

## **Curriculum Vitae**

**Name** : Darmawan Ismail MD

**Place/birth date** : Surakarta, 13 Desember 1975

**Educational History** : Medical doctor Sebelas maret University, 1999

Thoracic Cardiac & Vascular surgeon	Indonesia University, July 2009
Workshop of Cryosurgery	Ghuangzou, China. Aug 2009
Regional Training of Cryosurgery	Miami, USA. June 2010
Workshop Endovascular surgery	Phuket, Thailand. March 2011
Short course Thoracic surgery	London, UK. Nov 2011
Short course Vein surgery	Cologne, Germany. Aug 2014
Thoracoscopy Surgery Course	Singapore, Aug 2015
Peripheral Endovascular Surgery Course	Singapore, Sept 2016

### **Organization** :

Indonesian Association of Cardio Thoracic & Vascular Surgeon	2009-now
International Society of Cryosurgery	2010-now
International Association for the Study of Lung Cancer	2014 -now

### **Award** :

As “Distinguished Young Cryosurgeon” by International Society of Cryosurgery (ISC) in World Congress of Cryosurgery, Italy, November 2011.

In Asia Pacific Lung Cancer Conference (APLCC), Kuala Lumpur – Malaysia, November 2014.

### **Institution**

Faculty of Medicine- Sebelas Maret University, Surakarta Indonesia

# CRYOSURGERY

## IN CANCER

**DARMAWAN ISMAIL MD**  
**THORACIC CARDIAC & VASCULAR SURGEON**  
**SOLO - INDONESIA**



# Cancer Cases on the World in 2020 by WHO

- Population will be 8000 million
- New cancer case will be 20 million
- Current cancer case will be 30 million

# *Introduction.....*

## ● **INDONESIA**

- **LUNG CANCER INCIDENCE 5,96 / 100 THOUSAND**
  - **1<sup>ST</sup> MALE POPULATION**
  - **THE BIG FIVE IN FEMALE POPULATION**
- **3<sup>RD</sup> SMOKERS POPULATION IN ASIA (OVERALL)**
- **1<sup>ST</sup> SMOKERS MALE POPULATION IN ASIA**
- **20-25% TB PATIENTS WILL DEVELOP MALIGNANCY**
- **GERIATRIC PATIENTS → CO MORBID & POOR TOLERANCE**
- **LATE DIAGNOSIS → 95% DIAGNOSED AT IIIB AND IV STAGE**

# The Results of the 3 type treatments are not satisfactory

a shocked article at FUTURE magazine on March 22, 2004

Why ? --- Problem of early diagnosis

It's too late when patients saw doctors.

More the patients were at stage III or IV.

More the patients are geriatric.

Problem of treatment concept

Neglect cancer is a systemic disease



# thrivingwithlungcancer

Life with advanced lung cancer

Even with stage IV lung cancer, long-term survival is possible

“..I am daring to think of myself as a long-term survivor..”

Posted on January 9, 2014

“ Why we’re losing the war on cancer ? ”

Improvement of survival rate  
of cancer patients is disappoint

How to win it ? / What we can do ?

- Learn more & Awareness..
- Seek genuine BREAKTHROUGHS
- COMBINED fighting cancer

The Breakthrough is

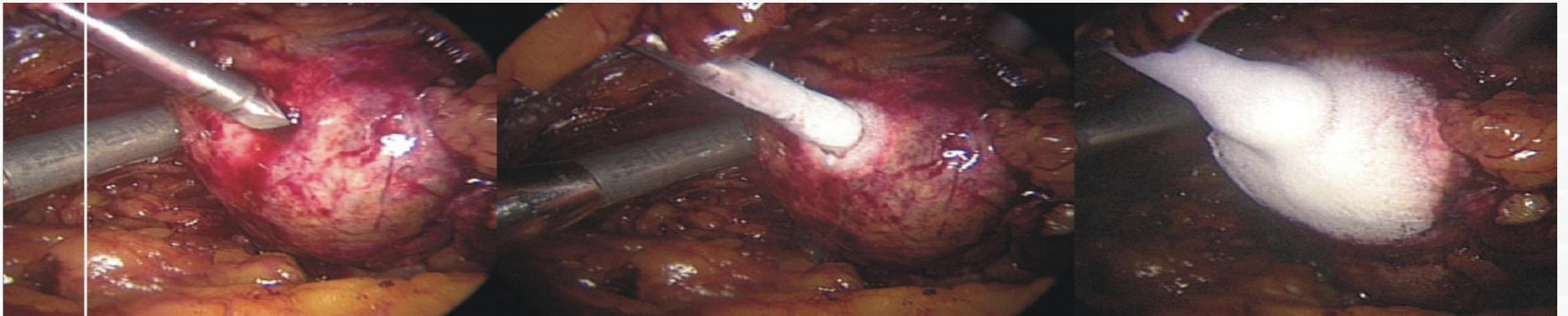
# Cryosurgery





# What is Cryosurgery?

Cryosurgery is a **SURGICAL TECHNIQUE** that employs freezing to destroy undesirable tissue.



Why

Cryosurgery

Should be PROMOTED ?

## SUITABLE CASES FOR CRYOSURGERY

- ❖ Advanced stages of thoracic malignancy (IIIB –IV)
- ❖ Locally advanced pulmonary nodules in thoracic area
- ❖ **LUNG METS**
- ❖ Early stages or nodule, with vulnerable to be performed a major surgery or contraindication
- ❖ **Geriatric** cases

# Advantages of Cryosurgery



## International Society of Cryosurgery

16TH WORLD CONGRESS OF CRYOSURGERY  
Italy 5 - 7 Nov 2011

- **Minimally invasive procedure**
- Local anesthesia
- **Poor tolerance of patient can be accepted**
- Can be repeated safely

Darmawan I, Soebandrijo. 2011. **Advanced Stage of Lung Cancer and Cryosurgery** . Sub Division of Cardio Thoracic and Vascular Surgery, Sebelas Maret University, Surakarta – Indonesia. Presented in World Congress of Cryosurgery.

Kawamura M, Izumi Y, Tsukada N, Asakura K, Sugiura H, Yashiro H, Nakano K, Nakatsuka S, Kuribayashi S, Kobayashi K. 2006. **Percutaneous cryoablation of small pulmonary malignant tumors under computed tomographic guidance with local anesthesia for nonsurgical candidates.** Division of General Thoracic Surgery, School of Medicine, Keio University, Tokyo, Japan. J Thorac Cardiovasc Surg. May;131(5):1007-13.



# Cryosurgery Doc.







elcc

EUROPEAN LUNG CANCER  
CONFERENCE

Geneva, Switzerland  
**13-16 APRIL 2016**



## **CRYOSURGERY FOR ADVANCED STAGES OF NON SMALL CELL LUNG CANCER (5 YEARS EXPERIENCE)**

**Darmawan I\*, Soebandrijo\*, Suradi\*\***

\* Sub Department CARDIOTHORACIC AND VASCULAR SURGERY,

\*\* Department PULMONOLOGY

Faculty of Medicine, Sebelas Maret University – Dr Muwardi Hospital  
Surakarta, Indonesia

# Cryosurgery for Multiple Nodules



## The Benefit of Cryosurgery on Multiple Nodules in Lung Malignancy (Serial Case report)

**Darmawan I\*, Soebandrijo\*, Suradi\*\***

\* Sub Department CARDIOTHORACIC AND VASCULAR SURGERY,

\*\* Department PULMONOLOGY

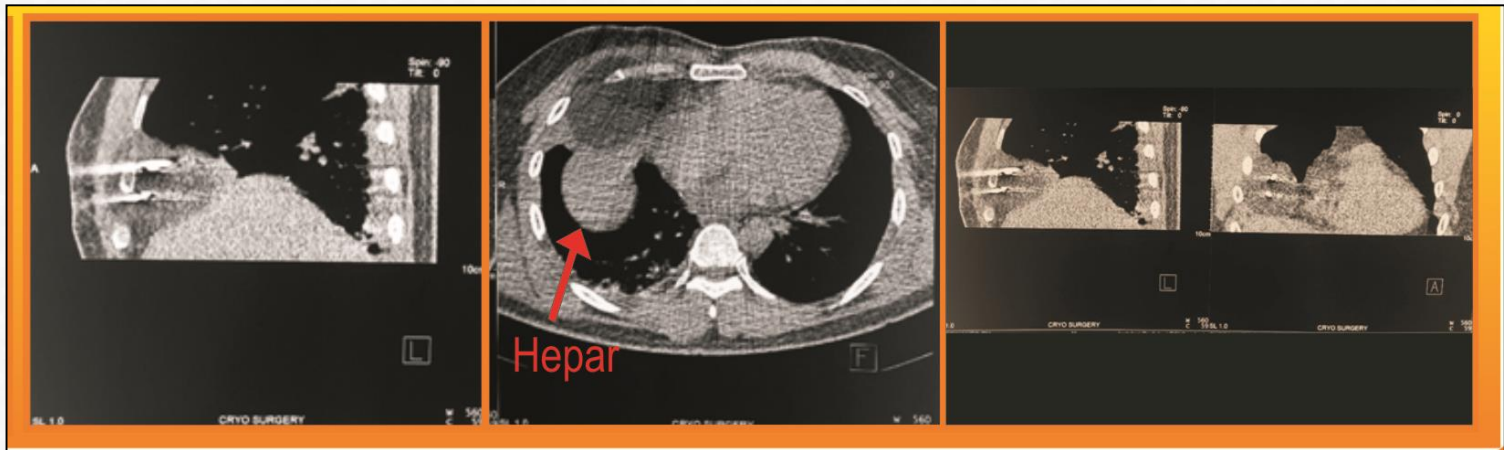
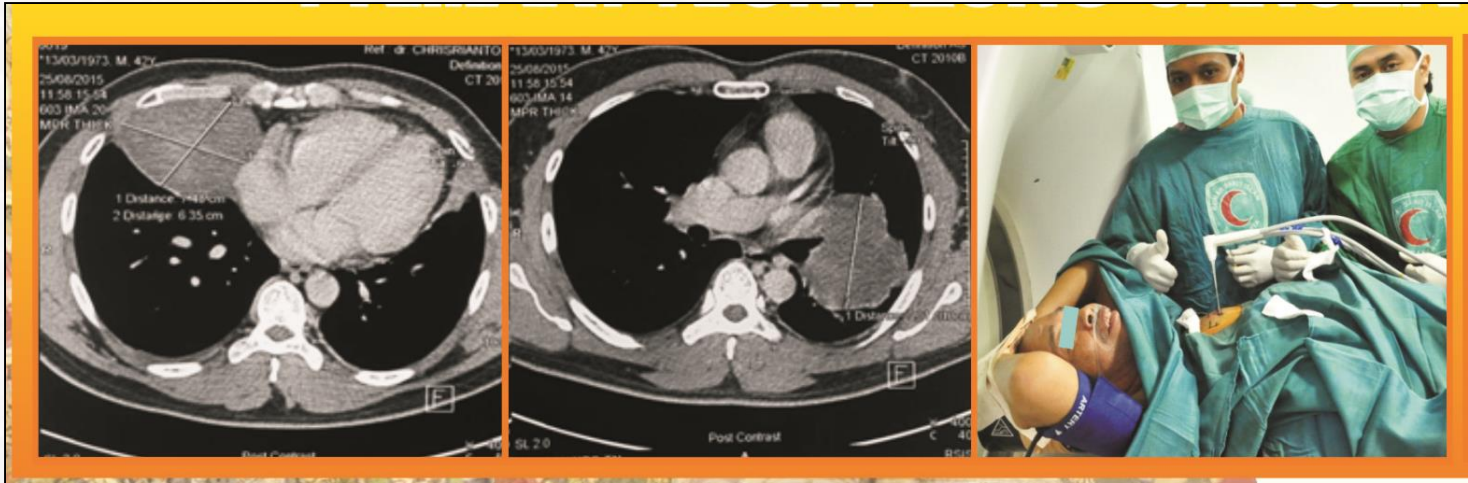
Faculty of Medicine, Sebelas Maret University – Dr Muwardi Hospital  
Surakarta, Indonesia

## PRIMARY RIGHT LUNG CANCER + SATELITE NODULE IPSILSATERAL





# PRIMARY RIGHT LUNG CANCER & BIG NODULE CONTRALATERAL



# Advantages of Cryosurgery

- Short hospital stay and recuperation
- Relatively inexpensive procedure

Maiwand MO, Asimakopoulos G. 2004. **Cryosurgery for lung cancer: clinical results and technical aspects.** Department of Thoracic Surgery, Harefield Hospital, Harefield, Middlesex, England. Technol Cancer Res Treat. Apr;3(2):143-50.

- Freedom from early side effects
- Less risk of complication

Niu L, Wang J, Zhou L, Wu B, Mu F, Li H, Hu Y, Hu Y, Zuo J, Xu K. 2010. **Complications of cryoablation in 644 lung cancer patients and its treatment.** Department of Medical Oncology, GIHB Affiliated to Fuda Hospital, Chinese Academy of Sciences, Guangzhou, China [Article in Chinese]. Zhongguo Fei Ai Za Zhi. Aug 20;13(8):832-4.



# Advantages of Cryosurgery



Malaysian Oncological Society



Malaysian Thoracic Society



INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER

6 - 8 November 2014 • Shangri-La Hotel,  
Kuala Lumpur, Malaysia



## **Cryosurgery and Weekly Chemotherapy as A Combine Treatment for Advance Stage of Non Small Cell Lung Cancer (NSCLC) in Geriatric Cases**

**Darmawan I, Soebandrijo**

Sub Department CARDIOTHORACIC AND VASCULAR SURGERY,  
Faculty of Medicine, Sebelas Maret University – Dr Muwardi Hospital  
Surakarta, Indonesia

# Cryosurgery

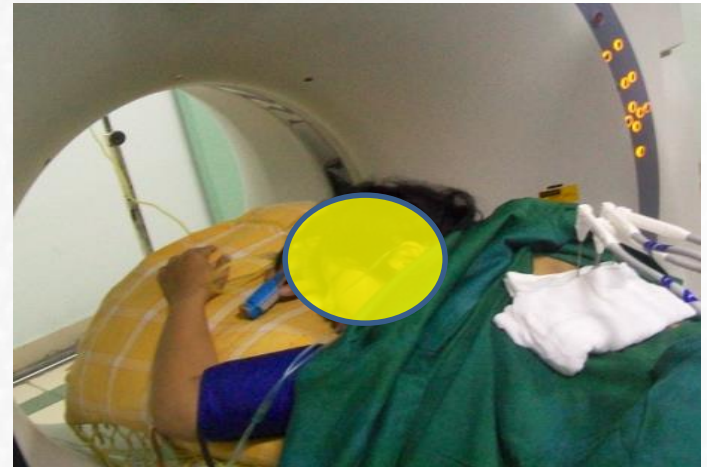
Is

**FLEXIBLE**

# Perform of Cryosurgery

## Transthoracal

Percutaneous guided CT Scan



Guided Thoracoscopy (VATS)



# Perform of Cryosurgery

## Direct

Thoracotomy incision

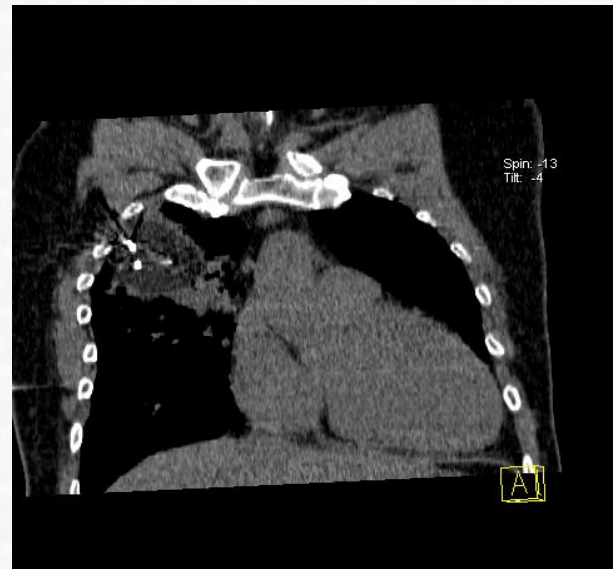
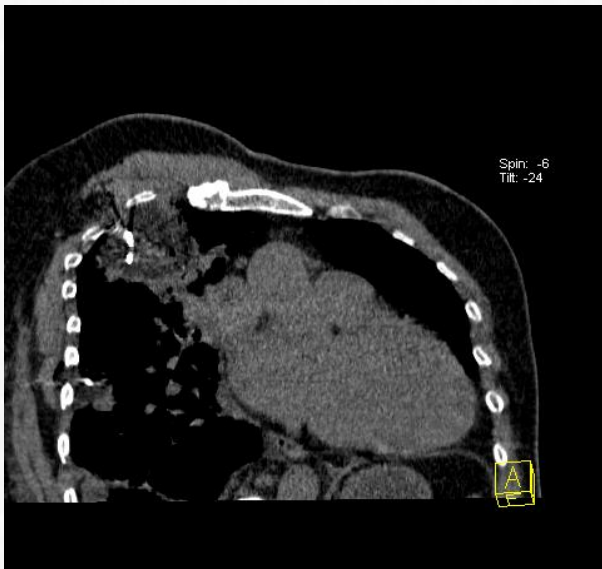
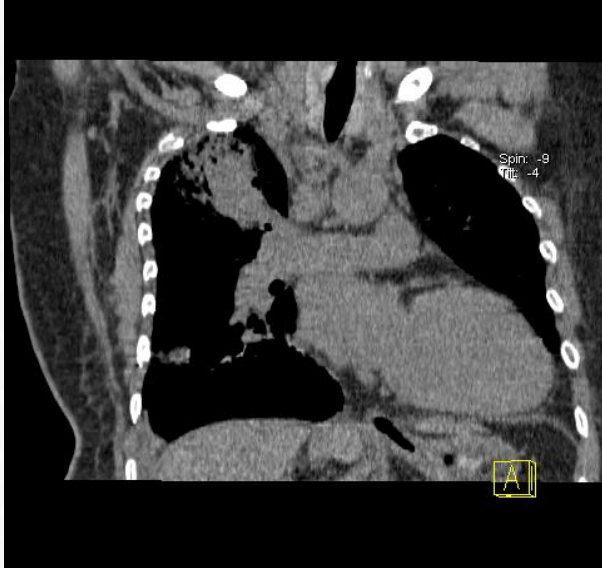


# Cryosurgery

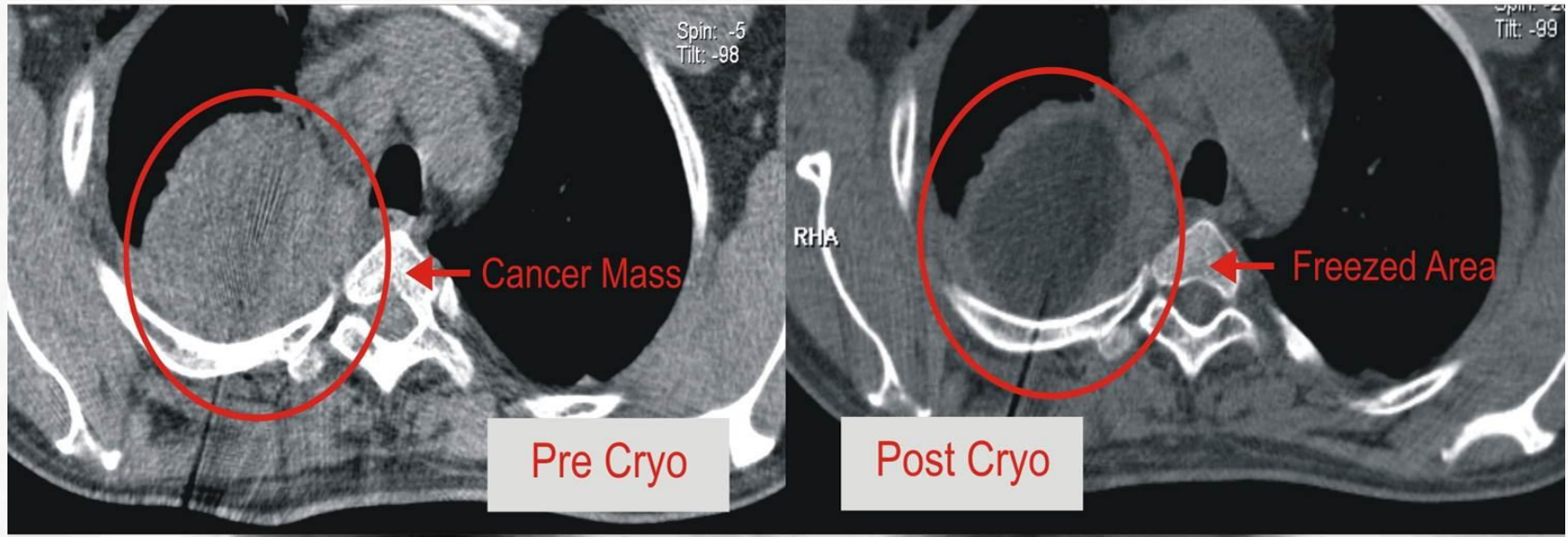
- Selected target organ
- Improve Quality of Life



# Cryosurgery Doc.



# Cryosurgery Doc.



# Quality of Life

	Pre treatment	During treatment
Anxiety	Severe	Improve
Treatment Expectation	Severe	Improve
Appetite	Decrease	Improve
Sleeping disorder	Severe	Less



# Cryosurgery

- Support main stream treatment
- Immune **“SENSITIZER”**



# Advantages of Cryosurgery

## Increase cancer destruction of chemotherapy

Wen J, Duan Y, Zou Y, Nie Z, Feng H, Lugnani F, Baust JG. 2007.

### **Cryoablation induces necrosis and apoptosis in lung adenocarcinoma in mice.**

Department of Surgical Oncology, Navy General Hospital, Beijing, China. Technol Cancer Res Treat. Dec;6(6):635-40.



**Weekly Chemotherapy:  
Minimal side effect**

# Advantages of Cryosurgery

Local treatment & induce systemic effect → **Immune sensitizer**

Sabel MS, Arora A, Su G, Chang AE. 2006.

**Adoptive immunotherapy of breast cancer with lymph node cells primed by cryoablation of the primary tumor.**

Department of Surgery, University of Michigan, Division of Surgical Oncology, USA. Cryobiology. Dec;53(3):360-6.



**Cryosurgery has loco-regional & systemic effect**

# Cryosurgery as *immunesensitizer*

Cancer Immunol Immunother  
DOI 10.1007/s00262-016-1858-x



ORIGINAL ARTICLE

## Optimized magnitude of cryosurgery facilitating anti-tumor immunoreaction in a mouse model of Lewis lung cancer

Yusuke Takahashi<sup>1</sup> · Yotaro Izumi<sup>2</sup> · Noriyuki Matsutani<sup>1</sup> · Hitoshi Dejima<sup>1</sup> · Takashi Nakayama<sup>1</sup> · Ryo Okamura<sup>1</sup> · Hirofumi Uehara<sup>1</sup> · Masafumi Kawamura<sup>1</sup>

Received: 24 September 2015 / Accepted: 10 June 2016  
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### Abstract

**Background** Cryosurgery has reemerged as a less invasive local treatment with possible immune-regulatory effects. However, the optimal magnitude of cryosurgery for achieving immune-regulatory responses at abscopal tumor sites remains unclear. We aimed to investigate appropriate magnitude of cryosurgery for this goal using a mouse model.

**Methods** C57BL/6J mice were inoculated with Lewis

fluid in Cryosurgery ×2 + LPS group were significantly increased compared with the other groups.

**Conclusions** This study suggested that achievement of approximately 73 % damaged area in the cryoablated tumor by two cycles of cryosurgery generates the most favorable immune-regulatory response for abscopal tumors via activation of anti-tumor immune cells as well as increased secretion of proinflammatory cytokines.

Evaluate of CD4, CD8, IL-1, IL-2, IL-6, IL-12, IFN gamma, & TNF alfa

# Complications are

- Nosocomial & surgical site infection
- Pain (minimal)
- **Pneumothorax**
- **Hemothorax**
- **Hemoptysis**
- Dysrhythmia
- **Cryo shock syndrome**

**Attenzione !!**  
**Double set up**



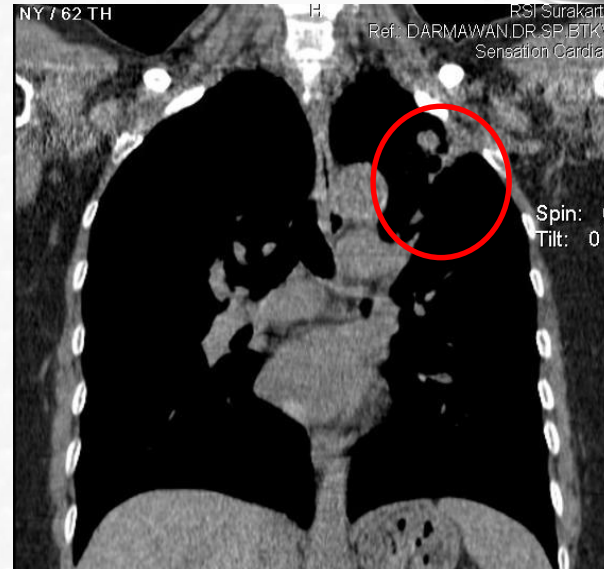
# Post Cryo Evaluation

- Clinical finding
  - Complains
  - Physiological state
  - Psychological state
- Tumor markers
- CT Scan
- PET Scan → important



Quality of Life  
Survival Rate

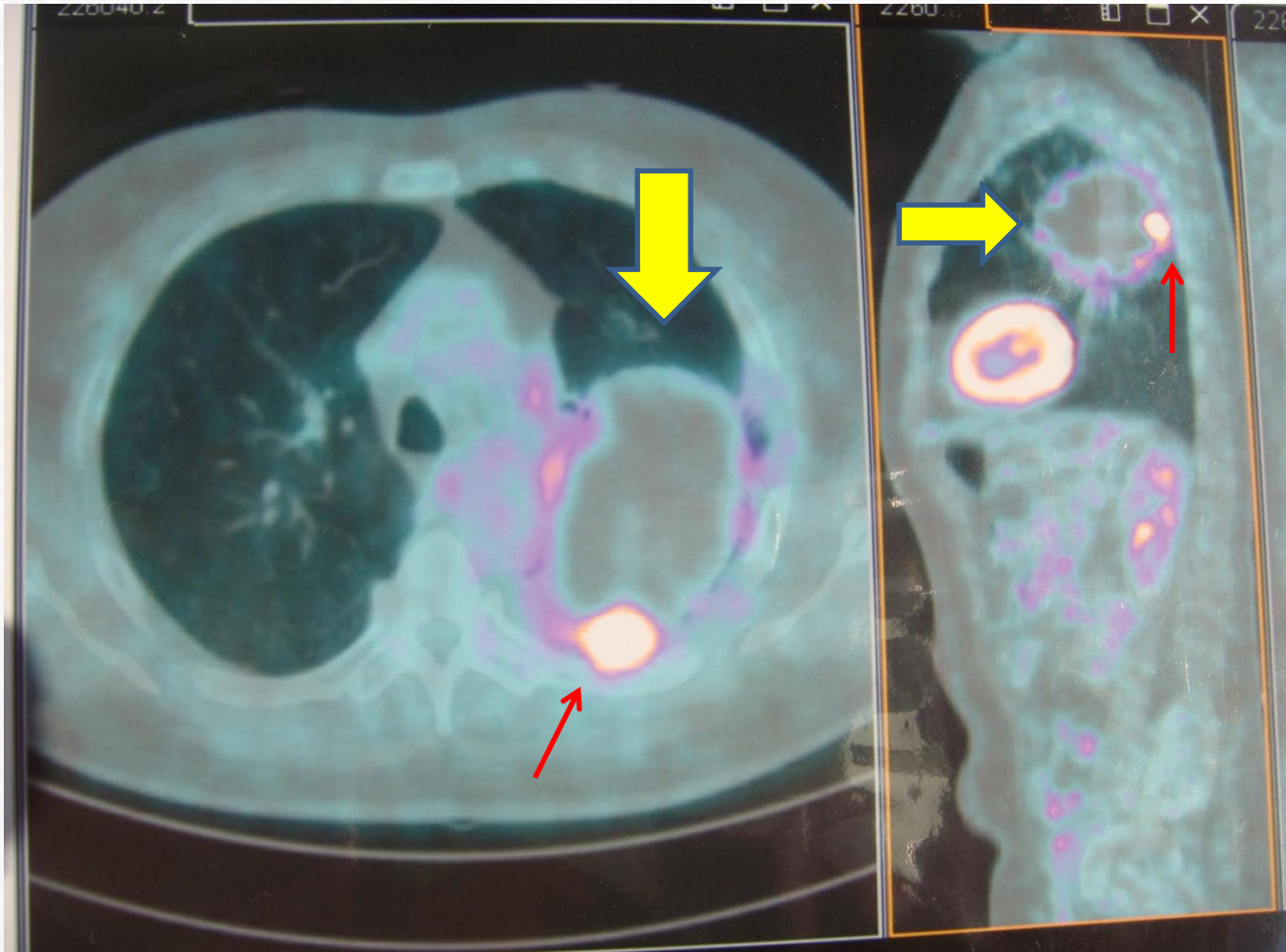
# Cryosurgery Doc.



9 month  
evaluatio

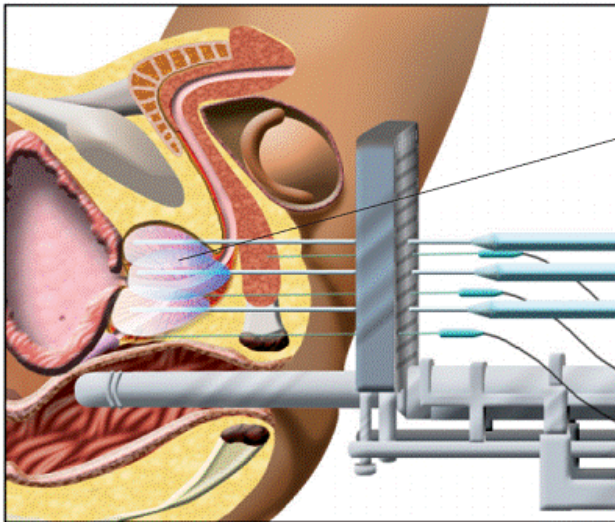
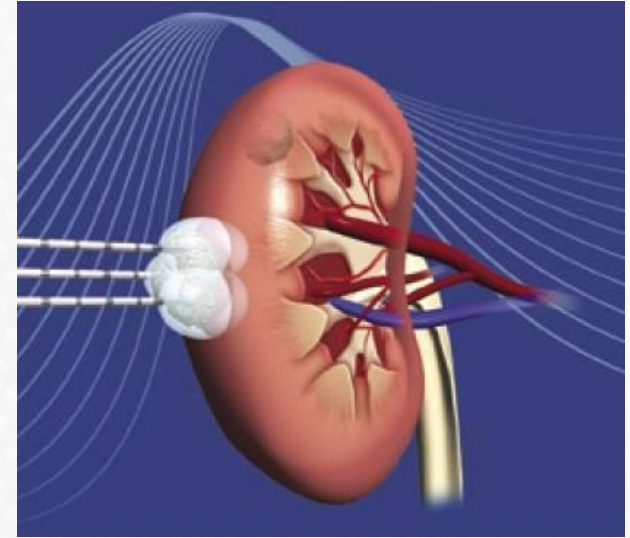
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# PET Scan result





# Apply of Cryosurgery

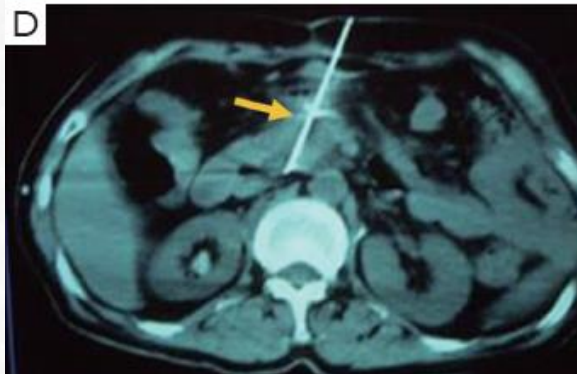
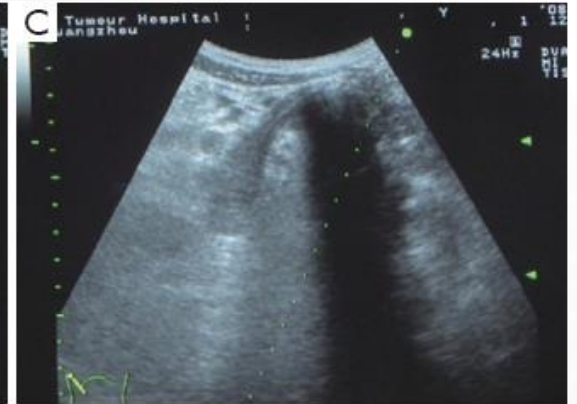


Ice ball  
developing in  
prostate gland

**Cryosurgical  
technique.  
2: Destruction  
of prostate  
tissue by ice  
formation.**



# Apply of Cryosurgery



# CONCLUSION

- **ADVANCED CASES OF LUNG CANCER -- HUGE NUMBER**
- **CRYOSURGERY SHOULD BE**
  - **LEARNED**
  - **PROMOTED**
  - **APPLIED TO SELECTED PATIENTS**
- **CRYOSURGERY** COULD BE CONSIDERED AS A PART OF THE MAINSTREAM TREATMENT **OF** **ADVANCED CANCER CASES**



**THANK YOU**