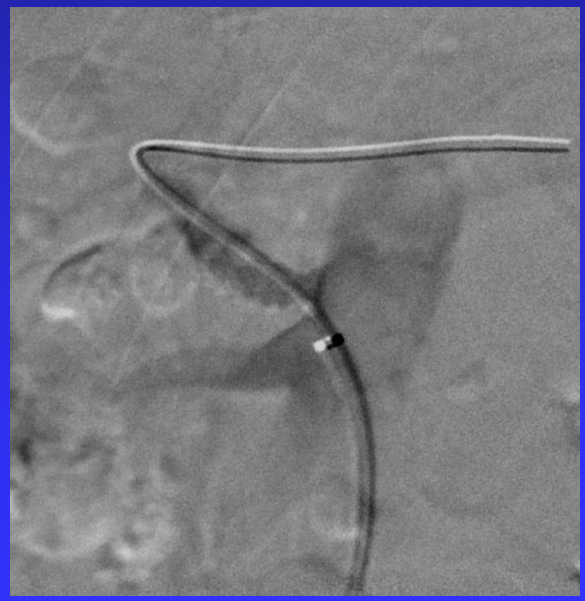




Anévrisme AMS (arcade PDDI):

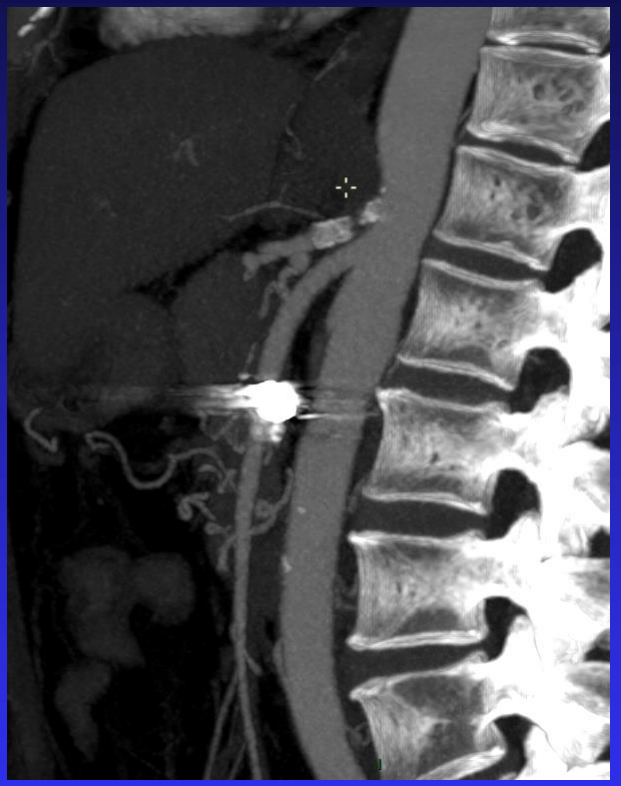


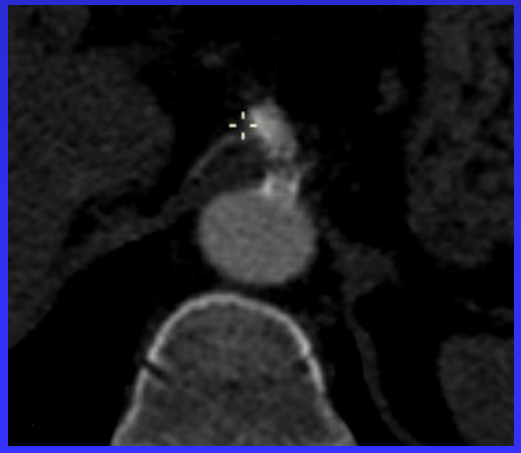




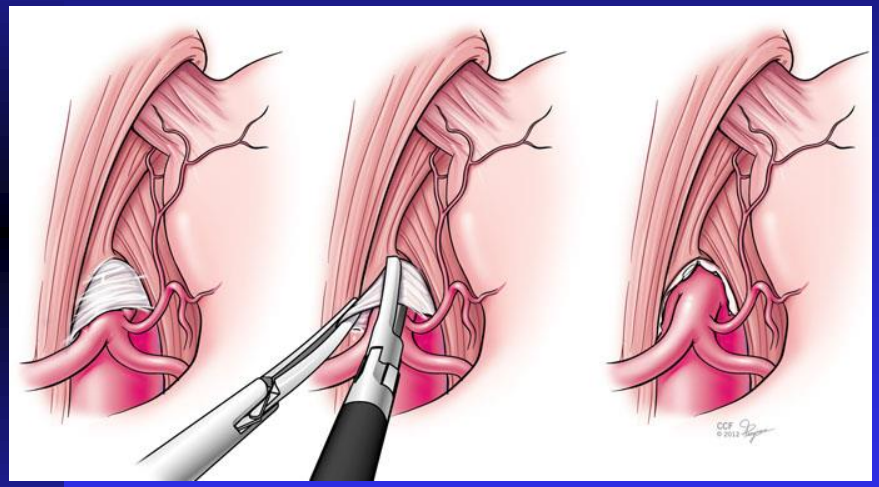
Femme 49 ans

Anévrisme AMS (arcade PDDI):





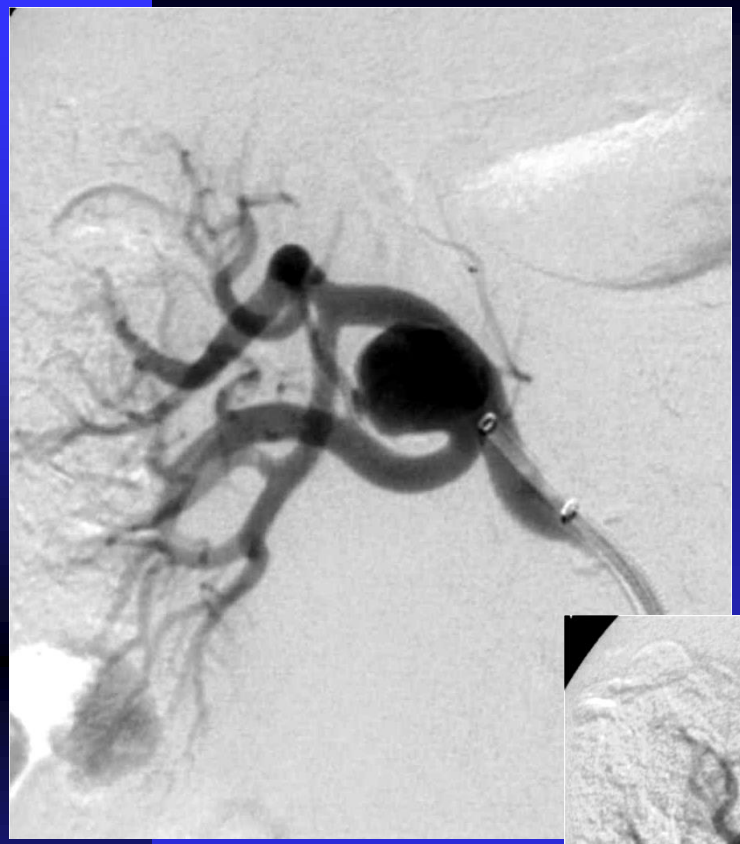
Traitement laparoscopique du “ligament arqué”

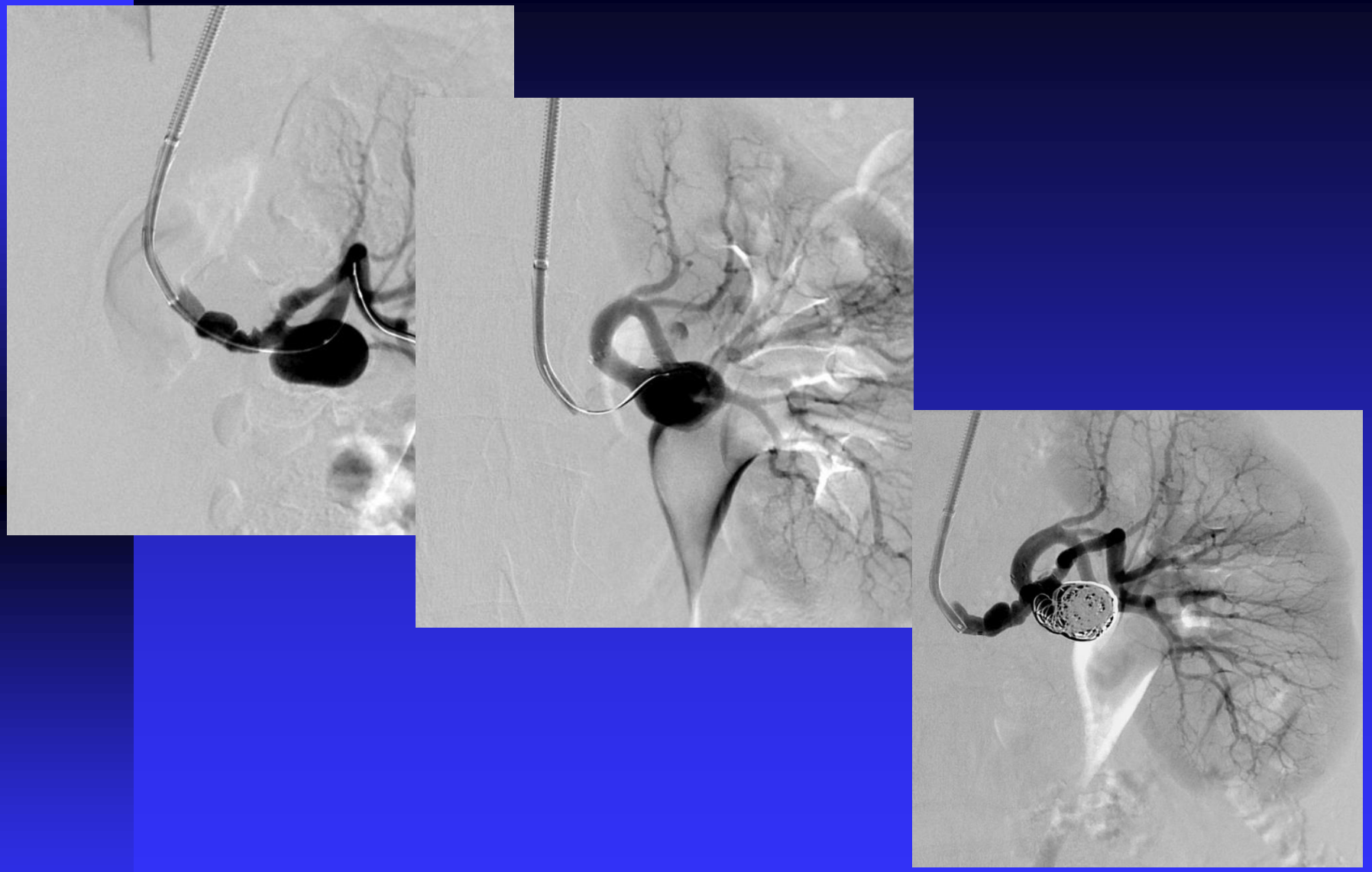


Cleveland Clinic

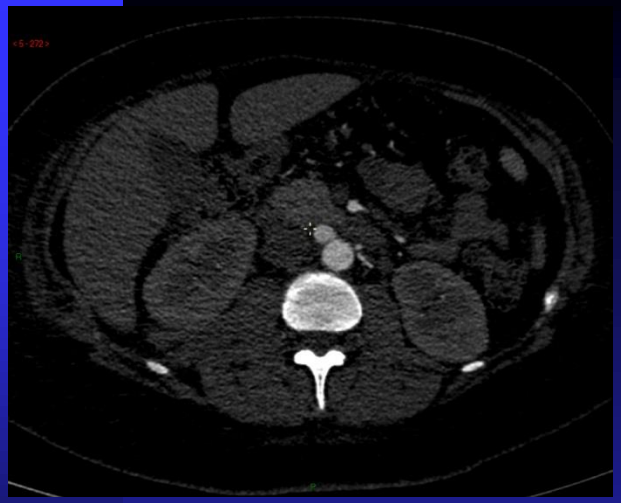
Anévrysmes artère rénale

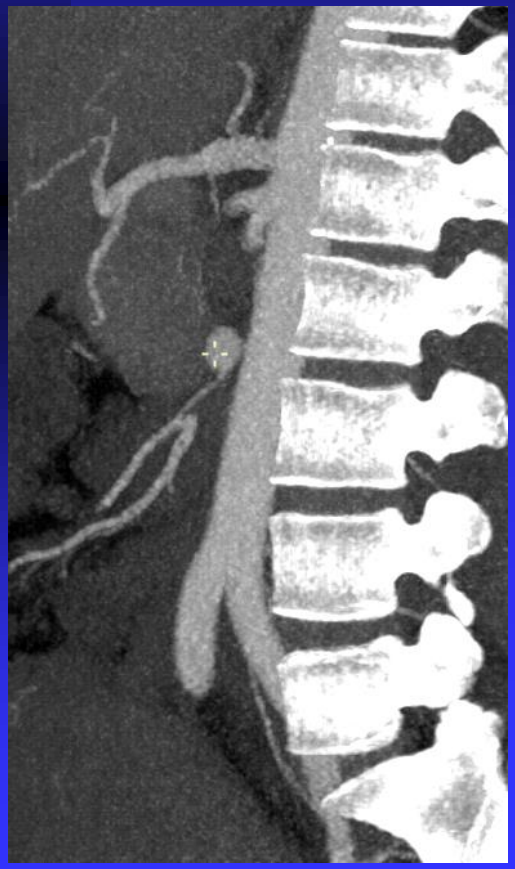
- Rare: 0.3-1%
- Etiologie:
  - athéromateux, traumatique, mycotique, maladie autoimmune (Takayasu, Horton, PAN), granulomatose (Tbc, Wegener, sarcoïdose), anomalies du tissu conjonctif (Ehler-Danlos, Marfan…)
- Plus fréquent chez: femme, multipare, 50 aine.
- Plus fréquent au niveau division hilaire de l'artère rénale, association possible avec DFM
- Histoire naturelle: HTA réno-vasculaire, rupture, infarctus rénal
- Généralement asymptomatiques
  - Risque rupture
  - Induction HTA pour anévrismes géants (?)
- Traitement si:
  - éventualité de grossesse
  - association à HTA ou lésion sténosante
  - augmentation taille dans le suivi: **>2 cm**.

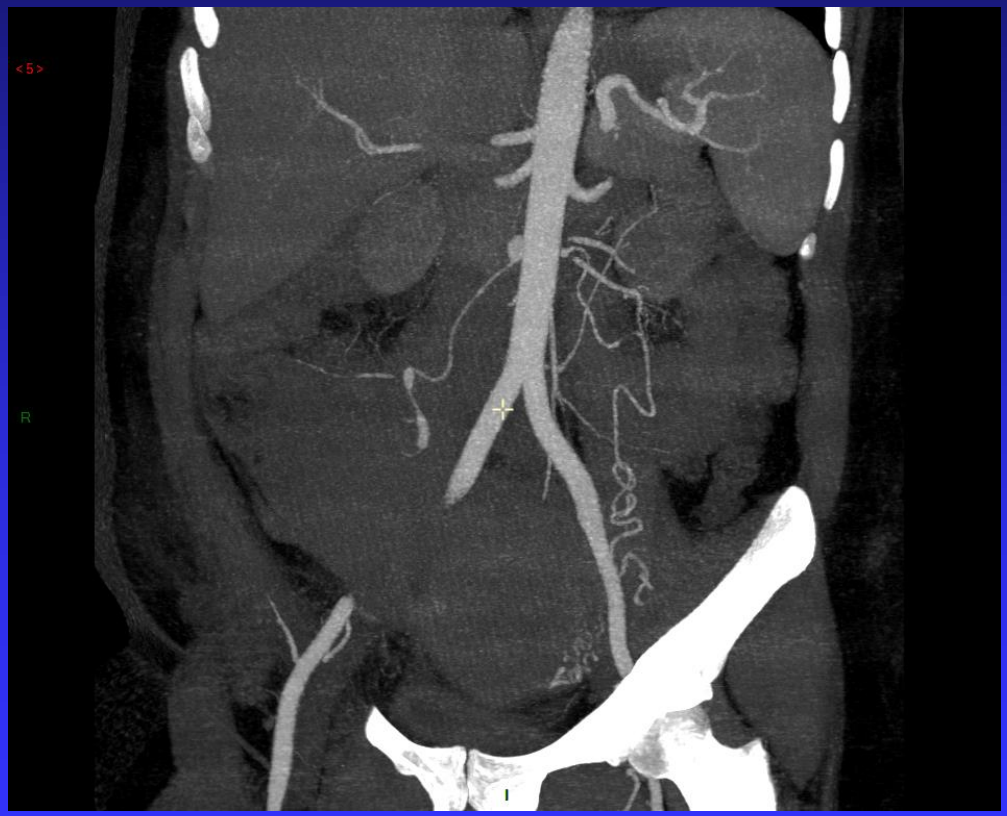




Raretés: artères gonadiques et lombaires





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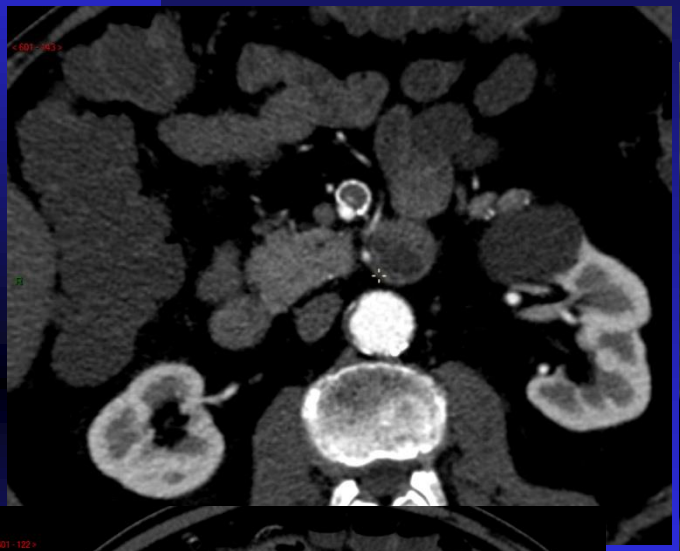
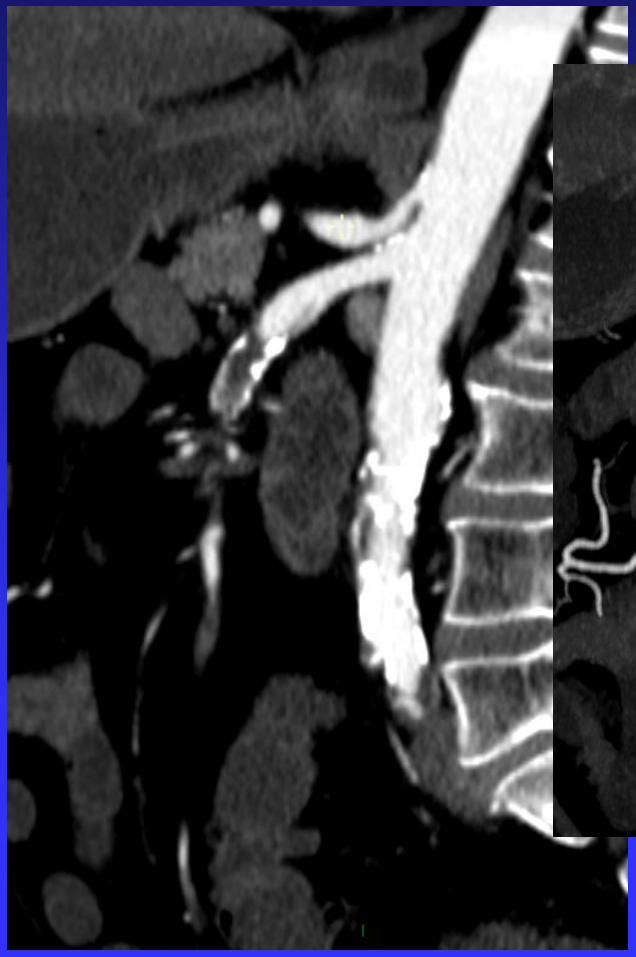
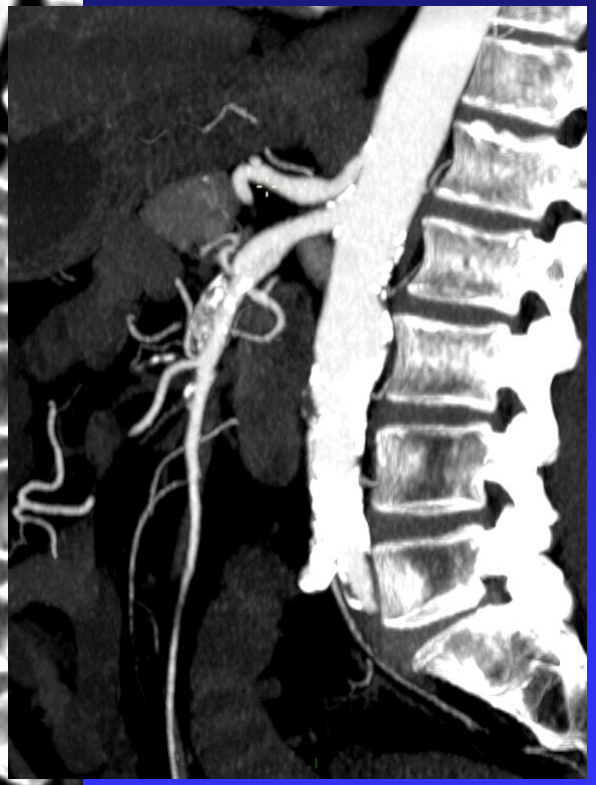
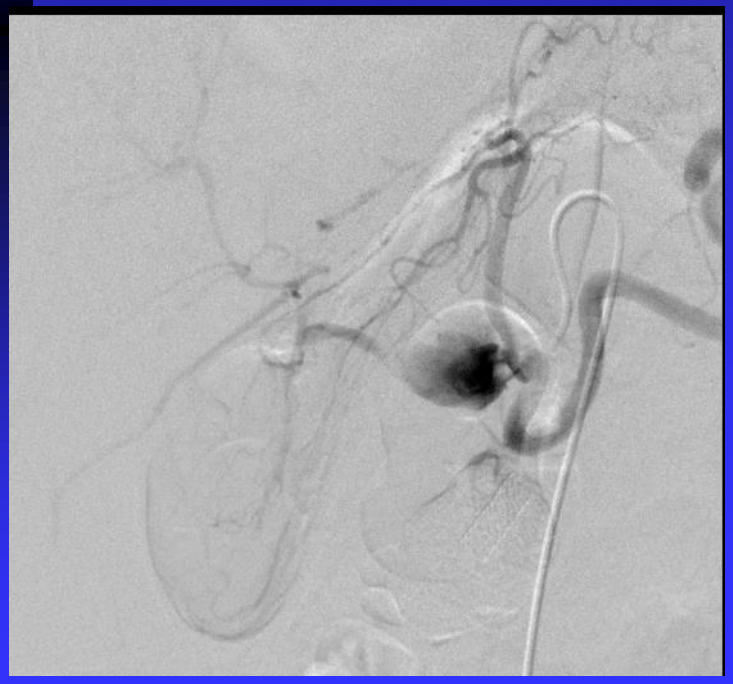
Dissection artères viscérales

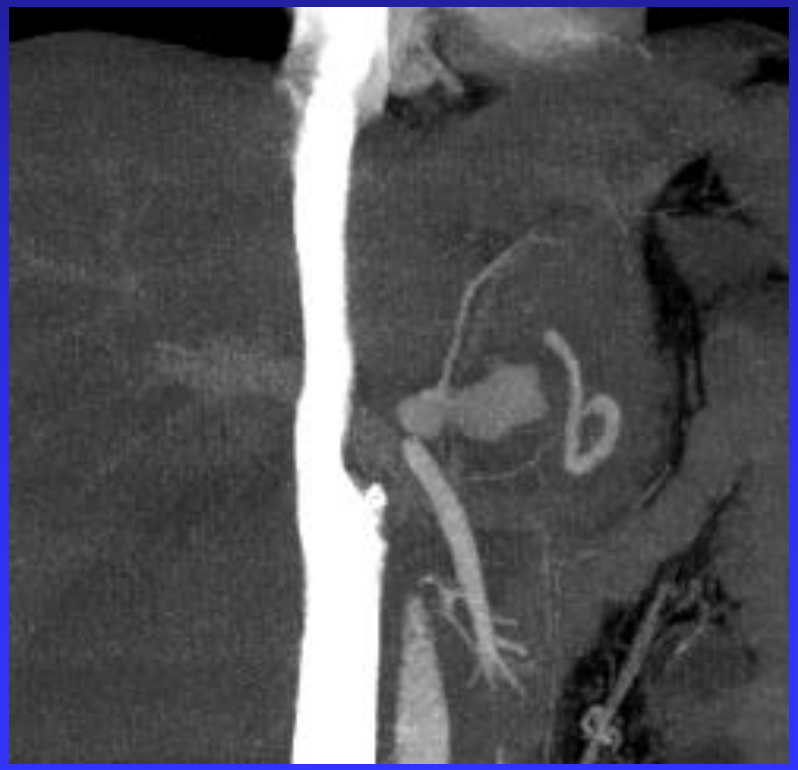
DISSECTION CHRONIQUE AMS

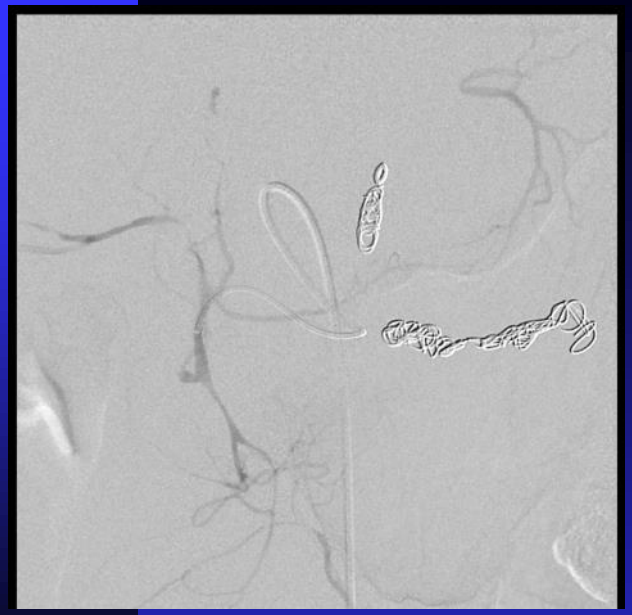


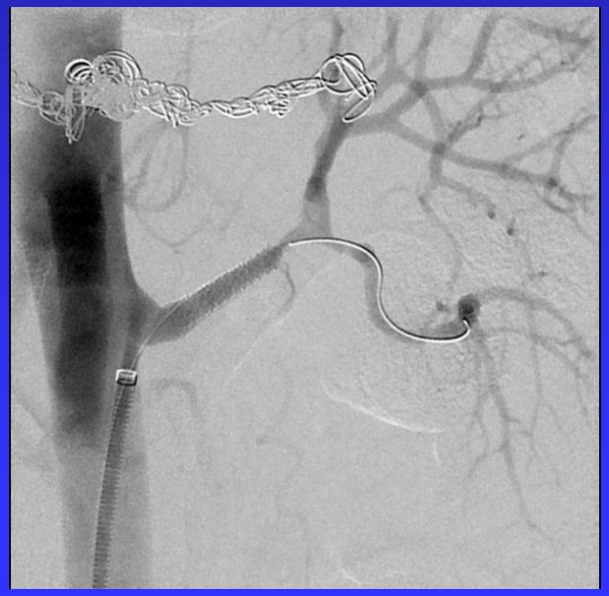


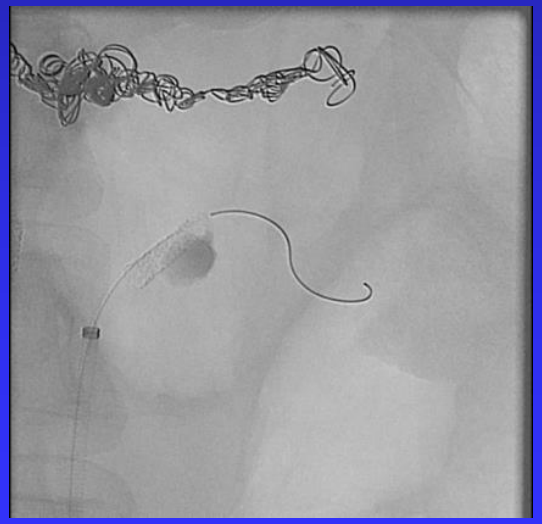










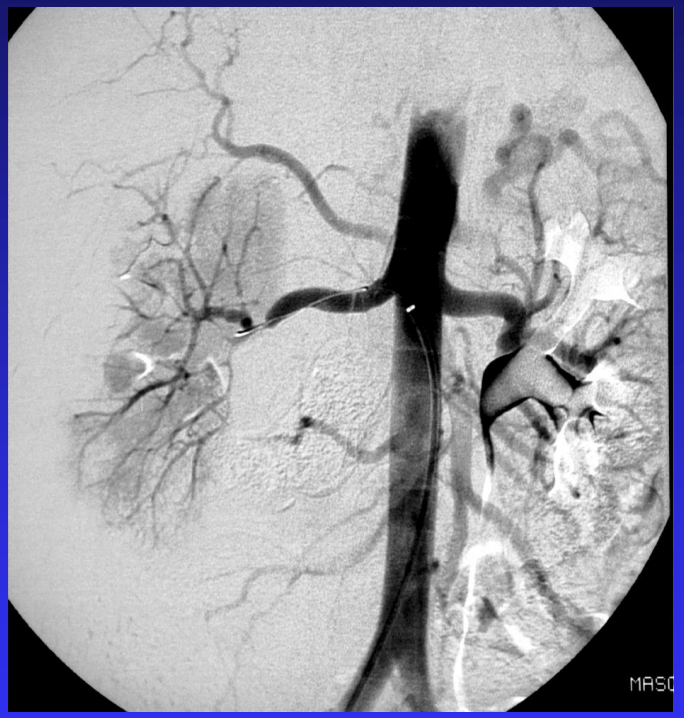


Dissection artère rénale

- Etiologies:
  - Traumatisme (fermé ou iatrogène KT)
  - Athérosclérose
  - Anomalies congénitales: Ehler-Danlos IV
  - PAN
  - Grossesse, DFM…
- Fréquence m:f (4:1) >< FDM (1:2.5)
- Age moyen = 40-45 ans
- Symptômes: douleur (+/- colique néphrétique)
- Bio: protéinurie, hématurie microscopique
- Traitement: médical, rarement stenting (lésions proximales, dissection aortique…).

Maladie du collagène (syndr. d'Ehler-Danlos)

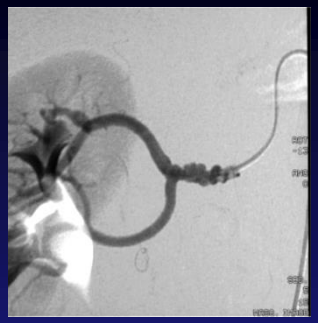
- Héréditaire
- Transmission autosomique (dominante ou récessive) ou à une néo-mutation
- H=F. Fréquence: 1/5000- 1/10.000 naissances
- 6 formes, atteinte clinique:
  - Cutanée: peau fragile, hyper-extensible, cicatrisation lente
  - Ligamentaire: hyper-laxité, instabilité articulaire, cyphoscoliose
  - Vasculaire (IV): synthèse déficiente collagène III (COL 3A1), autosomique dominant
    - hématomes, ecchymoses sans trouble coagulation.
    - Ruptures artérielles: thorax et abdomen (50%), tête et cou (25%), extremitiés (25%).
- Eviter traumatisme, chirurgie élective…
- Complications médicales: 25% à 20 ans, et 80% à 40 ans.
- Espérance de vie: 48 ans (moy.).



Sténose de l'artère rénale

- SAR athéromateuse (90%): SAR et occlusion
- SAR non athéromateuses:
  - Dysplasie fibro-musculaire (DFM)
  - Arterite inflammatoire (vasculites): Takayasu
  - Neurofibromatose (Von Recklinghausen)
  - Pédiatrie: coarctation aortique, syndr. de William's (hypercalcémie idiopathique), neurofibromatose
  - Post-radique

DFM: dysplasie fibro-musculaire

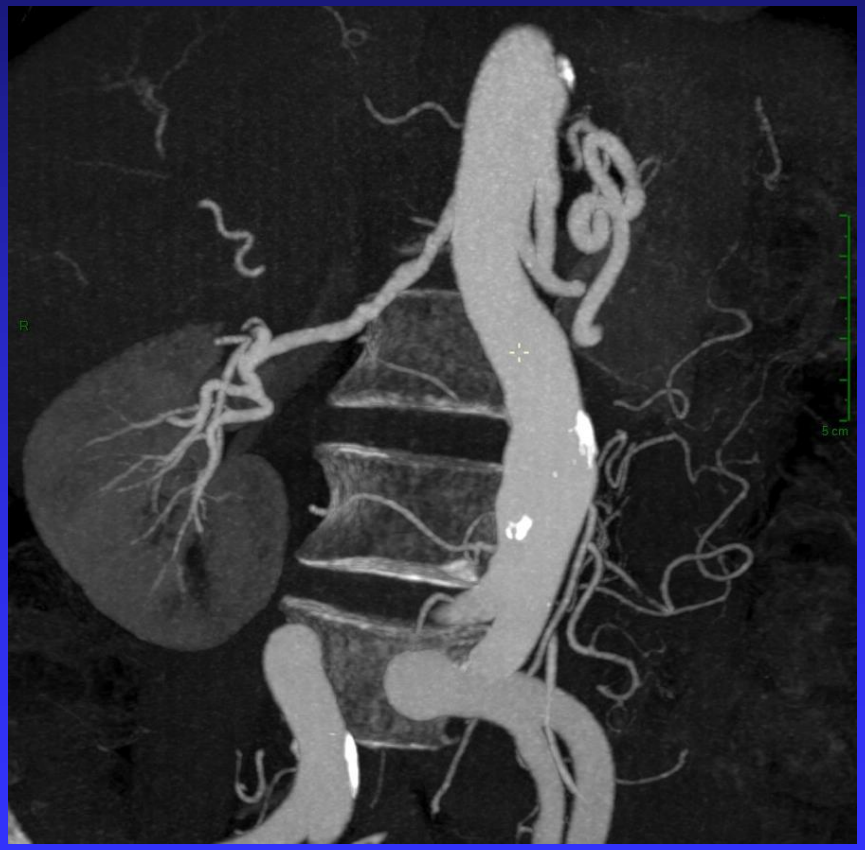


- Facteurs favorisant: hormonal (femmes 90%), génétique (7-11%), stress pariétal (trauma, HTA), ischémie vasa-vasorum.

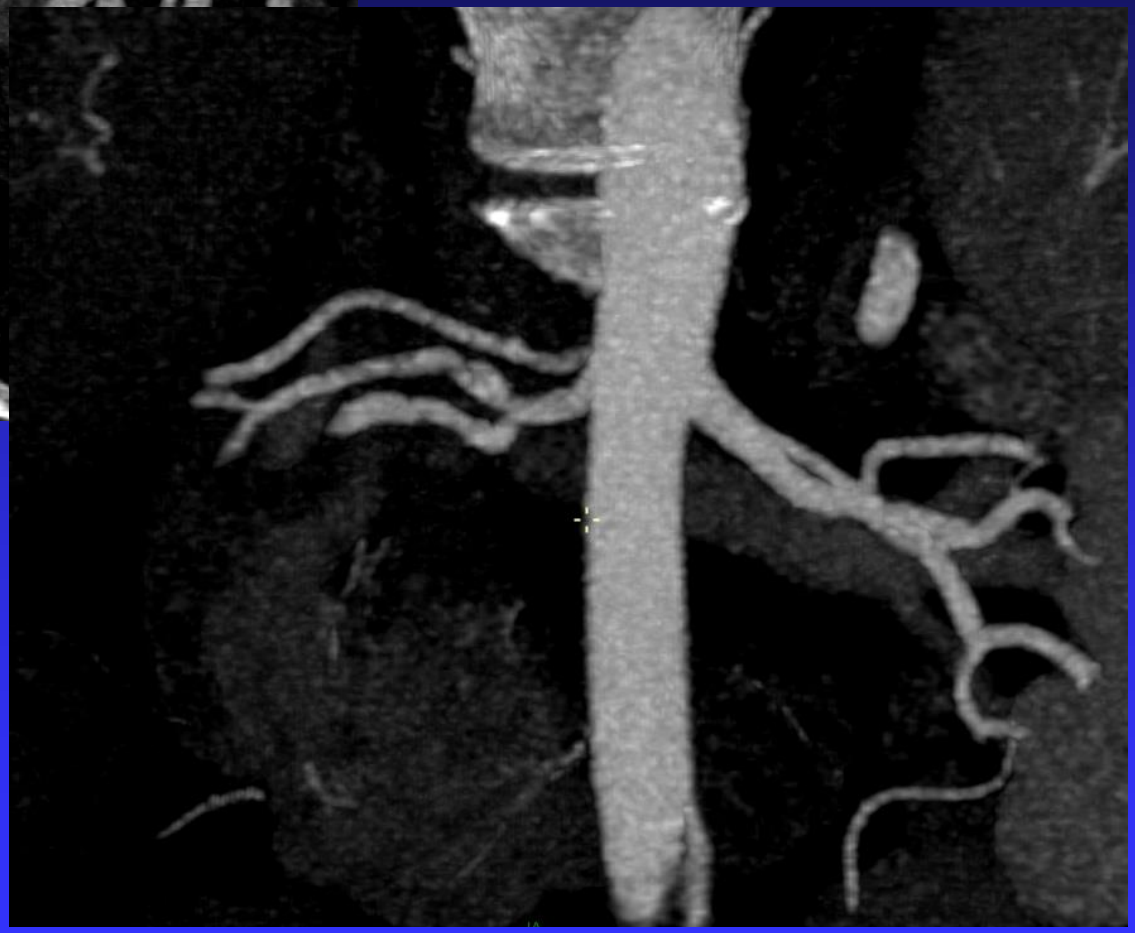
- *Classification anatomopathologique "dépassée":* "fibroplasie" intimale-médiale-périmédiale, "hyperplasie" médiale et périartérielle

- Classification radiologique:
  - Multifocale (90%): "collier de perle"
  - Focale (10%).


<401>
R


R
5 cm

DFM +



DFM focale

Topographie des dysplasies artérielles

- Rénale: > 70%
  - bilatérale 40%
  - si unilatérale → 95% art rénale DROITE
- Cérébrale: 10-20%
- Iliaque (m.inf.): 1%.

Aorte Abdominale

- Anévrisme aorte abdominale:
  - Définition et Étiopathogénie
  - Imagerie médicale, suivi, principe de traitement
  - EVAR
  - Pathologies non athéromateuses: aortites
  - (Dissection aortique).
- Anévrismes des branches de l'aorte abdominale
- Divers:
  - Dissections, ligament arqué, dysplasie fibro-musculaire artères rénales.

FIN