縦隔腫瘍・胸膜腫瘍に対するMRI拡散強調画像(DWI)の有用性

薄田勝男
嶋田病院　内科

縦隔腫瘍・胸膜腫瘍に対するMRI拡散強調画像(DWI)の有用性

薄田勝男
金沢医科大学呼吸器外科学

Body DWI 研究会

ＣＯＩ開示

演題発表に際し、
開示すべきCOI はありません。

演者:　　薄田　勝男

縦隔腫瘍

Usuda K, et al, Asian Pac. J. Cancer Prev. 16, 6469-6475, 2015.

対　象　n=28

良　性		悪　性	
疾　患	12	疾　患	16
嚢腫（気管支・縦隔・胸腺・心膜）	7	胸腺腫	7
胸腺過形成	2	胸腺癌	3
神経鞘腫	1	悪性リンパ腫	3
奇形腫	1	悪性胚細胞性腫瘍	2
縦隔内甲状腺腫	1	胸腺カルチノイド	1

方　法

使用機械

- **DWI :　SIEMENS　MAGNETOM　Avanto　1.5T**
  b factor　:　0 および 800
- **PET-CT :　SIEMENS　Biography Sensation 16**

- **良性・悪性を分ける至適カットオフ値**

  GraphPad Prism (USA)のROC (receiver operating characteristics) カーブを使用。

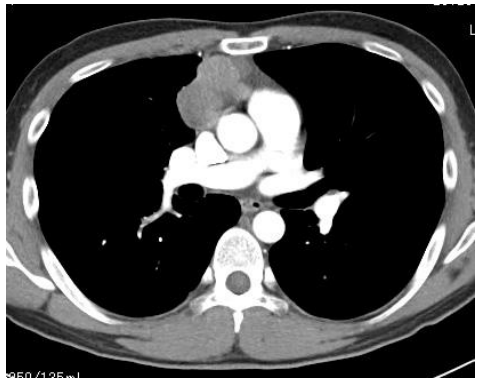
  ADC : 2.21 x $10^{-3}$$mm^2$/sec

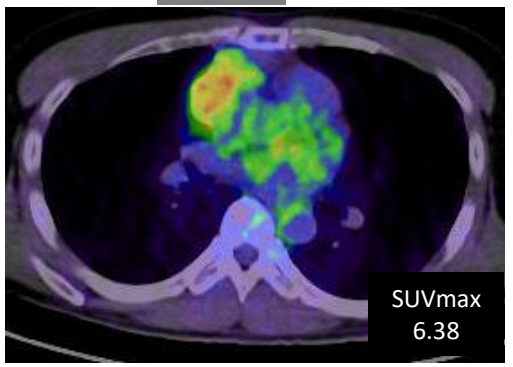
  SUVmax :　2.93

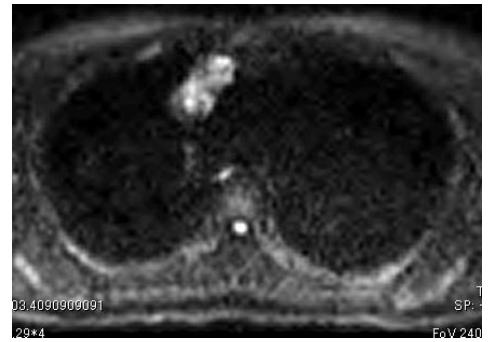
PET-CT

DWI

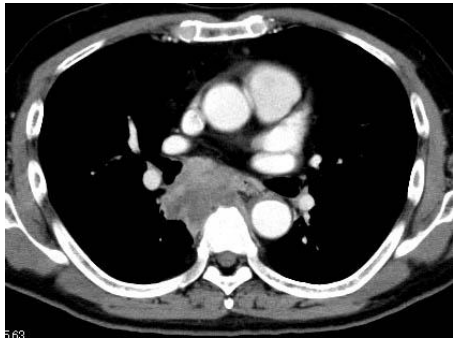
胸腺腫

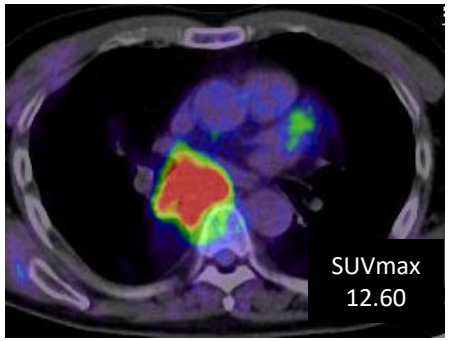


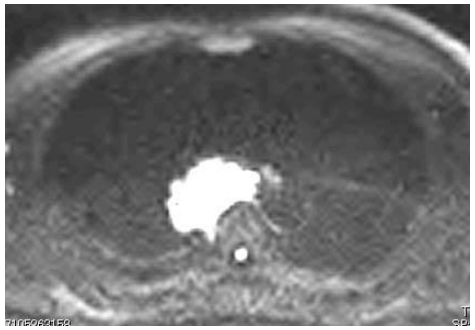




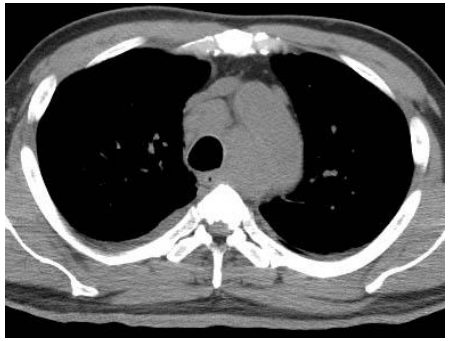
胸腺癌

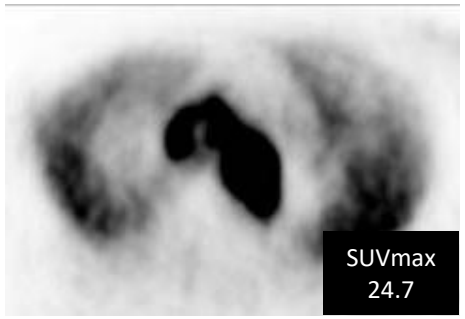


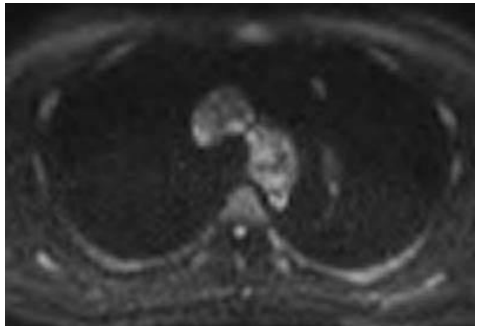




悪性リンパ腫





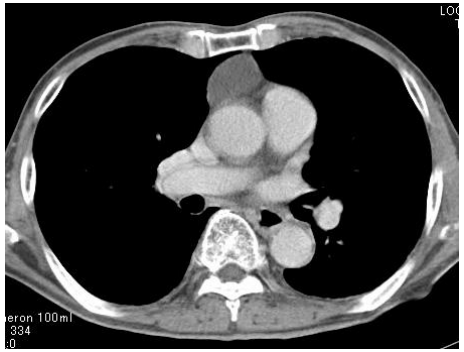


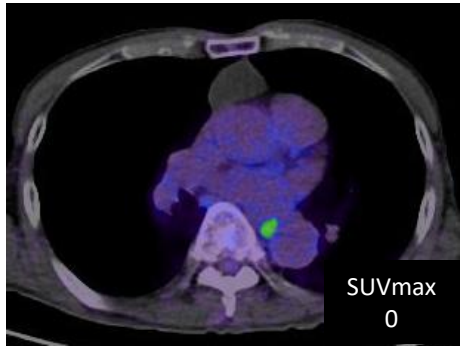
胸腺腫	SUVmax 6.38	ADC $1.43\times10^{-3}mm^2/sec$
胸腺癌	SUVmax 12.6	ADC $1.03\times10^{-3}mm^2/sec$
悪性リンパ腫	SUVmax 24.7	ADC $1.48\times10^{-3}mm^2/sec$

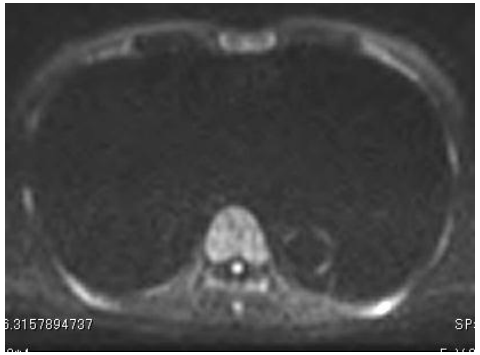
PET-CT

DWI

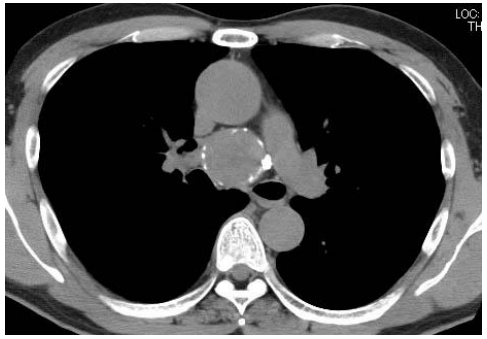
胸腺嚢胞

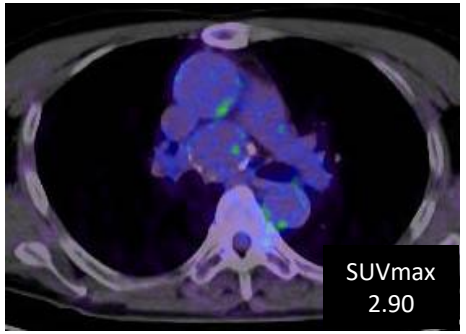


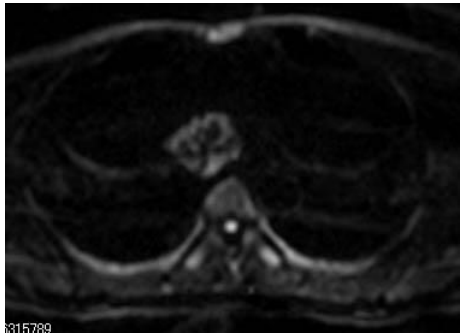




奇形腫

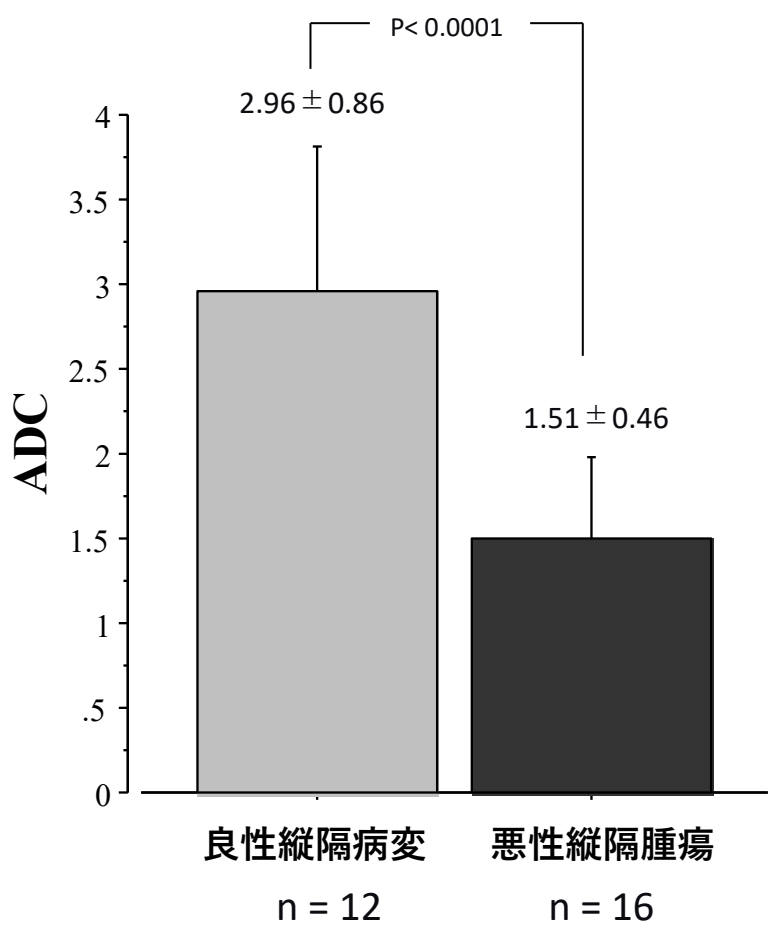




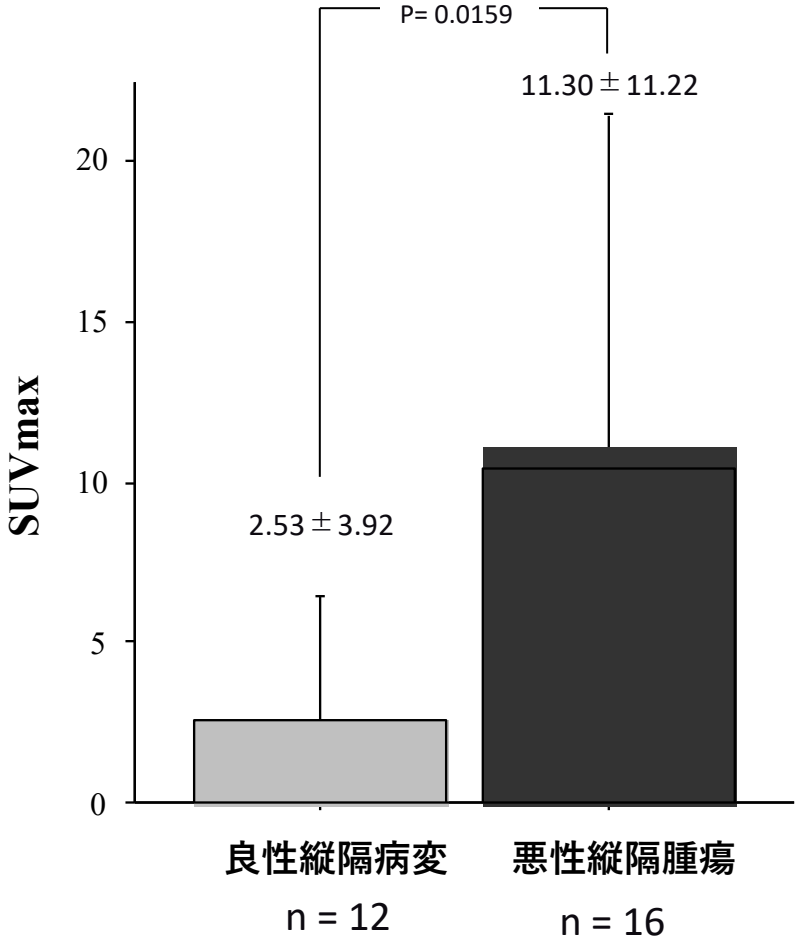


胸腺嚢胞　SUVmax 0　ADC $4.06\times10^{-3}mm^2/sec$

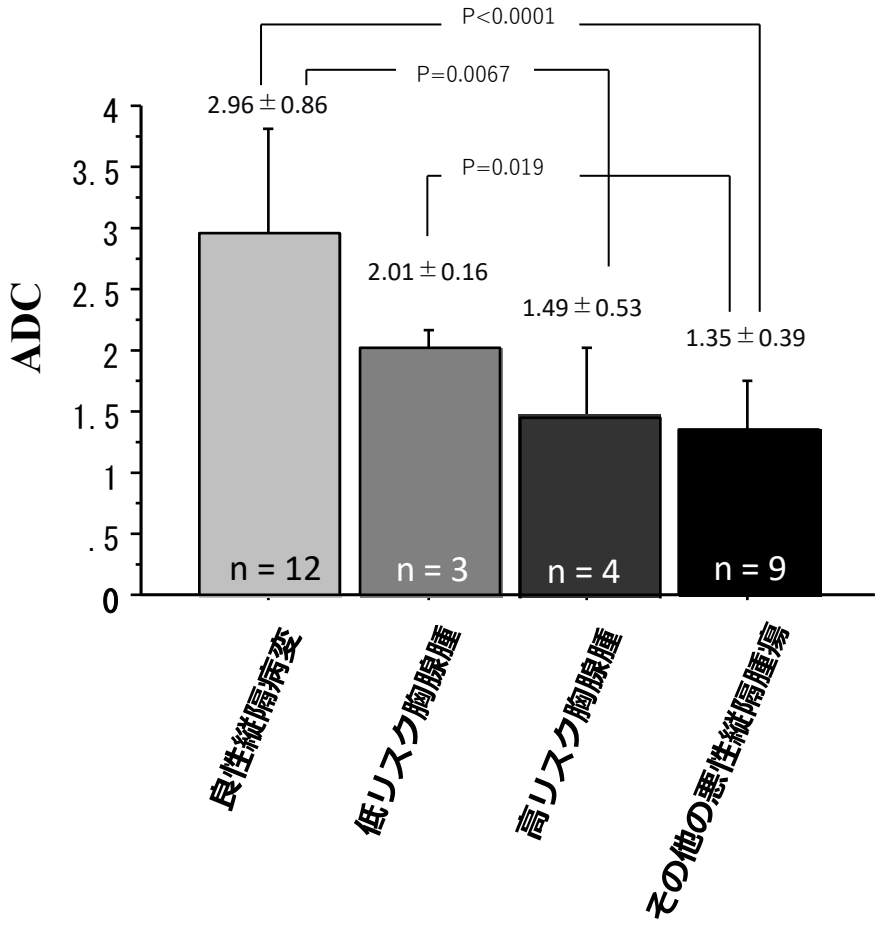
奇形腫　SUVmax 2.90　ADC $1.82\times10^{-3}mm^2/sec$



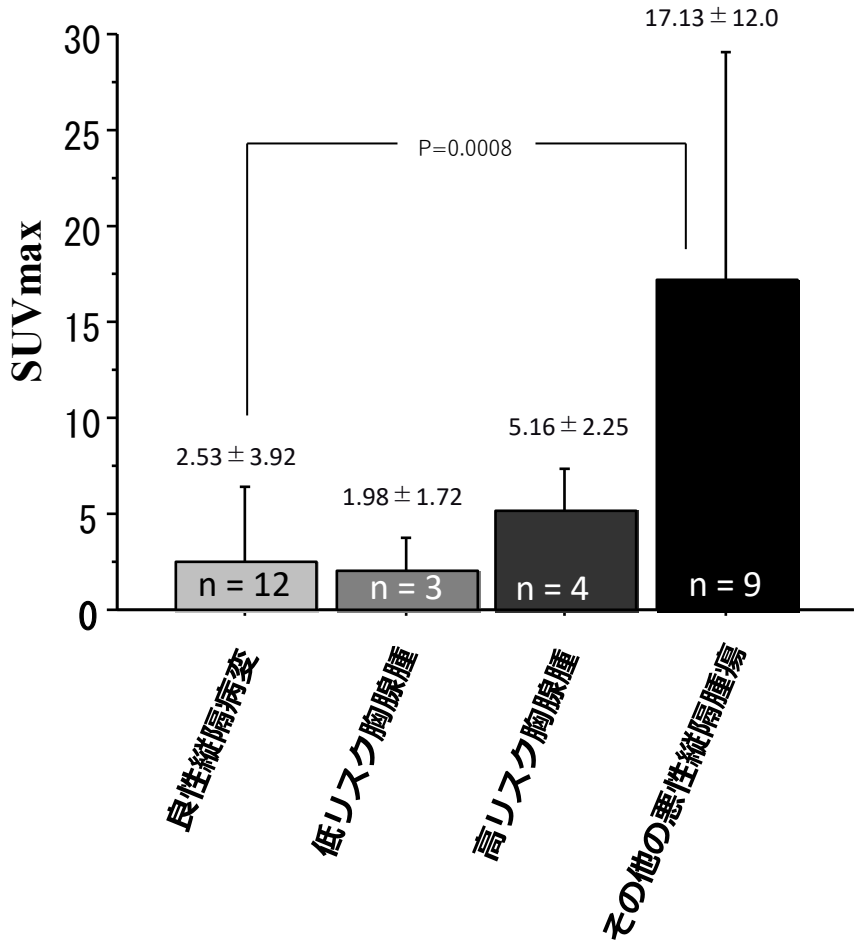
a: DWIでの比較



b: PET-CTでの比較



a: DWIでの比較



b: PET-CTでの比較

胸膜病変の診断におけるMRIの有用性

Usuda K, et al. Cancers. 2019;11(6): 811

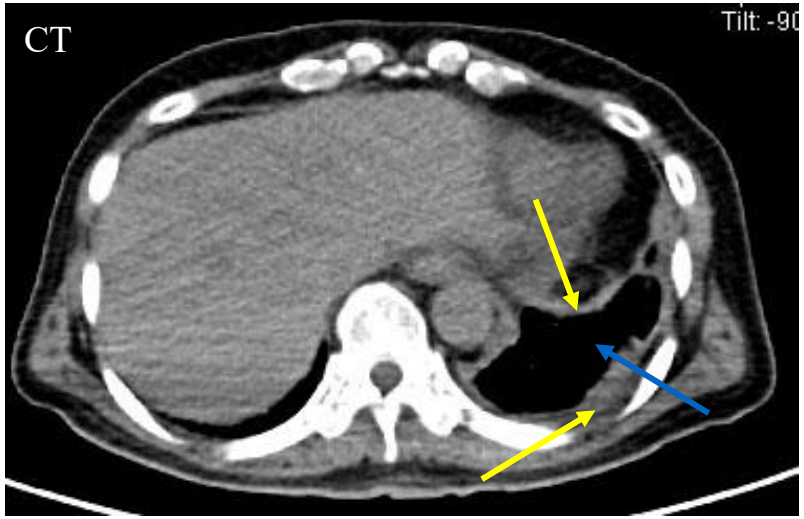
対　象　　n=43

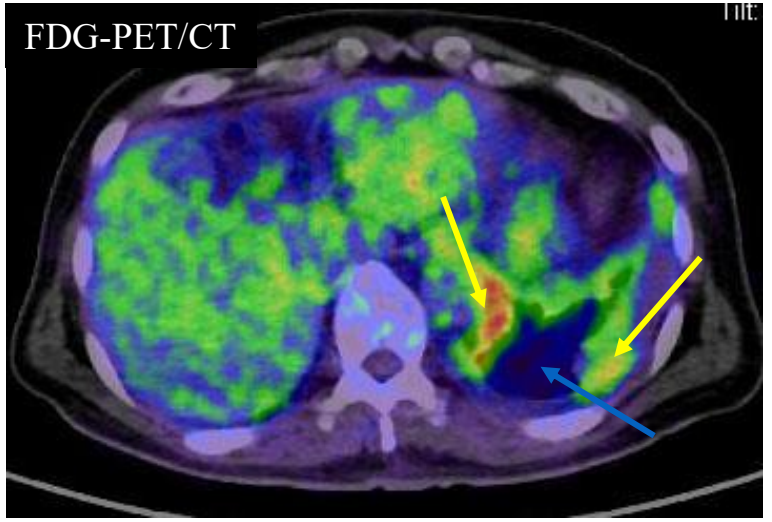
疾患	症例数
悪性胸膜中皮腫	11
癌性胸膜炎・胸膜播種	10
膿胸	10
胸水貯留	12

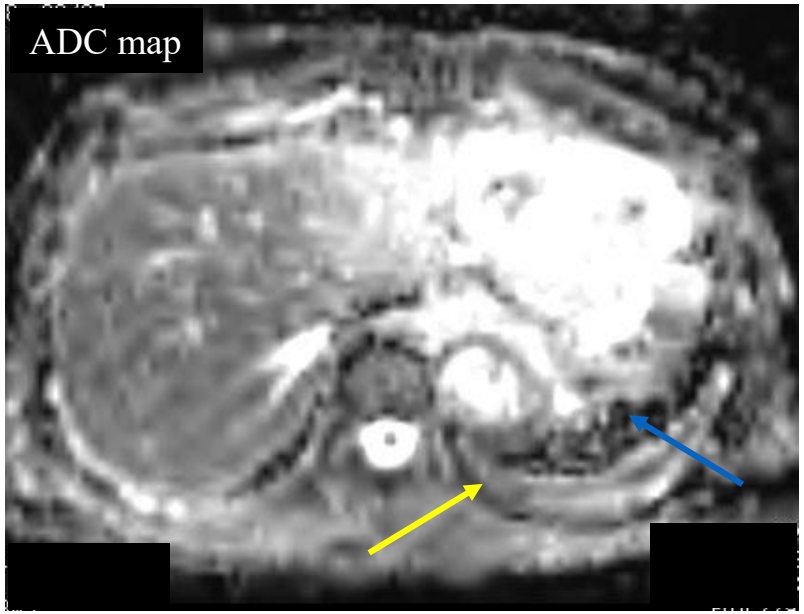
方　法

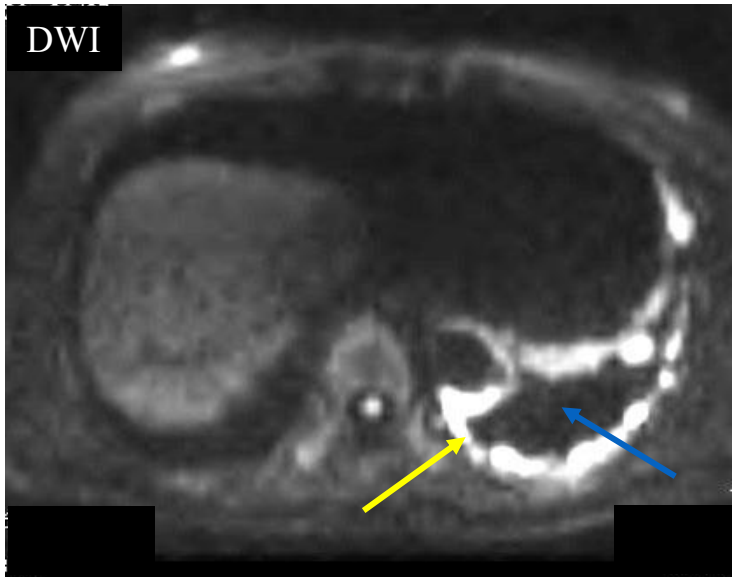
- DWI：　SIEMENS　MAGNETOM　Avanto　1.5T
  b factor　：　0 および 800
- PET-CT：SIEMENS　Biography Sensation 16

- 良性・悪性を分ける至適カットオフ値
  ADC：　$1.70 \times 10^{-3} mm^2/sec$
  SUVmax：4.45

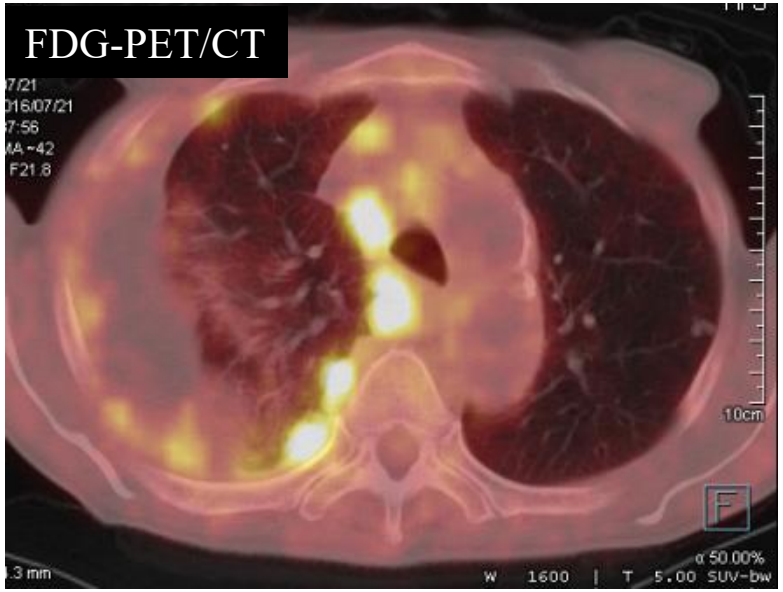


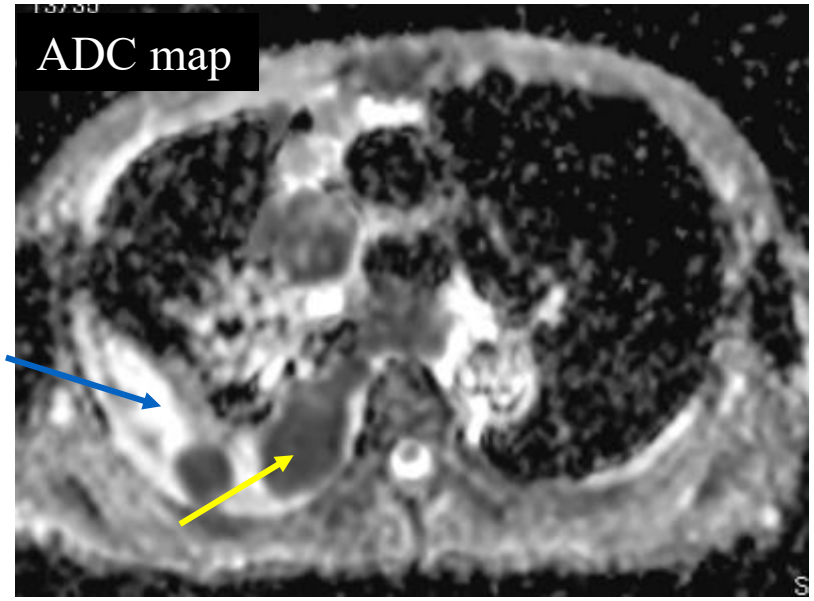


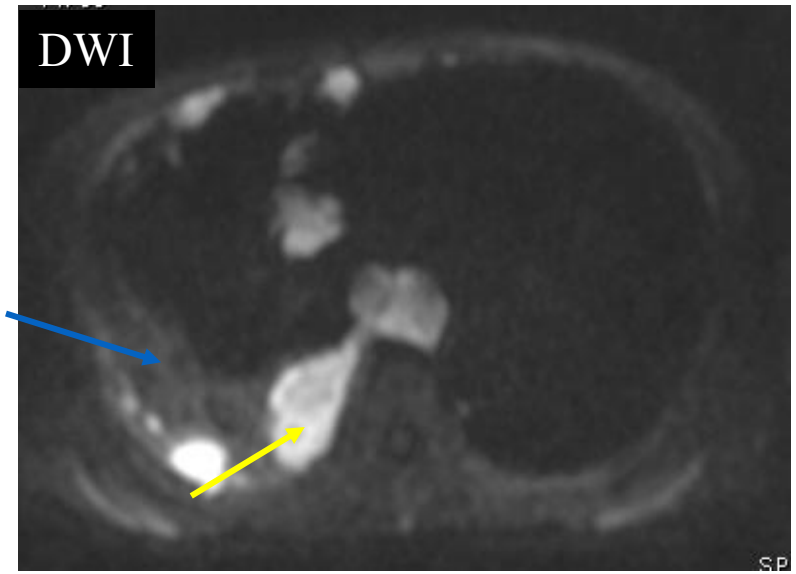




悪性胸膜中皮腫（MPM: cT4N2M0）. 黄色矢印は：胸膜病変、青色矢印：胸水。
胸膜病変のADC ： 0.84 x10^{-3} mm^2/sec (陽性)、胸水のADC ： 3.95 x10^{-3} mm^2/sec (陰性)
胸膜病変のSUVmax：12.39 (陽性)



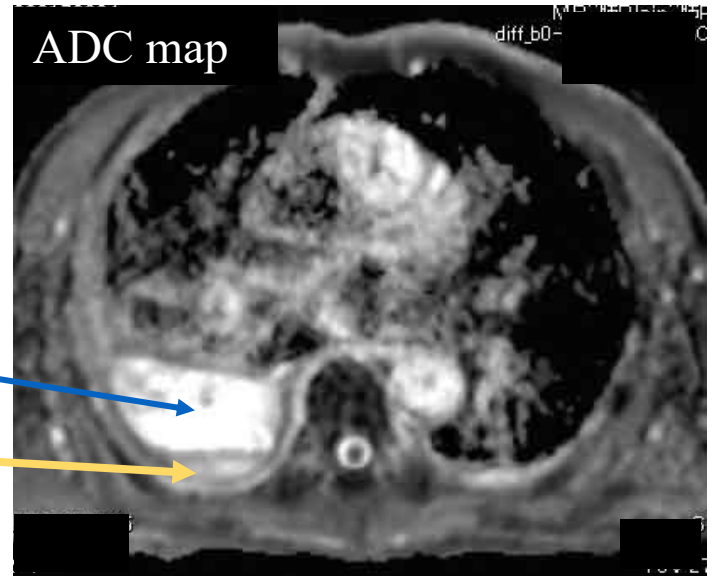


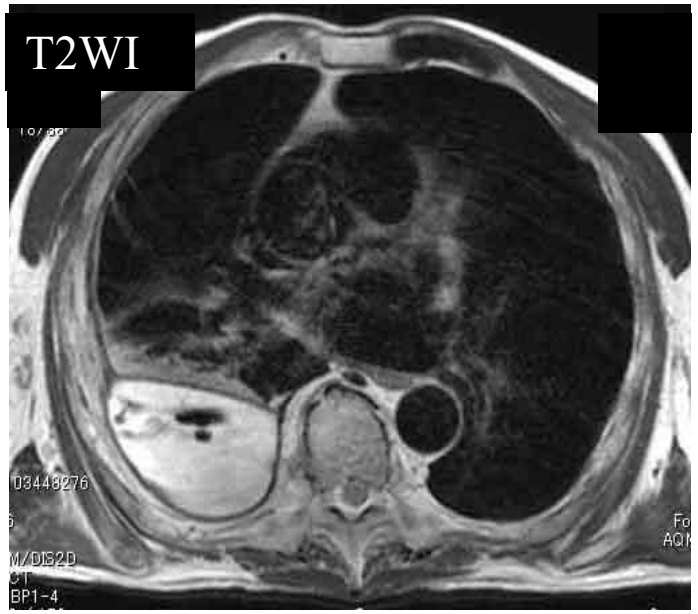


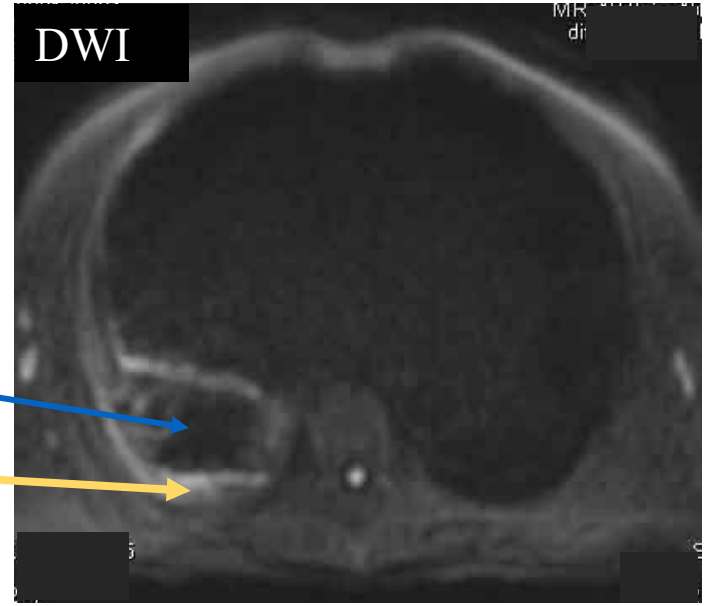
肺癌の胸膜播種症例　大細胞神経内分泌癌（LCNEC）

胸膜播種病変のADC：0.67 x10^{-3} mm^2/sec（陽性）、 胸水のADC ：3.03 x10^{-3} mm^2/sec（陰性）

胸膜播種病変に散在性のFDGの集積、SUVmax: 14.7（陽性）

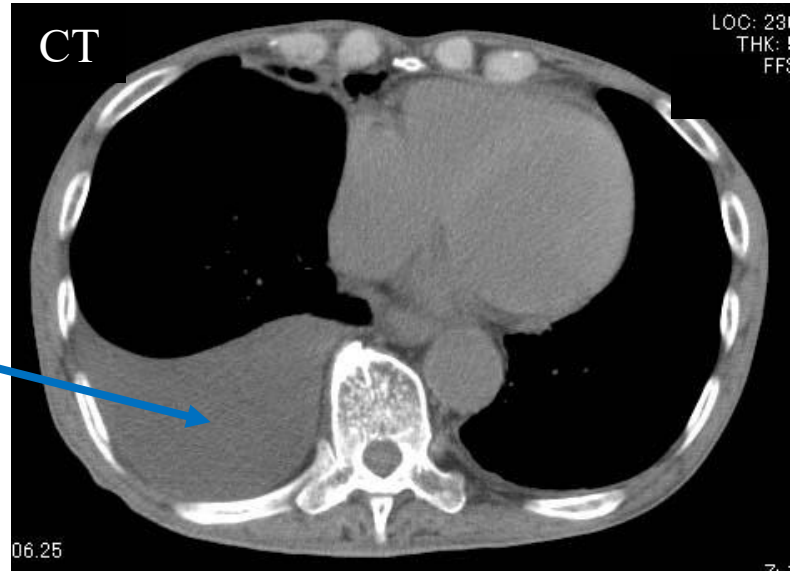


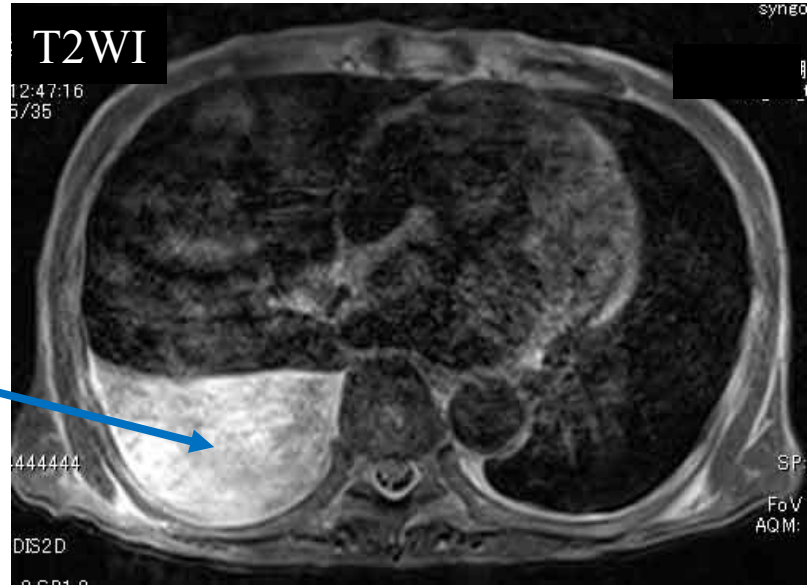


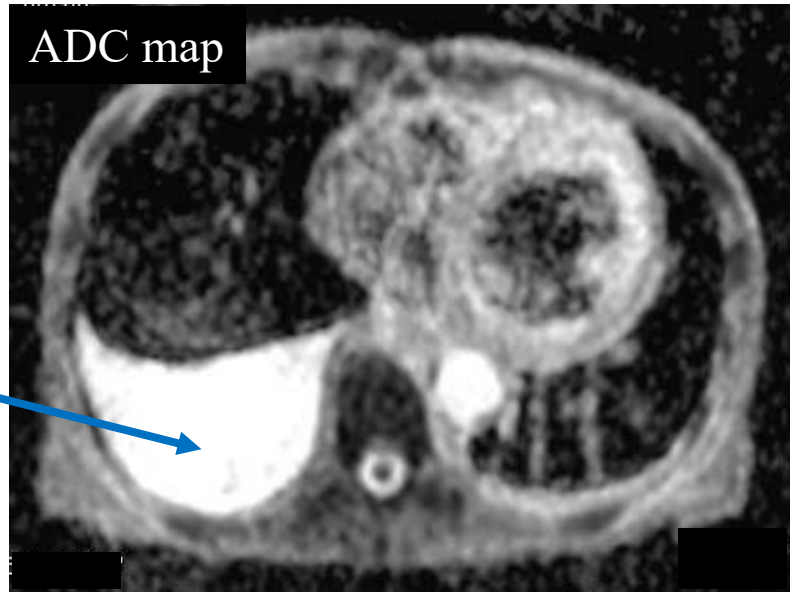


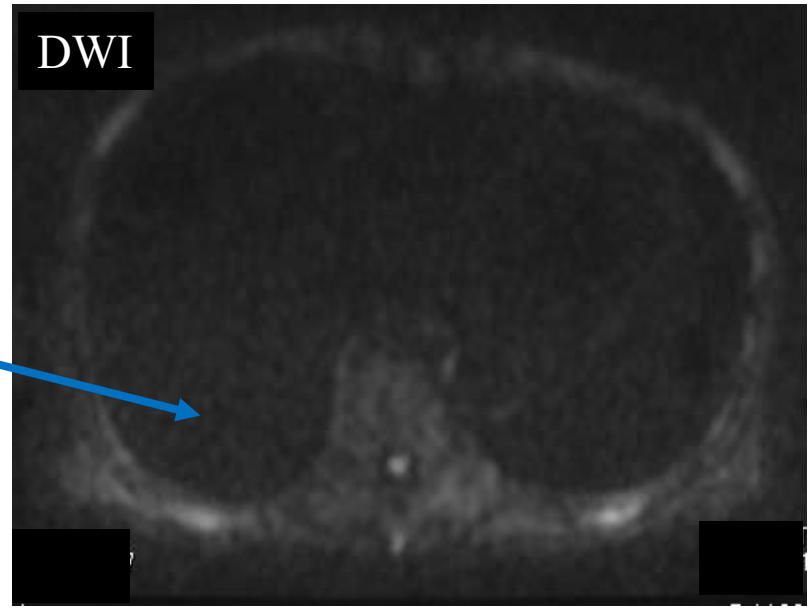
膿胸症例

胸膜のADC ： 1.82 x10^{-3} mm^2/sec（陰性）、胸水のADC ：3.95 x10^{-3} mm^2/sec（陰性）

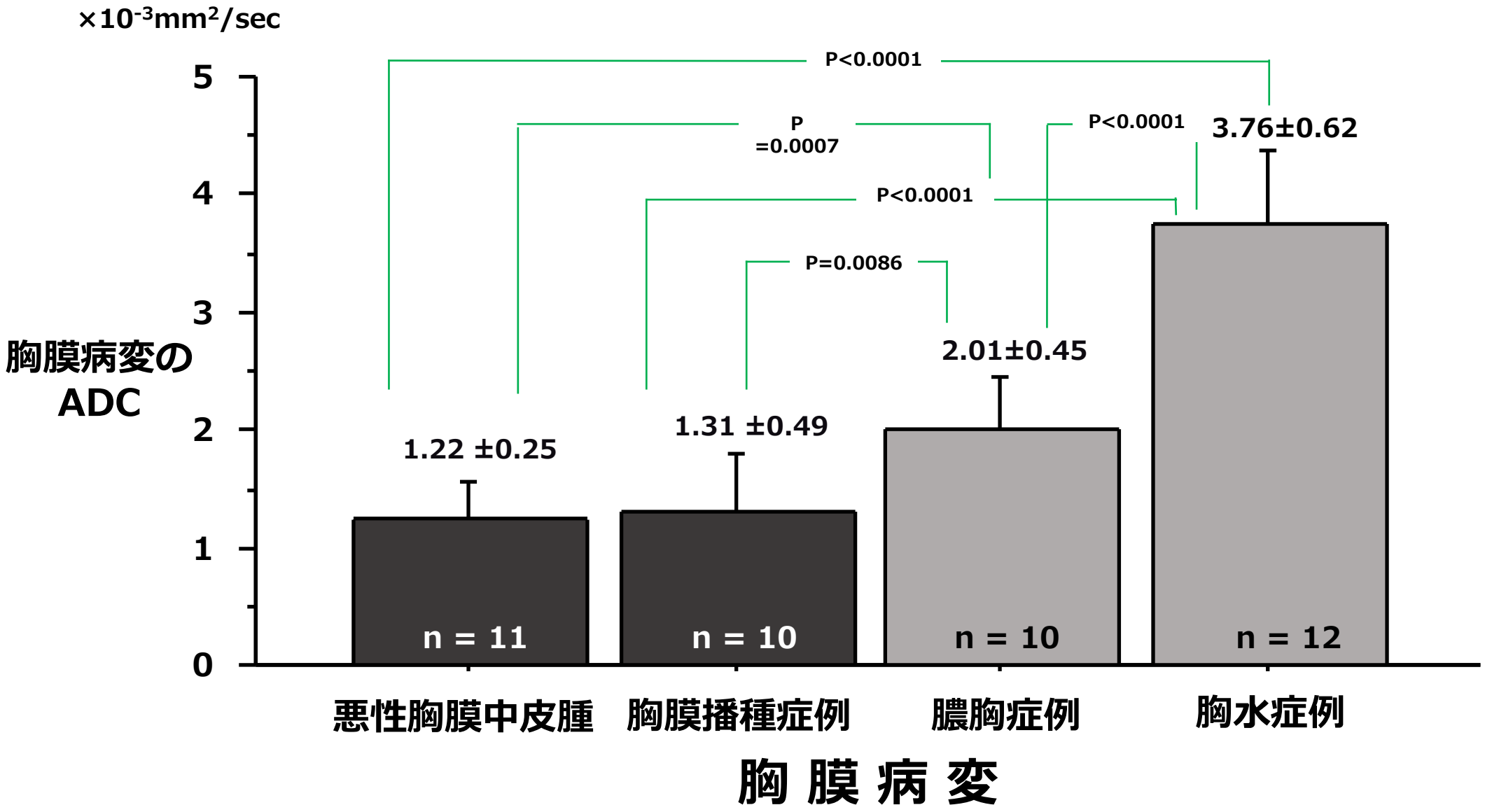








胸水症例　　**胸水のADC ： 4.02 x10^{-3} mm^2/sec (陰性)**



胸膜病変のADCの比較

悪性胸膜中皮腫のADC は、膿胸症例や胸水症例のADCより有意に小。
胸膜播種症例のADCは、膿胸症例や胸水症例のADCより有意に小。

まとめ

拡散強調画像により、縦隔腫瘍や胸膜腫瘍の良悪性の鑑別診断ができる。

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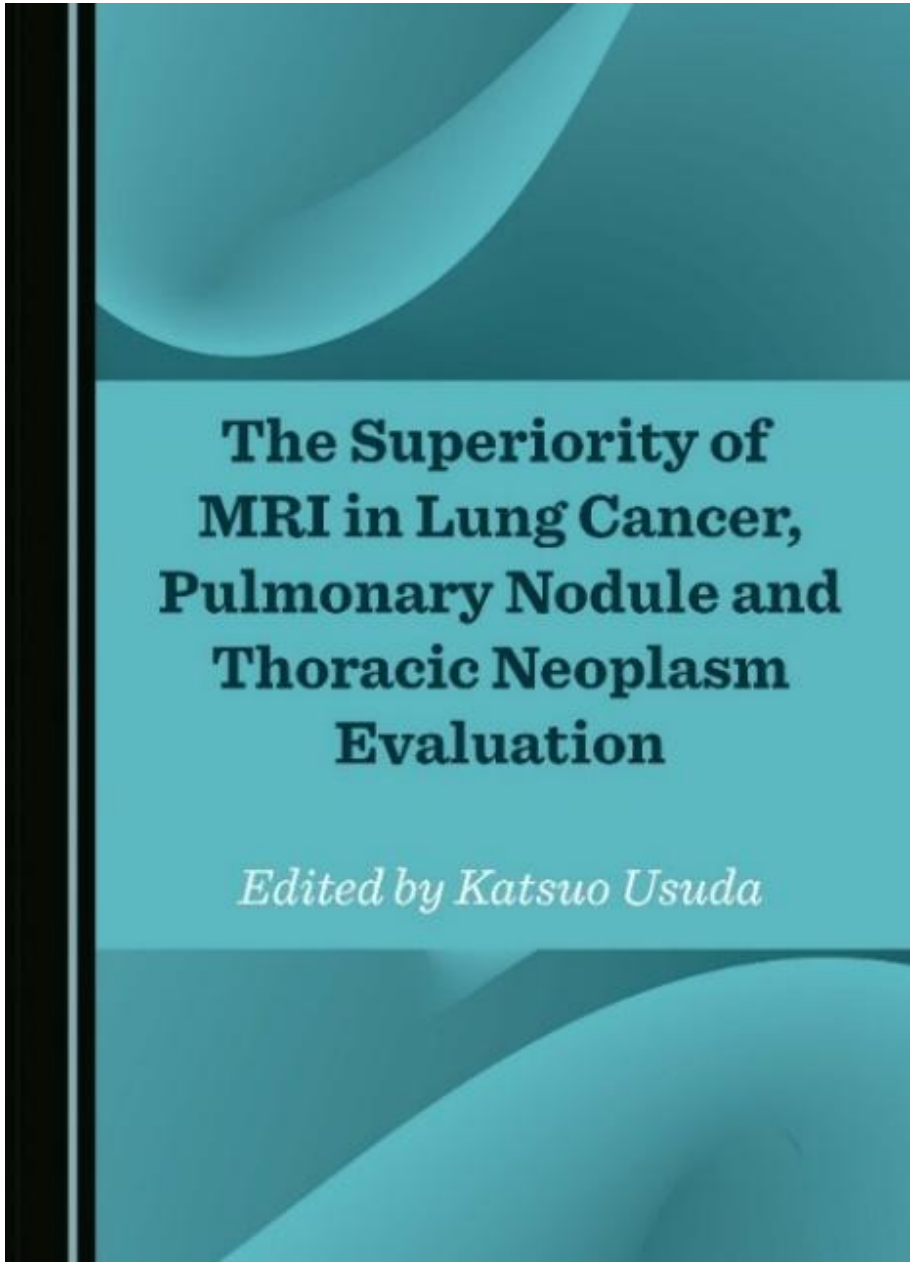

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Novel Insight of MRI for Lung Cancer and Thoracic Neoplasm

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Open Access Article 14 pages, 1844 KB

Targeted Imaging of Lung Cancer with Hyperpolarized ^{129}Xe MRI Using Surface-Modified Iron Oxide Nanoparticles as Molecular Contrast Agents

by **Atsuomi Kimura**, **Seiya Utsumi**, **Akihiro Shimokawa**, **Renya Nishimori**, **Rie Hosoi**, **Neil J. Stewart**, **Hirohiko Imai** and **Hideaki Fujiwara**

Cancers **2022**, *14*(24), 6070; **https://doi.org/10.3390/cancers14246070** - 9 Dec 2022

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Abstract Hyperpolarized ^{129}Xe (HP ^{129}Xe) MRI enables functional imaging of various lung diseases but has been scarcely applied to lung cancer imaging. The aim of this study is to investigate the feasibility of targeted imaging of lung cancer with HP ^{129}Xe **[...] Read more.**

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by **Katsuo Usuda**, **Masahito Ishikawa**, **Shun Iwai**, **Aika Yamagata**, **Yoshihito Iijima**, **Nozomu Motono**, **Munetaka Matoba**, **Mariko Doai**, **Keiya Hirata** and **Hidetaka Uramoto**

Cancers **2021**, *13*(20), 5166; **https://doi.org/10.3390/cancers13205166** - 14 Oct 2021

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Abstract The purpose of this retrospective study was to compare the diagnostic efficacy of FDG-PET/CT and MRI in discriminating malignant from benign pulmonary nodules and masses (PNMs). There were 278 lung cancers and 50 benign PNMs that were examined by FDG-PET/CT and MRI. The **[...] Read more.**

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Cancers **2023**, *15*(12), 3261; **https://doi.org/10.3390/cancers15123261** - 20 Jun 2023

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Cancers **2023**, *15*(3), 950; **https://doi.org/10.3390/cancers15030950** - 2 Feb 2023

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Abstract Since the Radiology Diagnostic Oncology Group (RDOG) report had been published in 1991, magnetic resonance (MR) imaging had limited clinical availability for thoracic malignancy, as well as pulmonary diseases. However, technical advancements in MR systems, such as sequence and reconstruction methods, and adjustments **[...] Read more.**

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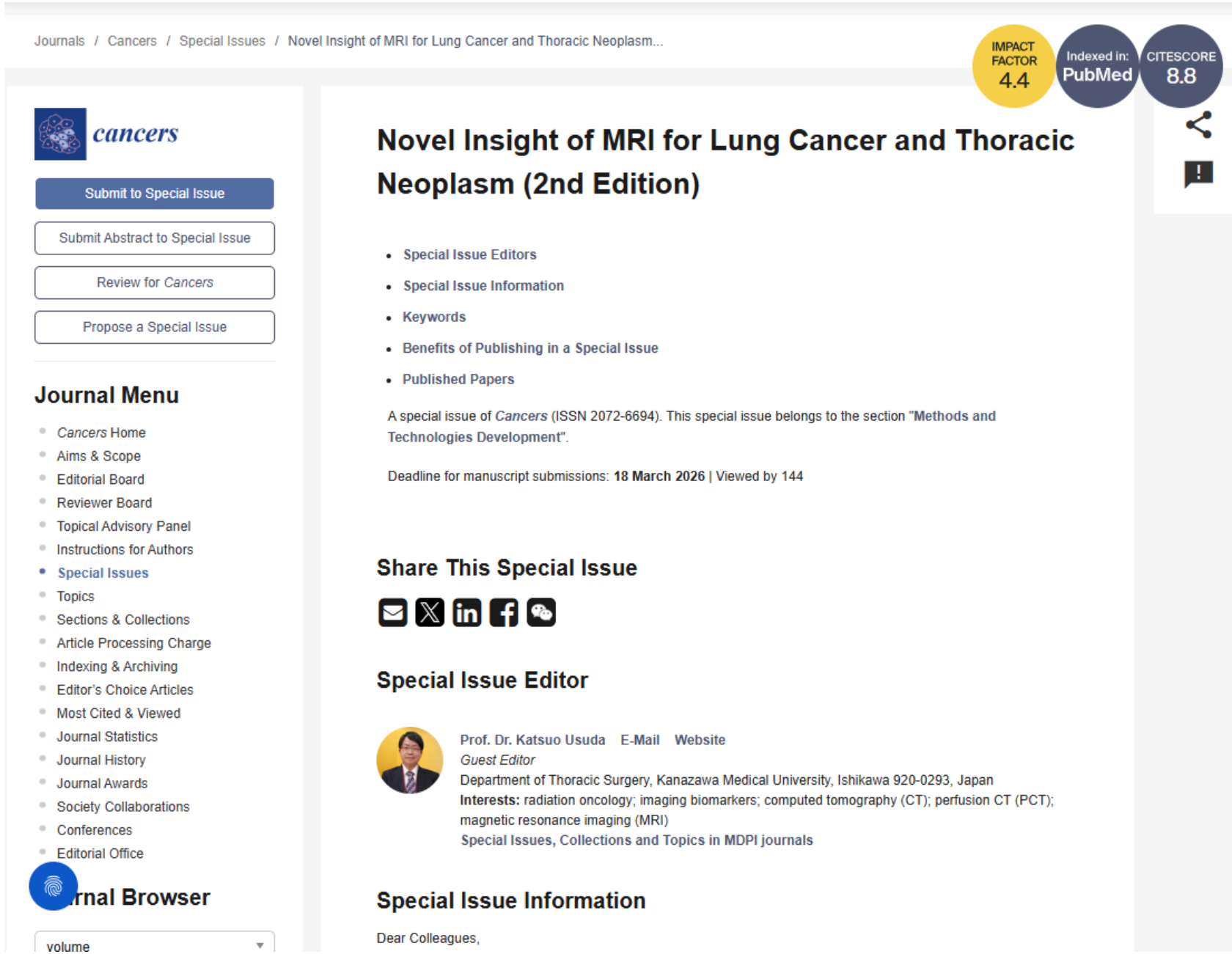

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Special Issues, Collections and Topics in MDPI journals

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