Retrieval of embolized devices

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Incidence of embolized devices

- A survey of AGA proctors carried out in 2003 revealed that there were 21 embolizations out of 3,824 ASO implants (0.55%).

- The incidence in every day practice varies in the literature from 1.5 – 5%

- Nevertheless it remains the most common device related adverse event in the **Manufacturer and User Facility Device Experience (MAUDE) data** issued by the FDA.

Causes of device embolization

1. Undersized device
2. Unsuitable anatomy such as Inadequate or floppy rims
3. Operator-related technical issues such as mal positioning of the device, excessive tension on delivery cable during deployment.
4. Malfunctioning device such as Fragmentation, dislodgment, fracture,....etc

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What about retrieval?

- In the survey conducted among AGA proctors, 15 of the embolized devices were retrieved using a trans-catheter approach (71.4%) and 6 were retrieved surgically (28.5%).

- On the other hand in the MAUDE database the device was retrieved surgically in 77.2% of cases and using a trans-catheter approach in 16.7% of cases. There were 2 deaths related to embolization.

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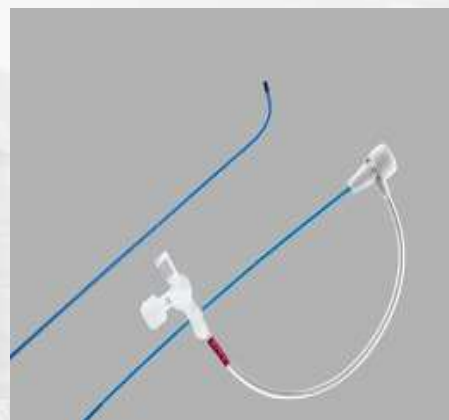**CardioEgypt 2018**   www.cardioegypt.com

Basic principles

- Prevention is better than cure
- Always be ready
- Know your device
- Safeguard the patient and the device
- Know when to stop
- Late embolization is not uncommon
- Embolization may be fatal so does retrieval
- Risk assessment algorithm

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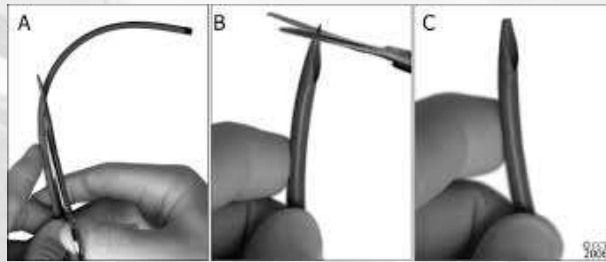CardioEgypt 2018
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Always be ready

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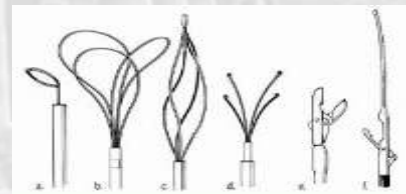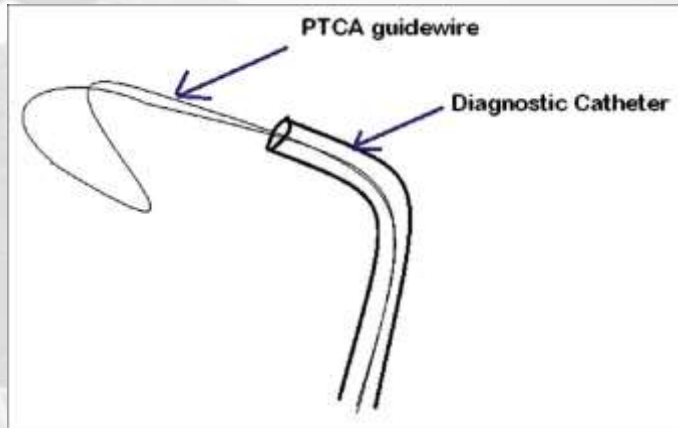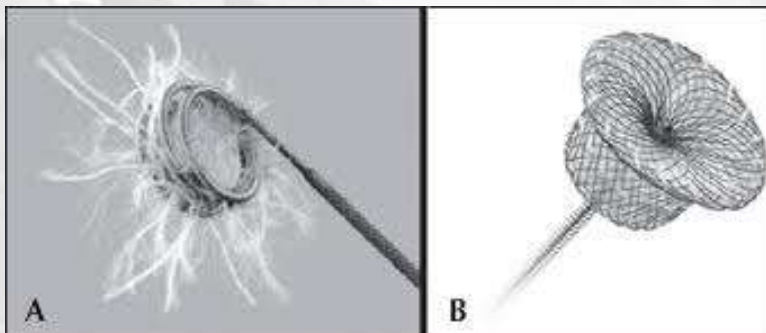CardioEgypt 2018
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Always be ready

Always be ready

Know your device

Know your device

Safe guard the patient and the device

Transcatheter Device Closure of Atrial Septal Defects

A Safety Review

John Moore, MD, MPH,* Sanjeet Hegde, MD,* Howaida El-Said, MD,*
Robert Beekman III, MD,† Lee Benson, MD,‡ Lisa Bergersen, MD, MPH,§
Ralf Holzer, MD, MSc,‖ Kathy Jenkins, MD, MPH,§ Richard Ringel, MD,¶
Jonathan Rome, MD,# Robert Vincent, MD,** Gerard Martin, MD,††
for the ACC IMPACT Steering Committee

After device embolization, the first objective is simply to get the device into a position in which it will not cause harm. The device may then be stabilized and moved or removed from the body.

Know when to stop

- The patient is vitally stable
- The device is not interfering with the circulation

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- There is high risk of injury of intra cardiac structures
- There is high incidence of device entrapment or major vascular complication with further retrieval of the device

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Late embolization is not uncommon

Silent Embolization of an Atrial Septal Defect Occluder Into the Right Ventricle Detected 20 Months Post-Implantation

Liang Tang, MD, Zhen-fei Fang, MD, Jian-jun Tang, MD, Xiang-qian Shen, MD, Xin-qun Hu, MD, and Sheng-hua Zhou, MD, PhD
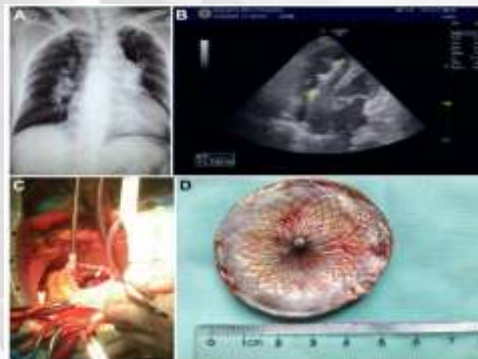
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Late embolization is not uncommon

8 Months post closure
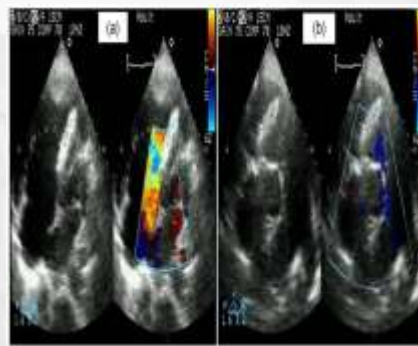
Accidentally discovered 7 Months post closure

Late embolization is not uncommon

74 years old patient whose previous follow up 3 months earlier was uneventful with history of ASD ADO 14 years ago

Presented with syncopal attack, recent onset rapid AF and RAD in the ECG

Embolization may be fatal so does retrieval

- Embolization interfering with flow or occluding a major vessel can be fatal perhaps in seconds as when a device occludes the RV inflow or the MPA

- Retrieval with possibility of major vessel dissection or perforation can lead to life threatening bleeding

- Retrieval with intra cardiac entrapment associated with major damage to the conduction system or the cardiac valves or resulting in cardiac perforation

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Risk assessment algorithm

What embolized?

Hard device or soft device

When it embolized?

Now, yesterday or I don't know

Where it embolized?

Intra cardiac or extra cardiac

Venous or arterial

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Risk assessment algorithm

How is the patient doing?

Vitally stable, neurologically stable & perfused

How it can be retrieved?

Percutaneous, surgical or hybrid

Who is going to retrieve it?

Me, the vascular surgeon or the cardiosurgeon

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Case 1

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Case 1

What embolized?	**Port-A- Cath**
When it embolized?	Weeks may be months
Where it embolized?	Hepatic vein-> IVC -> RA -> RV -> RVOT -> PA
How is the patient doing?	Stable
How it can be retrieved?	Percutaneous
Who is going to retrieve it?	Interventionalist

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Case 2

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Case 2

What embolized?	PDA-R
When it embolized?	IMMEDIATELY
Where it embolized?	PARTIALLY TO Aorta
How is the patient doing?	Stable
How it can be retrieved?	Percutaneous
Who is going to retrieve it?	Interventionalist

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Case 3

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Case 3

What embolized?	PDA-R
When it embolized?	1-24 hours
Where it embolized?	TO Aorta
How is the patient doing?	Stable
How it can be retrieved?	Percutaneous
Who is going to retrieve it?	Interventionalist

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Case 4

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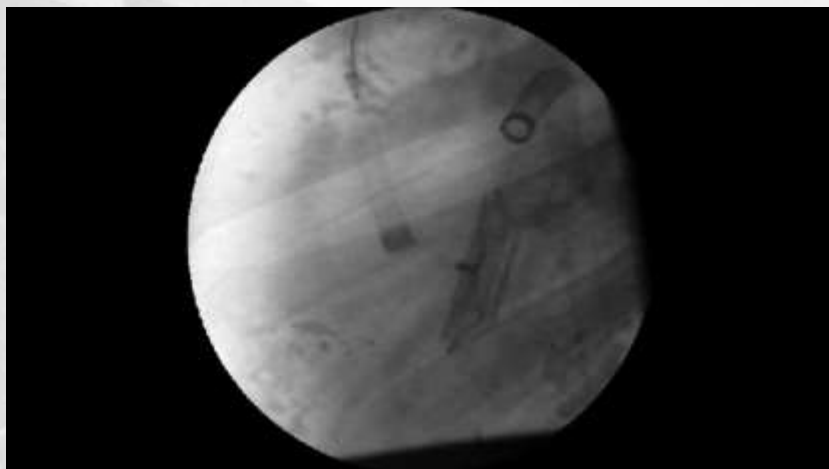CardioEgypt 2018
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Case 4

What embolized?	Amplatzer ASD ADO
When it embolized?	Immediately
Where it embolized?	Disengaged delivery in ULPV
How is the patient doing?	Stable
How it can be retrieved?	Percutaneous/surgical
Who is going to retrieve it?	Interventionalist/Vascular

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Case 5

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Case 5

What embolized?	Occluotec ASD ADO
When it embolized?	Immediately
Where it embolized?	Left ventricle
How is the patient doing?	Stable
How it can be retrieved?	Surgical
Who is going to retrieve it?	Cardiosurgery

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