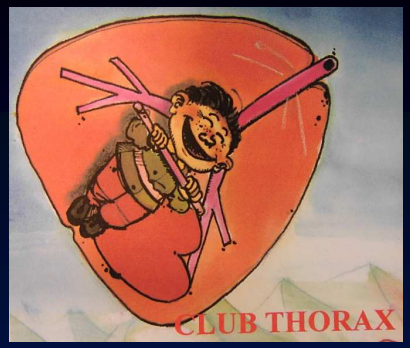
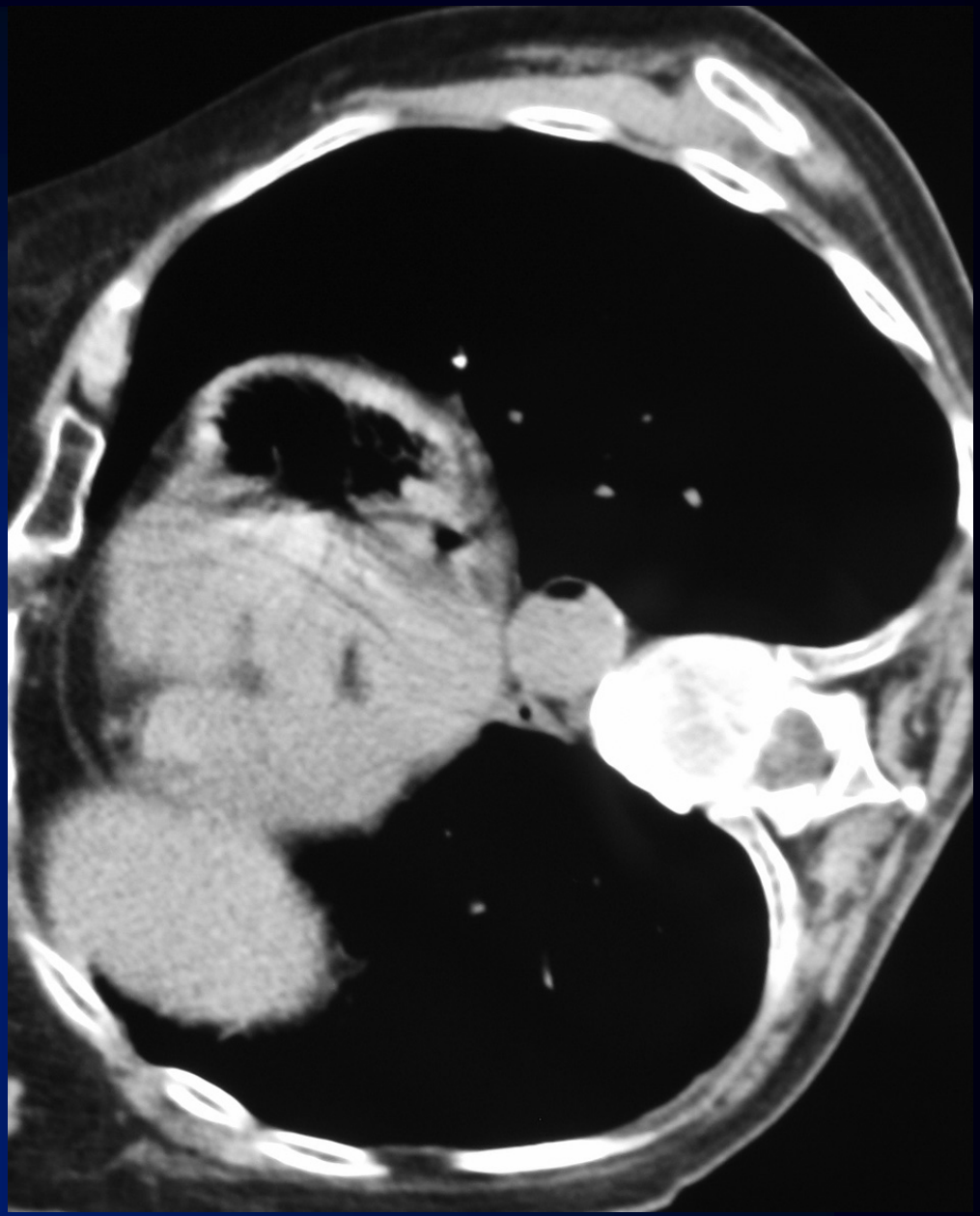


B Ghaye

- 73-year-old female
- Non-smoking
- Hysterectomy for leiomyosarcoma 6 y earlier
- Adjuvant brachytherapy and chemotherapy
- Right lower lobectomy and two wedge-resections in the right upper lobe and lingula for four metastases over the next four years
- RFA requested for treatment of a 11-mm metastasis which appeared in the left upper lobe 1 year later

RFA PROCEDURE

- CT fluoroscopic guidance
- general anesthesia
- right lateral decubitus
- 18G LeVeen Needle Electrode (Boston Scientific Corporation, Boston, Mass)
- 7th intercostal space without breathhold
- resistance of the nodule required four attemps of puncture
- cluster tip was deployed inside the lesion
- helical acquisition was obtained and 3D-reformatting confirmed optimal needle deployment inside the nodule before treatment



Diagnosis ?

Diagnosis

Aorta and left heart air embolism secondary to pulmonary lesion puncture during RFA procedure

CASE REPORT

- The patient remained stable
- The needle was immediately retrieved
- While compressing both carotid arteries, the patient was turned prone in a Trendelenburg position to avoid cephalic air embolism
- 100% oxygenation, antiplatelet agents and vasodilators
- Immediate hyperbaric oxygen treatment was not available

CASE REPORT

- CT 20 minutes later showed complete disappearance of air inside the heart chambers and vessels
- Cranial CT was unremarkable
- Patient transferred to ICU for observation and discharged two days later
- Clinical examination, blood tests, EKG and EEG were unremarkable, except a known hemiparesia of the right hand secondary to a cerebral vascular attack two years previously.

Systemic air embolism (SAE)

- SAE is a rare but potentially fatal complication after PTNB
- Should be differentiated from venous air embolism
- Reported incidence: 0.01-0.16 %
- About 26 cases of SAE following PTNB have been reported
- Mortality rate: > 60 % (highly unpredictable)
- Reported with any type and size of needles

Systemic air embolism
Pathophysiology in PTNB

- Introduction of air through the stylet of the needle (rapid inspiration)
- Needle pierces an air containing structure (bronchus, cavity, cyst,…) and a nearby vein creating a communication (Valsalva, coughing, deep inspiration, positive pressure ventilation)
- Introduction of air in arterial pulmonary circulation that pass in pulmonary veins through microcirculation

Systemic air embolism
Risk factors

- Factors which might have increased the risk of creating a fistula between airspaces or small airways and pulmonary veins in our patient may include:
  - strong cellular cohesion of a sarcomatous metastasis rendering nodule puncture difficult by a 16G or 18G RFA needle
  - prior history of multiple lung resection responsible for lung overdistension
  - endotracheal tube ventilation responsible of transient positive-pressure
- Others : diseased rigid lungs or pleura, Wegener or amyloid vasculopathy, non-cooperative patient