

Cardiac Erosion

**Do We need to be restrictive in
our practice?**

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Preamble

- EROSION is a real problem
- Can have catastrophic consequences
- Needs to be sorted out
- Cases are too few
- Number of variables too many
- Our current understanding too inadequate

Do we need to be restrictive?

NO

Have we changed our practices?

- We have NOT
- Sizing the defect
 - Stop flow technique
 - TEE imaging
- Choosing the device:
 - 2-4 mm more than the balloon size
 - 25% more than the maximum diameter
- We are liberal in choosing the device

Have we changed our imaging practice?

- Define only 6 rims



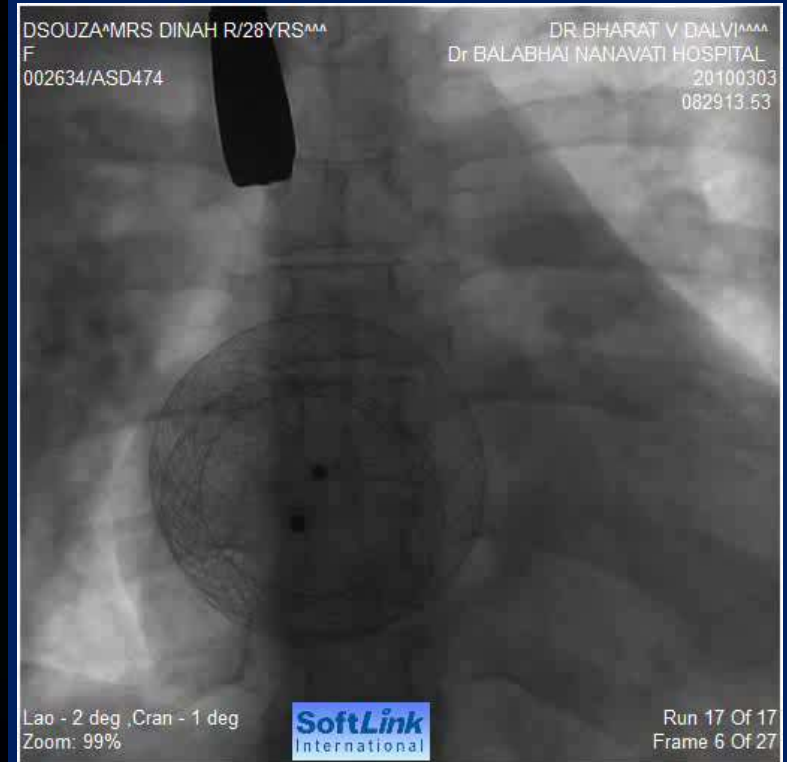
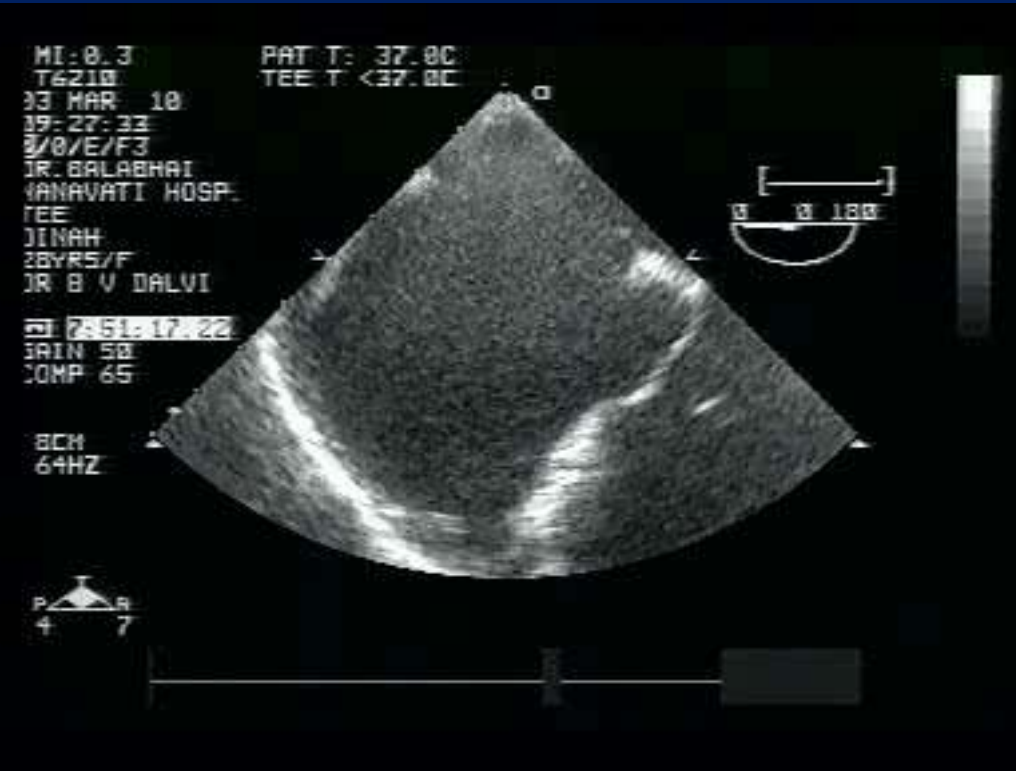
Have we been restrictive?

- We continue to close ASDs with absent/deficient aortic rim (90% of our patients)
- Large ASDs
- Large ASDs in small children
- Multiple ASDs
- Complex ASDs





Large ASDs in an Adult



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ADAK MALLIKA 1Y/F^{ASAAA}
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JAIN PRAGYAN 1Y/M^{ASAAA}
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Proponents of BAT

- Predictable Deployment
- 1-2 attempts to deploy
- “Soft” landing

“Soft Landing”



Should we be RESTRICTIVE?

- Where is the data?
- Where is the evidence?
- Why change?

2 Publications

- Amin et al: Erosion of ASO device after closure of secundum ASD: Review of registry of complications and recommendations to minimize future risks (Cathet Cardiovasc Interv 2004; 63:496-502)
- Divekar et al: Cardiac perforation after device closure of ASD with ASO (JACC 2005; 45:1213-1218)

What did they observe?

- All erosions occurred at the dome of the atria
- Deficient aortic rim was seen in 89%

What did they infer?

- Those with deficient aortic rim are prone to erosion

Why is this inference incorrect?

- There is no data on the aortic rim status in those who did not erode
- In last 6 months we did 80 ASDs of which 72 had deficient aortic rim (90%)
- Our Stroke unit
- 23/24 (96%) patients admitted with stroke were either bald/grey
- Baldness/grey is an incremental RF for Stroke

What did they observe?

- The device to unstretched ASD ratio was significantly larger in the event group when compared to FDA trial group

What did they infer?

- Over sized devices cause erosions
- One of the reasons for oversizing is the technique of estimating BSD

Why is this inference incorrect?

- Comparing real life data with a trial data :
Apples vs Oranges
- No data on device:unstretched ASD ratio from the same operators in whom there were no erosions.
- For all you know it might have been identical!!!

Another (bad) Attempt to nail “The Culprit”

- Amin Z. Echocardiographic predictors of cardiac erosion after Amplatzer Septal Occluder placement (Cathet Cardiovasc Interven 2014; 83:84-92)

Observations

- 3 patients device was oversized (Straddle)
- In the rest, all the rules set by Amin et al were followed
- Superior ASD
- Aortic rim deficiency at zero degrees
- Thin and friable posterior rim
- Malalignment of the atrial septum
- Tenting of TS

Inference

- “Predictors” of erosion
- Incremental risk factors
- No test of statistical significance
- Whether the occurrence of events is as a matter of chance?????

What did the other experts say?

- Erosion by the ASO: Experienced Operator Opinions at odds with Manufacturer recommendations? H El Said and John Moore Cathet Cardiovasc Interven 2009; 73:925-30
- CCISC survey
- Sizing practices were very different
- Over 70% preferred device straddling aorta

Data that we don't have

- About innumerable variables
- Atrial size, compliance, wall thickness
- Force of atrial contraction
- Force of ventricular contraction
- Aortic pulsatility
- Aortic wall characteristics
- Heart rate, rhythm
- Device-atrium interaction e.g Force/sq mm

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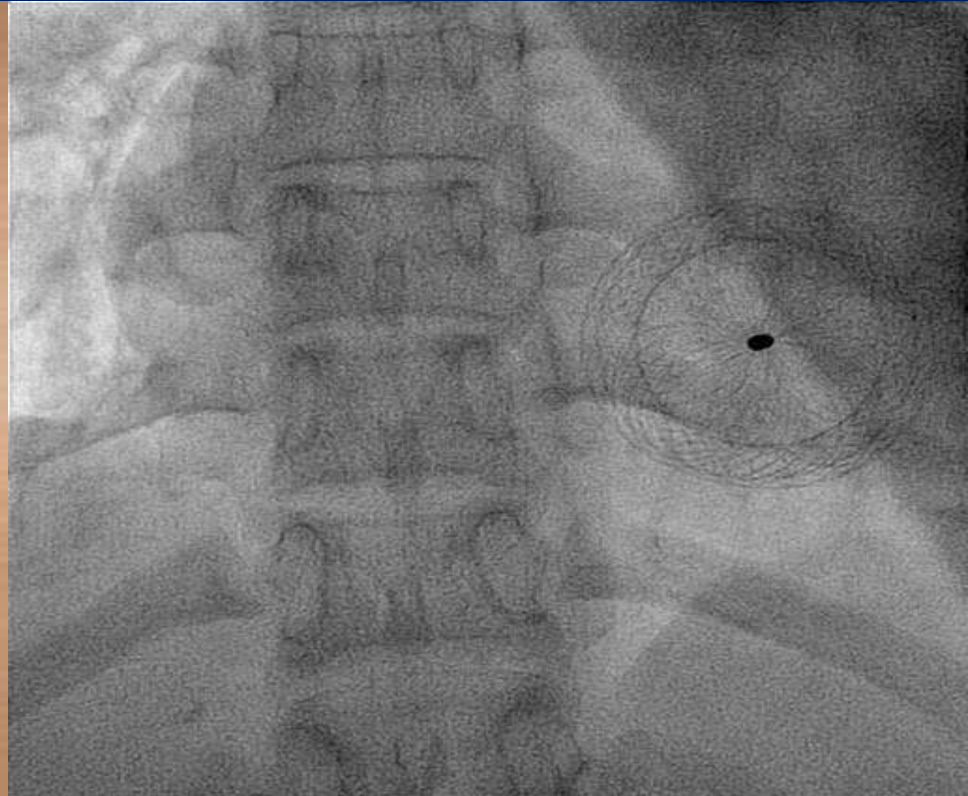
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Collateral damage



What is our take?

- No need to panic
- NEED TO BE CAREFUL – NOT to flout the basic principles of cardiac cath
- We do NOT understand the mechanism of erosion
- Need more data
- More insight into the mechanism
- NO NEED TO BE RESTRICTIVE