

Lithiase biliaire et imagerie

2020-2021

Scénario

- Contexte
- Technique
- Conditions cliniques
 - Lithiase vésiculaire
 - Diagnostic différentiel
 - Lithiase des voies biliaires
 - Dans la voie biliaire principale
 - En intra hépatique

Pourquoi utiliser l'imagerie ?

- Bilan d'épisodes de douleur de l'HCD :
 - coliques hépatiques
- Cholécystite:
 - Suspicion
 - Bilan
- Bilan étiologique d'une pancréatite



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Author Manuscript

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ACR Appropriateness Criteria Right Upper Quadrant Pain

Gail M. Yarmish, MD^a, Martin P. Smith, MD^b, Max P. Rosen, MD, MPH^c, Mark E. Baker, MD^d, Michael A. Blake, MB, BCh^e, Brooks D. Cash, MD^{f,g}, Nicole M. Hindman, MD^h, Ihab R. Kamel, MD, PhDⁱ, Harmeet Kaur, MD^j, Rendon C. Nelson, MD^k, Robert J. Piorkowski, MD^{l,m}, Aliya Qayyum, MDⁿ, and Mark Tulchinsky, MD^{o,p}



GUIDELINE SUMMARY

NGC:010147

1996 (REVISED 2013)

ACR Appropriateness Criteria® right upper quadrant pain.

Developer

American College of Radiology

SUMMARY

- When AC is suspected in patients who have right upper quadrant pain, the diagnosis should be confirmed or excluded using ultrasound and/or cholescintigraphy.



Ultrasound is preferred as the initial imaging test, with supplemental cholescintigraphy used in problematic cases, if the latter could potentially alter patient management.



- CT or MRI may be helpful in equivocal cases and can be used to identify complications of AC.
- If AC is excluded by ultrasound and/or scintigraphy, CT or MRI may be appropriate, depending on the clinical scenario.

Diagnostic criteria and severity assessment of acute cholecystitis: Tokyo Guidelines

MASAHIKO HIROTA¹, TADAHIRO TAKADA², YOSHIFUMI KAWARADA³, YUJI NIMURA⁴, FUMIHIKO MIURA², KOICHI HIRATA⁵, TOSHIHIKO MAYUMI⁶, MASAHIRO YOSHIDA², STEVEN STRASBERG⁷, HENRY PITT⁸, THOMAS R GADACZ⁹, EDUARDO DE SANTIBANES¹⁰, DIRK J. GOUMA¹¹, JOSEPH S. SOLOMKIN¹², JACQUES BELGHITI¹³, HORST NEUHAUS¹⁴, MARKUS W. BÜCHLER¹⁵, SHEUNG-TAT FAN¹⁶, CHEN-GUO KER¹⁷, ROBERT T. PADBURY¹⁸, KUI-HIN LIAU¹⁹, SERAFIN C. HILVANO²⁰, GIULIO BELLI²¹, JOHN A. WINDSOR²², and CHRISTOS DERVENIS²³

J Hepatobiliary Pancreat Sci (2012) 19:578–585
DOI 10.1007/s00534-012-0548-0

ORIGINAL ARTICLE

New diagnostic criteria and severity assessment of acute cholecystitis in revised Tokyo guidelines

Masamichi Yokoe · Tadahiro Takada · Steven M. Strasberg · Joseph S. Solomkin · Toshihiko Mayumi · Harumi Gomi · Henry A. Pitt · Dirk J. Gouma · O. James Garden · Markus W. Büchler · Seiki Kiriyaama · Yasutoshi Kimura · Toshio Tsuyuguchi · Takao Itoi · Masahiro Yoshida · Fumihiko Miura · Yuichi Yamashita · Kohji Okamoto · Toshifumi Gabata · Jiro Hata · Ryota Higuchi · John A. Windsor · Philippus C. Bornman · Sheung-Tat Fan · Harijt Singh · Eduardo de Santibanes · Shinya Kusachi · Atsuhiko Murata · Xiao-Ping Chen · Palepu Jagannath · SungGyu Lee · Robert Padbury · Miin-Fu Chen

Tokyo Criteria



Table 4 TG13 diagnostic criteria for acute cholecystitis

A. Local signs of inflammation, etc.:

(1) Murphy's sign, (2) RUQ mass/pain/tenderness

B. Systemic signs of inflammation, etc.:

(1) Fever, (2) elevated CRP, (3) elevated WBC count



Tokyo Criteria

Table 4 TG13 diagnostic criteria for acute cholecystitis

A. Local signs of inflammation, etc.:

(1) Murphy's sign, (2) RUQ mass/pain/tenderness

B. Systemic signs of inflammation, etc.:

(1) Fever, (2) elevated CRP, (3) elevated WBC count

C. Imaging findings:

Imaging findings characteristic of acute cholecystitis

Suspected diagnosis: One item in A + one item in B

Definite diagnosis: One item in A + one item in B + C



Imaging findings of acute cholecystitis

Ultrasonography findings (level 4)²⁻⁵

Sonographic Murphy sign (tenderness elicited by pressing the gallbladder with the ultrasound probe)
Thickened gallbladder wall (>4mm; if the patient does not have chronic liver disease and/or ascites or right heart failure)
Enlarged gallbladder (long axis diameter >8cm, short axis diameter >4cm)
Incarcerated gallstone, debris echo, pericholecystic fluid collection
Sonolucent layer in the gallbladder wall, striated intramural lucencies, and Doppler signals.

Magnetic resonance imaging (MRI) findings (level 1b-4)⁶⁻⁹

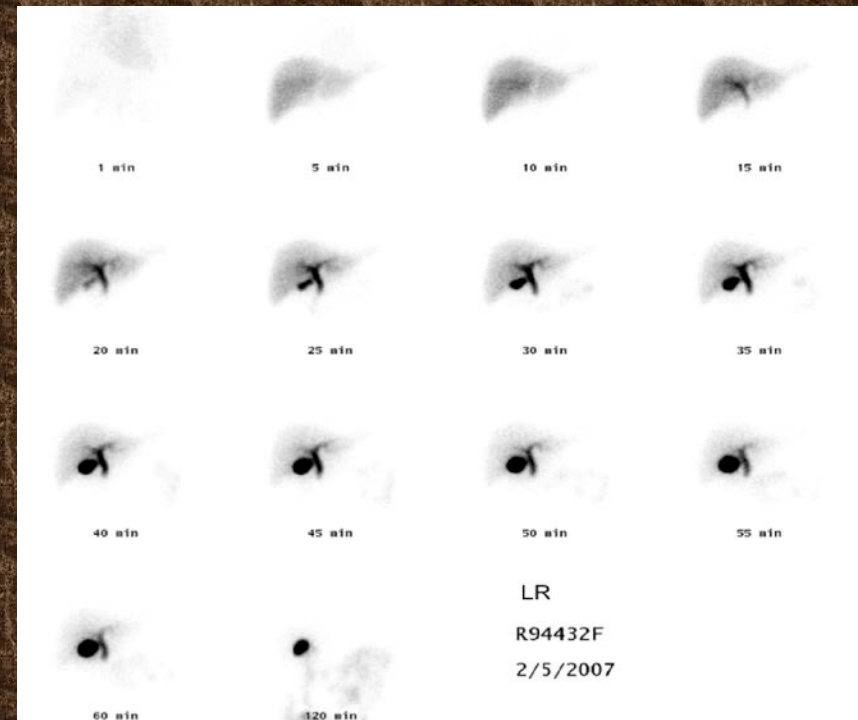
Pericholecystic high signal
Enlarged gallbladder
Thickened gallbladder wall.

Computed tomography (CT) findings (level 3b)¹⁰

Thickened gallbladder wall
Pericholecystic fluid collection
Enlarged gallbladder
Linear high-density areas in the pericholecystic fat tissue.

Tc-HIDA scans (level 4)^{11,12}

Non-visualized gallbladder with normal uptake and excretion of radioactivity
Rim sign (augmentation of radioactivity around the gallbladder fossa).





Imaging findings of acute cholecystitis

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Magnetic resonance imaging (MRI) findings (level 1b-4)⁶⁻⁹

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Thickened gallbladder wall.

Computed tomography (CT) findings (level 3b)¹⁰

Thickened gallbladder wall
Pericholecystic fluid collection
Enlarged gallbladder
Linear high-density areas in the pericholecystic fat tissue.



La lithiase biliaire

présence de calculs dans les voies biliaires

facteurs favorisants :

sexe féminin , âge , obésité , DNID , sédentarité
hémopathie chez l'enfant (drépanocytose)



La lithiase vésiculaire

- 10 à 20 % des occidentaux
 - 5 millions de français
- 80 000 cholecystectomies / an



La lithiase vésiculaire

conditions de formation

concentration ++ cholestérol / sels biliaries

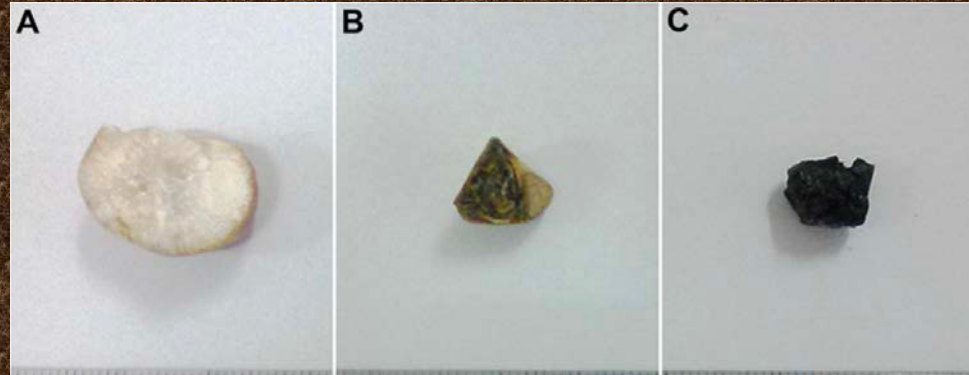
bile lithogénique

cristallisation dans la couche de mucus

microcristaux sédimentaires : sludge

hypomobilité , stase : phénomène d'agglomération

Composition



Weerakoon et al

Pure
cholesterol

Mixed
cholesterol

Pigment
Stone



UCL

La lithiase biliaire & vésiculaire



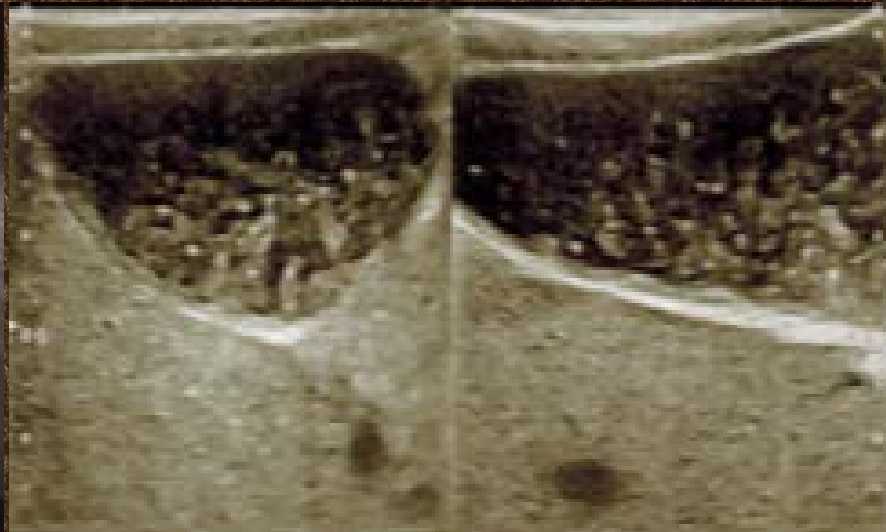
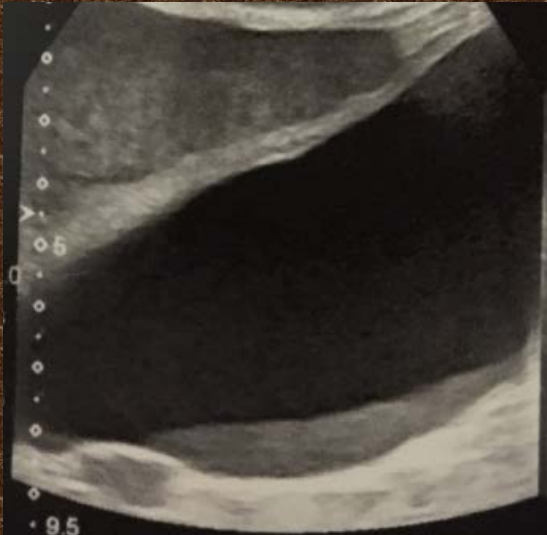
Table 1. Chemical composition of gallstones as revealed by FTIR.

Type of GS	Chemical composition	Frequency <i>n</i> (%)
Pure cholesterol	Cholesterol	10 (09)
Mixed cholesterol	Cholesterol, calcium bilirubinate, calcium carbonate, calcium phosphate	38 (37)
Pigment	Calcium bilirubinate	23 (23)
	Calcium bilirubinate, calcium carbonate, calcium phosphate	25 (25)
	Calcium bilirubinate and calcium palmitate	06 (06)

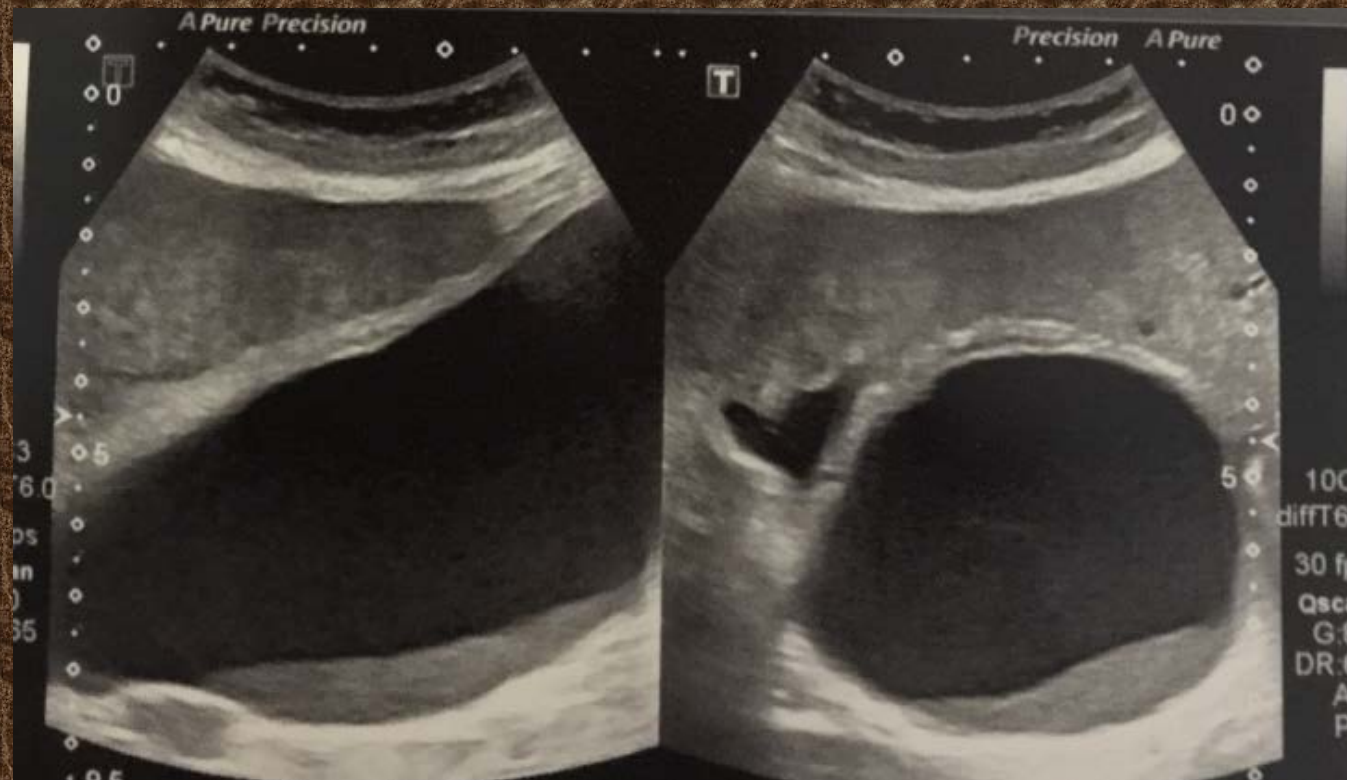
doi:10.1371/journal.pone.0121537.t001

La lithiase biliaire & vésiculaire

Sludge
Microlithiase
Lithiase

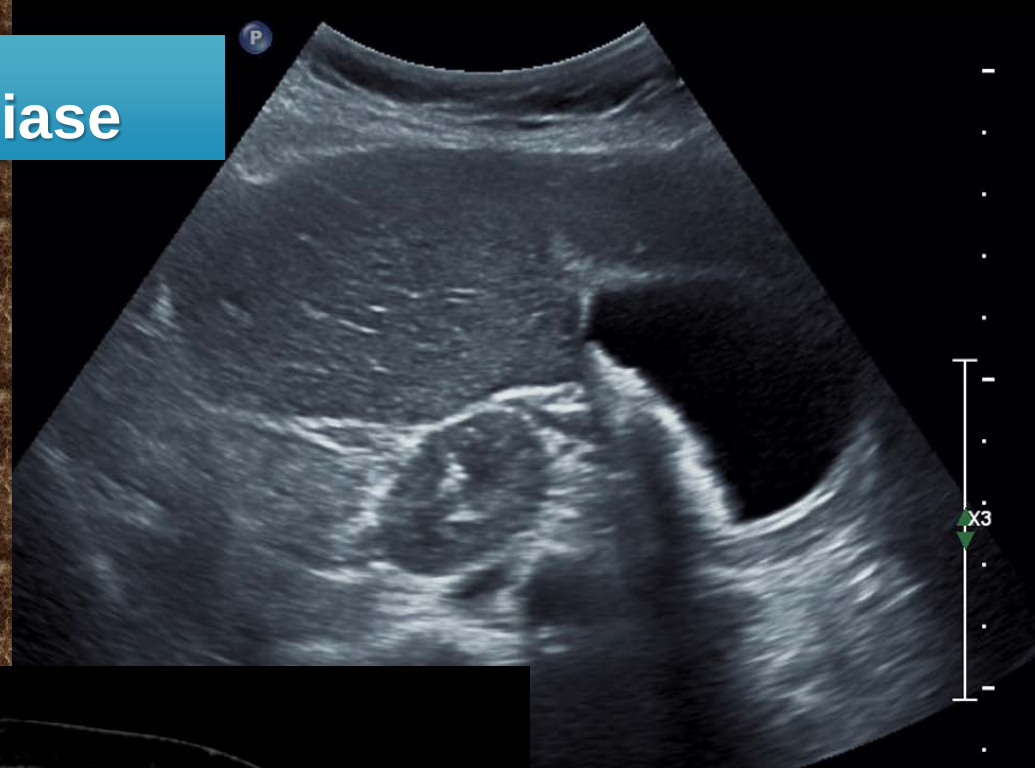


Sludge

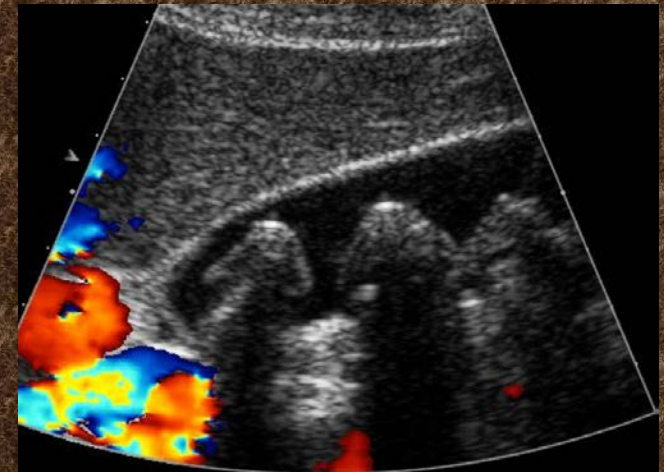


mélange de cristaux de cholestérol, sels calciques et mucus biliaire

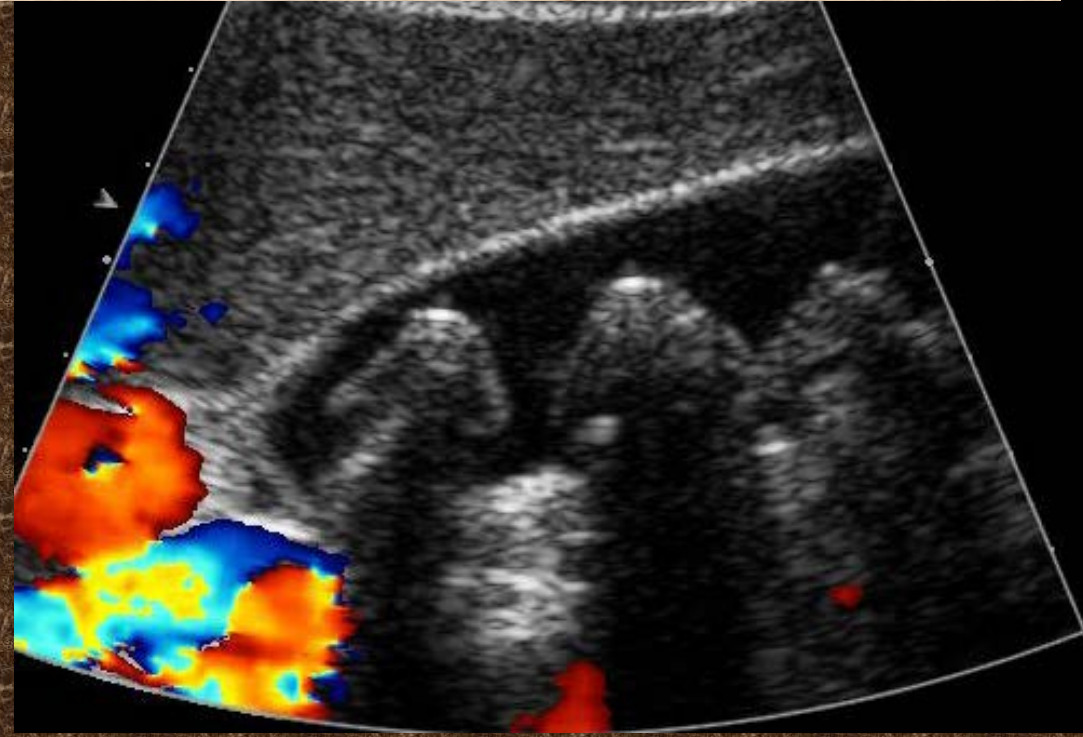
Microlithias



La lithiase cholestérolique



composition cholestérol ++
défaut solubilisation par les sels biliaires + atonie
jaunes/bruns , mous , friables , réguliers avec
facettes , radiotransparents , souvent multiples



La lithiase pigmentaire

- **noire**

(riche en Ca , Cu , Fe , Mg , Mang)

défaut de glucuronoconjugaison : bilirubine non conjuguée +++

hémolyse , cirrhose

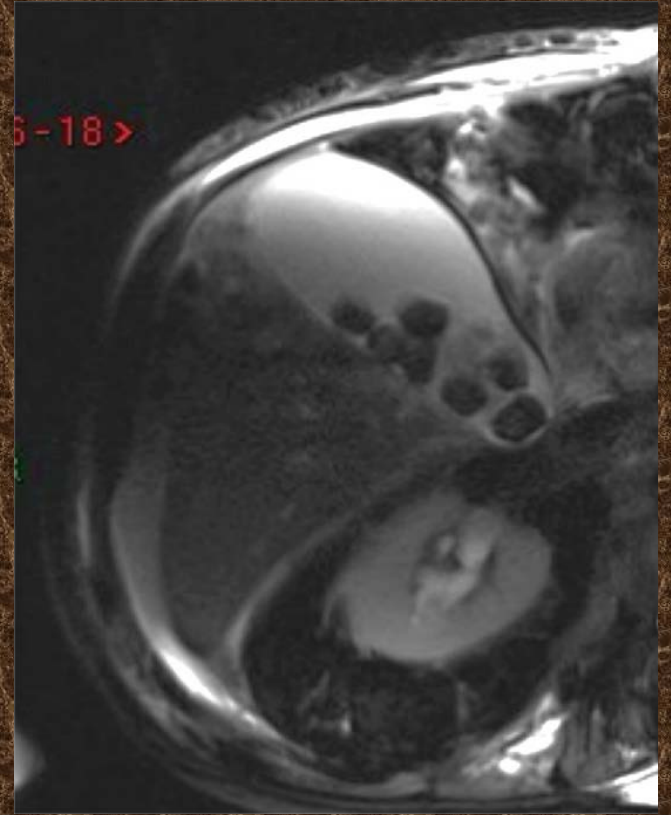
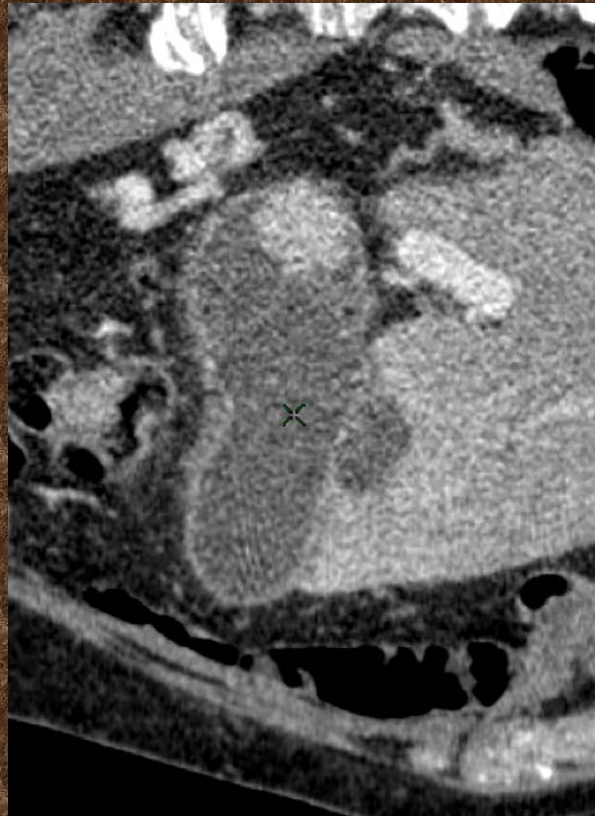
dure ,irrégulière radio opaque

- **brune** rare

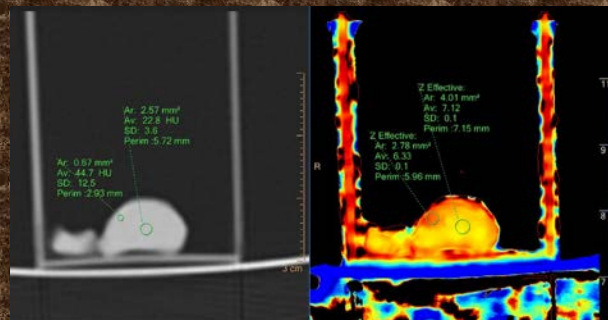
infection chro des voies biliaires

polymérisation de la bilirubine par B glycuronidase bactérienne

très friable , densité inter (parfois gaz / anaérobie)



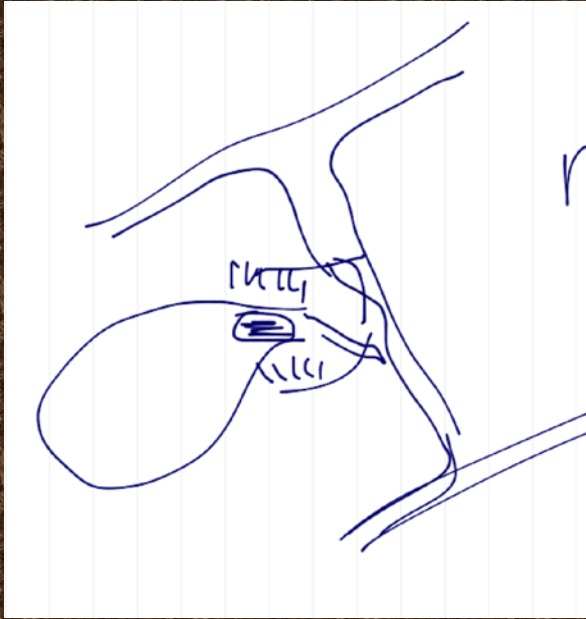
Lithiase mixte



Microlithiase vs granulôme



Mirizzi Syndrom



Ethan A. Smith¹
Jonathan R. Dillman¹
Khaled M. Elsayes¹
Christine O. Menias²
Ronald O. Bude¹



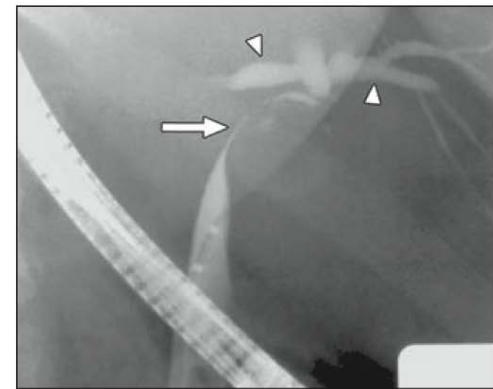
A



B



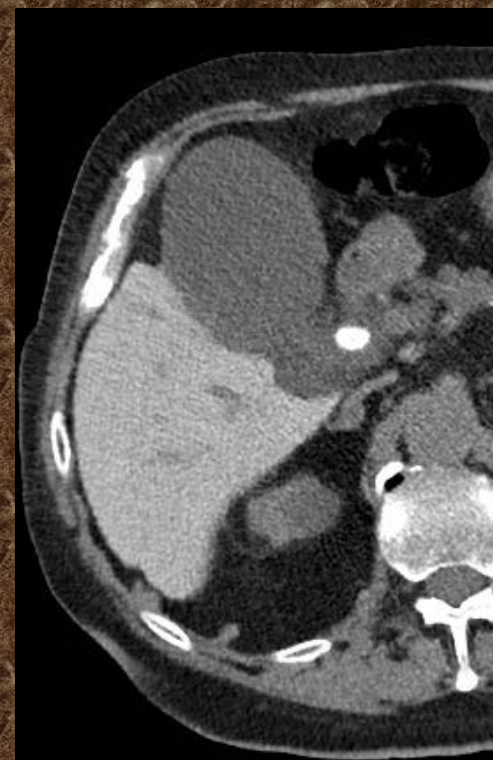
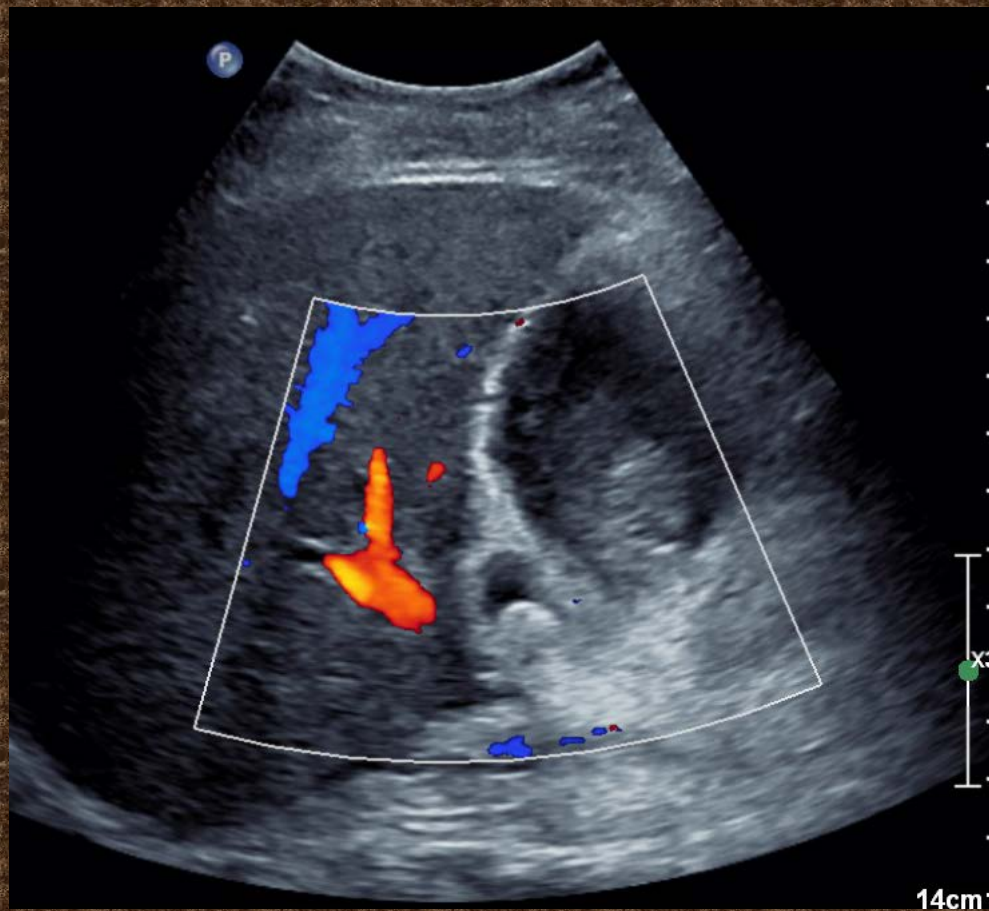
D



E

**Cross-Sectional Imaging of
Acute and Chronic Gallbladder
Inflammatory Disease**

AJR 2009; 192:188–196



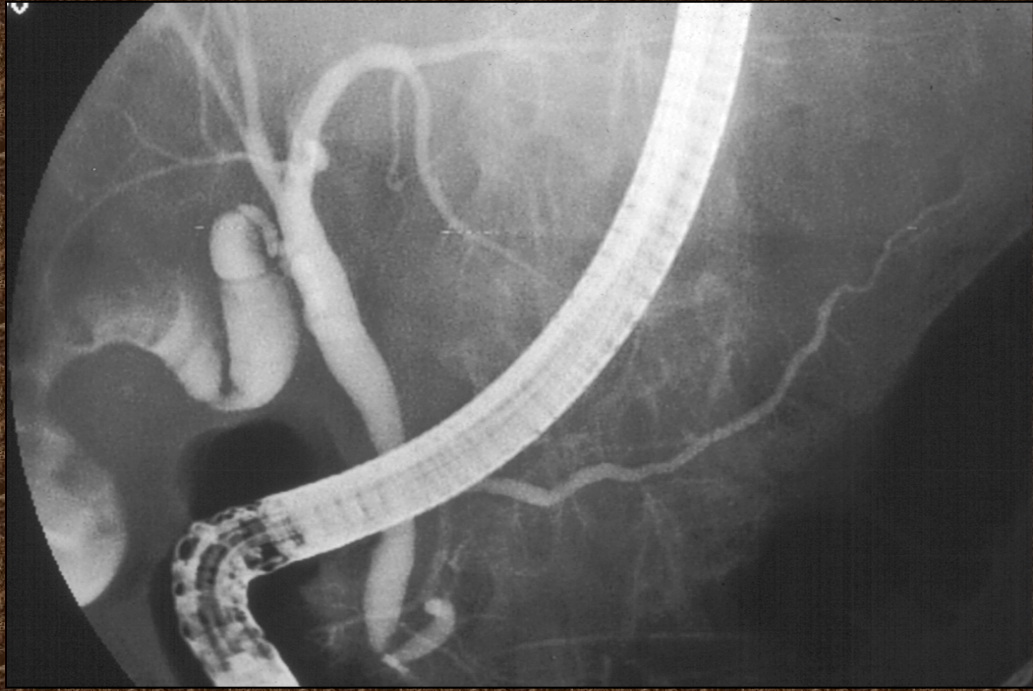
Lithiase des voies biliaires

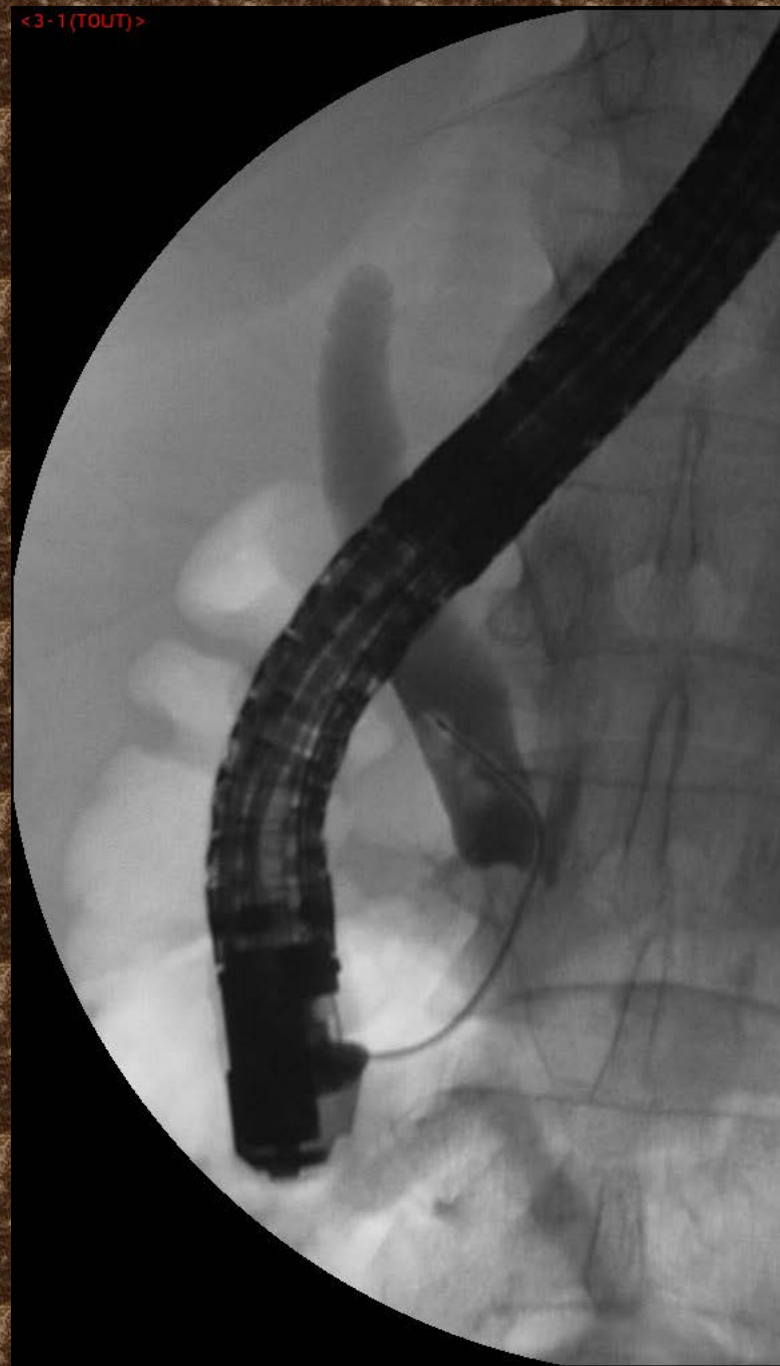
- Elle provient souvent de la migration d'un calcul vésiculaire
- Elle peut également se former dans les voies biliaires en étant favorisée par la stase et l'infection
- Elle peut provoquer un obstacle (ictère, angiocholite) ou une pancréatite aiguë



La lithiase des voies biliaires

- Echographie : sensibilité faible
- CholangioIRM : sensibilité élevée
- Echoendoscopie : lithiase du cholédoque







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REVIEW



Correspondence.
E-mail address: serge.erlinger@gmail.com (S. Erlinger).

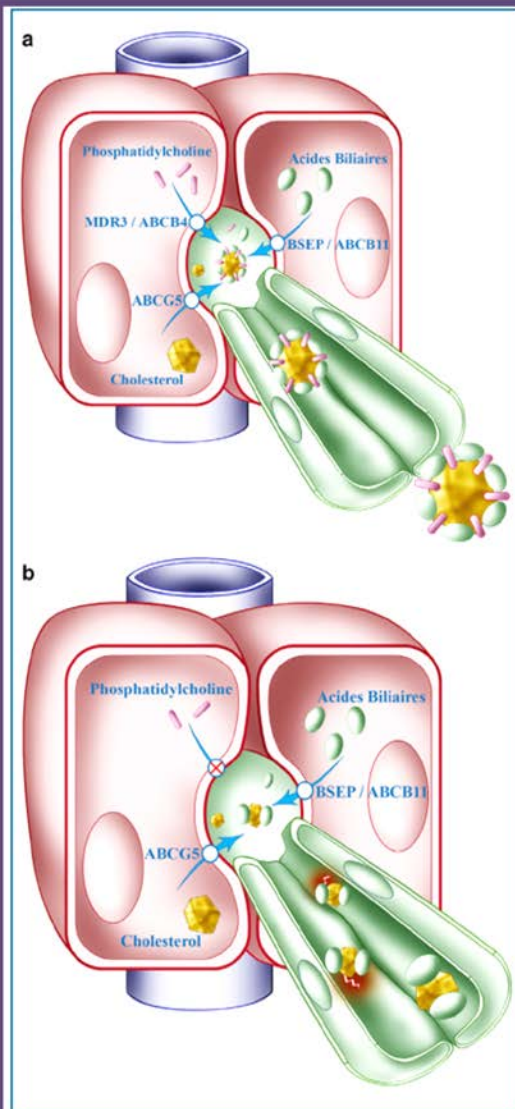


Figure 1. Pathophysiology of the LPAC syndrome; a: normal physiology: phosphatidylcholine is excreted by the MDR3 protein in the bile canaliculi at the level of the biliary hepatocyte pole. The micelles having been formed are mixed and stable, and cholesterol is solubilized in the bile; b: LPAC syndrome: The MDR3 protein (MultiDrug Resistance 3) is absent or deficient. In the absence of phosphatidylcholine, the micelles become simple, unstable and less able to solubilize cholesterol. The cholesterol precipitates and forms calculi. Along with lack of the protective effect of phosphatidylcholine, the presence of micro-crystals leads to chronic attacks on the cholangiocytes. The hepatocytes are designated in red, and the cholangiocytes in green. In the foreground in blue, a central lobular venule appears.

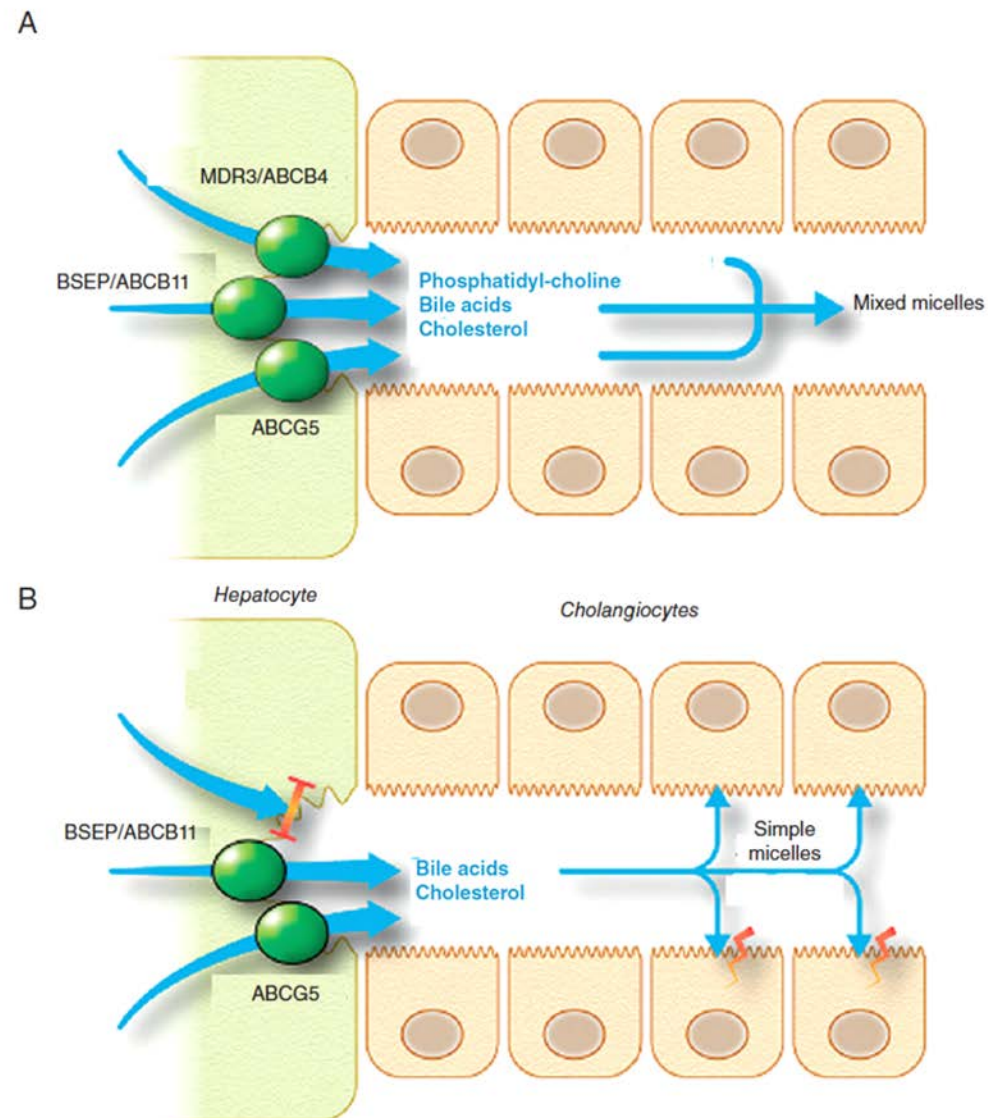
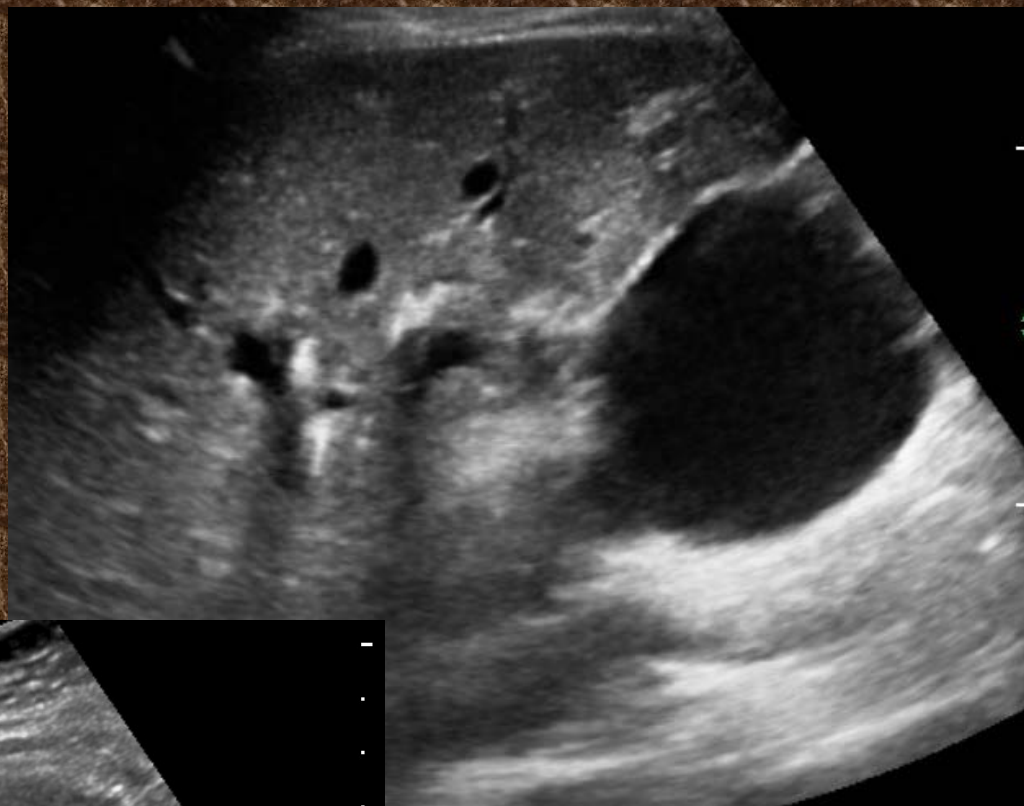


Figure 4 (A) Bile acid, cholesterol and phosphatidylcholine transport through the canalicular membrane in normal hepatocytes. (B) When MDR3/ABCB4 is defective, bile acids are transported without phospholipids. The bile acids then form simple micelles with potent detergent activity that can damage the neighboring cholangiocytes.





	Lithiase de la vésicule biliaire classique	Lithiase dans le contexte du syndrome LPAC
Âge au début des premiers symptômes	Après 50 ans	Avant 30 ans
Morphotype	Association avec un excès de poids, l'obésité	Poids normal
Sexe	Sex-ratio 1,5 femme / 1 homme	Sex-ratio 3 femmes / 1 homme
Imagerie	Lithiase isolée de la vésicule biliaire	Lithiase intrahépatique associée
Histoire de famille	-	Lithiase familiale au 1er degré, symptomatique avant 40 ans
Histoire personnelle	-	Cholestase gestationnelle
Cholécystite	Fréquent	Rare
Complications de la lithiase	Rare	Fréquent (migration, cholangite aiguë, pancréatite aiguë, etc.)
Récurrence des symptômes après cholécystectomie	Rare	Très fréquent (par définition)

Vésicule biliaire : tumeurs & pseudotumeurs

- Granulome à cholestérine (< 6 mm)
 - Unique
 - Multiples (cholestérolose, vésicule fraise)
- Adénomyose
 - Hyperplasie de la muqueuse et de la musculuse
 - Épaississement pariétal (localisé, diffus)
 - Artéfacts en queue de comète
- Tumeur
 - Polype (> 6 mm)
 - Adénocarcinome
 - Polype > 10 mm ou épaississement pariétal focal
 - Si découverte tardive : masse envahissant foie et voies biliaires

Autres anomalies pariétales

granulome < 6 mm
6 / 10 mm pseudo polype
vrai polype
> 10 mm adénocarcinome ?



Granulomes et polypes

cholestérolose

- forme diffuse : ensemble de la paroi

=> granulations hyperéchogènes multiples non mobiles sans cône d'ombre

- forme focale : « polype » cholestérolique

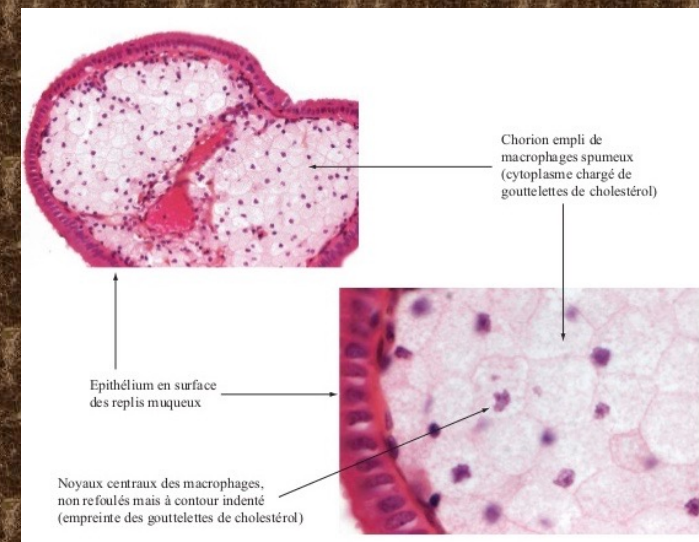
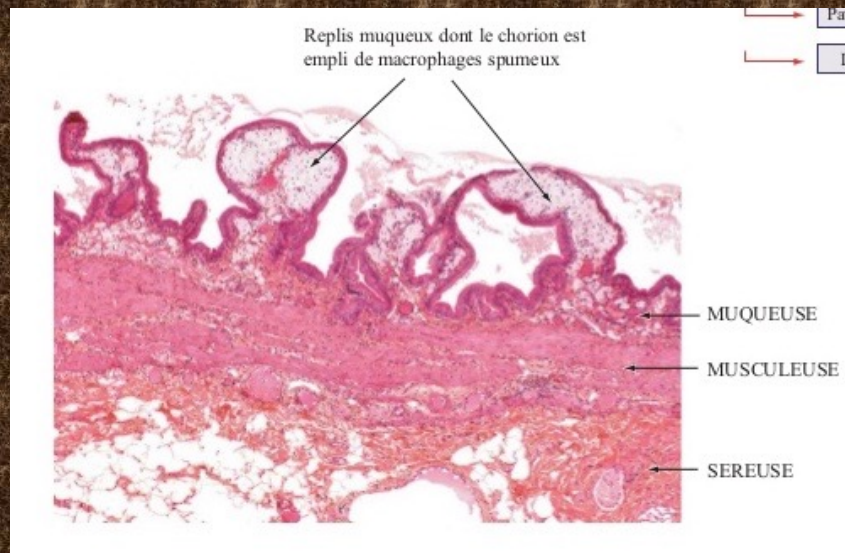
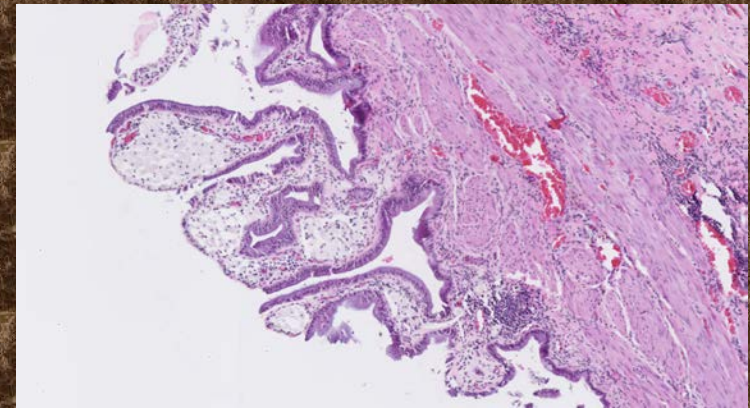
cholestérolose



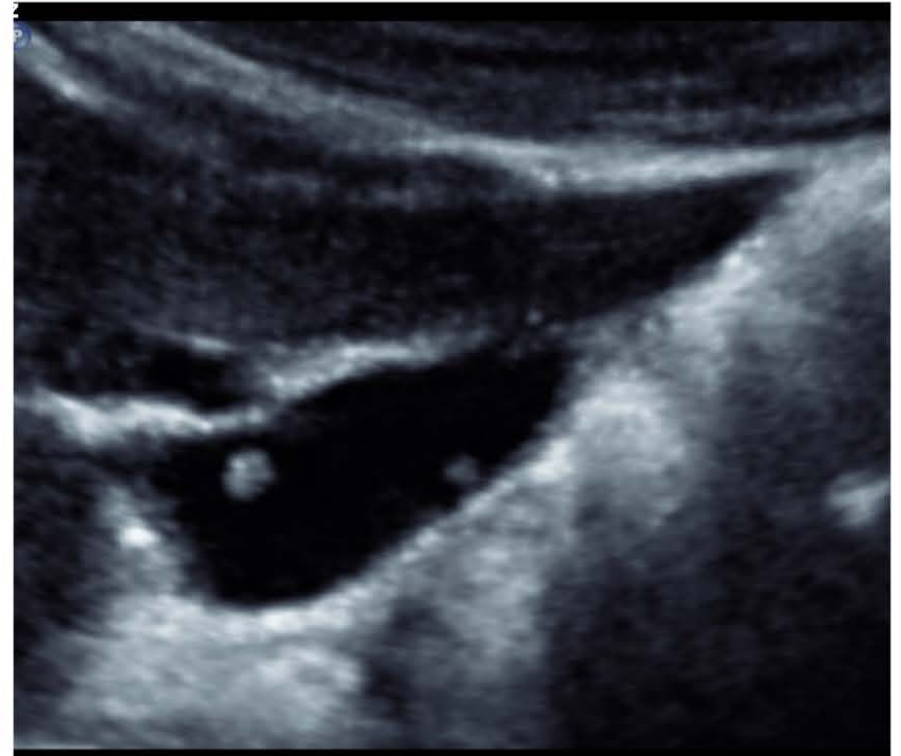
vésicule fraise

cholestérolose

hyperplasie de la muqueuse avec
accumulation de dépôts cholestéroliques
dans les macrophages du chorion
asymptomatique



cholestérolose



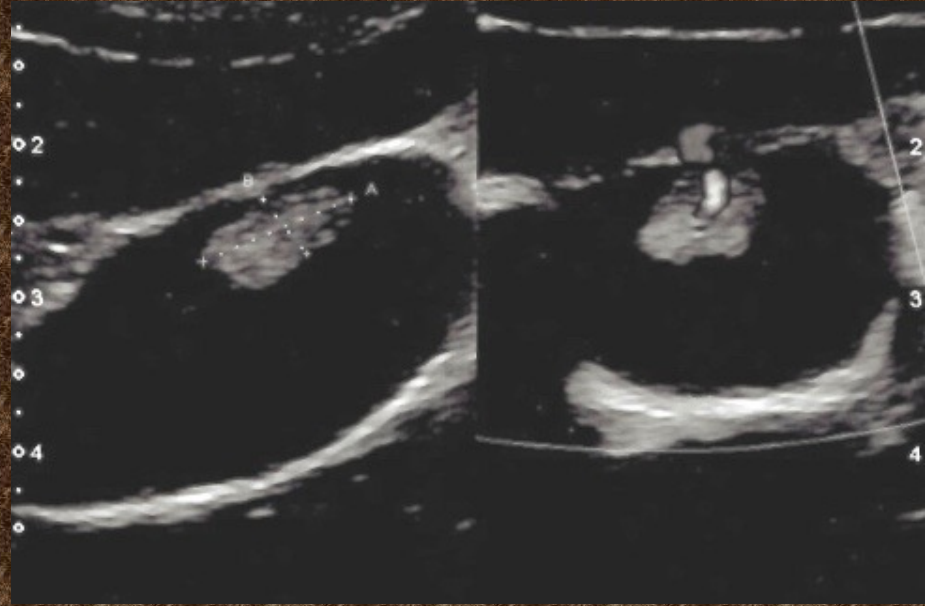
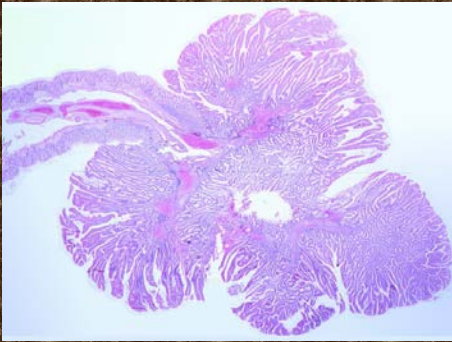
Multiples formations nodulaires appendues aux parois de la vésicule : granulomes

cholestérolose



- « polype » cholestérolique = granulome
formation échogène arrondie petite taille < 6 mm
pas de cône d'ombre rattachée à la paroi
D D parfois difficile avec le polype adénomateux

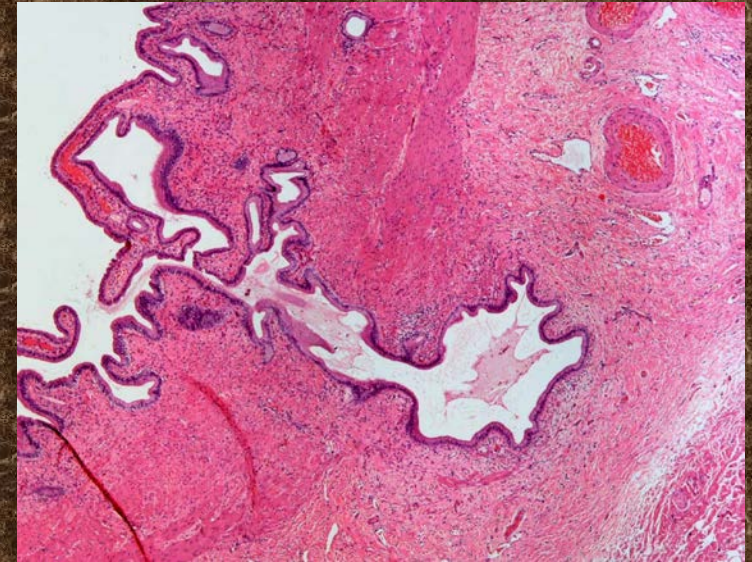
polype /adénome



tumeur épithéliale bénigne

moins hyperéchogène voir isoéchogène au foie
souvent unique , plus grande taille ≥ 6 à 20 mm
signal Doppler
potentiel malin

adénomyomatose



- processus inflam chronique
- prolifération de l'épithélium avec invagination de la muqueuse jusque ds la musculuse
(sinus de Rokitansky Aschoff)
- pas de dégénérescence , asymptomatique

Adenomyomatosis

Prevalence: 3-5% (W/M: 3/1)

Mecanism: wall hyperplasia

Wall: > 10mm (diffuse ou focal)

Etiology: ?

Asymptomatic.

No R/



Lin et al. *BMC Gastroenterology* 2011, 11:106
<http://www.biomedcentral.com/1471-230X/11/106>

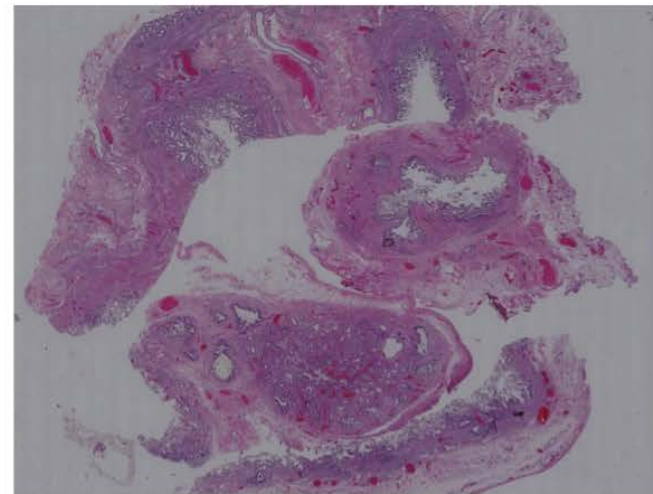


CASE REPORT

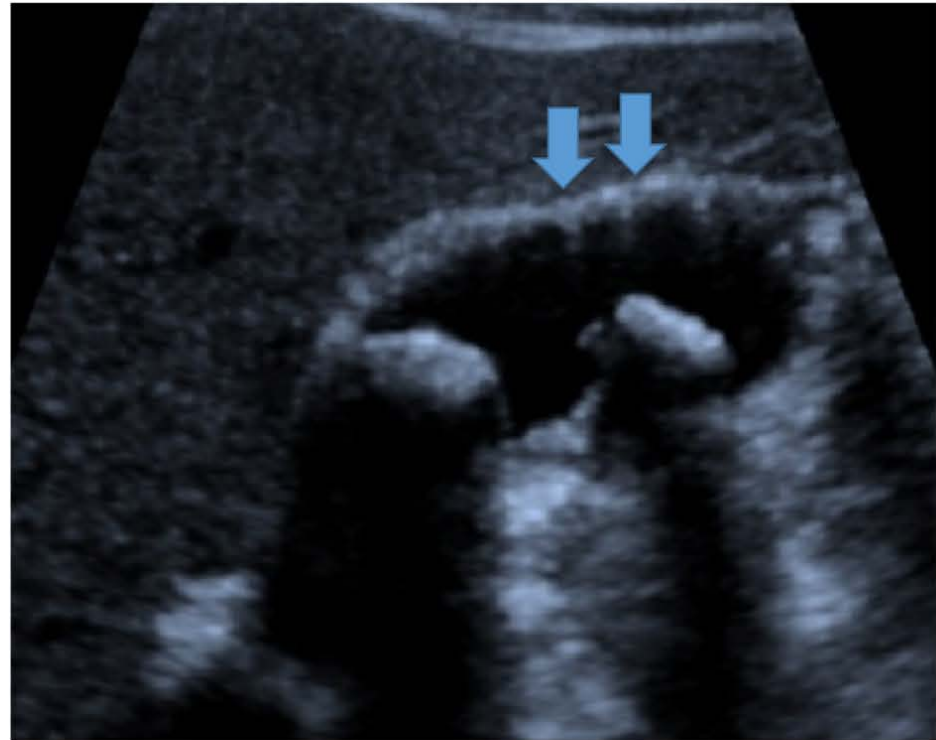
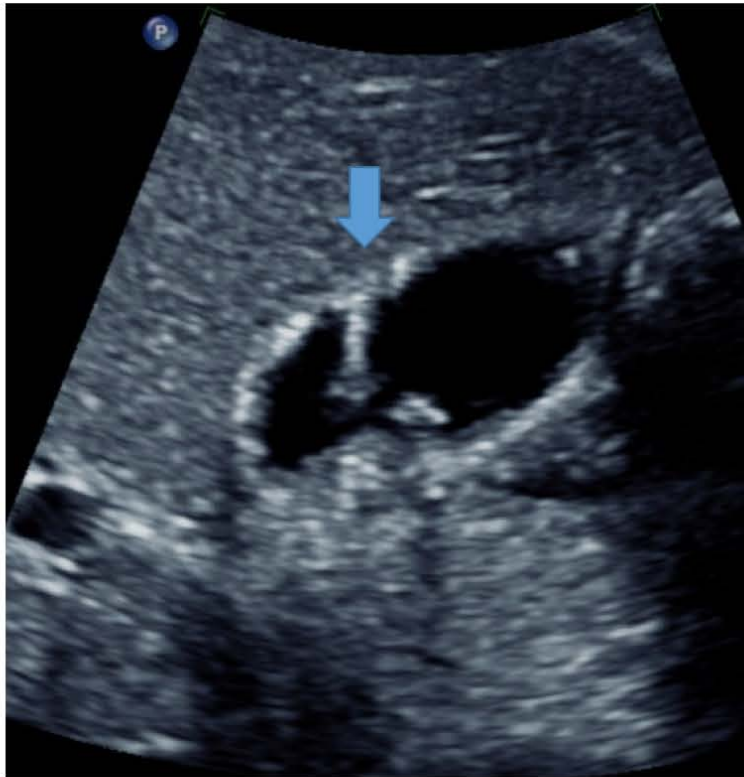
Open Access

Rare gallbladder adenomyomatosis presenting as atypical cholecystitis: case report

Sheng-Hong Lin^{1†}, Feng-Yee Chang^{2†}, Ya-Sung Yang^{2†}, Jong-Shiaw Jin^{3†} and Teng-Wei Chen^{4*}

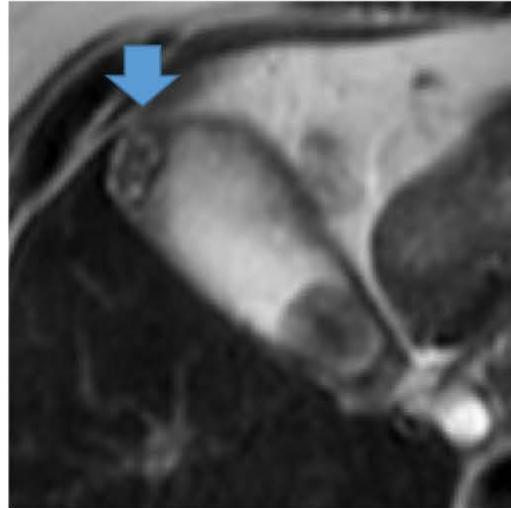


adénomyomatose



Adénomyose : artéfacts en queue de comète (flèche) associés ou non avec des calculs et/ou du sludge

adénomyose



Adénomyose de la paroi vésiculaire sous la forme d'un épaissement segmentaire en échographie et combiné à des petites expansions liquidiennes dans la paroi vésiculaire, mieux vues en IRM (flèches)

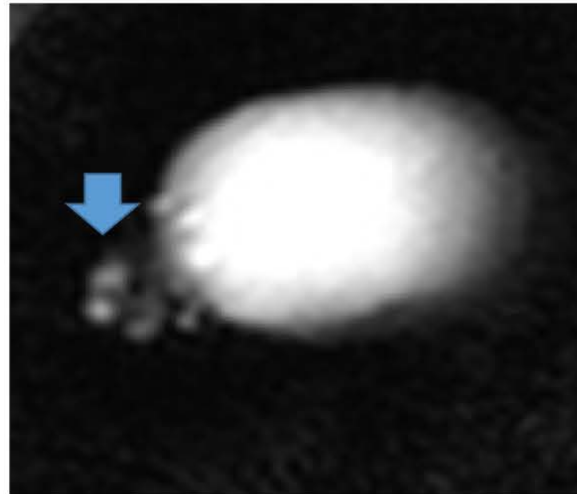


Fig. 1. Vésicule biliaire ouverte longitudinalement et montrant de nombreux calculs intra-muraux sous l'aspect de taches verdâtres / Fig. 2. Coupe transversale de la vésicule précédente avec deux calculs intra-muraux / Fig. 3. Un calcul intra-mural, riche en pigments, desquamation partielle de l'épithélium diverticulaire / Fig. 4. Coupe de vésicule biliaire montrant deux canaux de Luschka sensiblement normaux. Amas lymphoïde inflammatoire près du diverticule gauche / Fig. 5. Calcul intra-mural visiblement développé dans un diverticule de Luschka. Sclérose et réaction inflammatoire péridiverticulaire - La Presse médicale - [Articles originaux]

20e siècle

Revue : La Presse médicale - [Articles originaux], 1930, Articles originaux

Edition : Masson et Cie, 1930

Cote : 100000x1930xartorig

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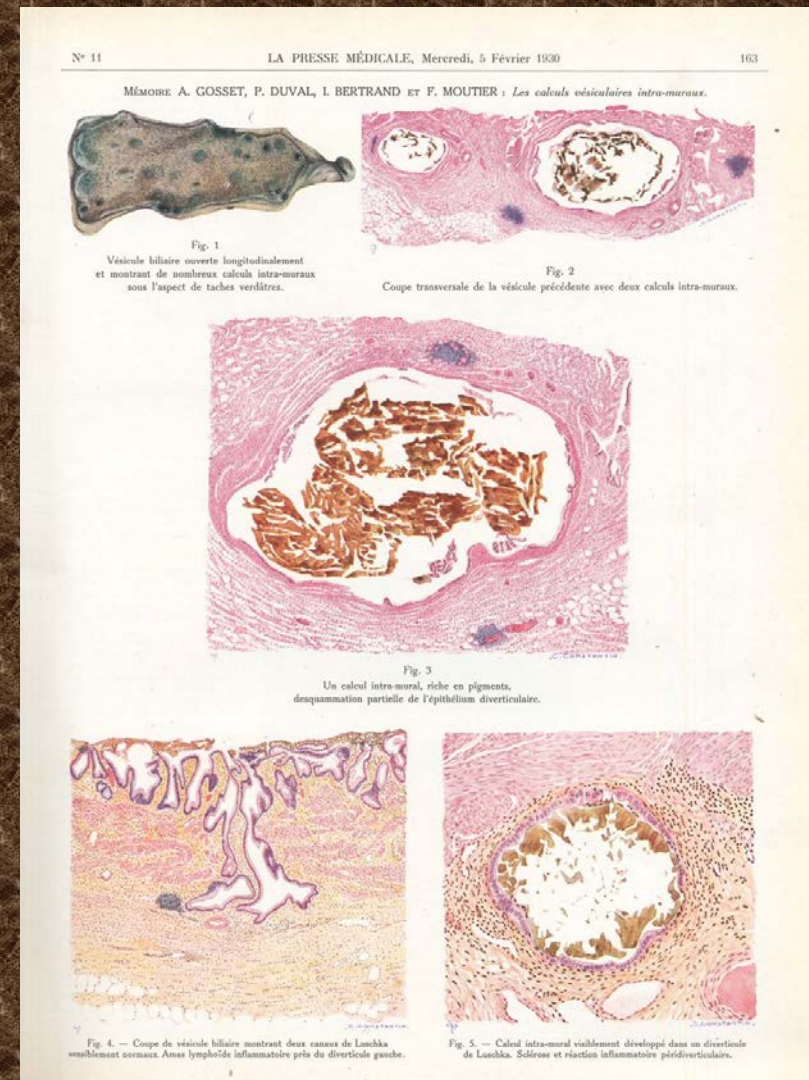
<https://www.biusante.parisdescartes.fr/histmed/image?med100000x1930xartorigx0163>

BIU Santé



<https://www.biusante.parisdescartes.fr/histmed/image?med100000x1930xartorigx0163>

163



Vésicule biliaire : cholécystite

- US
- CT
- IRM

CHOLECYSTITE



Pathological Classification

Y Kimura, J Hepatobiliary Pancr Sc 2013

Acute non complicated ch

- Edematous form

Complicated form ch

- Necrosing
- Suppurative
- Emphysematous

Chronic

- Chronic
- Xanthogranulomatous f

Clinico-Radiological Classification

E Smith J ACR 2009

- Acute non complicated ch
- Acute complicated ch
 - Gangrenous => Perforation
 - emphysematous
 - Suppurative cholecystitis
 - Hemorrhagic
- Acalculous
- Chronic

Scope of the Disease

Prevalence = 5 %

A Systematic Review and Meta-Analysis of Diagnostic Performance of Imaging in Acute Cholecystitis¹

Jordy J. S. Kiewiet, MD
Marjolein M. N. Leeuwenburgh, MD
Shandra Bipat, PhD
Patrick M. M. Bossuyt, PhD
Jaap Stoker, MD, PhD
Marja A. Boermeester, MD, PhD

Purpose: To update previously summarized estimates of diagnostic accuracy for acute cholecystitis and to obtain summary estimates for more recently introduced modalities.

Materials and Methods: A systematic search was performed in MEDLINE, EMBASE, Cochrane Library, and CINAHL databases up to March 2011 to identify studies about evaluation of imaging

145 to 153 in 2013
at St-Luc University Hospital

900 beds
> 50.000 emergency visits/ year

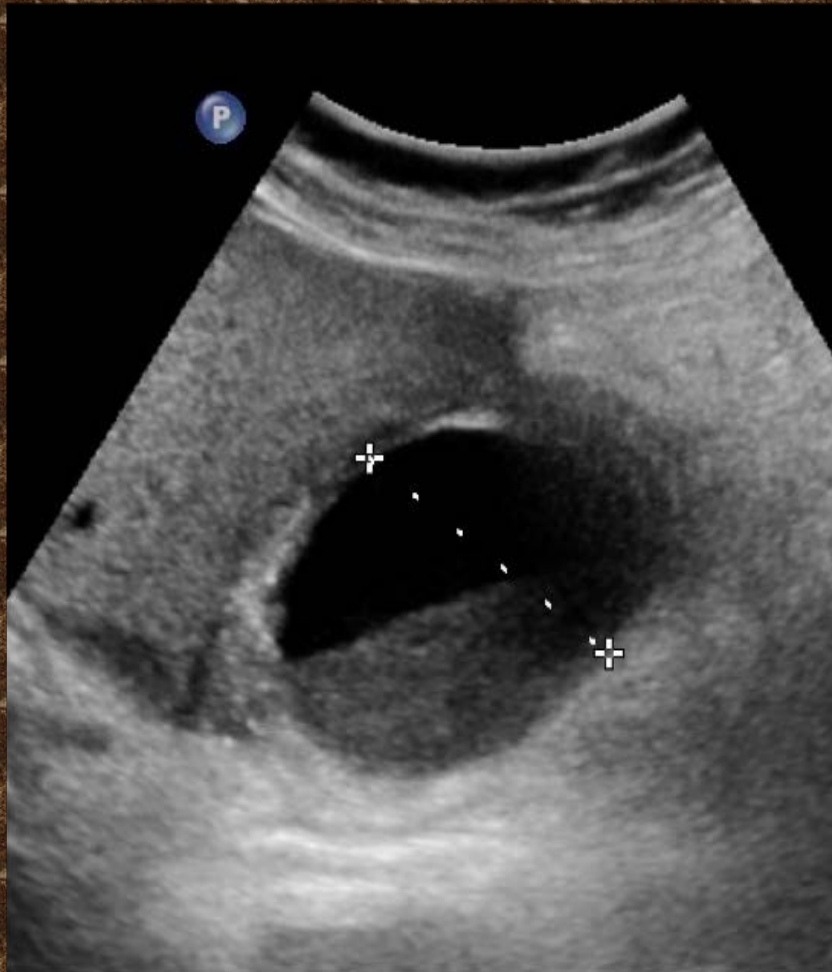
radiology.rsna.org ■ **Radiology:** Volume 264: Number 3—September 2012

US :

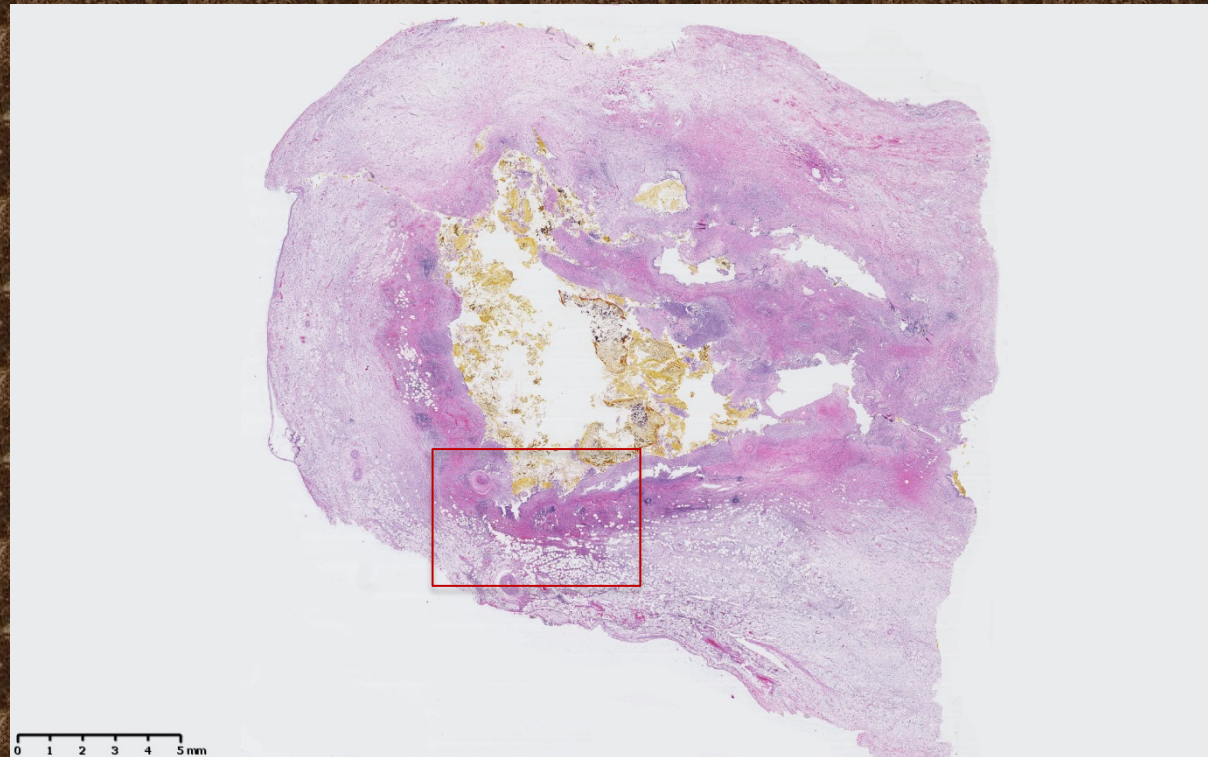
- Signe de Murphy
- Majoration du diamètre transverse > 4 cm
- Calcul ou de sludge
- Paroi de la vésicule > 5 mm
- Uquide périvésiculaire

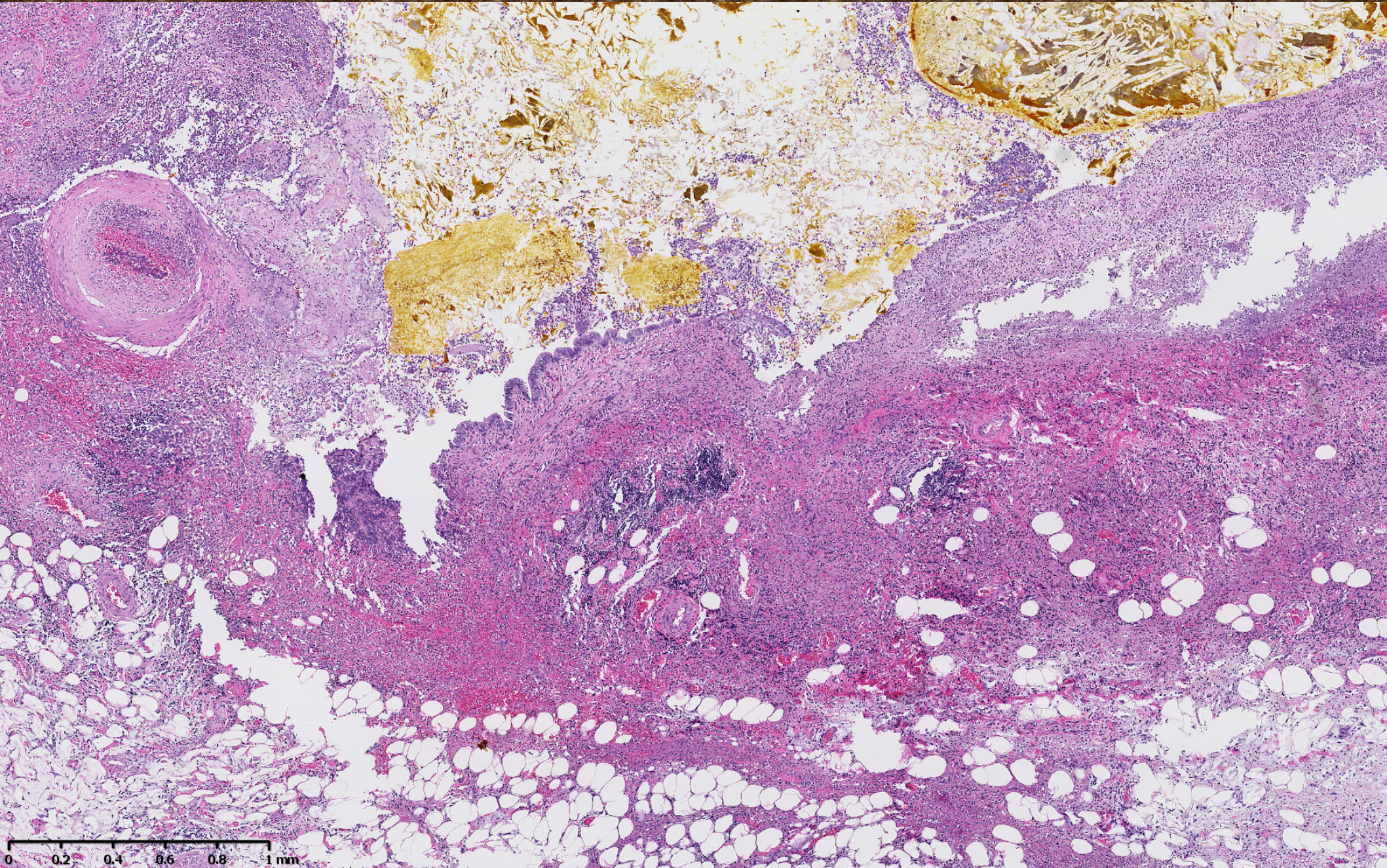


Cholécystite Aiguë



Cholécystite Aiguë





0 0.2 0.4 0.6 0.8 1 mm

Cholécystite Gangréneuse

- Forme Sévère de cholécystite => Altérations Ischémiques / nécrotiques
- Incidence : 2 à 30 %
- 10 à 40 % de cholécystites classiques se compliquent
- âgés, hommes, Diabète

Cholécystite Gangréneuse

- hémorragie :

= > intraluminaire

=> péritonéale

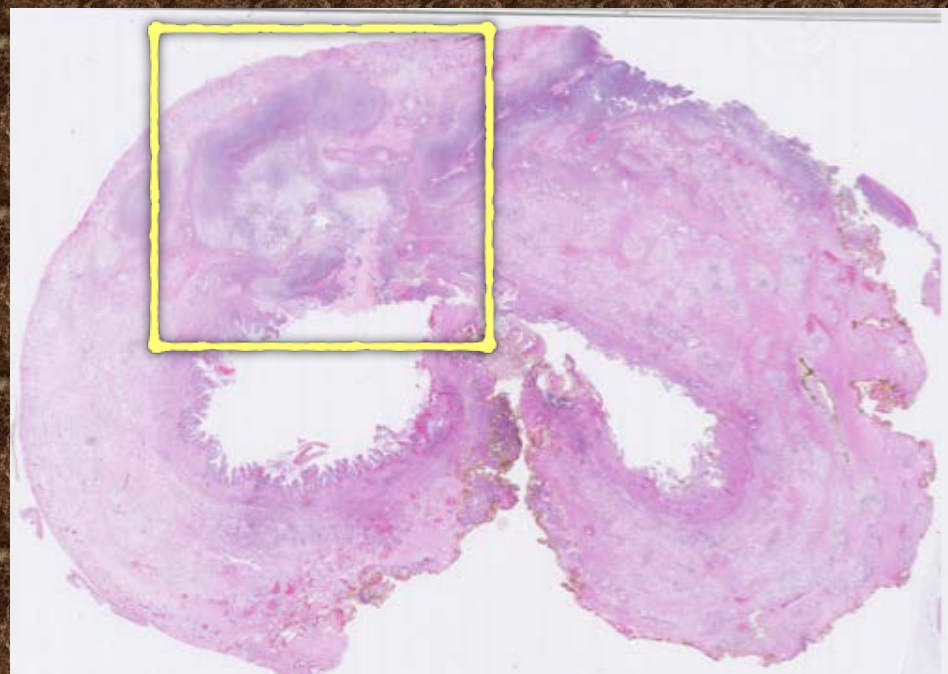
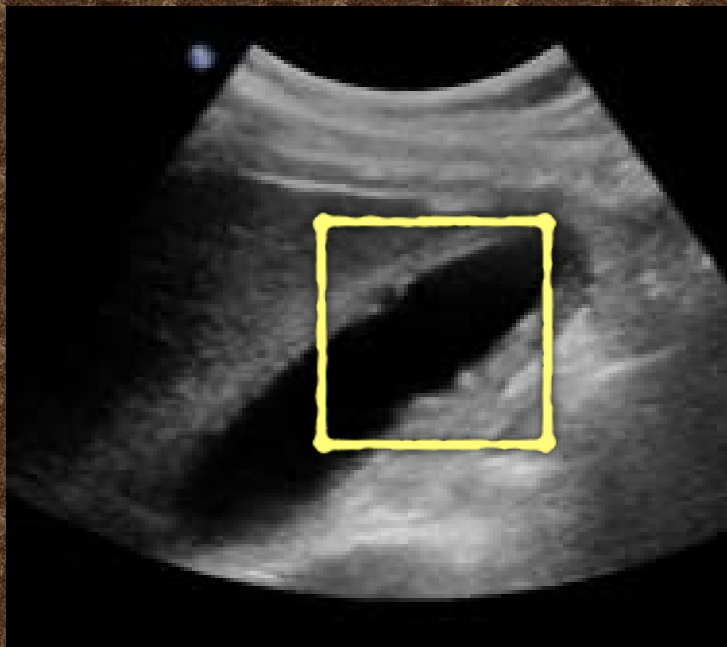
- perforation:

=> Dans le péritoine : péritonite biliaire aiguë (10%)

= > forme focale « couverte » : (subaiguë) abcès
périvésiculaire (60%)

= > fistule bilio-enterique : iléus biliaire (30%)



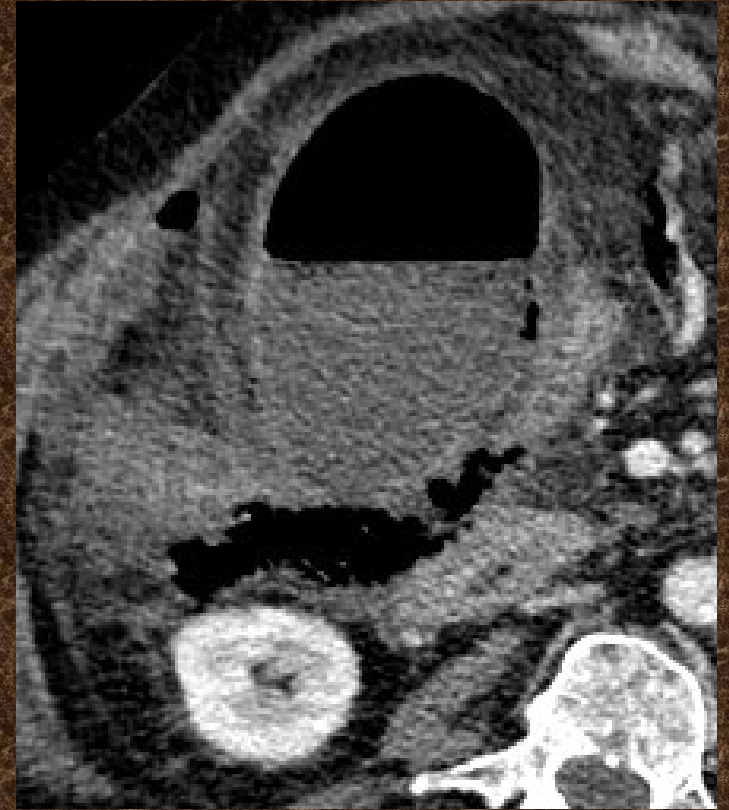


Gangrenous Cholecystitis & CT



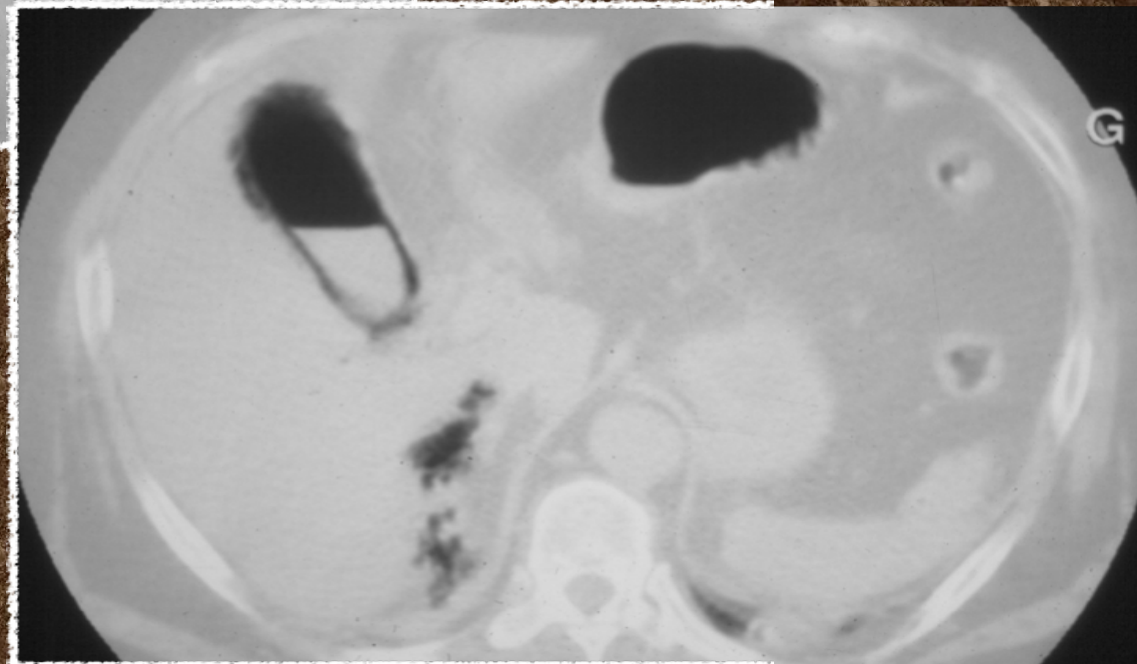
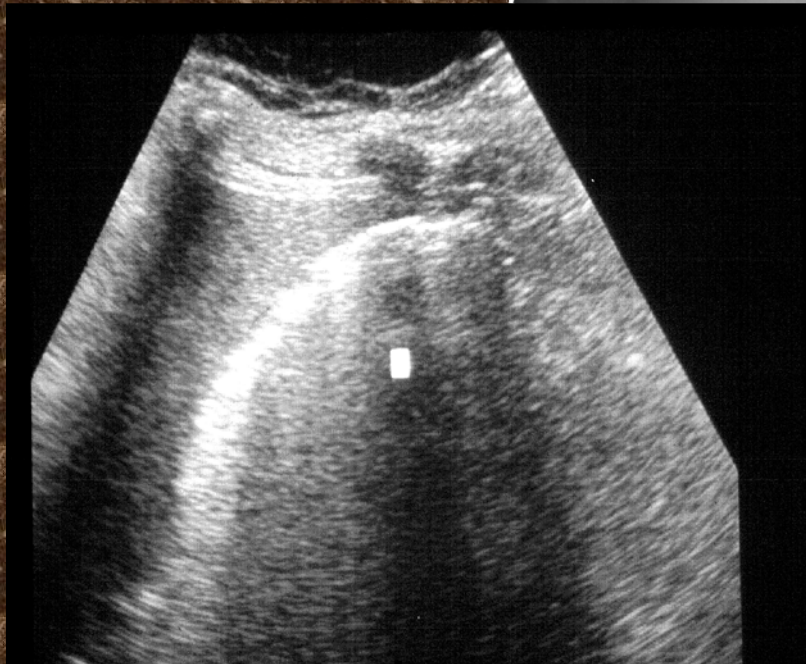
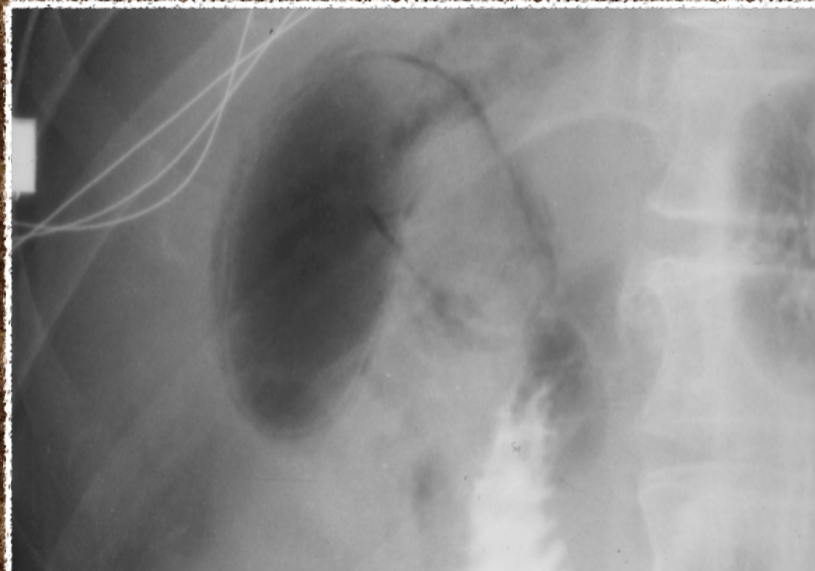
ELEMENTS CLES

- = > paroi irrégulière
- = > défaut de prise de contraste
- = > épaisseur de la paroi
- = > petit axe de la vésicule



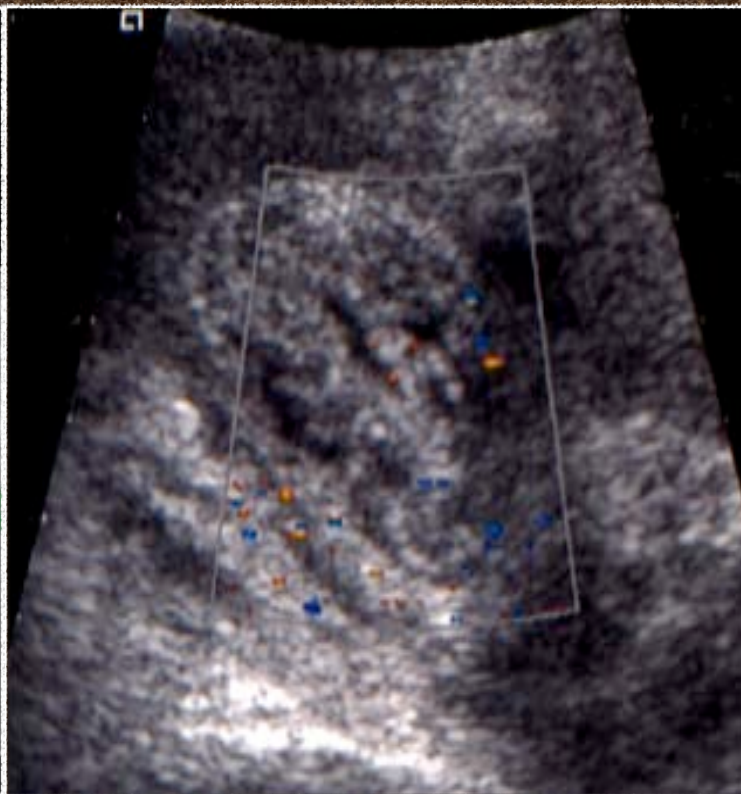
G.L. Bennet, CT Findings in Acute Gangrenous Cholecystitis,
AJR February 2002 vol.178 no.2 275-281

DD Cholécytite Emphysémateuse





Cirrhose



Hépatite



Insuffisance Cardiaque

Conclusion

- Lithiase vésiculaire
 - Diagnostic différentiel
- Lithiase des voies biliaires
 - Dans la voie biliaire principale
 - En intra hépatique
- Cholécystite ou DD

