Biopsies pulmonaires chirurgicales au cours des atteintes pulmonaires chez les malades d'hématologie

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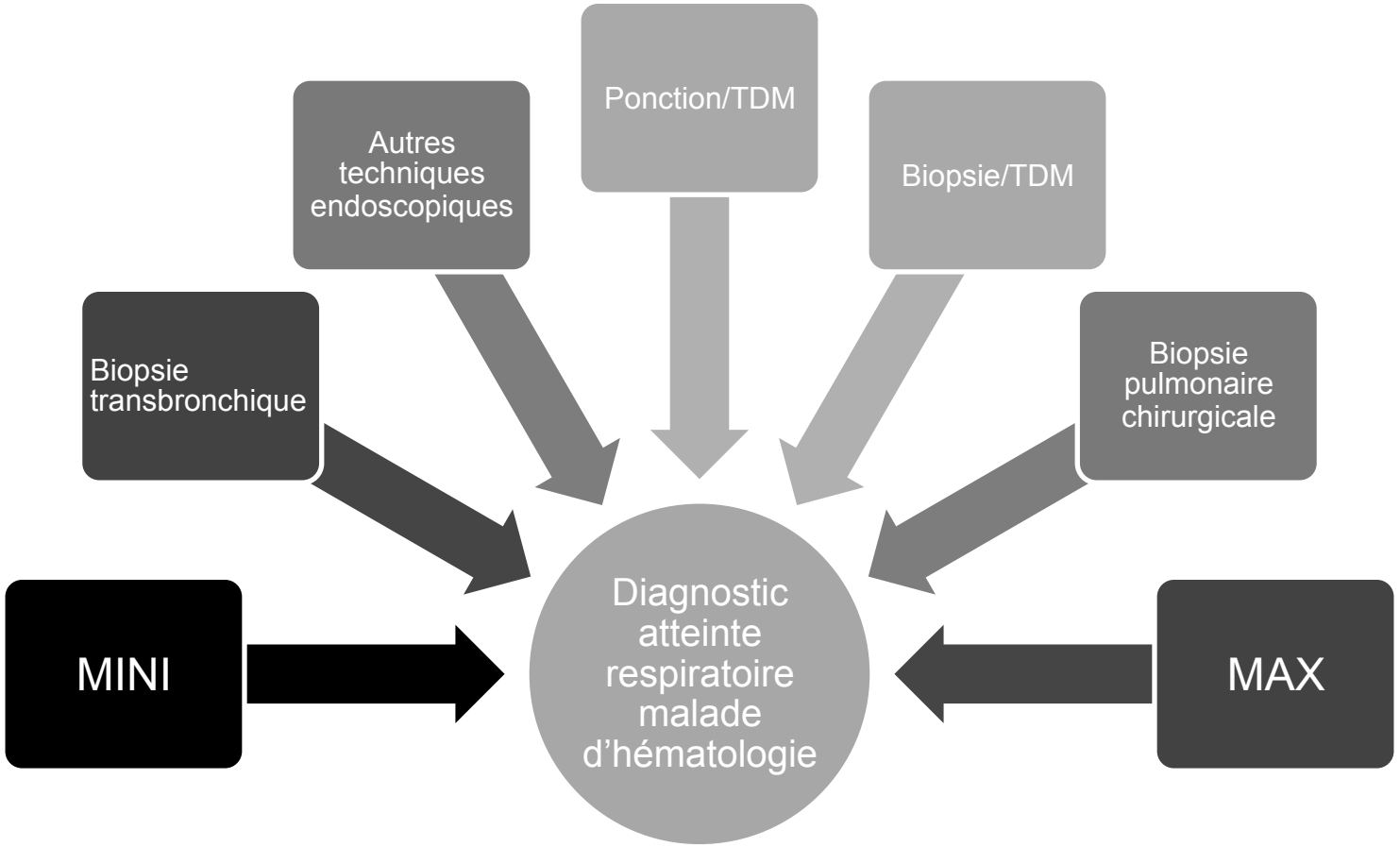
ابو علي الحسين بن عبد الله بن سينا
Abū ʿAlī al-Husayn ibn ʿAbd Allāh ibn Sīnā, dit Avicenne
7 août 980, Khormeytan, actuel Ouzbekistan
Premier vendredi du mois de Ramadan 1037, Hamadan, Iran
Philosophe, écrivain, médecin et scientifique musulman chiite d'origine persane
Kitab Al Qanûn fi Al-Tibb («Livre des lois médicales »)

- Pleurésie, médiastinite, abcès sous-phrénique
- Paralysie faciale centrale et périphérique
- Symptomatologie du diabète sucré
- Diagnostic différentiel sténose du pylore/ulcère

Atteintes pulmonaires du patient d'hématologie



- Leçon des autopsies
- Historique
- Pour quels patients d'hématologie ?
- Pour quelle(s) pathologie(s) ?
- Après quels examens ?
- Réalisables chez les patients d'hématologie hospitalisés en réanimation ?
- Conclusions ?

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Leçons des autopsies

- Classe I: diagnostic majeur ignoré en ante-mortem avec effet secondaire potentiel sur la survie et ayant pu entraîner une modification thérapeutique majeure
- Classe II: diagnostic majeur ignoré en ante-mortem sans effet secondaire potentiel sur la survie et n'ayant pu entraîner une modification thérapeutique majeure

- Classe III: diagnostic mineur ignoré relié à l'évolution terminale de la maladie mais non relié à la cause du décès
- Classe IV: autre diagnostic mineur ignoré

Goldman et al. N Engl J Med. 1983;308:1000-5.

Leçons des autopsies

Référence	Patients	Classe I (poumons)	Classe II (poumons)
Al-Saidi et al. 2002 (1994-1998)	n = 28 BMT, réanimation	1 (3.5%) (1:100%)	2 (7.1%) (2: 100%)
Xavier ACG et al. 2005 (2001-2003)	n = 118 hémopathies malignes, % BMT ?	33 (28%) (13: 39.4%)	27 (22.9%) (20: 74%)
Pastores SM et al. 2007 (1999-2005)	n = 86 25 HSCT, 18 hémopathies	15 (17.4%) (8: 53.3%)	10 (11.6%) (5: 50%)
Seftel MD et al. 2007 (1990-2004)	n = 48 37 allo BMT, 11 auto BMT, 20 réanimation	16 (34%) (6: 37.5%)	14 (30%) (4: 28.6%)

D'après Soubani AO, soumis, 2009.

Ana Carolina Galtarossa Xavier ·
Sheila Aparecida Coelho Siqueira ·
Luciano José Megale Costa · Thais Mauad ·
Paulo Hilário Nascimento Saldiva

Missed diagnosis in hematological patients—an autopsy study

Virchows Arch (2005) 446: 225–231

	n = 118
Classe I	☐ Pneumonie: 5 ☐ Ins. cardiaque gauche: 4 ☐ Embolie pulmonaire: 2 ☐ Aspergillose pulmonaire: 2 ☐ Maladie hématologique: 15
Classe II	☐ Pneumonie: 9 ☐ Aspergillose pulmonaire: 5 ☐ HIA: 4 ☐ Candidose pulmonaire: 2 ☐ Maladie hématologique: 5
Classe III	☐ Epanchement pleural: 9 ☐ HIA: 4 ☐ Cancers secondaires: 14
Classe 4	☐ HIA: 14 ☐ Ins. Cardiaque gauche: 8 ☐ Epanchement pleural: 6 ☐ Cancer bronchique: 5

Pulmonary Complications in Adult Blood and Marrow Transplant Recipients*

Autopsy Findings

Sunita Sharma, MD; Hassan F. Nadrous, MD; Steve G. Peters, MD, FCCP; Ayalew Tefferi, MD; Mark R. Litzow, MD; Marie-Christine Aubry, MD; and Bekele Afessa, MD, FCCP

(CHEST 2005; 128:1385–1392)

- 1996-2003, 71 patients Allogreffe: 34; autogreffe: 29
  - 25 (35.2%) neutropéniques
  - Indications de greffe: amylose: 14; LAM: 12; myélome: 10; LMC: 8; LNH: 5; MDS: 7; divers: 7
- Complications pulmonaires: 63/71 (89%)
- Diagnostic ante-mortem
  - 96 complications pulmonaires: 72% non diagnostiquées en ante-mortem
  - 13/27 (48%) complications infectieuses vs 14/69 (20%) complications non infectieuses (p = 0.006)

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(CHEST 2005; 128:1385–1392)

Complications pulmonaires	Ante-mortem	Autopsie
Infectieuses		
Pneumopathie bactérienne	8	13
Aspergillose	4	11
CMV	1	2
Candida	0	1
Non infectieuses		
DAD	12	35
HIA	1	10
Amylose	0	9
Embolie pulmonaire	0	5
Leucémie/lymphome	0	4
Bronchiolite oblitérante	0	2
BOOP	0	2
Protéinose	0	1
Pneumopathie d'inhalation	1	1

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(CHEST 2005; 128:1385–1392)

Pathologie	Diagnostiquées à l'autopsie non traitées	Traitées sans argument autopsique
Aspergillose	5/11 (45.5%)	10/16 (62.5%)
CMV	2/2 (100%)	7/7 (100%)
Bactéries	6/13 (46.1%)	22/27 (81.5%)
Pneumocystis	0	2/2 (100%)
HIA (stéroïdes)	7/8 (87.5%)	12/13 (92.4%)

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Lung Biopsy in Immunocompromised Hosts

RICHARD L. GREENMAN, M.D.*
PATRICK T. GOODALL, M.D.†
DONALD KING, A.B.‡
Stanford, California

488 October 1975 The American Journal of Medicine Volume 59

- 1969-1972, 78 patients
  - Biopsie à thorax ouvert: 48; aspiration à l'aiguille: 34; biopsie à l'aiguille: 13

Pathologie	n
LAM	**6**
Autres leucémies	**6**
Hodgkin	**25**
Autres lymphomes	**19**
Collagénoses	10
Transplanté rénal	7
Transplanté cardiaque	2
Ostéosarcome	1
Agammaglobulinémie	1
Granulomatose digestive	1

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- 22/78 (28.2%): PaO_2 < 55 mm Hg en AA, 70 mm Hg sous oxygène ou VM
- Complications
  - 2/48 (4.2%): pneumothorax
  - 2/48 (4.2%): saignement

Maladie	Maladie sous jacente	Infection spécifique	Inflammation non spécifique	Autre	Absence de diagnostic
Hodgkin	25	4	2	-	2
Autres lymphomes	19	5	2	-	7
Leucémies	12	4	4	1	3

Open Lung Biopsy in Patients with Acute Leukemia

ROBERT E. McCABE, M.D.
ROBERT G. BROOKS, M.D.
Palo Alto, California
and
Stanford, California
JAMES B. D. MARK, M.D.
Stanford, California
JACK S. REMINGTON, M.D.
Palo Alto, California
and
Stanford, California

April 1985 The American Journal of Medicine Volume 78 609

- 1974-1982, 15 patients
  - LAM
  - Température > 38°3
  - Neutrophiles < 1000 mm^3
  - Nouvel infiltrat sur la radiographie pulmonaire
  - 6/15 (40%) endoscopies ou ponctions percutanées avant biopsie chirurgicale
- 4/15: aspergillus
- 2/15: localisation tumorale
- 9/15: non contributives

Open Lung Biopsy in Patients with Acute Leukemia

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April 1985 The American Journal of Medicine Volume 78 609

- « The literature on the usefulness of open lung biopsy in patients with acute leukemia is difficult to evaluate, since studies have included immunosuppressed patients with a wide variety of underlying conditions and immunosuppressive drug regimens »

- « It is vital to have an experienced team of surgeons, anesthesiologists, pathologists and microbiologists for optimal, acquisition and processing of the biopsy specimen »

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The Utility of Open Lung Biopsy in Patients with Hematologic Malignancies

DOROTHY A. WHITE, PHILIP W. WONG, and ROBERT DOWNEY

AM J RESPIR CRIT CARE MED 2000;161:723–729.

- 1996-1998, 63 patients, 67 biopsies
  - % patients ?
  - 39 hémopathies malignes (Lymphomes: 29; LA: 9: 1 Waldenström); 15 allogreffes; 9 autogreffes
  - **4/63 (6%) neutropéniques; 3/63 (4%) ventilés**
- Avant biopsie:
  - 35/65 (55.5%) LBA
  - 8/65 (12.3%) biopsies transbronchiques
  - 6/65 (9.2%): aspiration à l'aiguille
- TDM
  - Diffus: 28/67
  - Focal: 39/67
- Thoracotomie: 51%, Vidéo: 49%
- Complications: 9/67 (13%) dont 1 décès

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	n (%)	Underlying Conditions				
Diagnosis	72* (100)	Lymphoma	Leukemia	Allogenic BMT	Auto BMT	Other†
Specific	45 (62)	25	7	7	5	1
Inflammatory	17 (23)					
BOOP		4	2	2	1	0
Granulomas		2	1	1	1	0
Lymph node		1	0	0	0	0
Drug toxicity		0	1	0	0	0
Vasculitis		1	0	0	0	0
Infections	15 (21)					
Fungal		5	1	1	0	1
Mycobacteria		1	1	2	0	0
Pyogenic bacteria		1	0	1	0	0
CMV		0	0	0	1	0
Malignancy	13 (18)					
Lymphoma		9	0	0	2	0
Leukemia		0	1	0	0	0
Adenocarcinoma		1	0	0	0	0
Nonspecific	27 (38)	10	4	8	5	0
Interstitial fibrosis	12 (17)	7	3	2	0	0
Diffuse lung damage	10 (14)	2	0	4	4	0
Chronic pneumonia	5 (7)	1	1	2	1	0

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AM J RESPIR CRIT CARE MED 2000;161:723–729.

- Diagnostics spécifiques dominants
  - Localisation tumorale: 13/67 (19%)
    - **9/13 (69.2%): lymphomes**
  - BOOP: 9/67 (13.4%)
  - Champignons: 8/67 (12%)
    - 4 *Cryptococcus neoformans*
    - 2 *Aspergillus fumigatus*
    - 1 *Coccidioides immitis*
    - 1 *Histoplasma capsulatum*
  - Mycobactéries: 4/67 (6%)
    - 3 *Mycobacterium avium intracellulare*
    - 1 *Mycobacterium tuberculosis*

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IMPACT OF BIOPSIES ON MORTALITY

		Mortality			
	n	All n (%)	Specific Diagnosis n (%)	Non-specific Diagnosis n (%)	p Value
All patients	67		41	26	
30-d mortality		12 (18)	2 (5)	10 (38)	0.008
90-d mortality		15 (22)	5 (12)	10 (38)	0.02
BMT patients	25		12	13	
90-d mortality		9 (36)	1 (8)	8 (62)	0.01
Neutropenia	4		0	4	
90-d mortality		2 (50)	0 (0)	2 (50)	
Mechanical ventilation					
30-d mortality					
Prebiopsy	3	3 (100)	0 (0)	3 (100)	
Postbiopsy	5	5 (100)	0 (0)	5 (100)	

COMPLICATIONS OF LUNG BIOPSIES

		Complications			
	n	Major n (%)	Prolonged CT n (%)	Prolonged MV n (%)	All* n (%)
All	67	2 (3)	5 (7)	5 (7)	9 (13)
Thoracotomy	34	1 (3)	3 (9)	3 (9)	6 (18)†
VATS	33	1 (3)	2 (6)	2 (6)	3 (9)
Platelets < 50,000	18	1 (6)	4 (22)	3 (17)	7 (39)‡
Platelets > 50,000	49	1 (2)	1 (2)	0 (0)	2 (4)

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AM J RESPIR CRIT CARE MED 2000;161:723–729.

« Facteurs cliniques »	n	Diagnostic spécifique	Diagnostic non spécifique	RR	p
Radiologie					
Focal	39	31 (79%)	8 (21%)	2.60 (1.4-4.8)	0.0001
Diffus	28	9 (32%)	19 (68%)		
Neutropénie					
Oui	4	0 (0%)	4 (100%)		0.01
Non	63	41 (65%)	22 (35%)		
VM					
Oui	3	0 (0%)	3 (100%)		0.03
Non	64	41 (64%)	23 (36%)		
Lymphomes	31	22 (71%)	9 (29%)		
Leucémies	10	6 (60%)	4 (40%)	0.69 (0.44-1.1)	0.07
BMT	25	14 (56%)	14 (56%)		
Chimiothérapie < 6 mois					
Oui	31	14 (45%)	17 (55%)	1.60 (1.00-2.47)	0.003
Non	36	26 (72%)	10 (28%)		
Fibroscopie + LBA					
Oui	35	16 (46%)	19 (54%)	0.57 (0.36-0.98)	0.002
Non	32	24 (75%)	8 (25%)		

Impact of Open Lung Biopsy for Undiagnosed Pulmonary Infiltrates in Patients With Hematological Malignancies

Ming-Shen Dai,[1] Shih-Chun Lee,[2] Ching-Liang Ho,[1] Yu-Chin Chen,[1] Wei-You Kao,[1] and Tsu-Yi Chao[1]*

American Journal of Hematology 68:87–90 (2001)

- Période ?
- 7 patients (3 LAL, 2 LAM, 1 LMC- allo BMT, 1 LNH)
- Neutropénie: 3 (43%)
- Explorations avant biopsie ?
  - **TDM: pneumopathie interstitielle diffuse non spécifique**
- Tous traités par anti-infectieux
- 19 ± 13 jours après le début des symptômes
- Lieu de la biopsie ?
- Pas de complication post-opératoire

Impact of Open Lung Biopsy for Undiagnosed Pulmonary Infiltrates in Patients With Hematological Malignancies

Ming-Shen Dai,[1] Shih-Chun Lee,[2] Ching-Liang Ho,[1] Yu-Chin Chen,[1] Wei-You Kao,[1] and Tsu-Yi Chao[1*]

American Journal of Hematology 68:87–90 (2001)

- Diagnostics
  - 1 protéinose (LAM) ➔ « Lavage pulmonaire »
  - 1 BOOP➔ ?
  - 1 atteinte spécifique (MDS acutisée) ➔ LATA
  - 1 pneumopathie à *Pneumocystis jiroveci* ➔ Bactrim®
  - 1 DAD ➔ Methylprednisolone
  - 2 « pneumopathies interstitielles non spécifiques » ➔ ?
- Survie: 3/7
- « OLB in patients with hematological malignancy may be useful in selected patients with a treatable hematologic disease who have treatable underlying causes of the pulmonary infiltrate. »

Z.H.A. Shaikh
H.A. Torres
G.L. Walsh
R.E. Champlin
D.P. Kontoyiannis

Open lung biopsy in bone marrow transplant recipients has a poor diagnostic yield for a specific diagnosis

Transpl Infect Dis 2002: **4**: 80–84

- 1998-1999, pédiatrie,12 biopsies
  - 10/547 allogreffes (1.8%); 2/658 autogreffes (0.3%)
  - 0 neutropénique; 3 ventilés
  - Avant biopsie: 58% LBA, 25% aspiration percutanée
  - TDM
    - 6: interstitiel diffus
    - 5: condensation « nodulaire »
    - 1: mixte + excavation
- 4 diagnostics positifs (33%), tous infectieux
  - 1 aspergillose, 1 mycobactérie, 1 *Candida*, 1 *Pneumocystis* + EBV PTLD
- Modification thérapeutique: 3/12
- Décès de tous les patients ventilés

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Open lung biopsy in bone marrow transplant recipients has a poor diagnostic yield for a specific diagnosis

Transpl Infect Dis 2002: **4**: 80–84

- OLB
  - Appeared to be safe for BMT patients
  - Has a low diagnostic yield for treatable infectious etiologies
  - Has value if non diagnostic because it excludes diagnoses that may required morbid therapies, such as administration of high-dose amphotericin B
- Further studies are needed to delineate the cost-benefit ratio

Surgical Lung Biopsy in Patients With Hematological Malignancy or Hematopoietic Stem Cell Transplantation and Unexplained Pulmonary Infiltrates: Improved Outcome With Specific Diagnosis

Mamoon Zihlif, Geeta Khanchandani, Huma P. Ahmed, and Ayman O. Soubani*
Division of Pulmonary, Critical Care and Sleep Medicine, Wayne State University School of Medicine, Detroit, Michigan

American Journal of Hematology 78:94–99 (2005)

- 1999-2003, 62 biopsies
  - 31/62 (50%) hémopathies; 13/62 (21%) autogreffe; 18/62 (29%) allogreffes (CSP); 8 cancers du sein
  - 27/62 (43.5%) neutropéniques; 13/62 (21%) ventilés
  - 34/62 (55%) LBA avant biopsie
  - TDM
    - 33/62 (53%): focal
    - 29/62 (47%): diffus
  - Complications: 7/62 (11%)
    - 4 VM > 48 heures
    - 1 fuites > 7 jours
    - 1 saignement et VM prolongée
    - 1 reprise chirurgicale pour saignement

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American Journal of Hematology 78:94–99 (2005)

Diagnostic	n= 66
☐ Spécifique	44 (67%)
■ Infectieux	19 (22%)
☐ Aspergillus	14
☐ CMV	3
☐ Pneumocystis	1
☐ Legionella	1
■ Tumoral	18 (27%)
☐ Lymphome	9
☐ Leucémie	2
☐ Cancer du sein	6
☐ Cancer bronchique	1
■ « Inflammatoire »	7 (11%)
☐ COP	3
☐ Toxicité médicamenteuse	2
☐ HIA	1
☐ Granulome/corps étranger	1
☐ Non spécifique	22 (33%)
☐ Pneumopathie organisée chronique	8
☐ DAD	6
☐ Fibrose interstitielle	4
☐ Granulome sans nécrose caséeuse	2
☐ « Pneumonie interstitielle »	2

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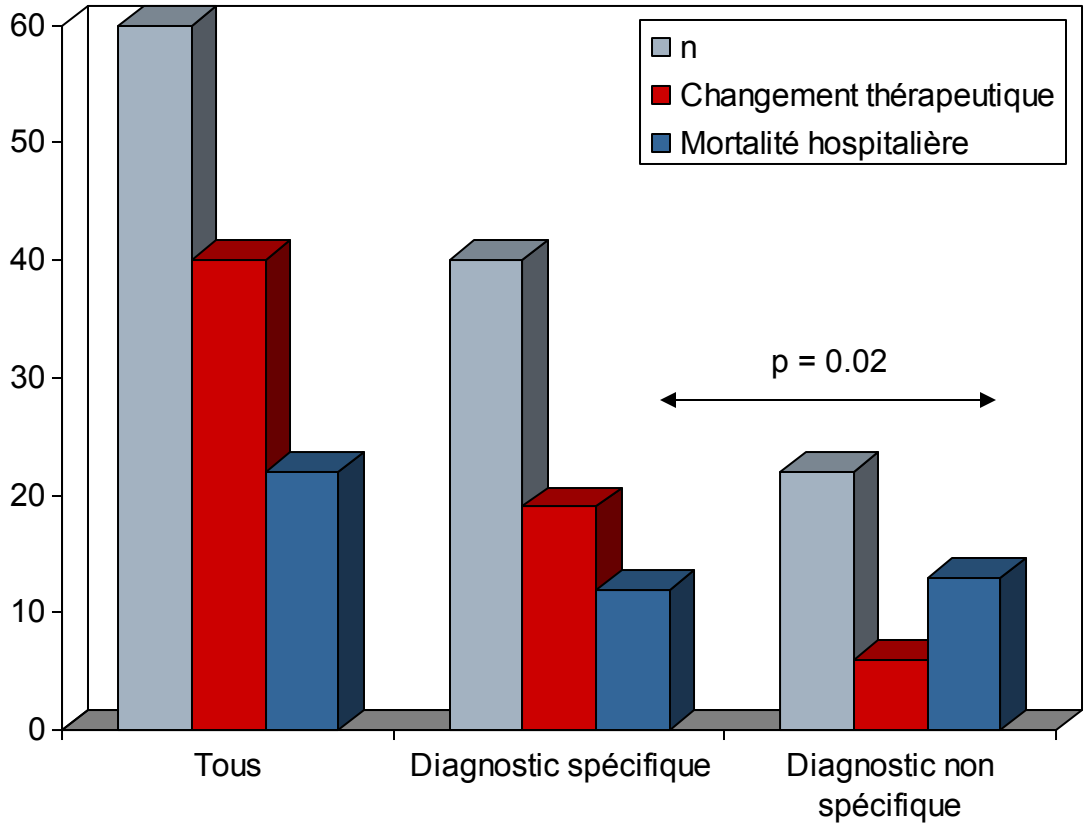

Pulmonary Complications Following Hematopoietic Stem Cell Transplantation: Diagnostic Approaches

Kasem Sirithanakul, Anan Salloum, Jared L. Klein, and Ayman O. Soubani*
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American Journal of Hematology 80:137–146 (2005)

- **Surgical lung biopsy (SLB) is the diagnostic gold standard in the evaluation of pulmonary infiltrates following HSCT**
- Most of the studies suggest that finding a specific diagnosis is associated with a change in management and improved outcome; however, there are no solid predictors of a specific diagnosis
- SLB should be reserved for patients in whom the underlying condition has a reasonable prognosis and the procedure likely leads to a significant change in management

Open Lung Biopsy in Pediatric Bone Marrow Transplant Patients

By Andrea Hayes-Jordan, Ely Benaim, Stacye Richardson, Javier Joglar, D. Kumar Srivastava, Laura Bowman, and Stephen J. Shochat
Memphis, Tennessee

Journal of Pediatric Surgery, Vol 37, No 3 (March), 2002: pp 446-452

- 1991-1998, pédiatrie, 19 biopsies
  - 15/313 allogreffes (4.8%), 4/215 autogreffes (3.2%)
  - 3/19 (15.8%) neutropéniques; 3/19 (15.8%) ventilés
  - Explorations avant biopsie ?
  - Pas de scanner; bilatéral: 15/19 (79%), unilatéral: 4/19 (21%)
- Complications post-opératoires: 9/19 (47%)
  - VM > 48 heures: 7/19 (37%)
  - Pneumothorax: 2/19 (10.5%)
  - Epanchement pleural: 1/19 (5.2%)
- Modification thérapeutique après biopsie: 17/19 (90%)
  - 5 BOOP, 4 *Aspergillus*, 4 « pneumopathie interstitielle »; 1 PTLD, 1 localisation tumorale, 1 *Parainfluenza*, 1 « alvéolite »
- Survie à J30: 3/17(18%); 2 COP, 1 PTLD

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- Histopathologic analysis of OLB specimens is very accurate in determining the cause of pulmonary infiltrates in pediatric patients who have undergone BMT
- OLB may not improve patient outcome
- Because the postoperative morbidity and mortality rates associated with OLB are high, careful patient selection is necessary
- The mortality rates of patients with MSOF or ventilator dependence are particularly high; therefore, less-invasive alternatives for diagnosis of pulmonary lesions should be considered before OLB is performed

The Utility of Lung Biopsy in Recipients of Stem Cell Transplantation

By James C.Y. Dunn, Karen W. West, Frederick J. Rescorla, L.R. Tres Scherer, Scott A. Engum, Thomas M. Rouse, James W. Smith, and Jay L. Grosfeld

Indianapolis, Indiana

Journal of Pediatric Surgery, Vol 36, No 8 (August), 2001: pp 1302-1303

- 1988-1999, pédiatrie, 15 patients, 17 biopsies
  - Cellules souches périphériques (2 tumeurs solides)
  - Neutropénie ?; 9/15 (60%) ventilés
  - Explorations avant biopsie ?
  - TDM ?
- 17 diagnostics positifs
  - 6 fibroses, 3 BOOP, 3 pneumopathies bactériennes (*Citrobacter*, *Enterococcus*, *Bacteroides*), 1 aspergillose, 1 *Influenza B*, 2 HIA, 1 embolie pulmonaire
- Modification thérapeutique: 4/17 (23.5%)
  - 100% BOOP ➔ Stéroïdes
  - 1 survivant
- « The high mortality rate and the low yield of lung biopsy in stem cell transplantation recipients observed in this study suggests that the utility of lung biopsy is very limited in these patients »

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- Historique
- Pour quels patients d'hématologie ?
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- Réalisables chez les patients d'hématologie hospitalisés en réanimation ?
- Après quels examens ?
- Conclusions ?

Importance of Open Lung Biopsy in the Diagnosis of Invasive Pulmonary Aspergillosis in Patients With Hematologic Malignancies

Kihyun Kim,[1] Mark H. Lee,[1]* Jingook Kim,[2] Kyung Soo Lee,[3] Sung Min Kim,[1] Man Pyo Jung,[1] Joungho Han,[4] Ki Woong Sung,[5] Won Seog Kim,[1] Chul Won Jung,[1] Sung Soo Yoon,[1] Young-Hyuck Im,[1] Won Ki Kang,[1] Keunchil Park,[1] and Chan Hyung Park[1]

American Journal of Hematology 71:75–79 (2002)

- 1995-2001, 31/325 (9.6%) patients biopsiés (32 biopsies)
  - 32/52 (61.5%) suspicions scannographiques
  - 8 LBA, pas d'antigénémie aspergillaire
  - 9/32 (28%) neutropéniques, 2/32 (6.2%) plaquettes < 20 000
- Confirmation diagnostique: 17/32 (53.1%)
  - 13/32 aspergillose invasive, 2/32 aspergillome, 2/32 mucormycose
- Autres diagnostics: 15/32 (46.9%)
  - 9 BOOP, 3 HIA, 1 CMV, 1 tuberculose, 1 candida

- « In conclusion, in view of low positive predictive value of chest CT scan and very low morbidity of open lung biopsy, this procedure is recommendable for the diagnosis of IPA and determination of its treatment »

Pulmonary aspergillosis in hematologic malignancies: *lights and shadows*

Livio Pagano, Luana Fianchi, and Morena Caira

haematologica | 2008; 93(11) | 1611 |

Test	*Advantages*	*Disadvantages*
Microscopy	· quick · easy	· needs experience · low sensitivity · need for treatment of the sample
Culture	· useful to discriminate *aspergillus* from other filamentous *fungi* (i.e. *fusarium, scedosporium*)	· long laboratory process time · positivity at a late stage of disease · low sensitivity and specificity
GM-EIA	· good sensitivity · early indicator of infection · repeated monitoring increases sensitivity and specificity · serial assessment for monitoring of therapy	· cut-off value is under discussion · false positivity · false negativity
PCR	· identification to *species* level · high sensitivity · wide range of identification (pan-fungal)	· lack of standardization of the test (variable performance) · cost
Histology	· *gold standard* to prove aspergillosis · culture of tissue required	· frequently impracticable because of thrombocytopenia or unstable clinical conditions

GM-EIA: galactomannan antigenemia enzyme immunoassay; PCR: polymerase chain reaction.

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- "Despite their importance, characteristic radiological patterns do not allow us to diagnose a certain aspergillosis, because of the similarity with other angioinvasive fungi, such as ***zygomycetes, fusarium spp* or *scedosporium spp***. Surprisingly, even non-fungal agents, such as *pseudomonas aeruginosa and nocardia,* can mimic aspergillosis CT-scan appearance."

- **This makes biopsy necessary to clarify the diagnosis**

Bronchiolitis obliterans organizing pneumonia in cancer: a case series

M. Mokhtari*, P. B. Bach*,†, P. A. Tietjen‡ and D. E. Stover*

*Departments of Medicine and †Epidemiology and Biostatistics, Memorial Sloan–Kettering Cancer Center, New York, NY, ‡Department of Medicine, Saint Vincent's Hospital and Medical Center, New York, NY, U.S.A.

respiratoryMEDICINE Vol. 96 (2002) 280–286

- 1992-1999, 8519 biopsies ➔ 43 BOOP
  - Hémopathies: 16/44 (37%) (Lymphomes: 6; leucémies: 1; allogreffes: 9)
  - Neutropéniques ? Ventilés ?
  - Thoracotomie: 29 (68%)
  - Vidéothoracotomie: 10 (23%)
  - Transbronchiques: 4 (9%)
  - Aspect TDM aspécifique
    - Tumeurs solides: prédominance de masse ou nodule
    - Hémopathie: prédominance d'infiltrats

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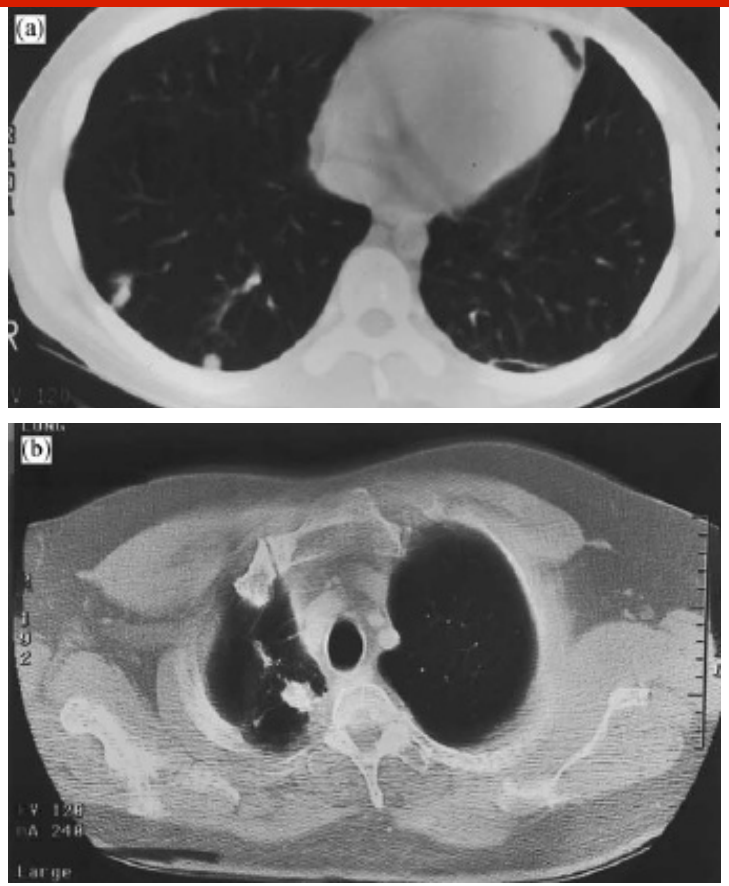
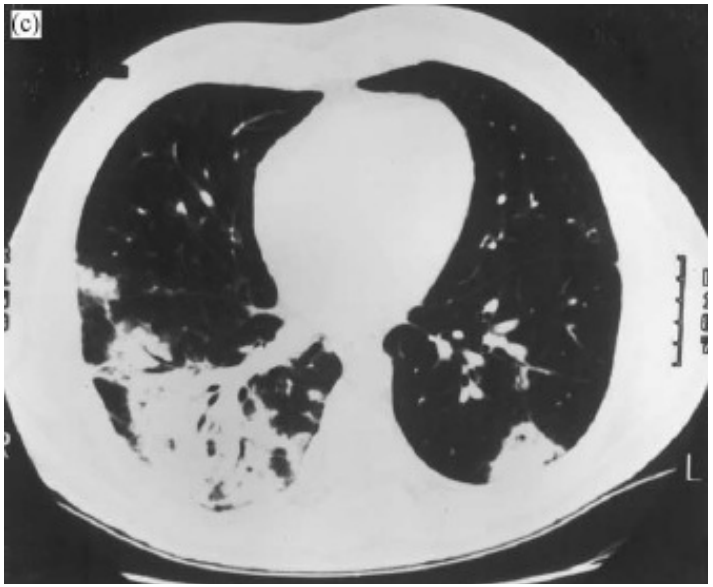
respiratoryMEDICINE Vol. 96 (2002) 280–286



Tumeurs solides



Leucémie aiguë myéloblastique

- Leçon des autopsies
- Historique
- Pour quels patients d'hématologie ?
- Pour quelle(s) pathologie(s) ?
- Après quels examens ?
- Réalisables chez les patients d'hématologie hospitalisés en réanimation ?
- Conclusions ?

Lung Biopsy in Immunocompromised Hosts

RICHARD L. GREENMAN, M.D.*
PATRICK T. GOODALL, M.D.†
DONALD KING, A.B.‡
Stanford, California

488 October 1975 The American Journal of Medicine Volume 59

- 1969-1972, 78 patients
  - Biopsie à thorax ouvert: 48; aspiration à l'aiguille: 34; biopsie à l'aiguille: 13

Procedure	P. carinii (no.)	Fungal (no.)	Bacterial (no.)
Needle aspirate	2/2	3/4	4/9
Needle biopsy	3/3	0/1	. . .
Open biopsy	4/4	5/6	2/4

The Benefits of Open Lung Biopsy in Patients with Previous Non-Diagnostic Transbronchial Lung Biopsy*

A Guide to Appropriate Therapy

*Luis H. Toledo-Pereyra, M.D.; Tom R. DeMeester, M.D., F.C.C.P.;** Ann Kinealey, M.D.; Heber MacMahon, M.D.; Andrew Churg, M.D.; and Harvey Golomb, M.D.***

CHEST, 77: 5, MAY, 1980

- 1975-1976, 13 biopsies après négativité BPTB (13/20)
  - 4 Hodgkin; 4 LAM; 2 LAL; 2 LNH; 1 «hairy cells »
  - 6/13 (46%) neutropéniques; 2/13 (15.4%) ventilés
  - 4/13 (30.8%) plaquettes < 20 000
- 100% diagnostics positifs par biopsies
  - 6 localisations tumorales (4 Hodgkin, 2 LNH)
  - 4 *Pneumocystis*
  - 3 COP
  - 1 *Mycobacterium kansasii*
- « Our experience indicates that when the transbronchial biopsy in immunosuppressed patients with malignant disease is nondiagnostic, an open lung biopsy should be performed if the clinical condition continues to deteriorate »

Open Lung Biopsy Provides a Higher and More Specific Diagnostic Yield Compared to Broncho-Alveolar Lavage in Immunocompromised Patients

MICHAEL E. ELLIS[1], DAVID SPENCE[2], ABDERREZAK BOUCHAMA[1], JOHN ANTONIUS[3], MAHER BAZARBASHI[1], FAREED KHOUGEER[4], EDWARD B. DE VOL[5] and the FUNGAL STUDY GROUP*

Scand J Infect Dis 27: 157–162, 1995

- Date ? 13 biopsies
  - 5 allogreffés, 2 aplasies médullaires, 2 LAM,1 Hodgkin, 1 LAL
  - 1 transplanté rénal, 1 transplanté hépatique
  - Neutropéniques?; ventilés ?
  - Plaquettes: 68.6 $\pm$ 68.2 (8-207); 8 patients transfusés
  - LBA réalisé sous anesthésie générale avant biopsie
  - Pas de complication

- Diagnostic LBA: 4/13 (31%)
- Diagnostic biopsie: 12/13 (92%)

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Scand J Infect Dis 27: 157–162, 1995

Diagnostic	LBA	Biopsie pulmonaire
HIA	7	3
Pneumocystis	1	3
CMV	0	3
Pseudomonas	1	1
Aspergillus	0	1
Embolie pulmonaire	0	1

- 8 modifications du traitement anti-infectieux après résultats de la biopsie
- « OLB may be safely performed in most immunocompromised patients with febrile pulmonary infiltrates, and the diagnostic yield from OLB is higher than BAL »
- « Clearly the optional timing of diagnostic intervention remains conjectural »

- Leçon des autopsies
- Historique
- Pour quels patients d'hématologie ?
- Pour quelle(s) pathologie(s) ?
- Après quels examens ?
- Réalisables chez les patients d'hématologie hospitalisés en réanimation ?
- Conclusions ?

Open lung biopsy in early-stage acute respiratory distress syndrome

Kuo-Chin Kao[1,2], Ying-Huang Tsai[1,2], Yao-Kuang Wu[1,2], Ning-Hung Chen[1,2], Meng-Jer Hsieh[1,2], Shiu-Feng Huang[3,4] and Chung-Chi Huang[1,2]

Critical Care 2006, **10**:R106 (doi:10.1186/cc4981)

- Complications: 8 (20%)
  - 2: hypotension; 2: pneumothorax;2: emphysème sous-cutané; 2: fistule broncho-pleurale
  - Pas de différence “au lit”-salle d’opération (24% vs 15%, *p* = 0.3799)

	Immunocompétents (n = 24)	Immunodéprimés (n = 17)	p
Diagnostic spécifique	9 (38%)	9 (53%)	0.33
Diagnostic non spécifique	8 (47%)	-	0.69
Modification thérapeutique	17 (71%)	13 (77%)	0.69

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Critical Care 2006, **10**:R106 (doi:10.1186/cc4981)

- 1999-2005, 41 patients, SDRA
- Immunodéprimés: 17 (41%)
  - **Hémopathies: 10 (24.4%); type ? neutropénie ? plaquettes? BMT ?**
  - Cancers « solides »: 4
  - HIV: 2
  - Transplanté rénal:1
- LBA avant biopsie: 32 (78%); TDM avant biopsie: 22 (54%)
- Délai intubation-biopsie: 3.0 ± 1.9 jours (1-7)
- PaO_2/FiO_2: 116 ± 43 mmHg; PEEP: 11.1 ± 3.1 cm H_2O
- Biopsie:
  - 26 (63%) en salle d'opération
  - 15 (37%) au lit (FiO_2: 1; PEEP > 12cm H_2O)
  - Vidéo thoracotomie: 8 (19.5%)

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- Complications per-opératoires: 0/41
- Complications post-opératoires: 8/41 (19.5%)
  - Chute tensionelle transitoire (< 12 heures): 2
  - Pneumothorax: 2
  - Emphysème sous-cutané: 2
  - Fuite aérique prolongée: 2
  - Aucun décès rapporté à ces complications
- Pas de différence significative
  - Immunodéprimés vs non immunodéprimés (21% vs 18%, p = 0.8)

Open lung biopsy in early-stage acute respiratory distress syndrome

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Critical Care 2006, **10**:R106 (doi:10.1186/cc4981)

- Performance diagnostique (immunodéprimés):
  - Spécifique (infectieux, UIP, hypersensibilité): 12/17 (70.6%)
  - Non spécifique (DAD, fibrose, œdème, BOOP): 5/17 (29.4%)
- Modifications thérapeutiques (globale): 30/41 (73%)
  - Stéroïdes « fortes doses » (1g/j methylprednisolone): 18
  - Stéroïdes « faibles doses » (2-3 mg/kg/j methylprednisolone): 7
  - Bactrim®: 3
  - Modification antibiothérapie: 1
  - Arrêt antibiothérapie: 1
- Amélioration de la survie hospitalière des immunodéprimés
  - 71% vs 33% non immunodéprimés (p = 0.0187)

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Key messages

- Open lung biopsy is an acceptably safe diagnostic procedure for some selected early-stage patients with acute respiratory distress syndrome.
- In patients with early-stage acute respiratory distress syndrome of suspected non-infectious origin, open lung biopsy may have a high diagnostic yield rate.
- The role of open lung biopsy in patients with acute respiratory distress syndrome needs to be investigated in prospective, randomized and controlled clinical trials.

❑ « Limitation is that some specific diagnosis such as viral pneumonitis may be underdiagnosed because its identification depends on the availability of laboratory facilities. A standardized comprehensive microbiological examination of BAL before OLB should be established »

Impact of bedside open lung biopsies on the management of mechanically ventilated immunocompromised patients with acute respiratory distress syndrome of unknown etiology

Emmanuel Charbonney MD[a,*], John Robert MD[b], Jean-Claude Pache MD[c], Jean-Claude Chevrolet MD[a], Philippe Eggimann MD[d]

Journal of Critical Care (2009) **24**, 122–128

- 1993-2005, 19 patients, immunodéprimés: 17 (89%)
- **Hémopathies: 10 (52.6%); Neutropénie: 7 (70%)**
  - **BMT: allo 6 (5 LAM, 1 LMC); auto: 1 (aplasie); Hodgkin: 3**
- Délai intubation-biopsie: 5 jours (2-11)
- PaO_2/FiO_2: 119 ± 34 mmHg; PEEP: 6 ± 3 cm H_2O
- Amines vasopressives: 14 (73.7%)
- Antibiothérapie: 19 (100%); anti-fungiques: 8 (42.1%), anti-viraux: 4 (21.1%)
  - Biopsie: 100% au lit (30 à 45 minutes)

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Journal of Critical Care (2009) **24**, 122–128

Examens avant biopsie	n (%)
LBA	18 (94.7%)
Biopsies trans-bronchiques	**1 (5.2%)**
Bactériologie, parasitologie et mycologie (LBA ou aspiration trachéale)	19 (100%)
PCR virales (LBA)	3 (15.8%)
Scanner	19 (100%)

- Biopsies
  - Lingula: 12 (63%) (Infiltrat pulmonaire bilatéral et symétrique)
  - LID: 4 (21%)
  - Autres: 3 (16%)
- Complications: locales (5: 26%)
  - Pneumothorax: 3 (1 nécessitant chirurgie supplémentaire)
  - Pertes sanguines: 2

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Journal of Critical Care (2009) **24**, 122–128

- Diagnostics retenus chez les 10 patients d'hématologie
  - 4 DAD ➔ 2: corticoïdes; 1: défibrotide; 1: LATA
  - 2 fibroses à la Bléomycine ➔1: corticoïdes, arrêt des anti-infectieux; 1: LATA
  - 2 pneumopathie à CMV ➔ Ganciclovir, arrêt des autres anti-infectieux
  - 1 pneumopathie à *Pneumocystis jiroveci* ➔ Résultat post-mortem
  - 1 pneumopathie au Busulfan ➔ Corticoïdes, arrêt des anti-infectieux
  - 1 embolie pulmonaire ➔ Pas de traitement
- Décès: 100%; 2/3 LATA: patients d'hématologie

- Leçon des autopsies
- Historique
- Pour quels patients d'hématologie ?
- Pour quelle(s) pathologie(s) ?
- Après quels examens ?
- Réalisables chez les patients d'hématologie hospitalisés en réanimation ?
- Conclusions ?

Conclusions ?

- Allogreffés
- Lymphomes ➔ localisation spécifique
- Pathologies mycosiques et virales
- BOOP
- Pédiatrie ?

- TDM et LBA avant biopsie
- Importance des examens virologiques et mycologiques

- Possible chez les patients d'hématologie en réanimation

- A quel moment ?