



Vascularisation bronchique et NBI

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Déclarations

RÉMUNÉRATION ET
AVANTAGES À TITRE
PERSONNEL en relation avec la
COMMUNICATION :



AUCUN

UTILISATION de l'IA en relation
avec la COMMUNICATION :

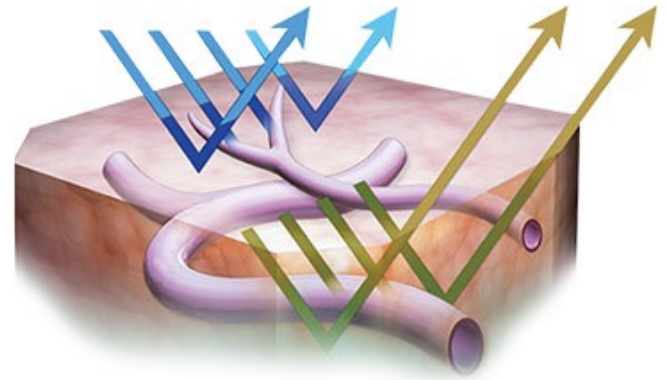
SI JE VOUS PARLE
D'INTELLIGENCE
ARTIFICIELLE,
VOUS PENSEZ À ?



AUCUNE

NBI (Narrow Band Imaging) et vascularisation bronchique

- NBI (imagerie à bandes étroites) disponible en bronchoscopie souple.
- Améliore la visibilité des vaisseaux en filtrant la lumière blanche en longueurs d'onde lumineuses spécifiques qui sont absorbées par l'hémoglobine.
- Les vaisseaux de la muqueuse et de la sous-muqueuse bronchique apparaissent de couleur cyan.

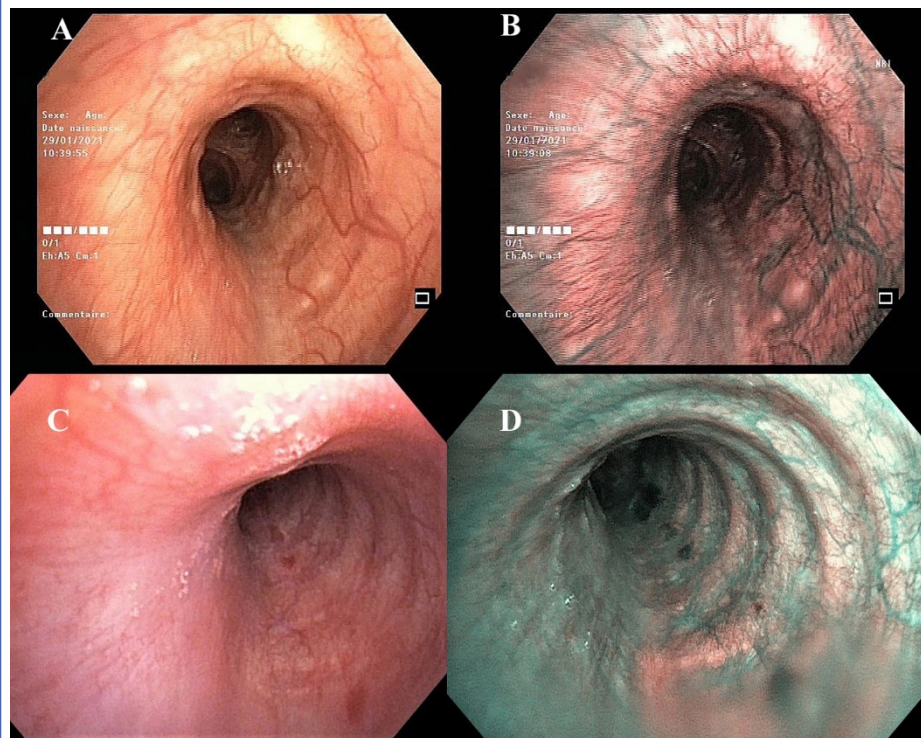


Carcinome épidermoïde

Case Reports: Bronchial Mucosal Vasculature Is Also Involved in the Acute Vascular Distress Syndrome of COVID-19



Vincent Jounieaux^{1*}, Damien Basille¹, Bénédicte Toublanc¹, Claire Andrejak¹, Daniel Oscar Rodenstein² and Yazine Mahjoub³



37-year-old man hospitalized for suspicion of COVID-19 pneumonia
Two negative RT-PCR pharyngeal swabs

27-year-old man hospitalized for suspicion of COVID-19 pneumonia
a COVID-19
One rapid test + one pharyngeal swab RT-PCR : negative

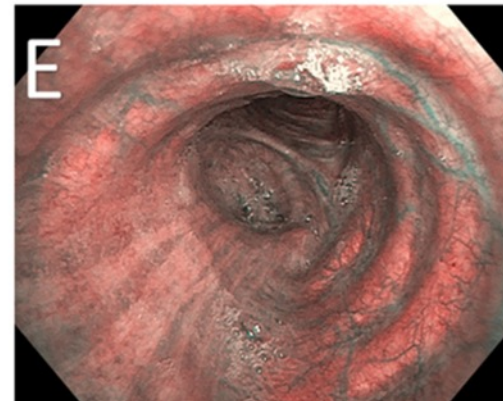
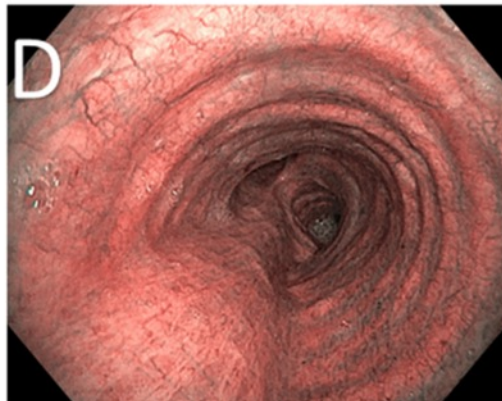
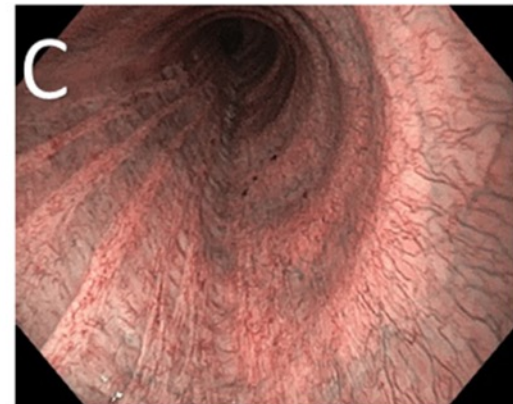
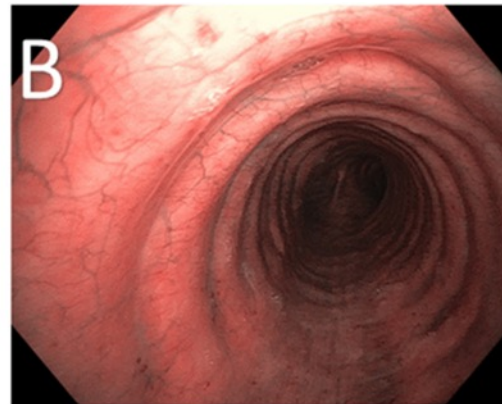
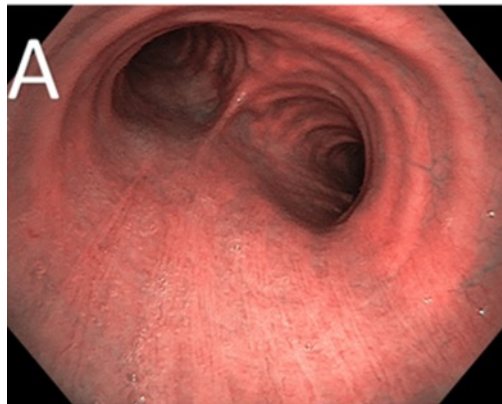
Original article

Role of narrow band imaging in assessing bronchial mucosal hypervascularization in COVID-19 patients



Damien Basille^{a,b,*}, Bénédicte Toubanc^a, Géraldine François^a, Isabelle Mayeux^a, Claire Poulet^a, Lola Soriot^a, Mélanie Drucbert^a, Nour Ahmad^a, Claire Andrejak^{a,b}, Daniel Rodenstein^c, Yazine Mahjoub^d, Vincent Jounieaux^{a,b}

NEW



Etude prospective sur 30 patients : vidéobronchoscopie avec étude en lumière blanche et en NBI

- ❑ Groupe 1 : 10 patient Covid-19
- ❑ Groupe 2 : 10 patients infection non Covid-19
- ❑ Groupe 3 : 10 patients nodule pulmonaire périphérique

Clinical trial registration: NCT04884061.

Baseline characteristics of the 30 patients included in the study according to the study group.

	COVID-19 (n = 10)	Non COVID-19 (n = 10)	Nodule (n = 10)	p value (COVID-19 vs others)
Male	8 (80)	6 (60)	8 (80)	0.682
Age (year)	57.6 ± 12.1	58.2 ± 20.1	69.0 ± 7.9	0.302
BMI (kg/m ²)	30.7 ± 7.9	24.1 ± 6.3	27.1 ± 3.0	0.049
Charlson Comorbidity Index	3 [2 – 4]	4 [3 – 6]	4 [3 – 9]	0.046
Oxygenation modality				^a
Room air	5 (50)	8 (80)	10 (100)	
Low flow oxygen	4 (40)	2 (20)	0 (0)	
High flow oxygen	0 (0)	0 (0)	0 (0)	
Mechanical ventilation	1 (10)	0 (0)	0 (0)	
SaO ₂ /FiO ₂	357.8 ± 70.8	421.0 ± 71.2	458.6 ± 7.1	0.002
Hb (g/dl)	12.9 ± 2.3	10.1 ± 1.7	12.4 ± 1.9	0.050
Leucocyte (10 ³ /mm ³)	11.4 ± 6.8	8.5 ± 3.8	6.5 ± 2.2	0.116
PNN (10 ³ /mm ³)	9.5 ± 6.7	6.1 ± 3.0	4.2 ± 1.8	0.075
Lymphocyte (10 ³ /mm ³)	0.9 ± 0.7	1.5 ± 0.9	1.6 ± 0.4	0.046
CRP (mg/L)	62.8 ± 66.6	109.6 ± 102.3	25.9 ± 29.8	0.625

Continuous variables are presented as mean (± standard deviation) or median [interquartile range] according to their distribution, and categorical variables as frequency (%).

^a Statistical testing not performed due to insufficient data.

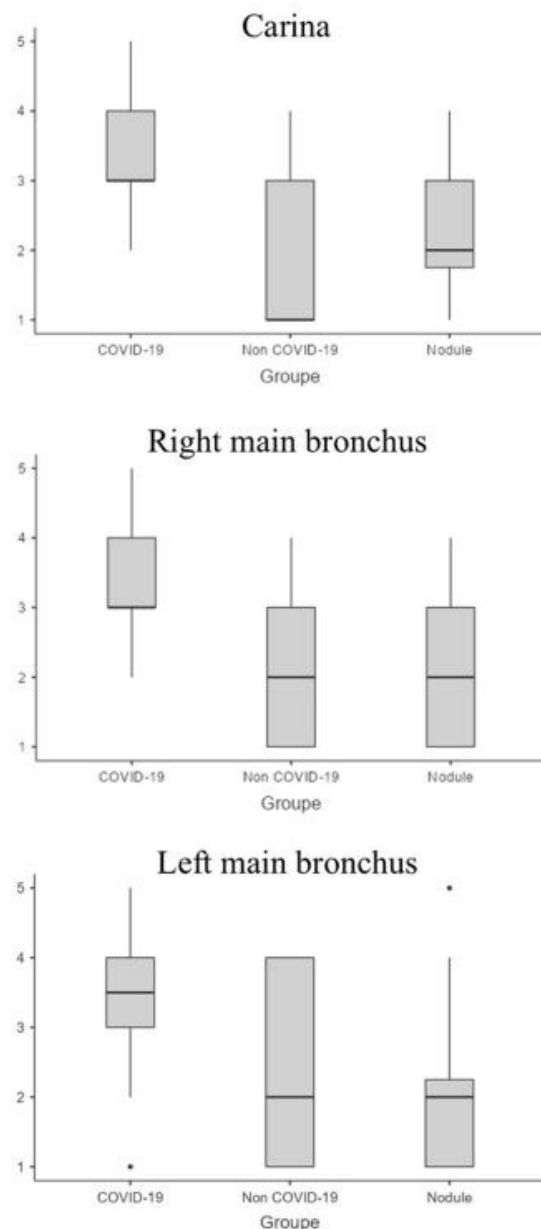


Fig. 3. Vascular density score by study group (pooled results of the two raters). Upper panel: Carina. Middle panel: Right main bronchus; Lower panel: Left main bronchus.

Lecture en aveugle par deux opérateurs des photos systématiques :

- Trachée : LB et NBI
- Tronc souche droit : LB et NBI
- Tronc souche gauche : LB et NBI

Respiratory Medicine and Research 87 (2025) 101155

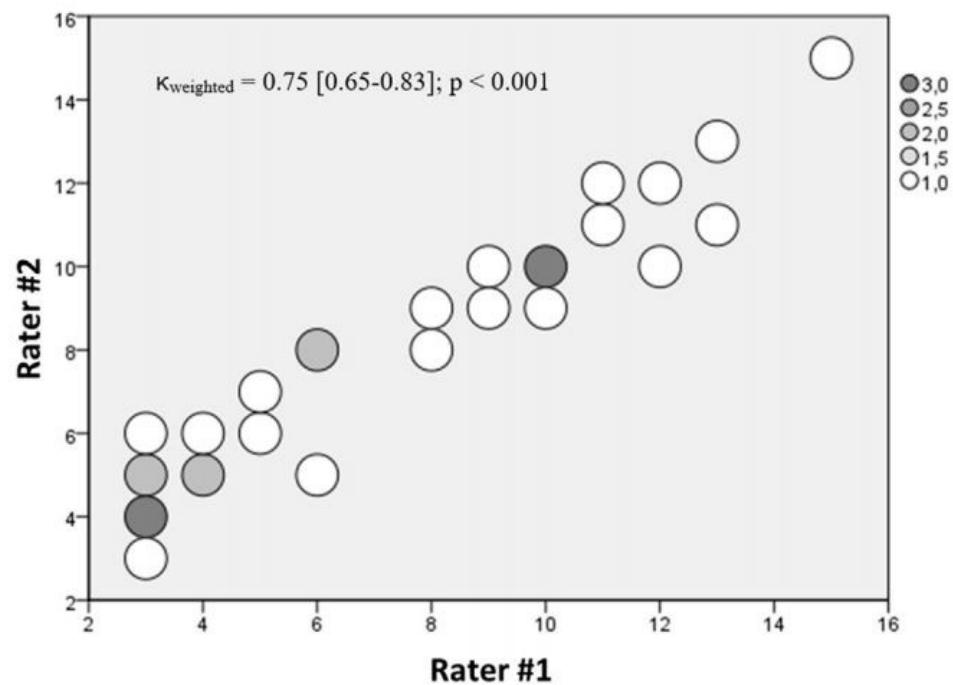
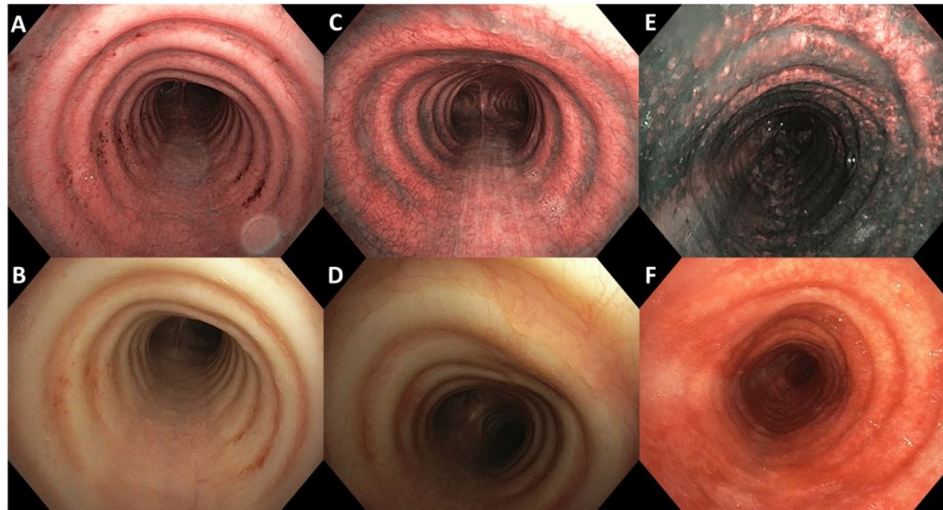
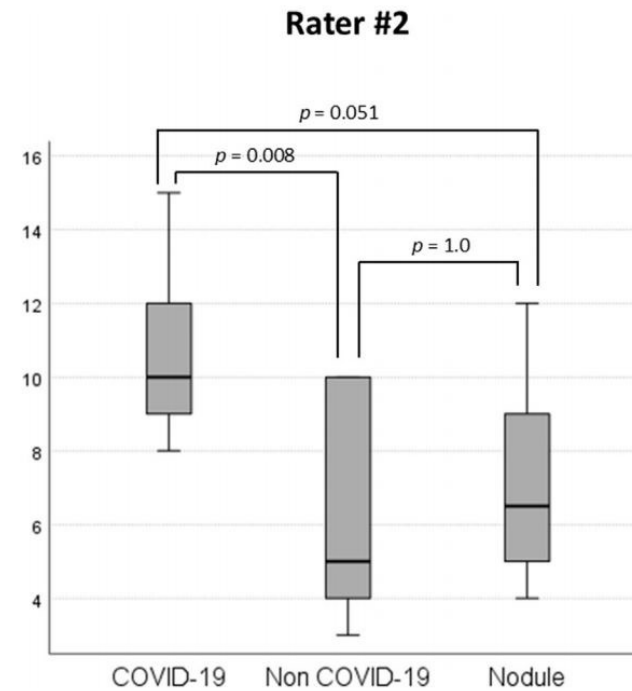
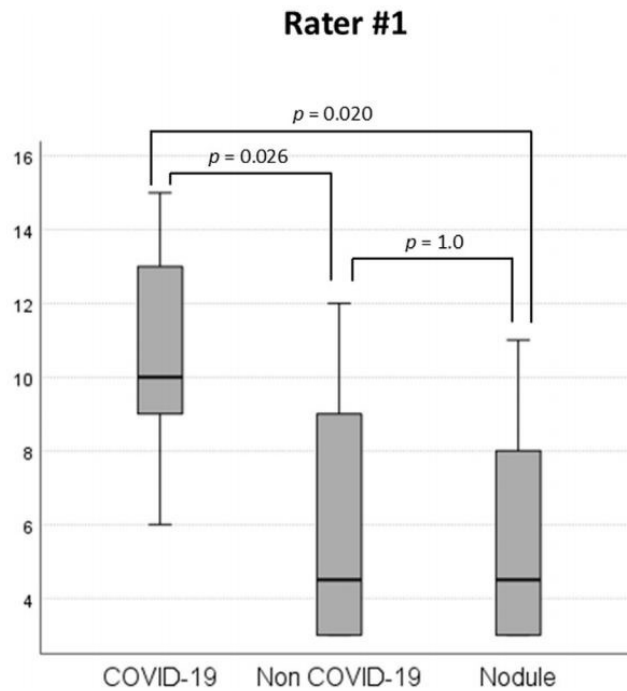


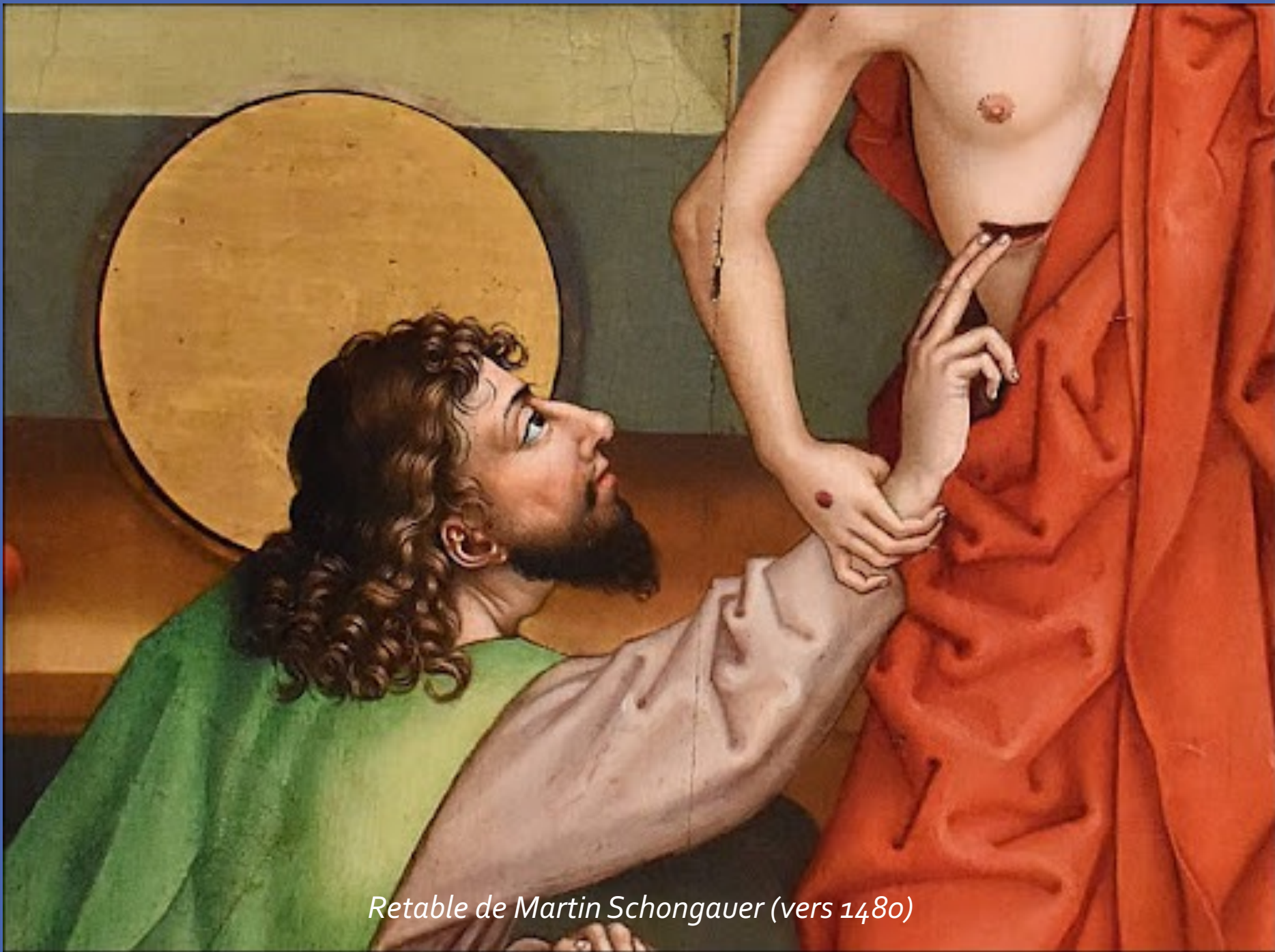
Fig. 4. Interobserver correlation for the global vascular density score.



D. Basille, B. Toublanc, G. François et al.

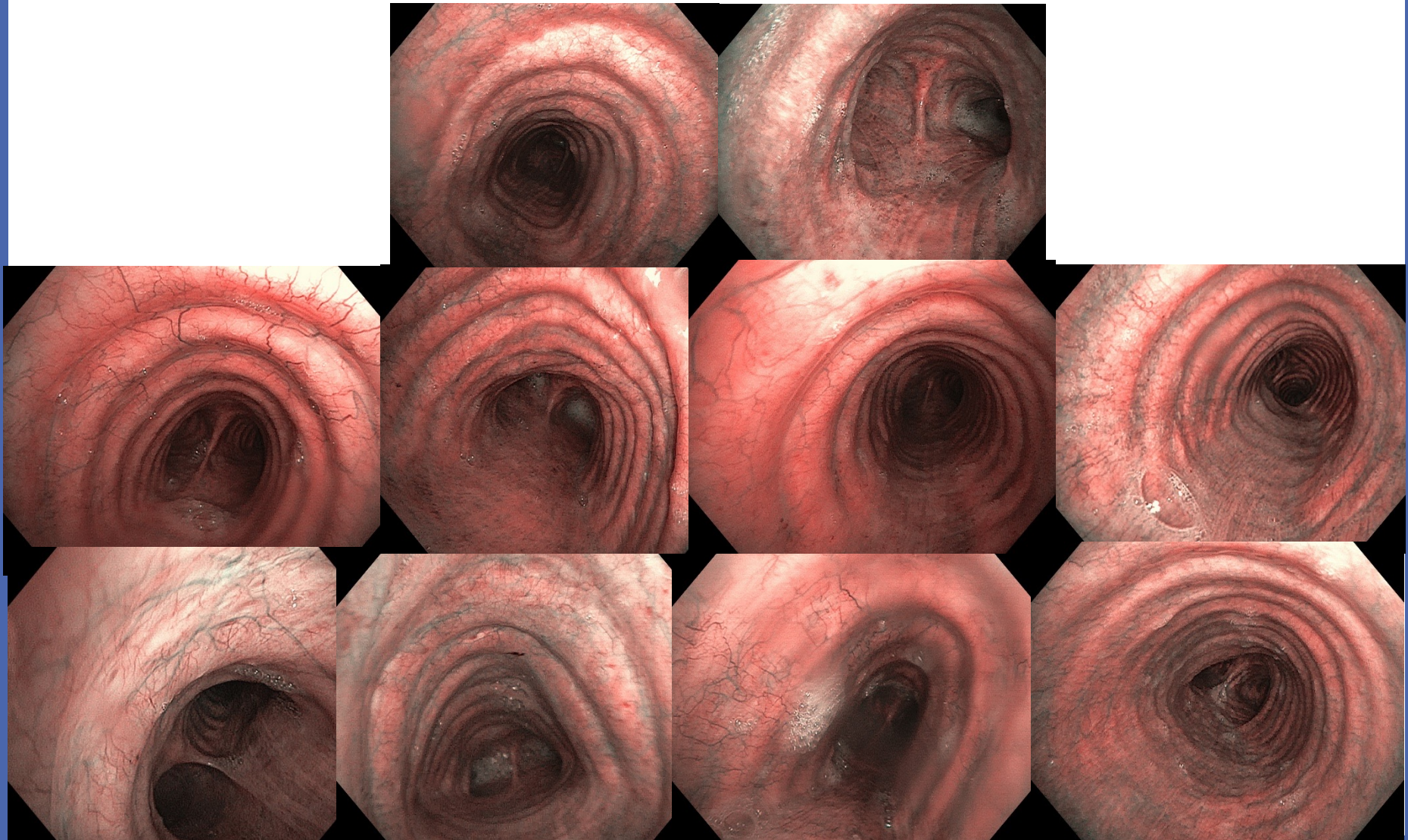
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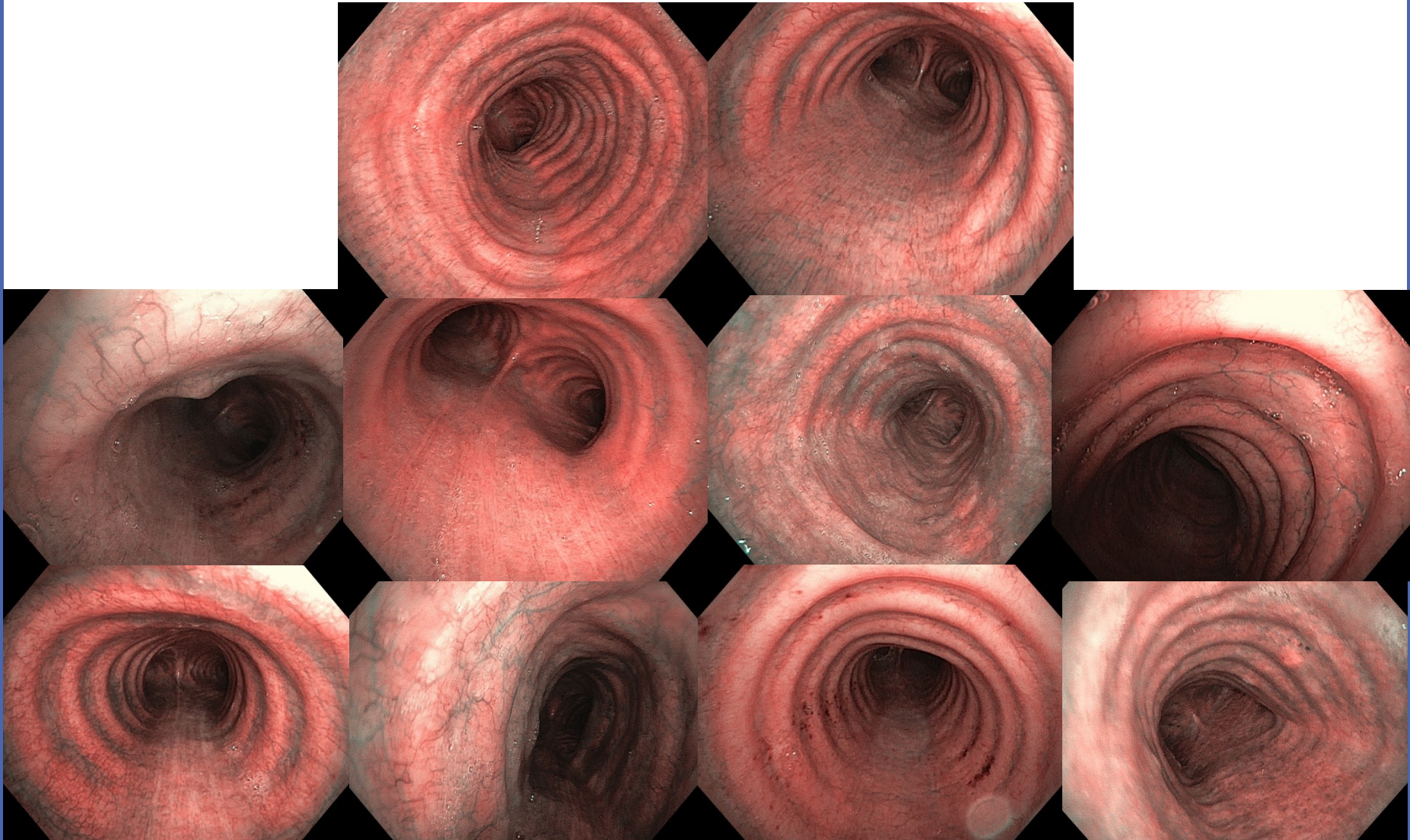


Retable de Martin Schongauer (vers 1480)

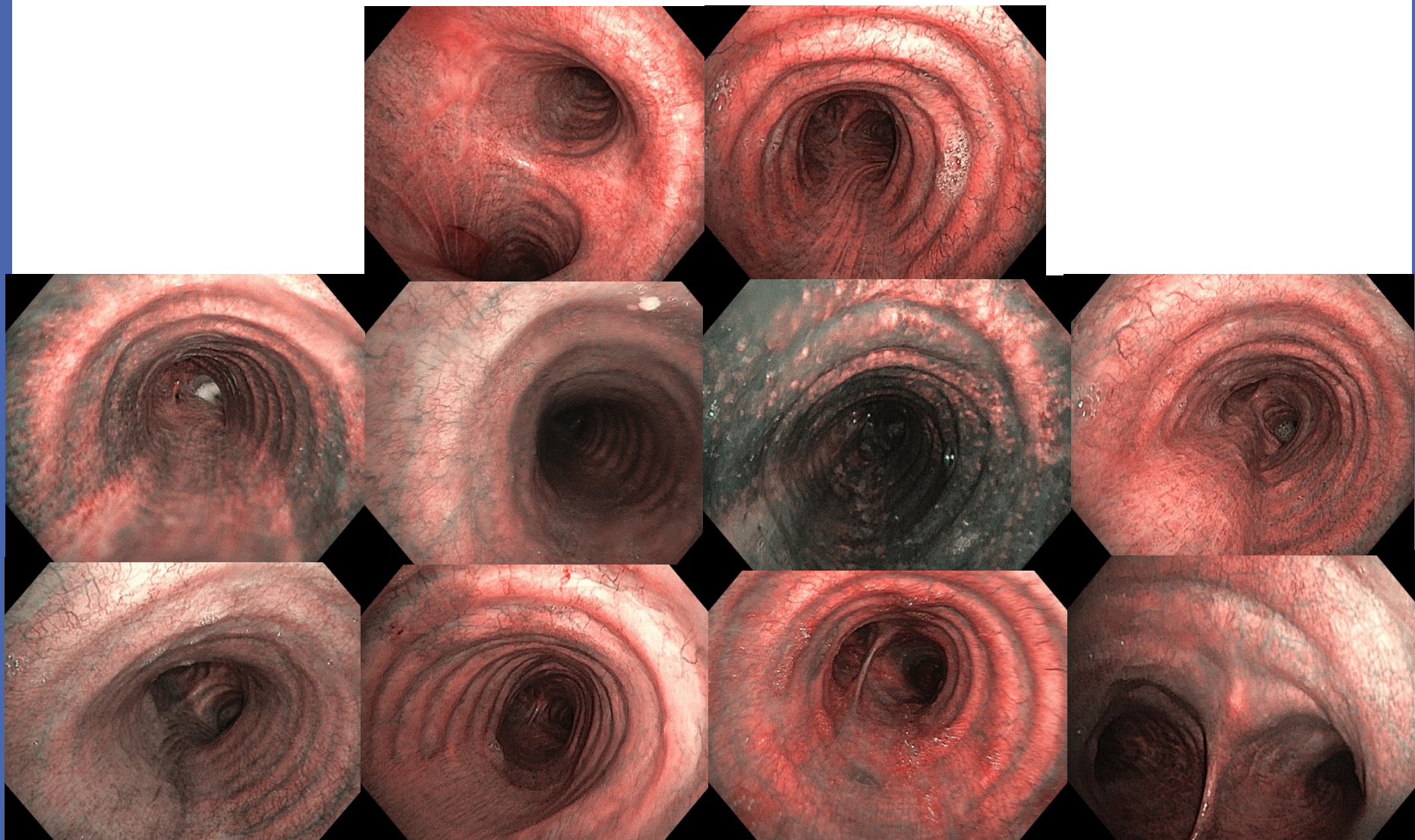
NBI : groupe « nodule pulmonaire »



NBI : groupe « infection non Covid-19 »



NBI : groupe « infection Covid-19 »



Hypervascularisation bronchique diffuse

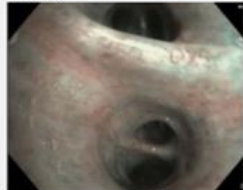
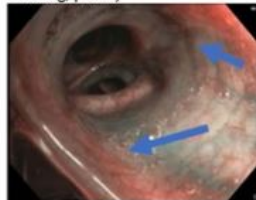
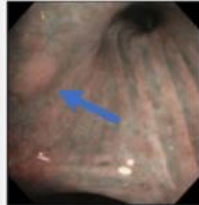
- Rétrécissement mitral
- Séquelles de radiothérapie thoracique élargie (ancien champ en mantelet dans le cadre de la maladie de Hodgkin)
- Sarcôïdose
 - Avis du Pr Yurdagül UZUNHAN (Hôpital Avicenne),
 - NBI et sarcôïdose (*J Bronchol Intervent Pulmonol* 2025 ; 32:e1000)

Use of Narrow Band Imaging to Guide Endobronchial Biopsy for Suspected Sarcoidosis

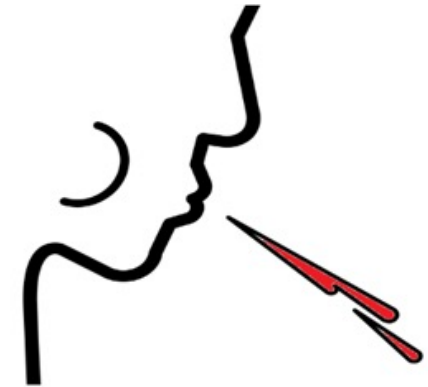
Daniel Vis, MD,* Elaine Dumoulin, MD,* Erik Vakil, MD,*
Paul MacEachern, MD,* Laila Samy, MD,† Chris Hergott, MD,* and
Alain Tremblay, MD*

Aspects NBI : normal, modifications non spécifiques (érythème), plaque ou nodule hypovascularisé, multiples nodules hypovascularisés

- Covid-19

WL description	NBI description	Grade
Normal 	Normal 	Low
Non-specific changes (erythema, swelling, pallor) 	Non-specific changes (erythema, swelling, pallor) 	Low
Single focal thickening/raised area of the airway or airway bifurcations 	Single hypovascular plaque or nodule 	High
Multiple raised nodular abnormalities (ie. "Cobblestoning") 	Multiple hypovascular nodular abnormalities ie. "NBI cobblestoning" 	High

Conséquences



Symptômes cardinaux Covid-19 : fièvre, toux, asthénie et dyspnée.

Fréquence de l'hémoptysie :

• 0,9 à 5%

Gwan W et al. N Engl J Med 2020 Feb 28. <https://doi.org/10.1056/NEJMoa2002032>

Xu XW et al. BMJ 2020;368:m606

• 3,3%

Méta-analyse de Al Maqbali M et al. Biological Research For Nursing, 2022, Vol. 24(2) 172–185

= Facteur pronostique

- Hémoptysie (symptôme initial) = ↑ risque d'évolution défavorable (formes modérées → sévères et graves)

Méta-analyse de He et al. Frontiers, 2021 (8), 561264

- Hémoptysie (symptôme initial) : facteur de risque indépendant de mortalité

Yang L et al. PLoS ONE 2020, 15(11): e0243124.

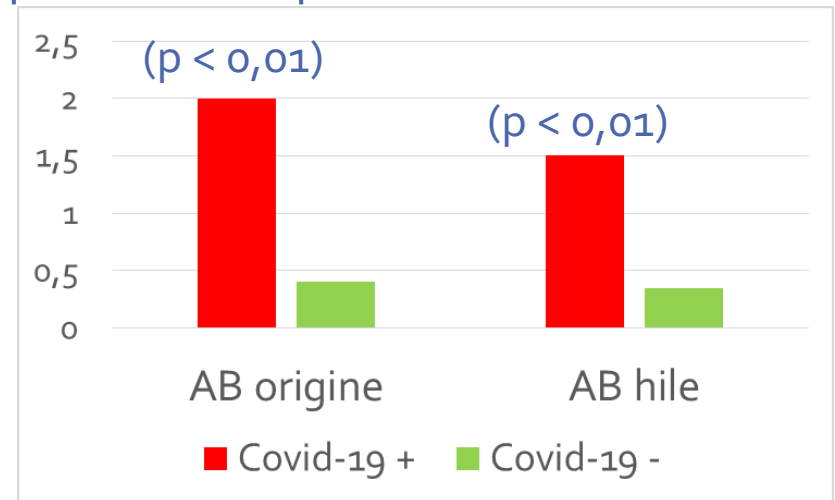
- Hémoptysie : facteur de risque de mortalité

Zhang L et al. Arch Virol. 2021 Apr 2;166(8):2071–2087.

Artères bronchiques et Covid-19

Chau Y et al. J Vasc Interv Radiol.2020, (12):2148-2150.

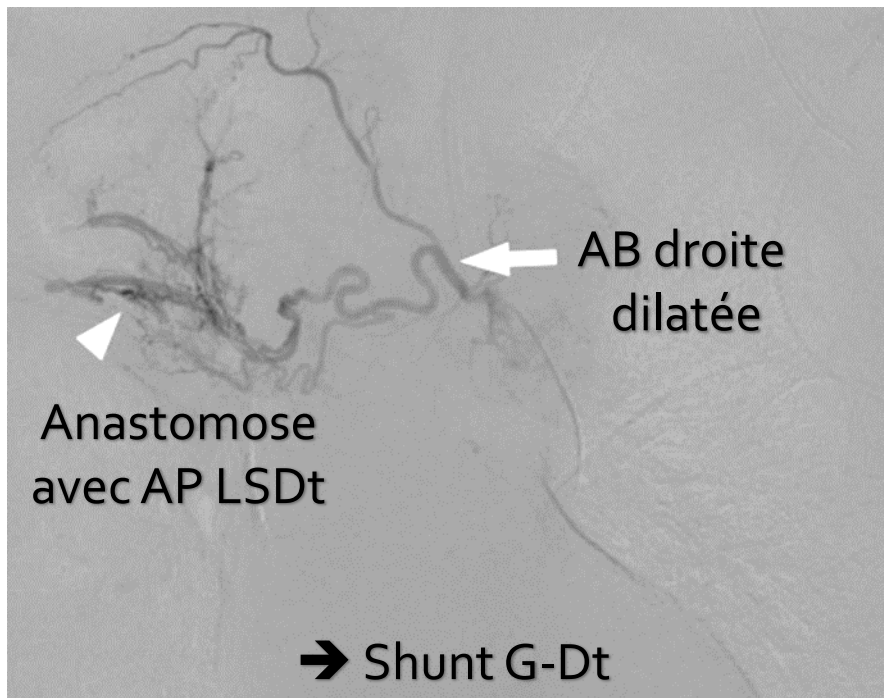
- Étude rétrospective
- Mesures en aveugle par deux radiologues du diamètre des AB à leur origine et au niveau du hile.
- 90 patients TDM injecté pour suspicion EP entre 13/3/20 et 5/5/20
- Exclusion patients avec pathologies respiratoires responsables HVBS



- Corrélation entre le calibre des AB et sévérité de l'atteinte pulm ($p < 0,01$)

Hémoptysies massives : série CHU Tenon

Barral M et al. Cardiovasc Intervent Radiol. 2020, 43:1949-1951.



- Première vague : 23/2/20 - 5/5/20
- 25 hémoptysies sévères requérant embolisation artérielle
- dont 4 Covid-19 (**16%**)
- Dilatation artères bronchiques : 3 patients / 4
- 3 sans étiologie retrouvée, 1 DDB
- **Shunt angiographique significativement plus fréquent en cas de Covid-19 : 71% versus 17% ($p < 0,01$)**

COVID-19 pneumonia: ARDS or not?

Luciano Gattinoni^{1*}, Davide Chiumello² and Sandra Rossi³



16/4/2020

Severe Covid-19 disease: rather AVDS than ARDS?

Yazine Mahjoub^{1*}, Daniel Oscar Rodenstein² and Vincent Jounieaux³

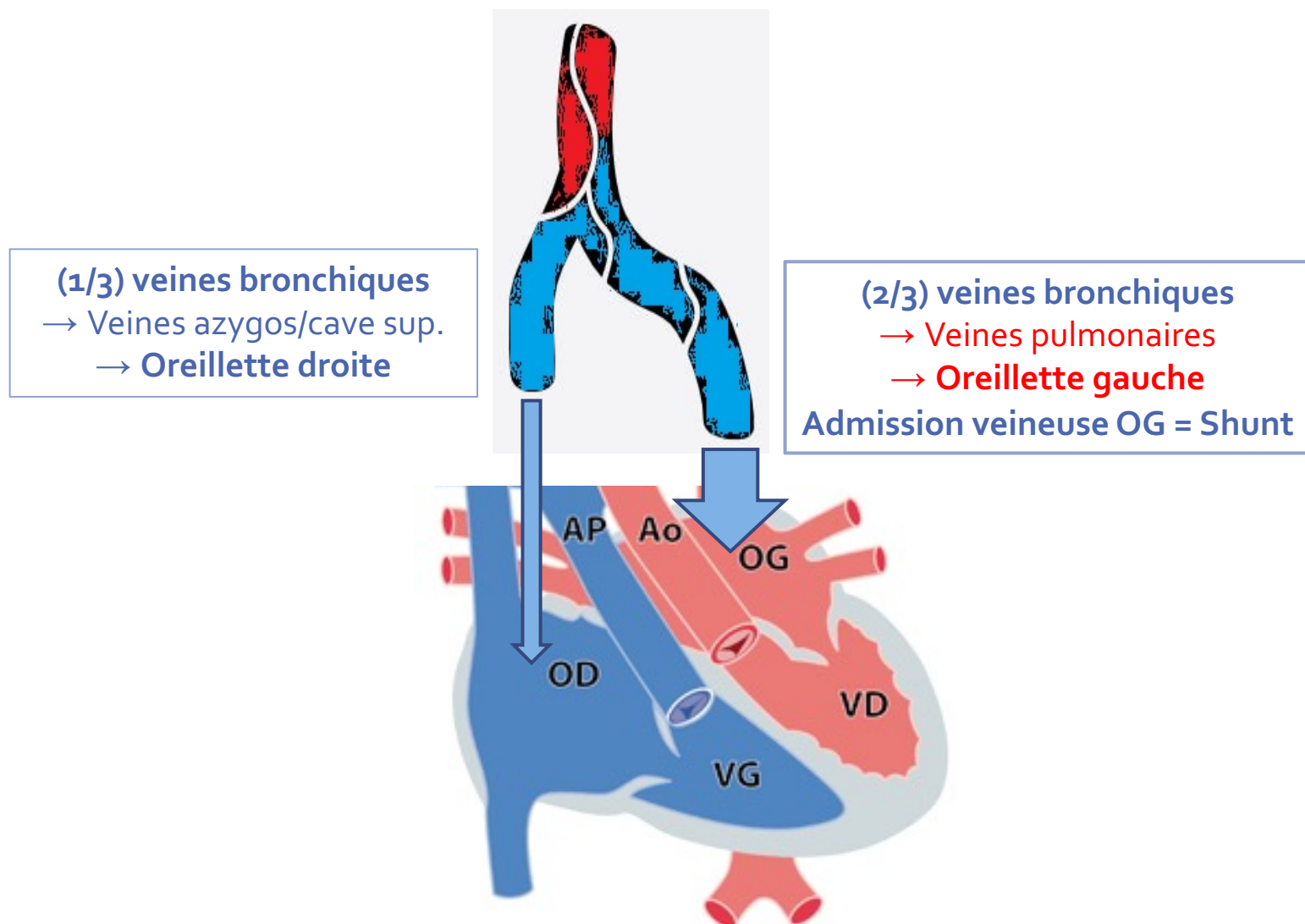


25/4/2020

SDRA Type 1: severe hypoxemia is associated with respiratory system compliance > 50 ml/cmH₂O. The lung's gas volume is high, the recruitability is minimal, and the hypoxemia is likely due to the loss of hypoxic pulmonary vasoconstriction and impaired regulation of pulmonary blood flow.

➔ *Shunt intrapulmonaire*

Artères bronchiques (branches de l'aorte)



→ Hypervascularisation bronchique contribue au shunt intrapulmonaire du Covid-19

Shunt intrapulmonaire et Covid-19

- ✓ Anomalies vasculaires artérielles (bronchiques et pulmonaires)
Ackermann et al. N Engl J Med. 2020 Jul 9;383(2):120-128.
Lang et al. Radiol Cardiothorac Imaging. 2020 Jun 18;2(3):e200277.
- ✓ Hypoxémie (Happy hypoxia)
Jounieaux et al. Am J Respir Crit Care Med. 2020 Dec 1;202(11):1598-1599.
Abou-Arab et al. Can J Anaesth. 2021 Feb;68(2):262-263.
Huette et al. World J Clin Cases. 2021 May 16;9(14):3385-3393.
- ✓ Shunt intrapulmonaire
Jounieaux et al. BMC Infect Dis. 2021 Jan 28;21(1):122.
Jounieaux et al. Eur J Nucl Med Mol Imaging. 2021 Sep;48(10):3022-3023.
- ✓ Hyperdébit cardiaque et ↓ RVP
Caravita et al. Eur J Heart Fail 2020; 22: 2228– 2237.
- ✓ Orthodéoxie
Giosa et al. Crit Care. 2021 Dec 16;25(1):429.

comme dans le syndrome hépato-pulmonaire

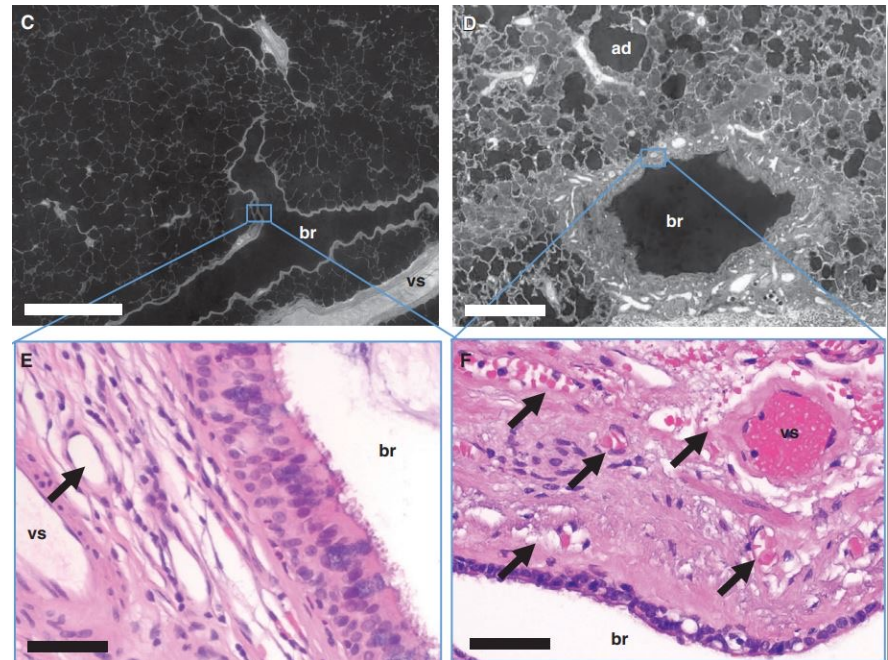
IMAGES IN PULMONARY, CRITICAL CARE, SLEEP MEDICINE AND THE SCIENCES

The Bronchial Circulation in COVID-19 Pneumonia

Maximilian Ackermann^{1,2}, Paul Tafforeau³, Willi L. Wagner⁴, Claire L. Walsh⁵, Christopher Werlein^{6,7}, Mark P. Kühnel^{6,7}, Florian P. Länger^{6,7}, Catherine Disney⁸, Andrew J. Bodey⁹, Alexandre Bellier¹⁰, Stijn E. Verleden¹¹, Peter D. Lee⁸, Steven J. Mentzer¹², and Danny D. Jonigk^{6,7}

Am J Respir Crit Care Med 2022; 205(1), 121–125.

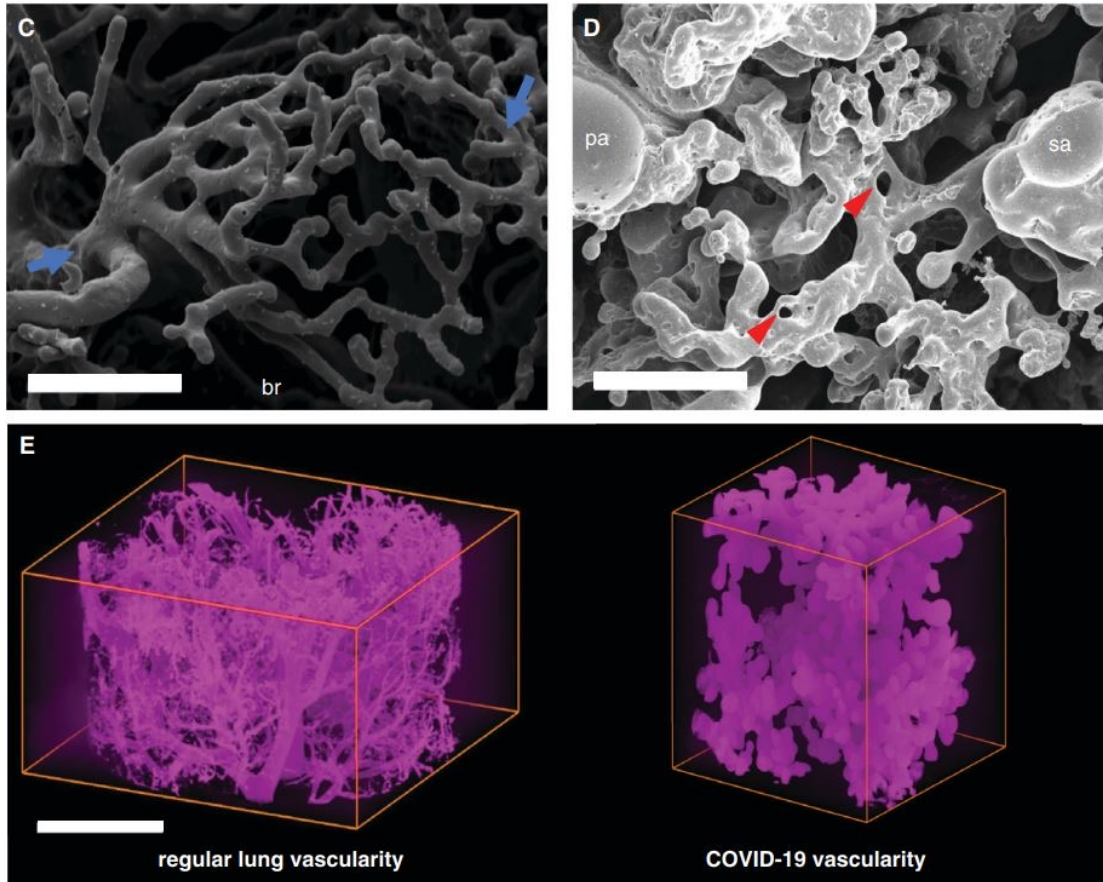
- Pulmonary endothelialitis,
 - Microangiopathy,
 - Abberant angiogenesis
- +
- Dilated peribronchial and perivascular microvessels (vasa vasorum)



- Continued perfusion in conditions such as ARDS or pulmonary embolism
- Intrapulmonary shunting by the bronchial circulation

Ackermann M et al.

Am J Respir Crit Care Med 2022; 205(1), 121–125.



Présence d'anastomoses artério-veineuses entre la circulation pulmonaire et bronchique responsable d'une $\uparrow$ **shunt intrapulmonaire**



Research Topic

COVID-19 Related Acute Vascular Distress Syndrome: from Physiopathology to Treatment

Volumes I & II

Impact :

- 45 775 Total views
- 34 081 Article views
- 9 286 Article downloads
- 2 408 Topic views

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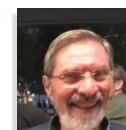


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Daniel Rodenstein

Service de
Pneumologie, Cliniques
Universitaires Saint-Luc
Bruxelles, Belgium

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Conclusions

- Covid-19 = maladie vasculaire
- responsable d'une néoangiogénèse artérielle pulmonaire
- mais aussi d'une vasodilatation artérielle bronchique
- Toutes deux participent au shunt intrapulmonaire de l'AVDS

