

# Retrieval of a “MONSTER ” Device in the Left Atrium

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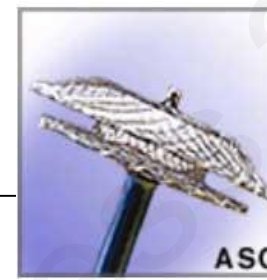
# Declaration of Interest

- I have **Nothing to disclose** concerning this presentation

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# Case History



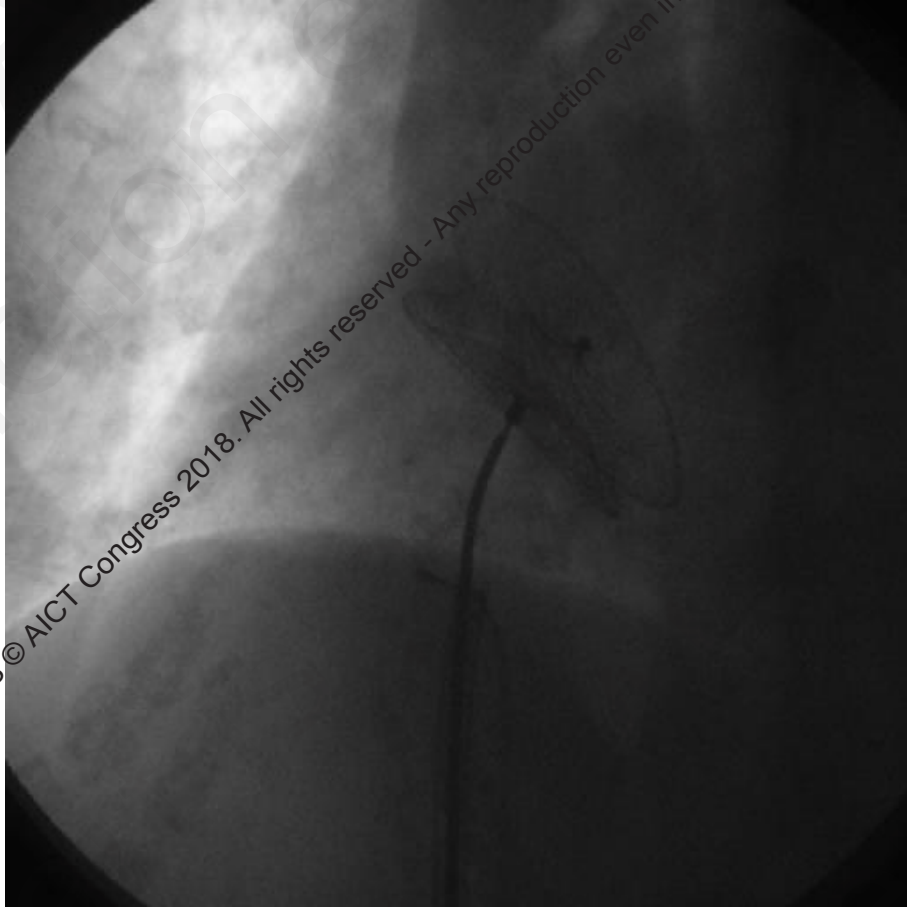
- A 22 year old lady, with large 3.6 cm ASD, huge RA / LA ; RV volume overload
- Slight deficient retro-aortic rim
- Adequate rims for other sides
- Qp:Os = 6.5 to 1 , mild PHT
- Patient prefer Percutaneous Closure
- Technically FEASIBLE though very CHALLENGING
- Successfully implanted with a 40 mm ASO  
( Amplatzer Septal Occluder )
- Under Intracardiac Echocardiography ( ICE ) Guidance in LA

Done in 2006

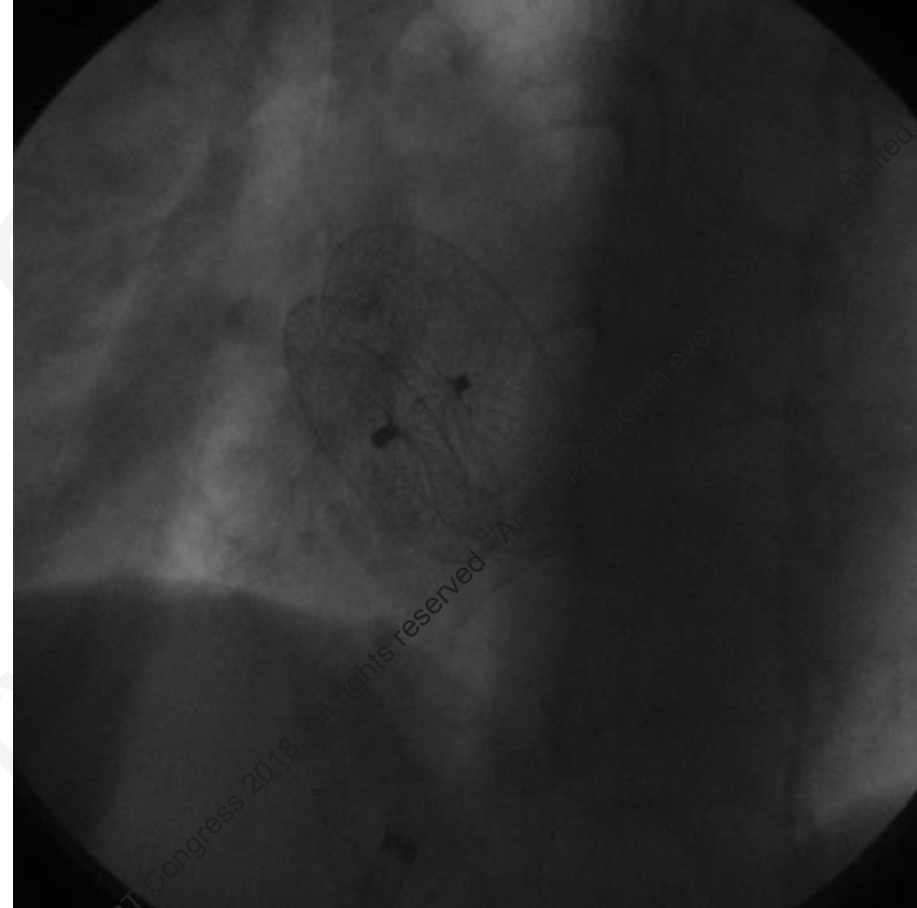
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# ASO Procedure

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Wriggling Maneuver -  
**Stable** position



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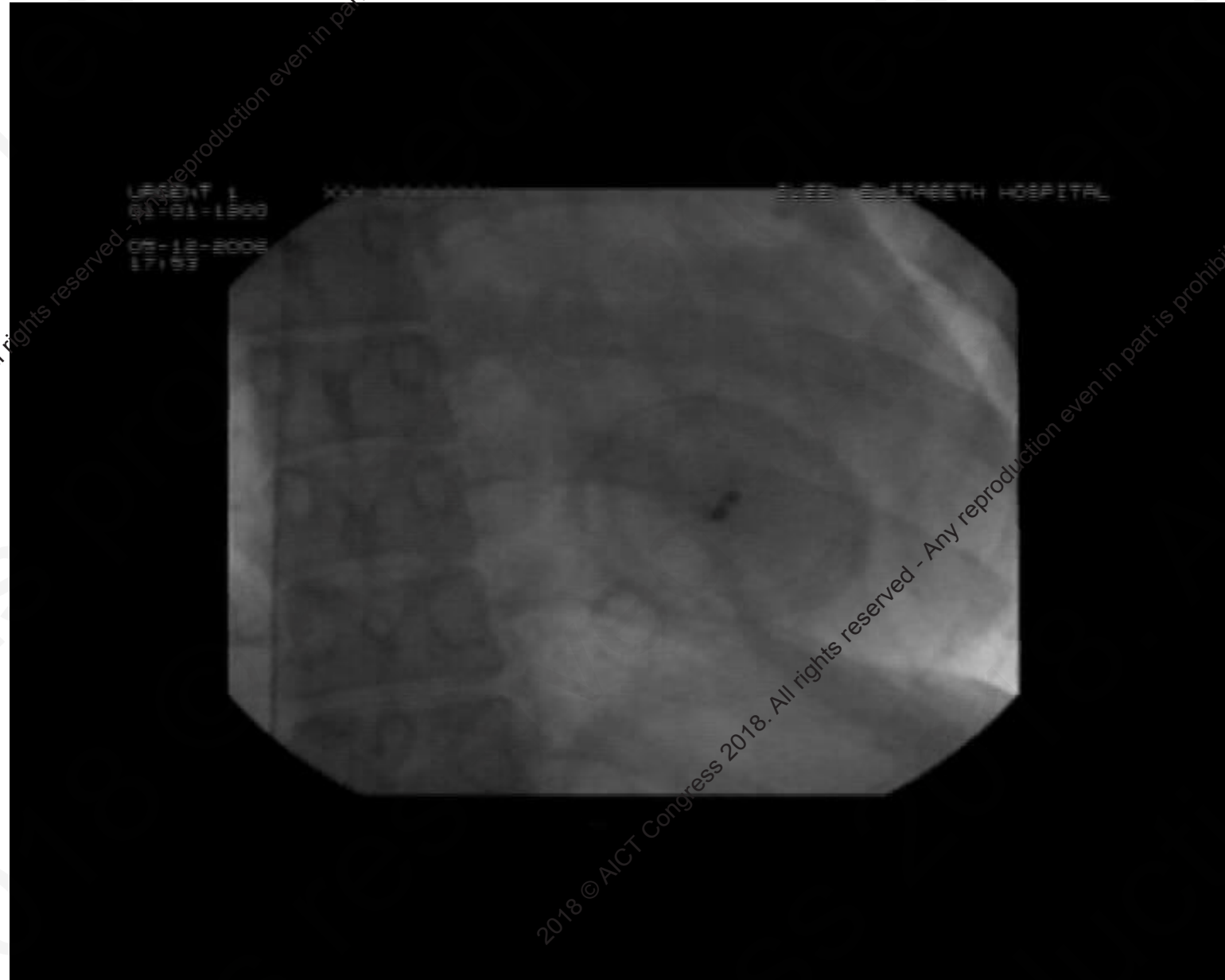
# Case - Progress

- Monitored in CCU
- On Aspirin and Plavix ( DAPT )
- Presented with **Non-sustained VT**  
3+ hours post procedure
- Hemodynamically still stable
- Urgent bedside Echocardiography :
  - ASO Not seen in RA / LA ??
  - FB seen in RV body
  - No pericardial effusion
  - NO inflow or outflow obstruction **YET**

# What to Do Next ?

- 1/ Call surgeons urgently for emergency open heart surgery
- 2/ Try to “ get ” that **HUGE** 40 mm ASO out from the heart Percutaneously ?
- 3/ Keep closely observe in CCU and surgery only when deteriorate
- 4/ Give Amiodarone for non-sustained VT and elective surgery later

# Dislodged 40mm device in RV !!



# Management

- Consult surgeons for opinion
- Can we take the “ **HUGE** ” dislodged device out **SAFELY** and **TIMELY** by percutaneous means ?
- Concern for Surgical approach :
  - Emergency Setting
  - Psychologically unprepared for patients and relatives
  - Bleeding Cxs ( on Aspirin + Plavix )
  - Higher operative mortality



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??????



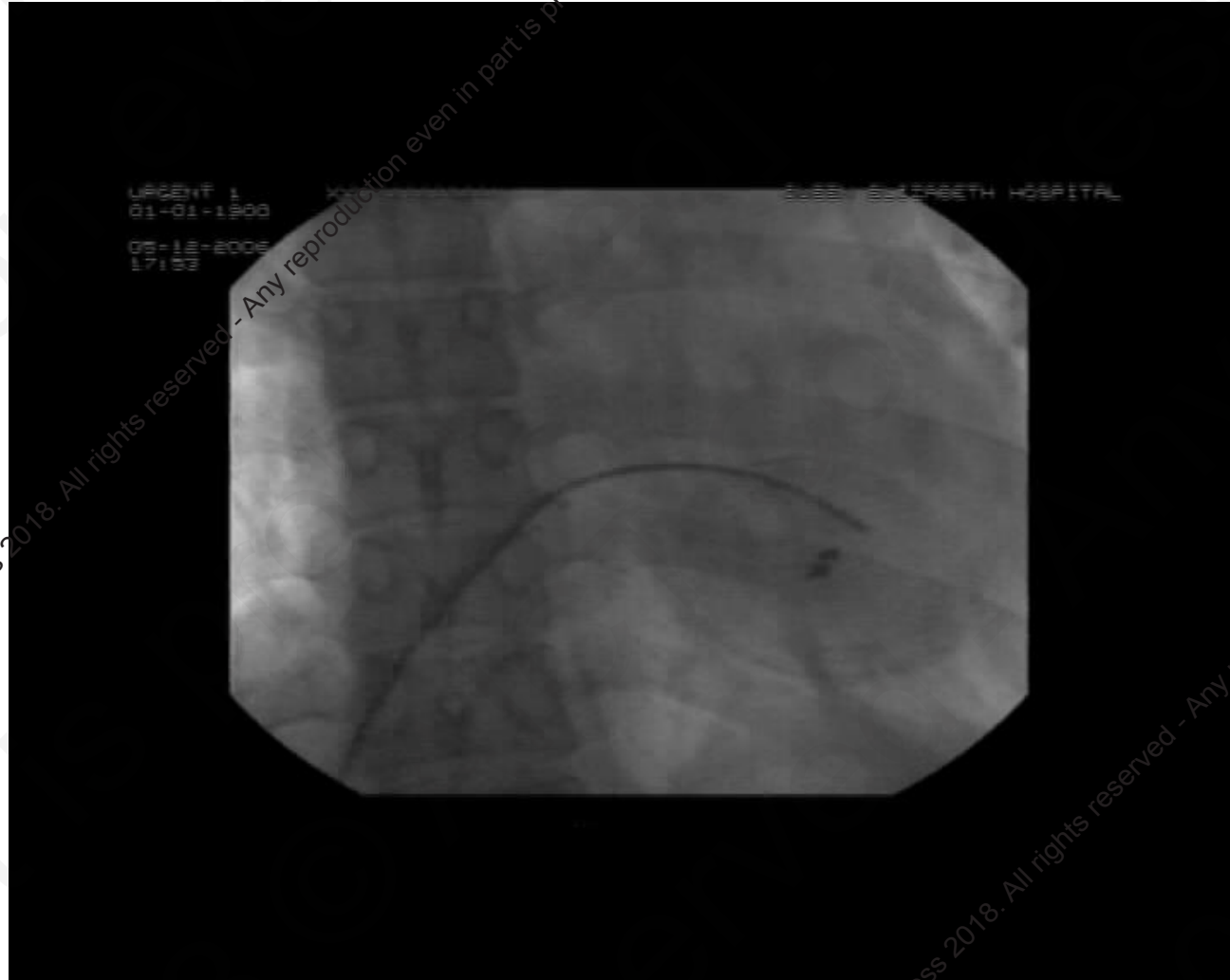
How TO "GET OUT" from  
the Heart ????

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# Strategy

- Patient **Safety** is the first concern
- Prevent arrhythmia / perforation / catastrophe
- Prevent further shifting position of the device to occlude the inflow /outflow tract -> **Device STABILIZATION**
- Must reduce the size of the **HUGE** device **FIRST** before taking out from the body
- Need a **Strong** retrieving device to **CATCH** the very bulky ASO
- **Rescue Package** ready (RBC ; Pericardiocentesis set ; IABP; portable CPS and surgeons standby etc )

# Procedure



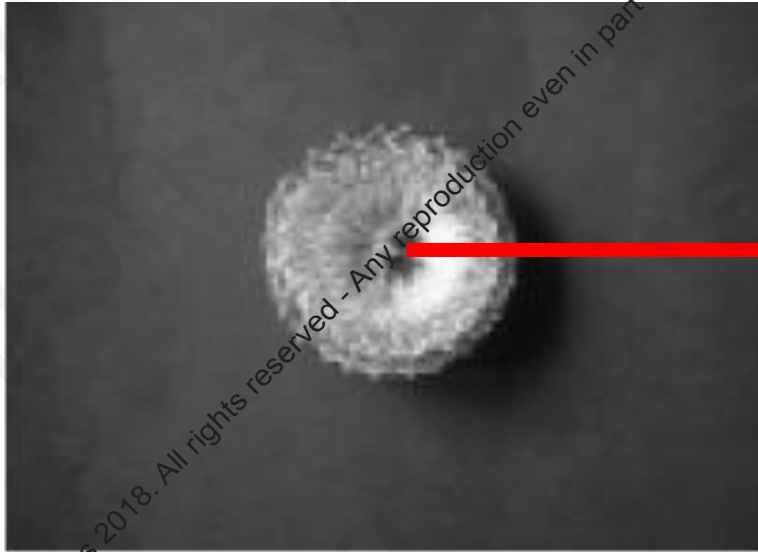
**14 F**  
**long**  
**sheath** via  
RFV to RA

- A Long Biopsy Forcep to **FIX & STABILIZE** the ASO In Place FIRST

**AIM :** Prevent shifting of position of the device  
and Reduce VT / SUDDEN occlusion the inflow / outflow tract

# Amplatzer Septal Occluder

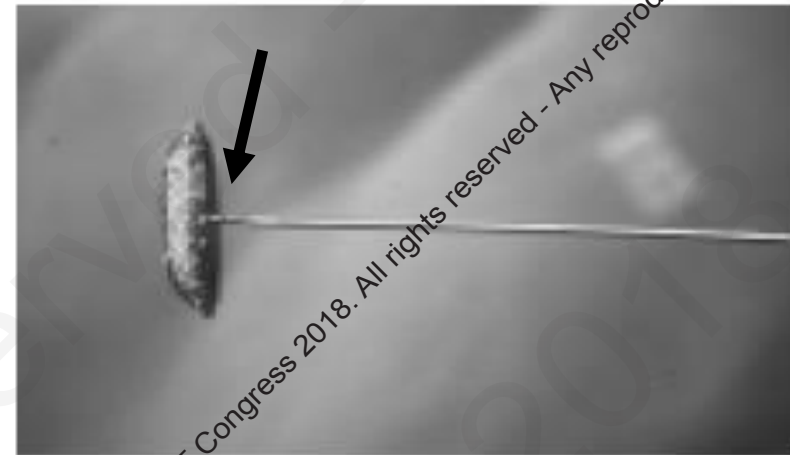
**UNDERSTAND the STRUCTURE WELL !!**



(b) Frontal view of the occluder.

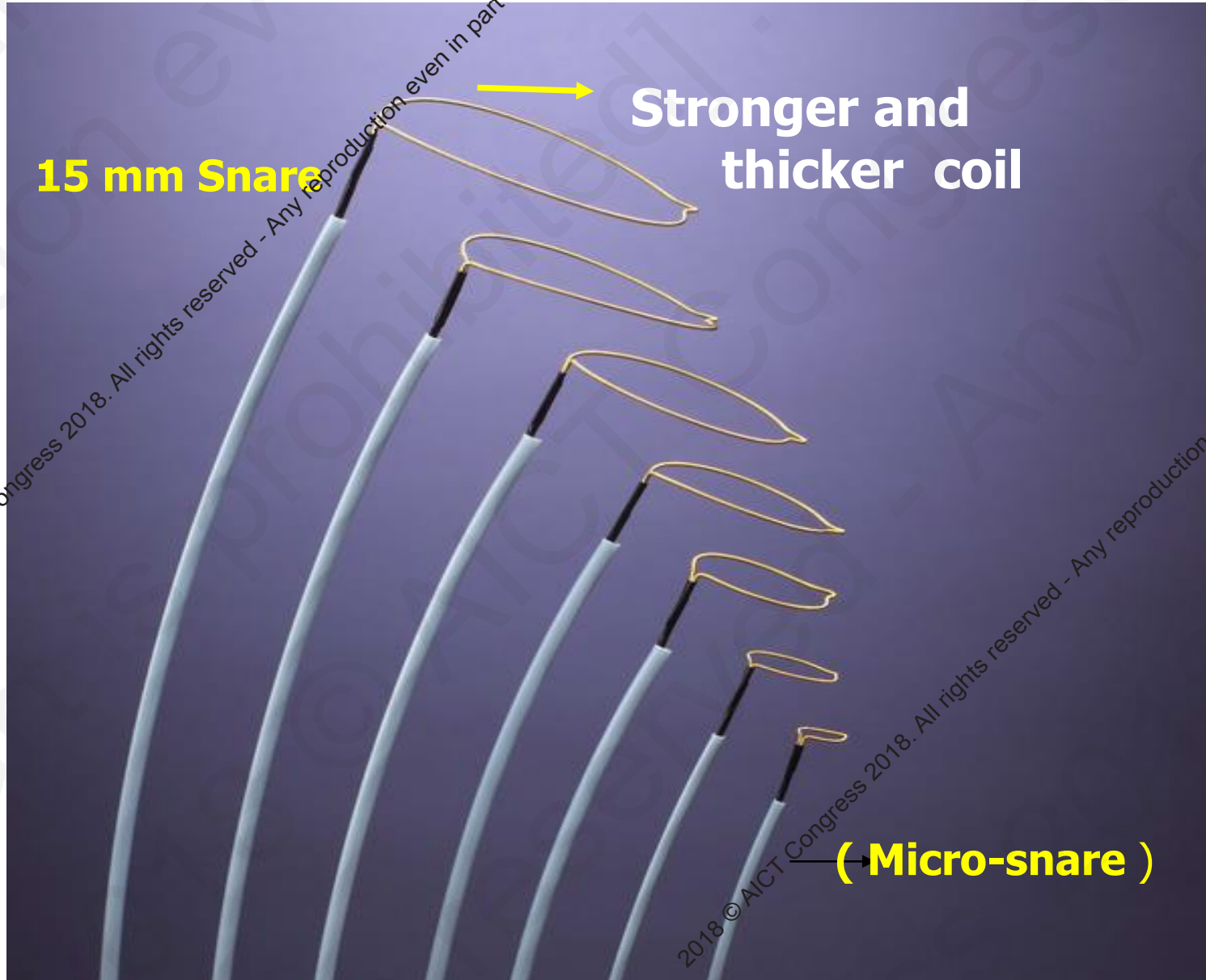
Connecting Hub for Delivery cable

- The TARGET Catching point by the Snare

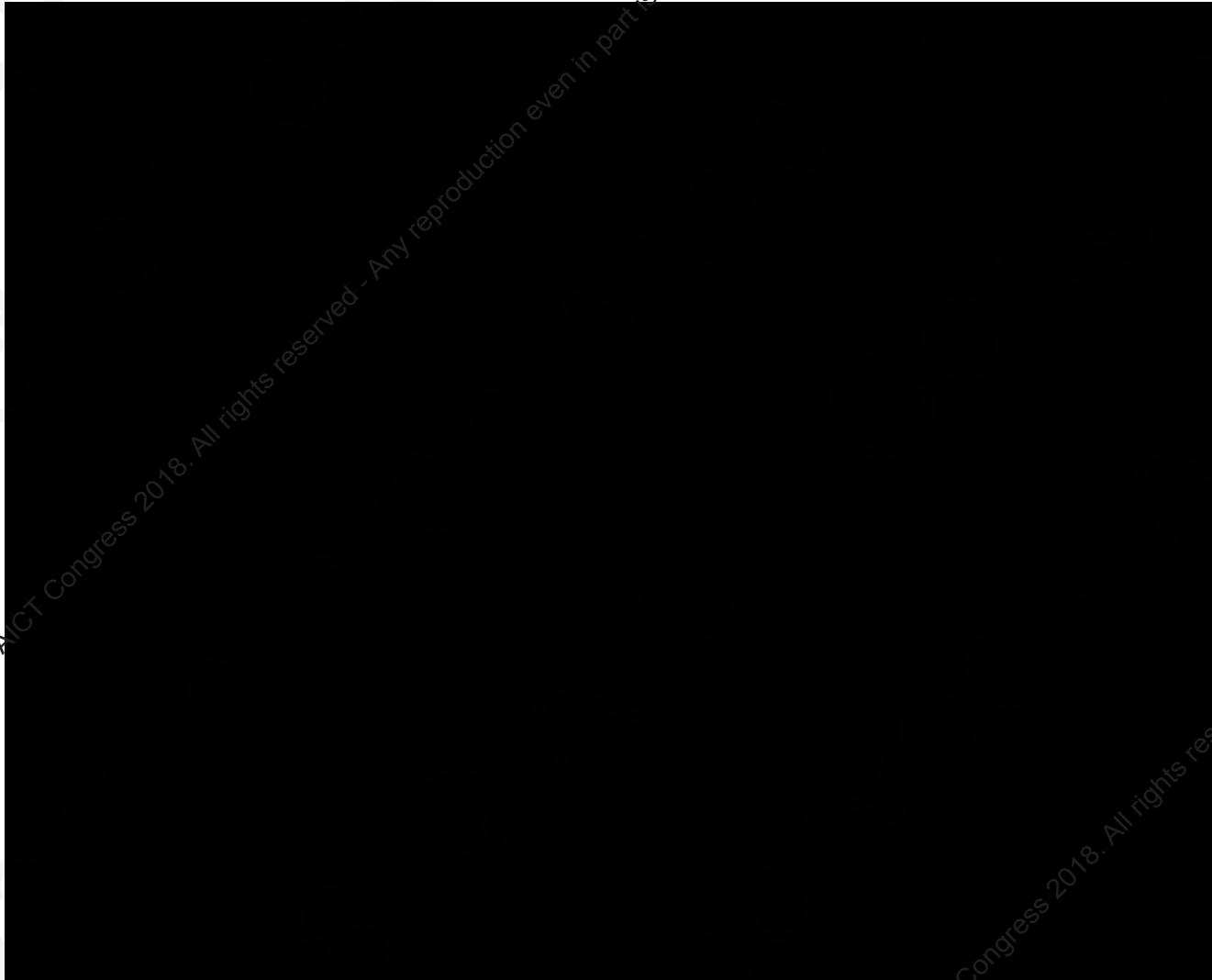


(c) Side-view of the occluder screwed onto a delivery cable.

# The Goose Neck Snare Family

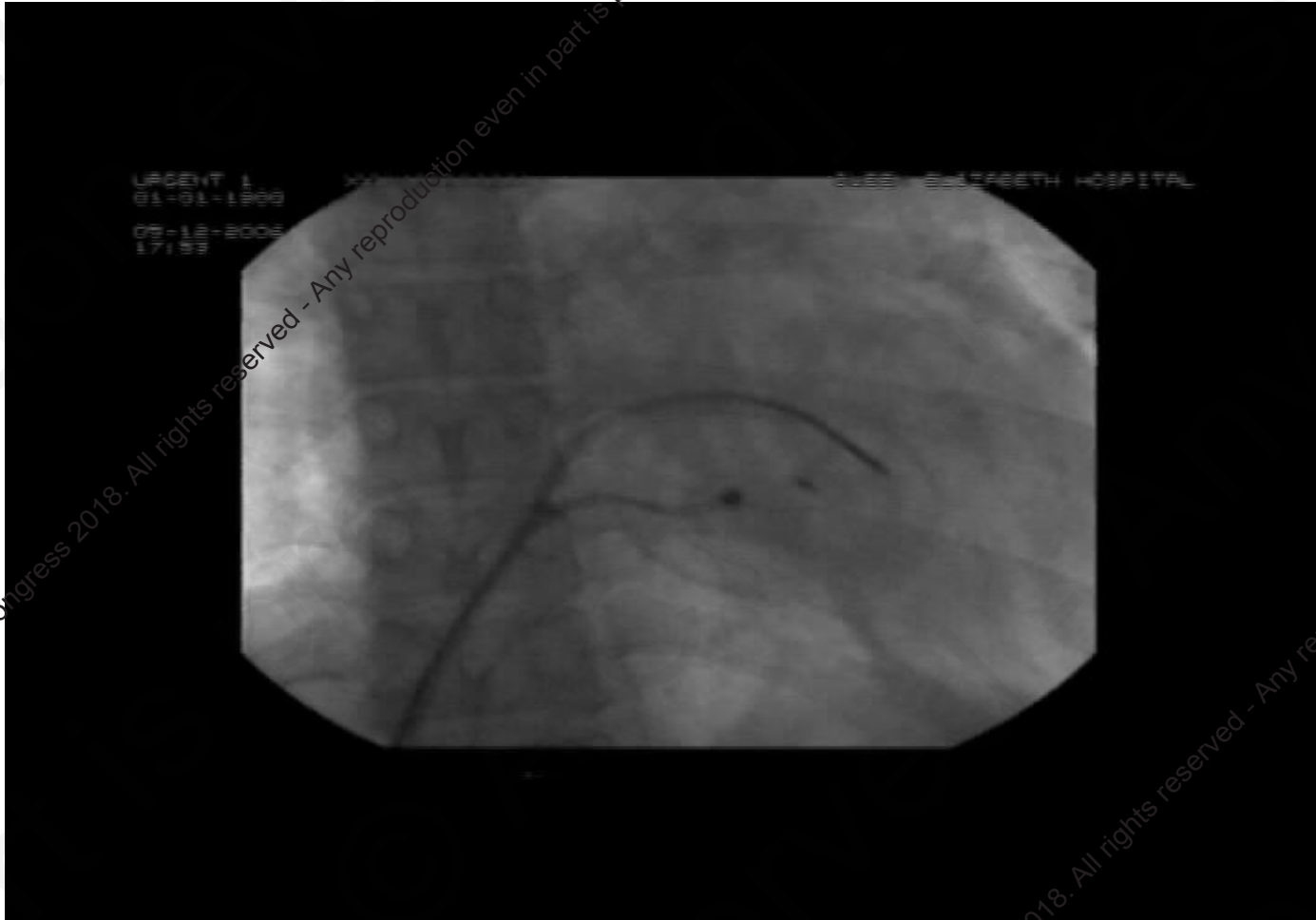


# The Cowboy Technique



After stabilization with the forcep,  
the **Screw** of ASO was caught by a **15 mm Gooseneck Snare**

## Gently Pull the device back to RA

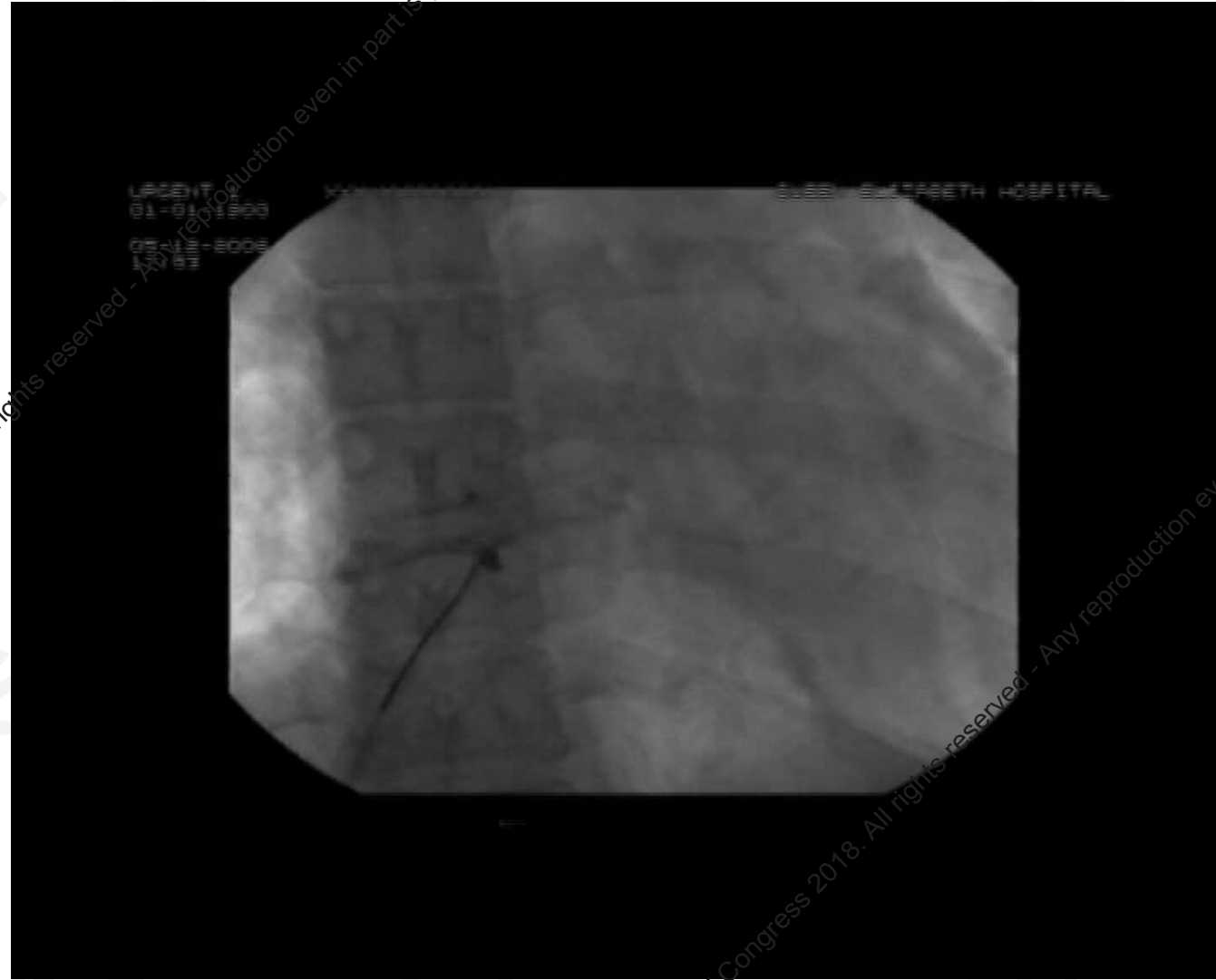


Still  
very  
frequent  
Non-sustained  
VT

The Hub was caught and then secured by the snare by clockwise rotation few X

So; the ASO was pulled back very gently to right atrium, to avoid further arrhythmia / obstruction

# Finally.....



Multiple manipulation to **Align** the screw with the long sheath,  
then ASO retrieved out via the delivery sheath



# OUTCOME

- Echo – NO perforation / Valve damage
- No More VT
- Home 2 days later
- Elective ASD Closure done few weeks later
- Recovered uneventfully

# Lessons to learn

- Extreme Caution in closing Large ASD with Device
- Delayed dislodgement may occur
- Close monitor in CCU is needed
- Treatment plan for device Dislodgement /Embolization should be available
- Percutaneous route for retrieval of **HUGE** ASO device is feasible with appropriate equipments ( complete set of snares; biopsy forcep; large long sheath , Rescue package etc );  
? cowboy- interventionalist and great surgeons
- Surgeons Backup is Mandatory

## Retrieval of an Embolized Amplatzer Septal Occluder

Kam Tim Chan,\* MBBS, MRCP and Boron Cheung Wah Cheng, MBBS, MRCP

Percutaneous closure of secundum atrial septal defect (ASD) by various devices has been proven to be an effective and safe treatment modality for patients with congenital heart diseases. However, we have to be aware of the potential early and late complications like device embolization and formulate plan for rescue procedures. We have reported a case of successful closure of a large secundum ASD in a 23-year-old woman by a 40 mm Amplatzer septal occluder (ASO), which embolized into the right ventricle 4 hr after the procedure. This had caused palpitation and nonsustained ventricular tachycardia. Patient safety was our most important concern and after discussion with the cardiac surgeons and the patient, we would like to make a percutaneous stepwise attempt for retrieval. We first applied an endocardial biopsy forcep to grasp the disk of the ASO to fix and stabilize the dislodged device. This would prevent the device from obstructing the inflow and outflow tract and causing catastrophic consequences. Then, a 15-mm Amplatz gooseneck snare was used to catch exactly at the connecting hub of the ASO disk, and the whole apparatus could then be cautiously and safely retrieved out from her body without complications. This had saved her from an unplanned emergency open heart operation that carried significant bleeding complication. © 2009 Wiley-Liss, Inc.

**Key words:** device embolization; percutaneous; forcep; snare

### INTRODUCTION

The advent of percutaneous occlusion techniques have enabled the successful closure of many large size atrial septal defects (ASD). We report a case of successful deployment of a 40-mm Amplatzer septal occluder (ASO), which unfortunately dislodged and embolized to the right ventricle (RV) a few hours after

### PROCEDURE

The patient was pretreated with aspirin 160 mg and clopidogrel 300 mg orally, as loading dose. Right femoral vein approach was used and a 40 mm ASO (AGA Medical Corporation, USA) was successfully deployed under intracardiac echocardiography (ICE) guidance. The wriggling maneuver had showed that the device

# Multicentre Non-randomized Pivotal trial - AGA Medical Ltd.

<b>Major Adverse Events</b>	<b>Amplatzer pats</b>	<b>Surgery pats</b>	<b>p</b>
Cardiac arrhythmia require major treatment	2/442 ( 0.5% )	0/ 154 ( 0% )	1.00
Device embolization w surgery removal	3/ 442 ( 0.7% )	0/ 154 ( 0% )	0.57
Device embolization w percutaneous removal	1/ 442 ( 0.2% )	0/ 154 ( 0% )	1.00
Delivery system failure	1/ 442 ( 0.2% )	0/ 154 ( 0% )	1.00
Pericardial effusion w tamponade	0/ 442 ( 0 % )	3 / 154 ( 1.9%)	0.017
Pulmonary odema	0/ 442 ( 0 % )	1/ 154 ( 0.6% )	0.26
Repeat surgery	0/ 442 ( 0 % )	2/ 154 ( 1.3% )	0.066
Surgical wound adverse events	0/ 442 ( 0 % )	2/ 154 ( 1.3% )	0.066
<b>Total Major adverse events ( patients )</b>	<b>7/ 442 ( 1.6% )</b>	<b>9/154 (5.2%)</b>	<b>0.03</b>

- Migration of ASO is rare but can be life-threatening complication
- ASO dislocation and surgical reintervention are currently reported in 1.0% to 1.9%
- Common sites of dislocation : LA in 24.6%, aorta in 18.4%, and RV in 16.7% (\*)
- Risk factors : Large Defect; undersize device; inadequate rims; Excessive tension on delivery cable
- **Rescue operation** after failure of trans-catheter ASD closure : reported to associate with a sobering 20-fold higher mortality than an elective ASD operation (\*)

(\*) DiBardino, D.J. et al. Analysis of the US FDA Manufacturer and User Facility Device Experience database for adverse events involving Amplatzer septal occluder devices and comparison with the Society of Thoracic Surgery congenital cardiac surgery database. J Thorac Cardiovasc Surg. 2009; 137: 1334–1341

# Other Reported Rare Complications

- Delayed cardiac perforation
- Atrial wall erosion
- Aorto- RA or LA fistula
- Delayed Valvular perforation causing severe regurgitation due to ASO

NB. ( CAUTION in MVP patients with Severe cusp prolapse )

Thank you very much

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# Percutaneous Closure of ASD -Complications

## Closure of Atrial Septal Defect With the Amplatzer Septal Occluder in Adults

Nicolas Majunke, Jacek Bialkowski, Neil Wilson, Malgorzata Szkutnik, Jacek Kusa, Andreas Baranowski, Corinna Heinisch, Stefan Ostermayer, Nina Wunderlich, Horst Sievert (The American journal of Cardiology 2009; 103; 4; 550- 554 )

650 Adults w Amplatzer Septal Occluder – Procedural success rate = 98%

### Complications:

During the procedure →

:Device embolization (2 patients; 0.3%)

:Transient ST depression (1 patient; 0.2%)

Immediately after the procedure and during follow-up →

:New-onset AF (28 patients; 4.3%)

( Electrical cardioversion was successfully in most )

Complications requiring Emergency or Elective surgery -->

( 6 patients ,0.9% )\_

Hemopericardium

( 2 patients, 0.3% )

Device embolization

( 3 patients, 0.5% )

Pericardial tamponade

( 1 patient, 0.2% )

Serious complications were RARE

14<sup>th</sup>

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