

Technical considerations for bronchial artery embolization for lung cancer

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Disclosures: No COI

Learning Objects

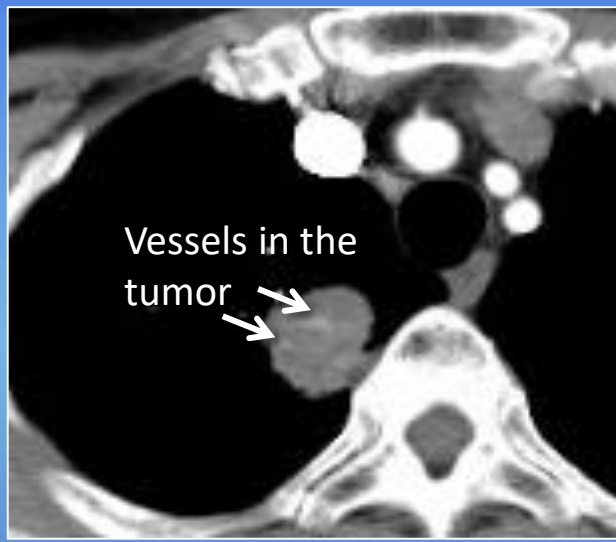
- How to treat lung and mediastinal tumors safely and effectively with the techniques of chemoembolization
- Diagnostic modalities for preoperative information
- Sophisticated methods to select feeding arteries
- How to choose the effective drugs
- The best embolic material
- How to avoid adverse events
- How to take care of patients

Background

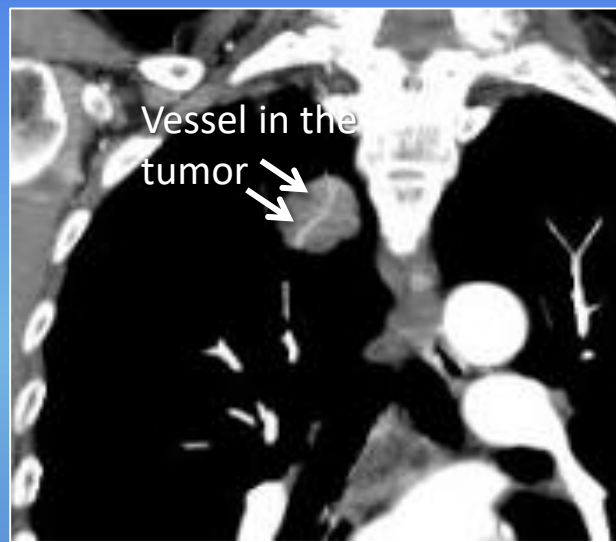
After the standard therapies for primary lung cancer, it is not uncommon to find local recurrence and/or mediastinal invasion. Patients usually have many urgent symptoms like dyspnea, cough or fever caused by obstructive pneumonia. It is necessary to conduct treatments, however, conventional treatments are usually ineffective for recurrent cases. The tranarterial treatment had attempted in 1970's, however, it didn't become the standard treatment because of technical problems. With the progress in interventional radiology, the trans-bronchial arterial approach has become feasible in recent years. The feeding arteries to the lung and mediastinal tumors are systemic arteries, such as bronchial artery, branches from subclavian artery or inferior phrenic arteries.

Blood supply to lung tumor; Pulmonary arteries or Systemic arteries?

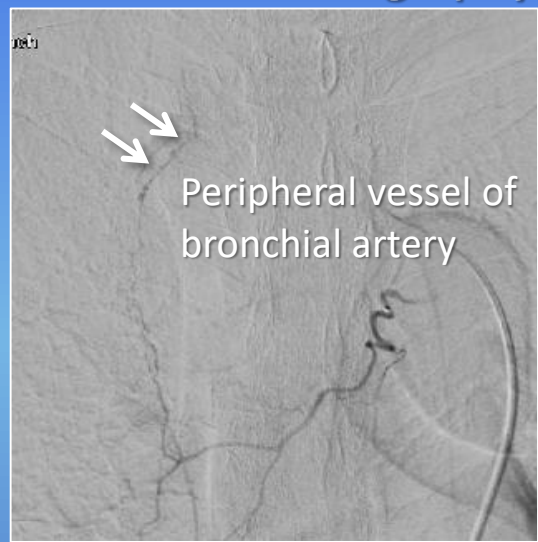
Axial view



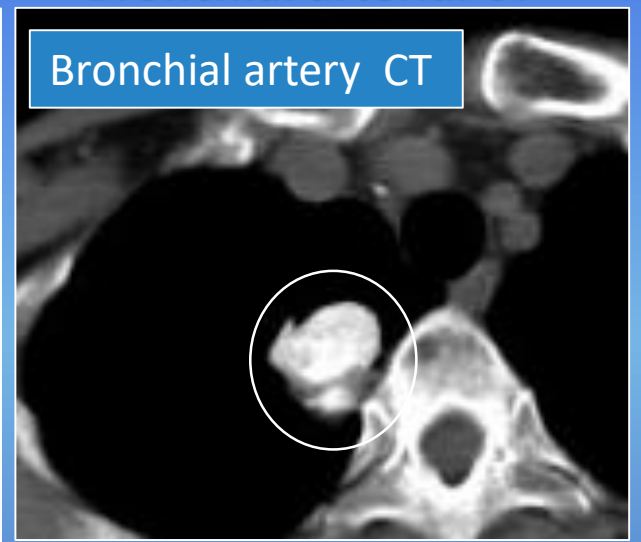
Coronal view



Bronchial arteriography



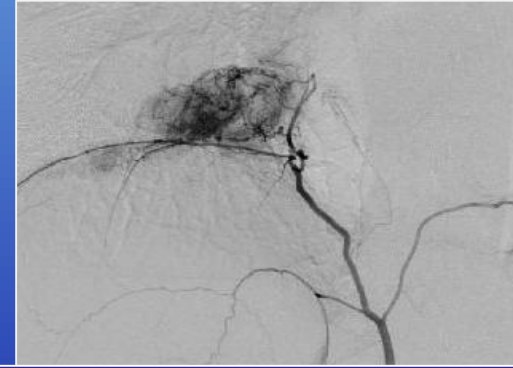
Bronchial arterial CT



Internal thoracic artery

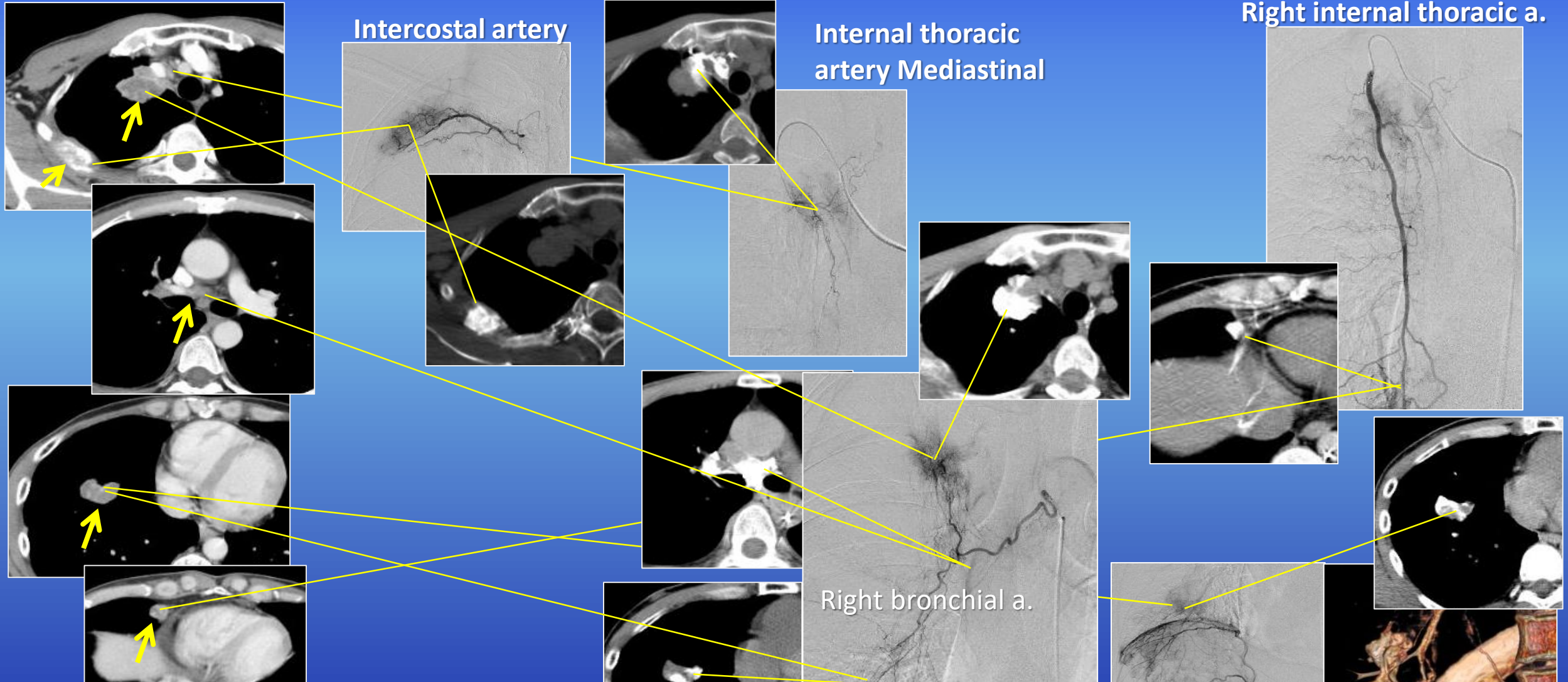


Inferior phrenic artery



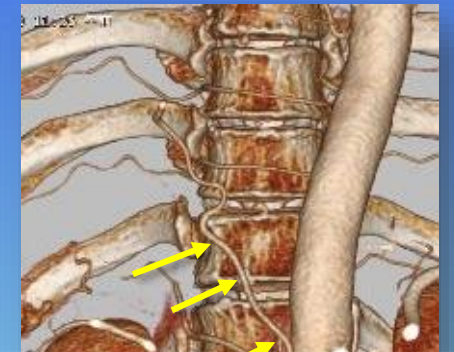
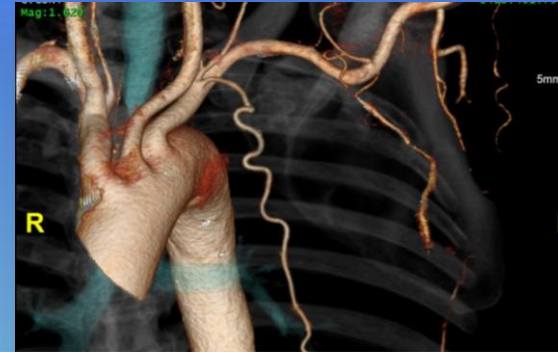
Lung and mediastinal tumors are feed by systemic arteries including bronchial arteries and branches arising from subclavian artery, intercostal arteries or inferior phrenic arteries.

Feasibility to select all lesion in the thorax NSCLC, cT4N2M1 Stage IV, 46 y/o M



All lesions in the lung field and mediastinal lymph node metastases can be approached through the systemic arteries using a microcatheter.

Diagnostic imaging to analyze the vascular anatomy



3-D images of the aorta and its branches are excellent guidance for superselective catheter insertion.

Treatment modalities and techniques

Angio-CT hybrid system



Pre-shaped microcatheter



[Video](#) [Crick here](#)

Spherical embolic material



HepaSpheres



Apparatus and devices for better treatment results.

Roles of Bronchial Artery TACE

TACE for lung cancer: Chemo-infusion is to kill the tumor cells,
Embolization is to help retention of drugs.

Purpose of TACE for lung and mediastinal tumors are

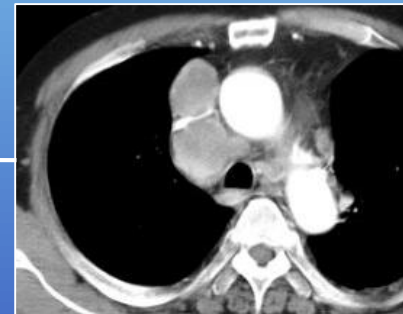
To reduce tumor burden

To release airway stenosis

To improve vascular stricture

To reduce pleural effusion

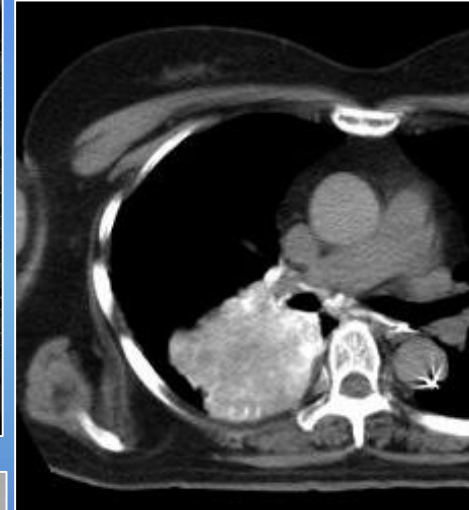
To control hemoptysis



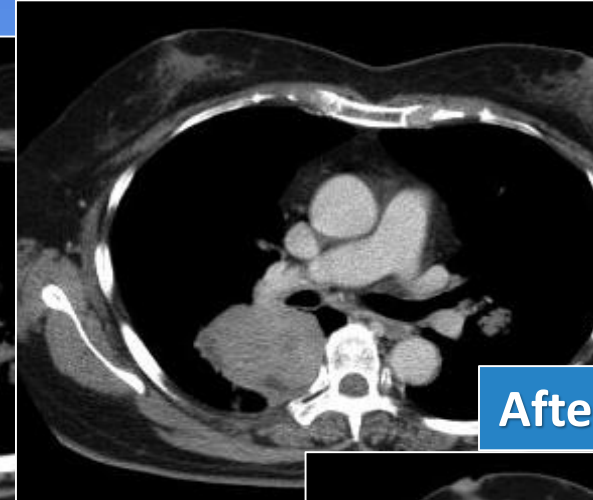
The final Goal is to improve symptoms and prolong patients' life with less adverse events.

Case presentation 56 y/o F None small cell carcinoma

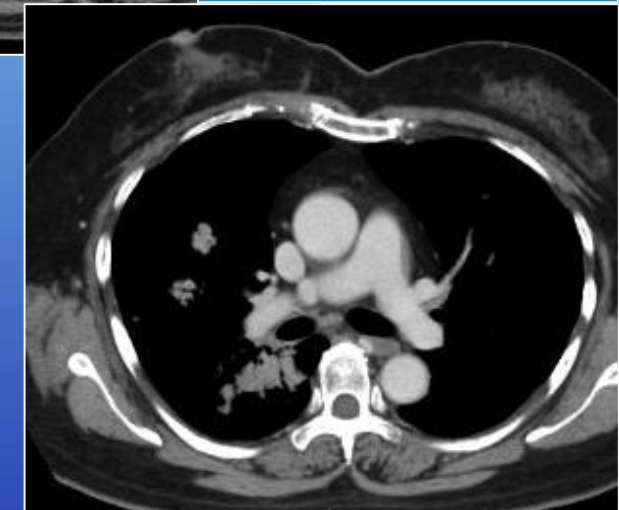
To reduce tumor burden



After one month



After one year



Infusion

CDDP; 20mg, DTX;20mg

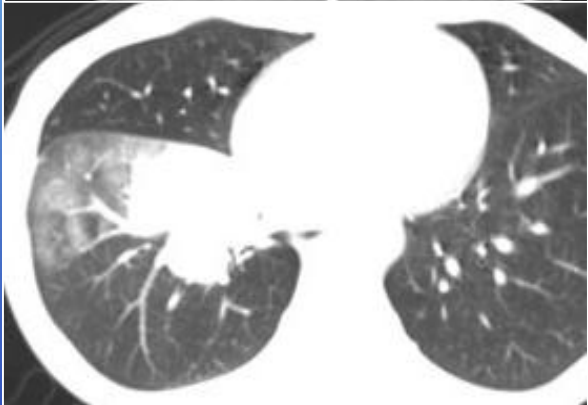
Embolization

DTX loaded HepaSphere (50-100);15.5mg

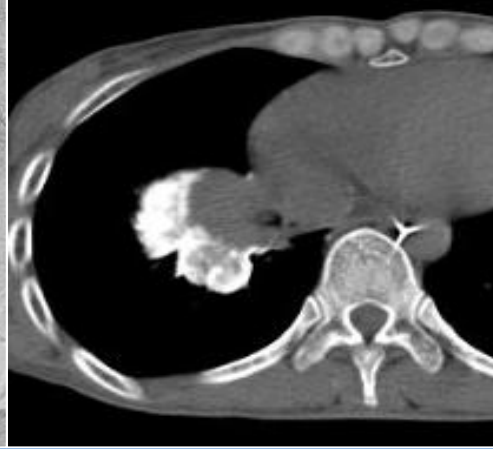
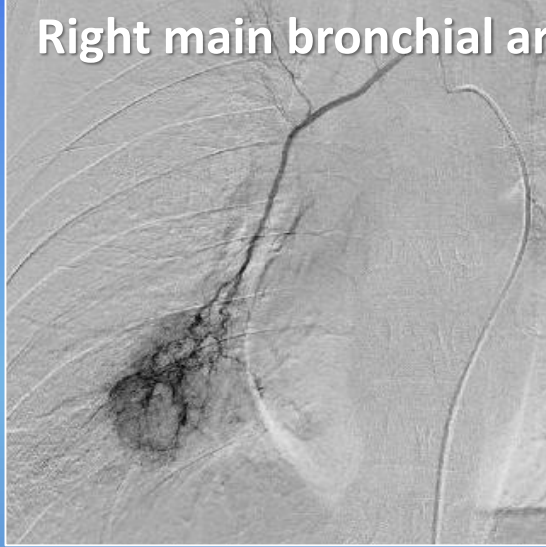
The TACE is effective to get shrinkage of lung and mediastinal tumors.

Case presentation 63 y/o man None small cell carcinoma, cT2bN2M1 Maeda akemi

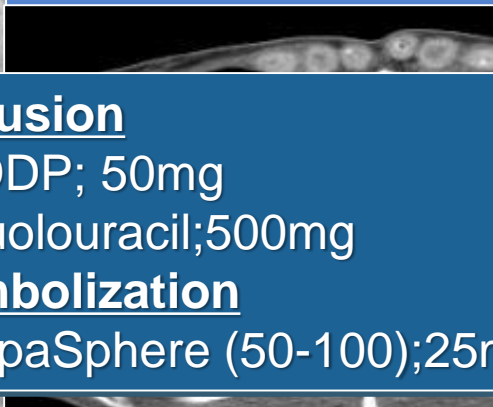
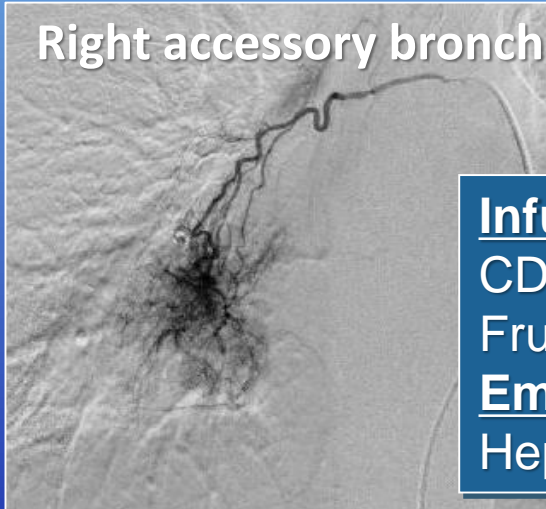
To release airway stenosis



Right main bronchial artery



Right accessory bronchial artery



Infusion

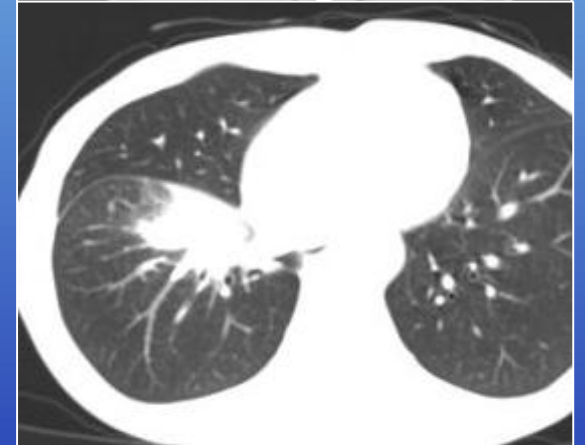
CDDP; 50mg

Fruolouracil;500mg

Embolization

HepaSphere (50-100);25mg

After two months

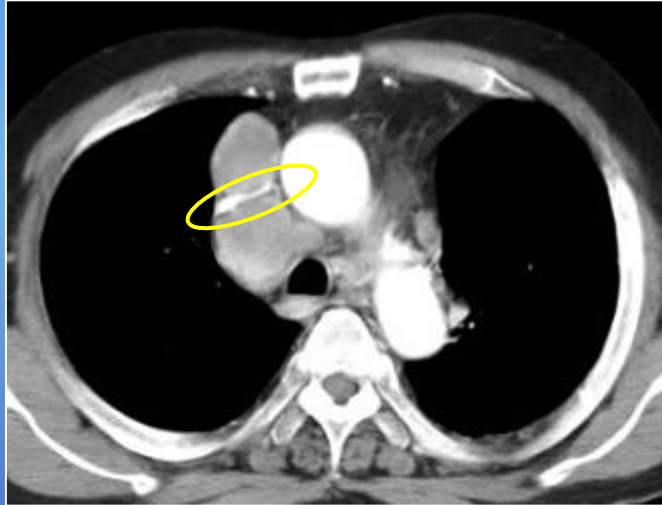


The TACE can release air way stenosis.

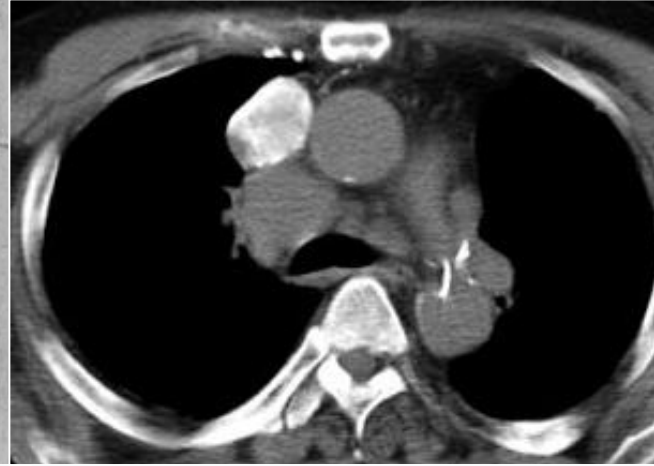
Case presentation 45 y/o man Carcinoid tumor

To improve vascular stricture

Superior vena cava syndrome



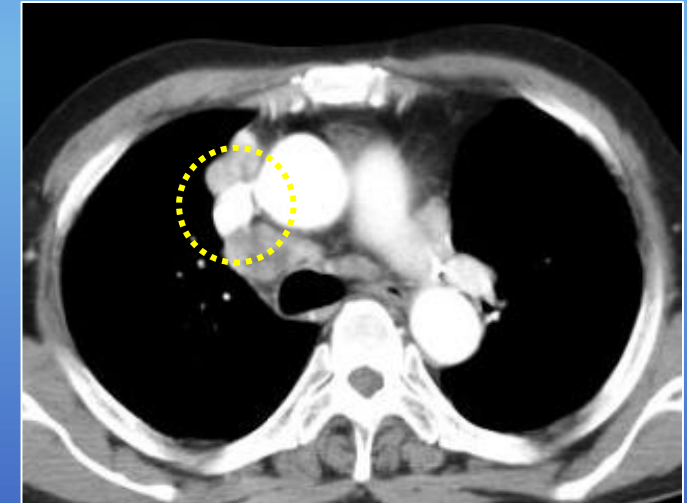
Right internal thoracic artery



Right main bronchial artery



After 7 months



Infusion

CDDP; 50mg

Fruolouracil;500mg

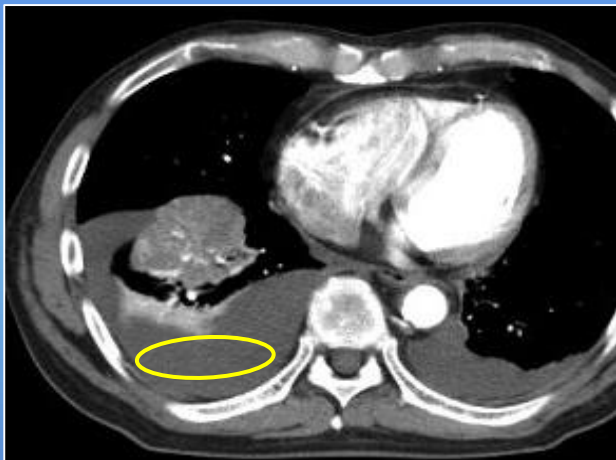
Embolization

The TACE can release the vascular stenosis.

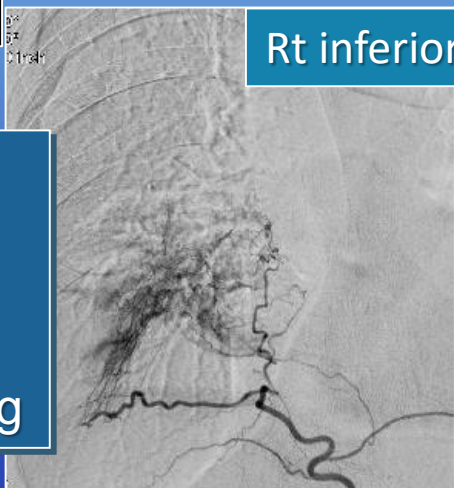
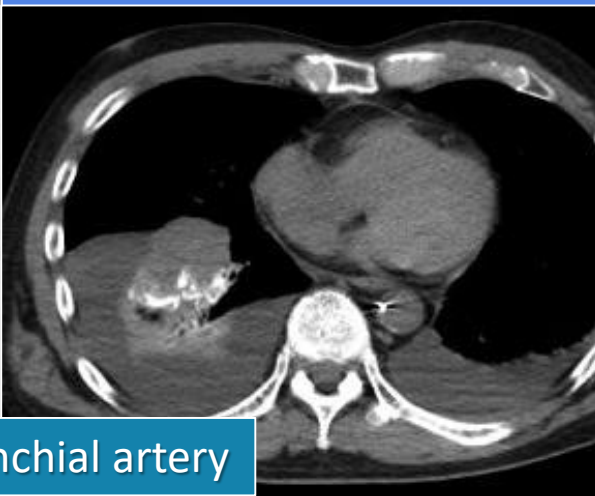
Case presentation 63 y/o man None small cell carcinoma, cT2bN2M1

Nishiya

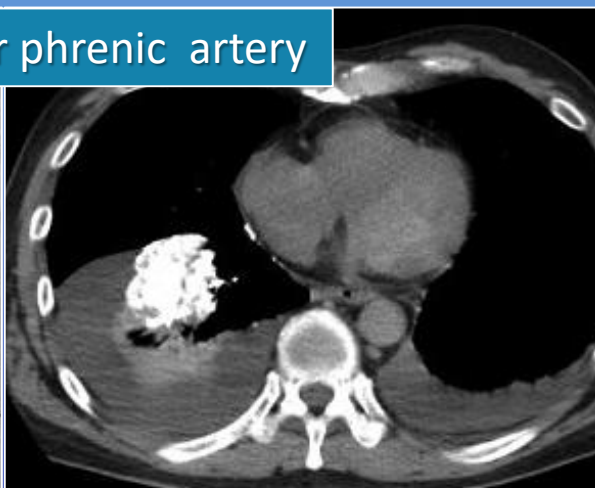
To reduce pleural effusion



Rt bronchial artery



Rt inferior phrenic artery



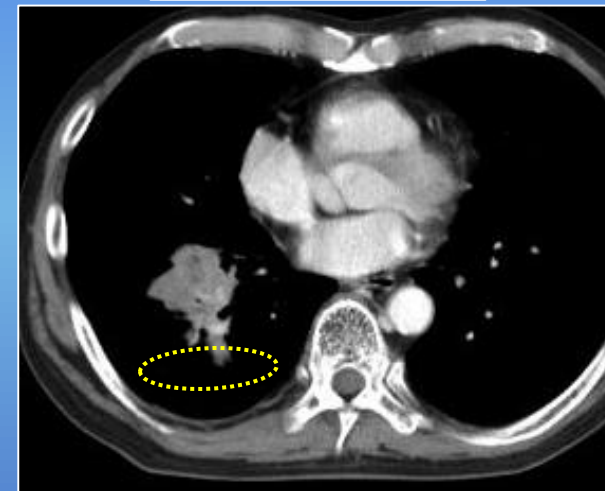
Infusion

CDDP; mg
Fruolouracil; mg

Embolization

HepaSphere (50-100);25mg

After one year

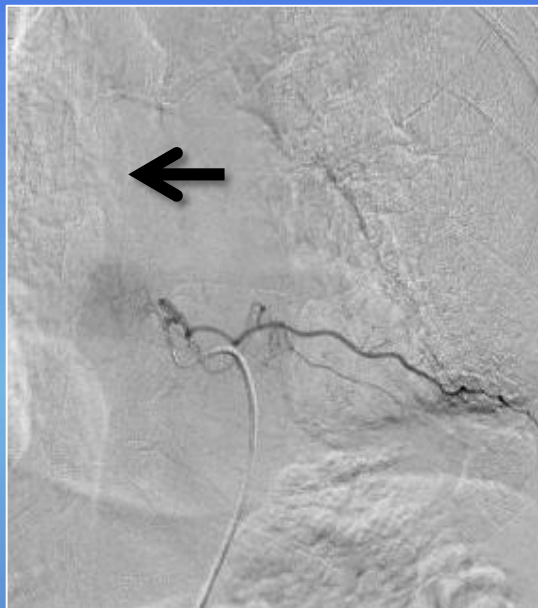
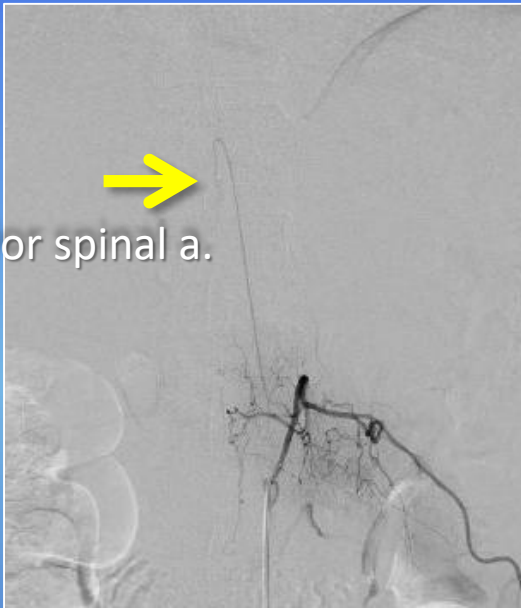


The TACE can reduce pleural effusion.

Confirmation of the anterior spinal artery

How to avoid incidence

Anterior spinal a.

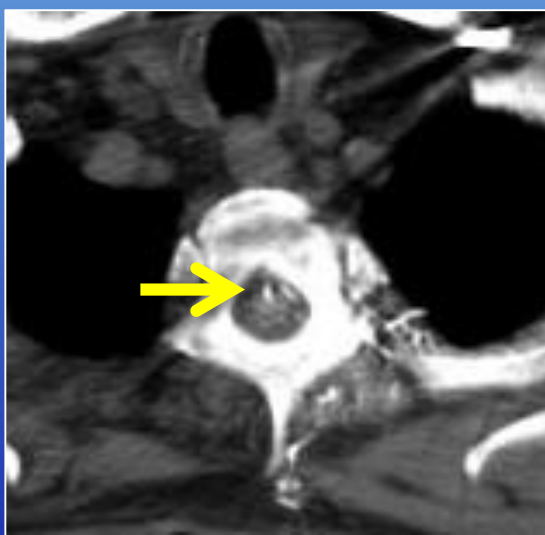
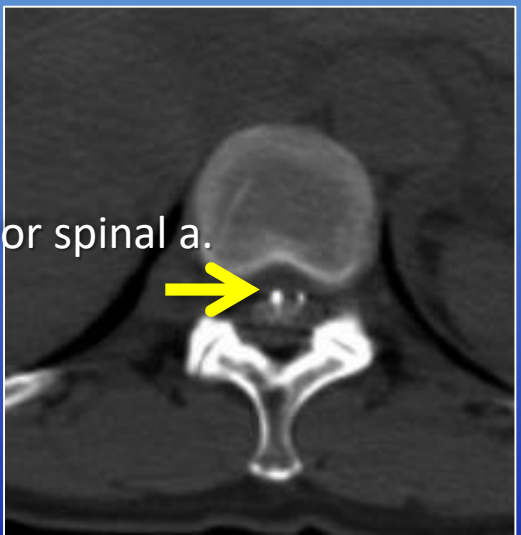


Careful observation of DSA

Angio-CT or conebeam CT

- Lidocain Test:
- 5 ml of 0.5% Lidocain
 - Slow injection to the intercostal artery
 - Motor and sensory nerve check of the both legs.

Anterior spinal a.



Conslusions

- Three dimensional images from preoperative CT examination is indispensable to analyze the tumor relating arteries and to successful insertion of microcatheter to the target arteries.
- Microcatheter manipulation without a micro-guide wire is critical to avoid arterial spasm and to get sufficient distribution of anti-cancer drugs within the target lesions.
- Angio-CT during selective contrast infusion to the target artery is reliable to allocate drugs to each artery and to avoid complications.
- Selection of effective anti-neoplastic agents is important and spherical embolic material is indispensable to get good results.
- The critical points to avoid spinal damage are careful observation of intercostal arteriography, angio-CT of the intercostal artery and/or the lidocaine test.
- Transarterial treatment for lung and mediastinal tumors is feasible with use of recent techniques not only imaging techniques and interventional radiology.

References

Refer to presentation number 1295 “Trans-bronchial artery chemo-embolization for primary lung cancers”.

- S Hori, T Nakamura, N Kennoki, I Djima, A Hori Transarterial management of advance lung cancer *Japanese Journal of Clinical Oncology*, 2021, 1–7 doi: 10.1093/jjco/hyab050
- A Hori, I Dejima, S Hori, T Nakamura, S Ueda Transarterial Treatment of Lung Cancer *Life* 2022, 12, 1078. <https://doi.org/10.3390/life12071078>