

Atrial Septum Tearing due to Balloon Sizing in ASD Device Implantation

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Disclosure

- ✦ There's no conflict of interest

Background

- ✦ Balloon sizing of ASD has been an established protocols
- ✦ Many centers are not using balloon sizing due to high successful rate
- ✦ Tearing atrial septum by balloon sizing has been reported

- ✦ We reported the case of intra atrial tearing by balloon sizing

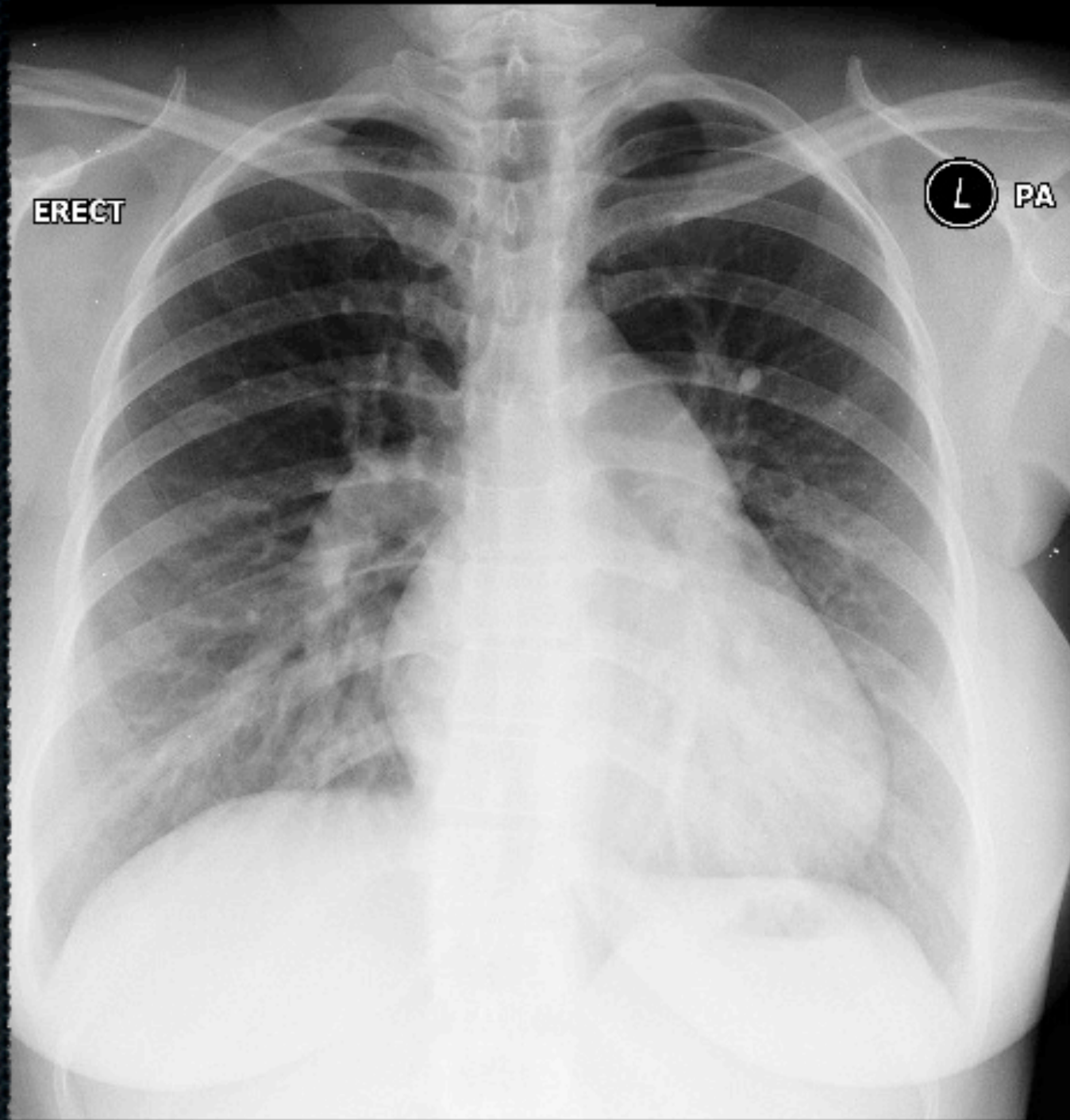
The Case

- ✦ Woman, 30 years old, come to NCCHK with chief complain intermittent shortness of breath
- ✦ DOE(-), PND(-), Orthopnea (-)
- ✦ RRTI (-). FD (-) cyanosis (-), spell (-), squatting (-)

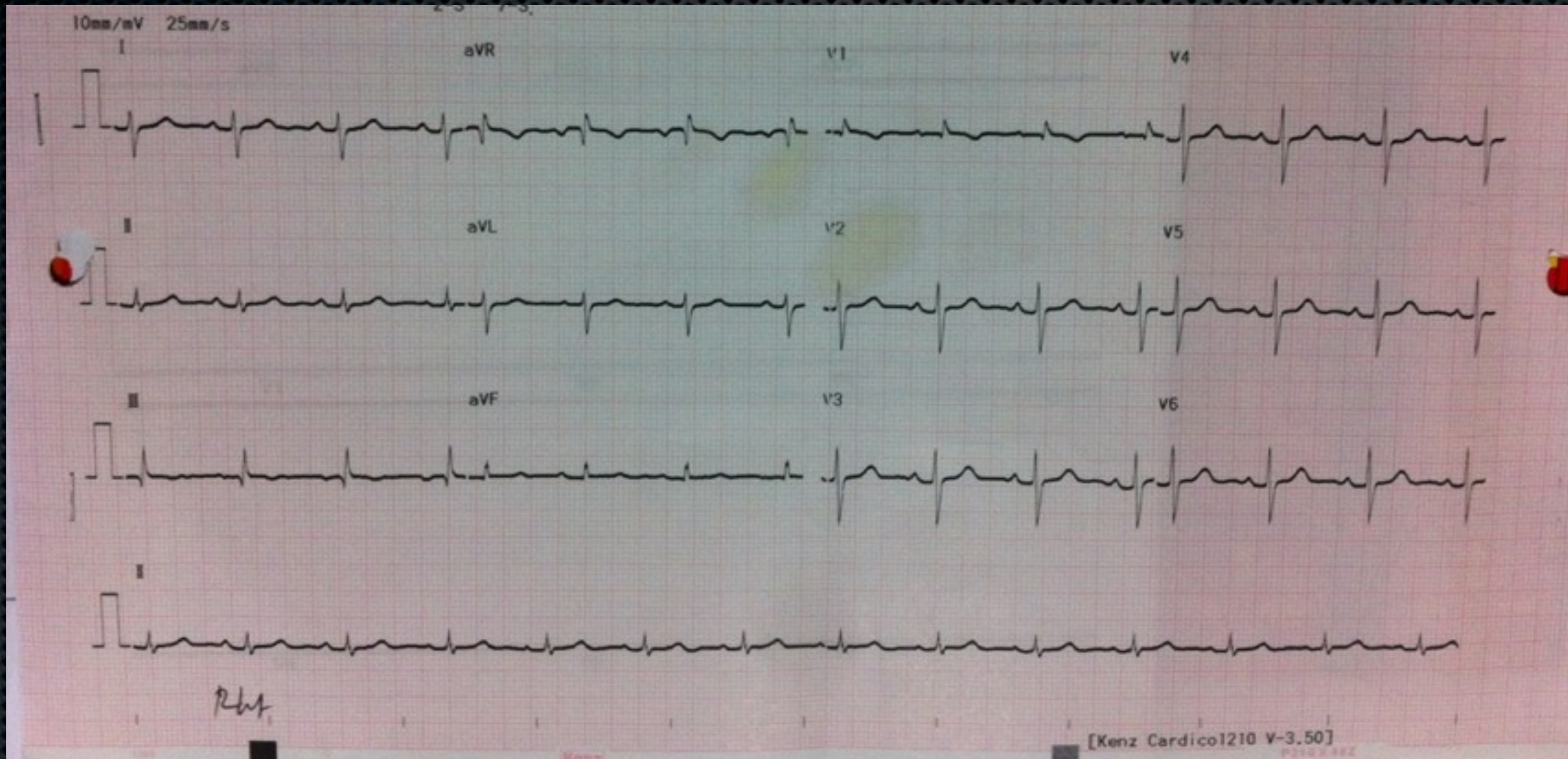
The Case

- The patient's hemodynamic is stable during the examination
- The physical examinations are normal except, there is wide fixed split in the second heart sound

CXR



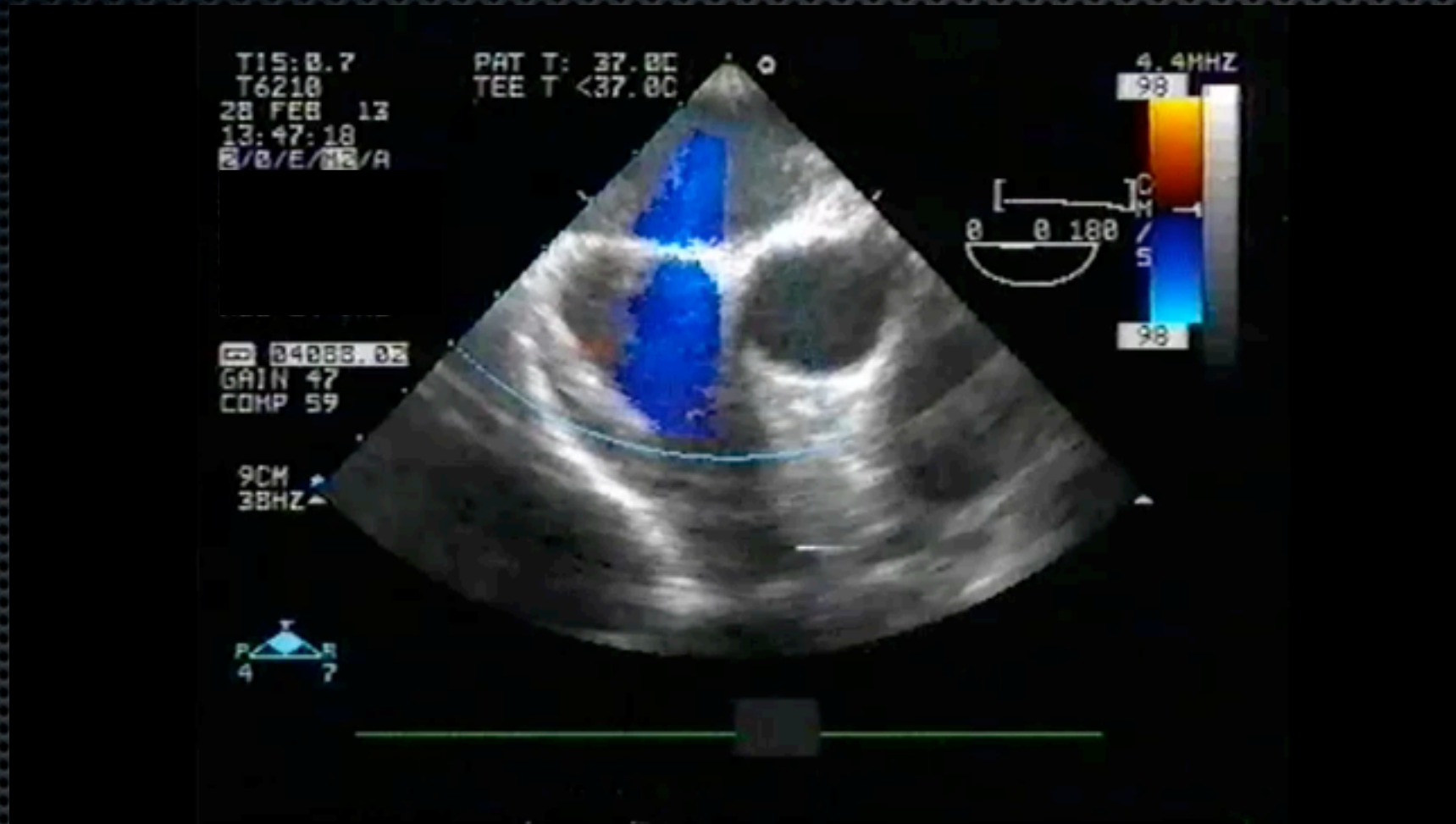
ECG



The Case

- ✦ Echocardiography examination:
 - ✦ Dilated right atrium and ventricle, paradoxical IVS, good RV function (TAPSE 3.4cm), normal dimension of LA-LV, good LV function (EF 59%; E/A>1), secundum ASD with 16mm in diameter left-to-right shunt, no VSD and PDA, MR trivial, TR mild (TVG 26mmHg) dilated PA, and normal aortic arch.
- ✦ TEE: the secundum ASD is suitable for device occluder.

The Procedures



- ✦ Patient was intubated, TEE was performed
- ✦ TEE finding was 15x14mm; diameter : 15mm

T15:0.8
T6210
28 FEB 13
14:19:43
E/B/E/A

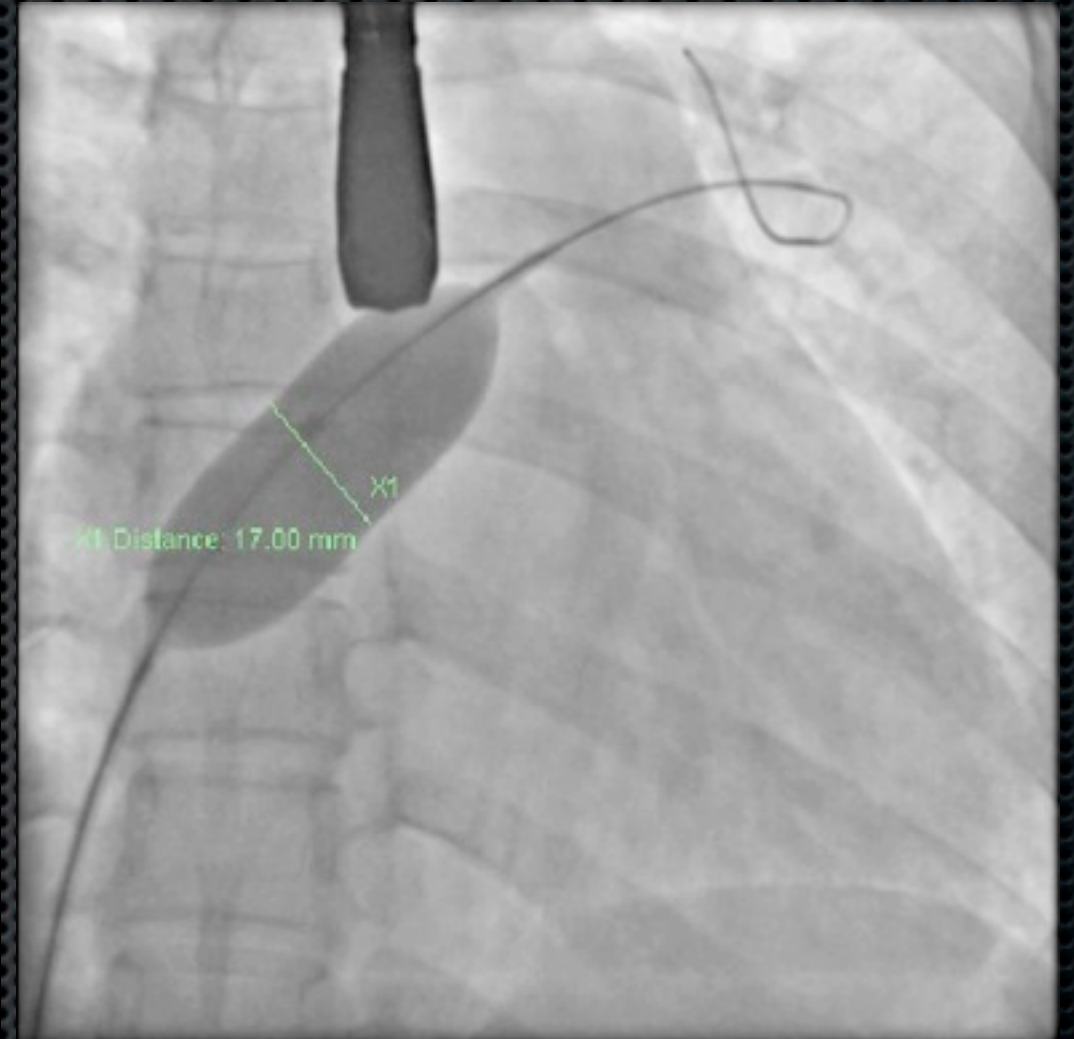
PAT T: 37.0C
TEE T <37.0C

4.4MHZ

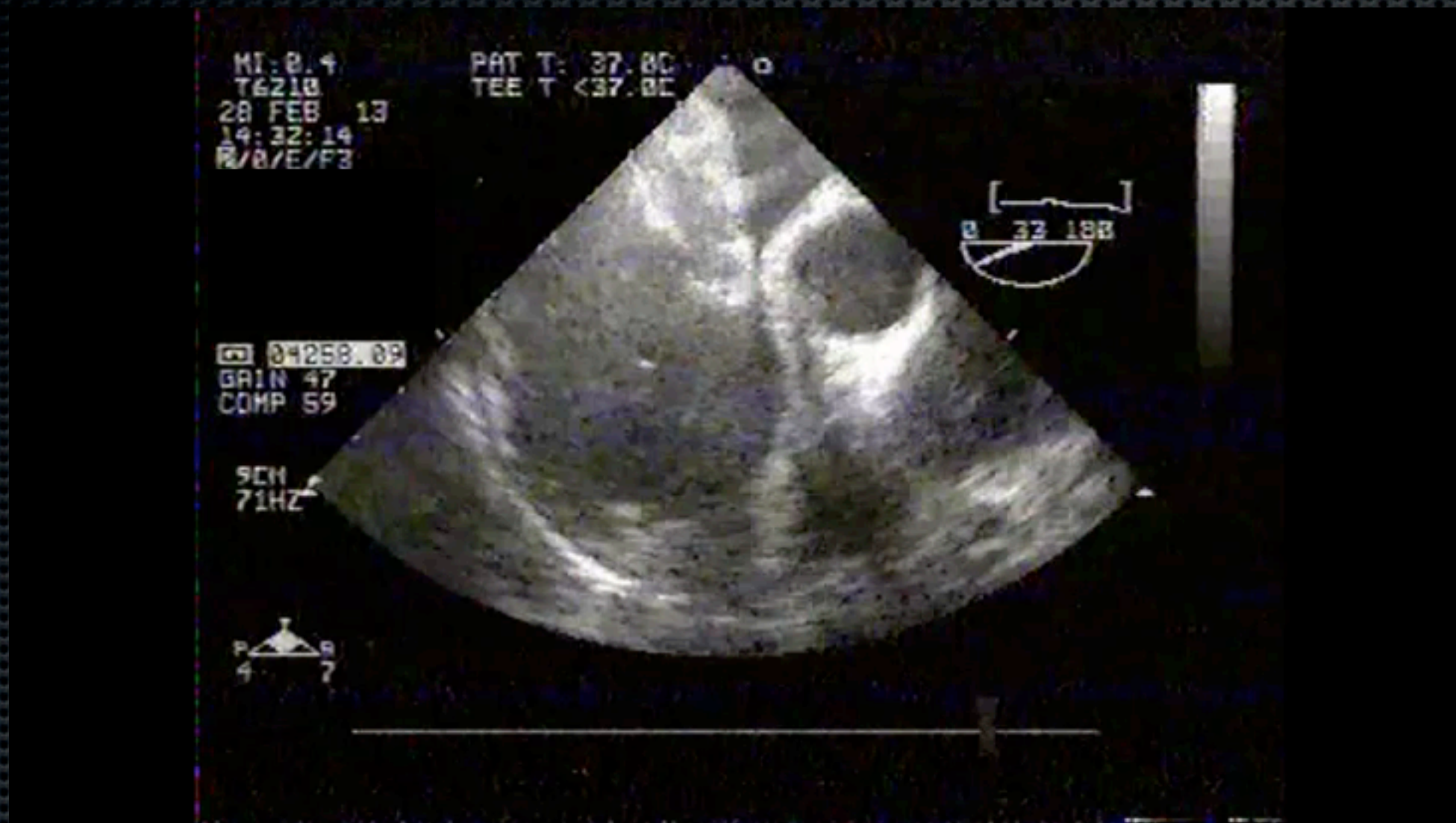
04208.12
GAIN 47
COMP 59

9CM
21HZ

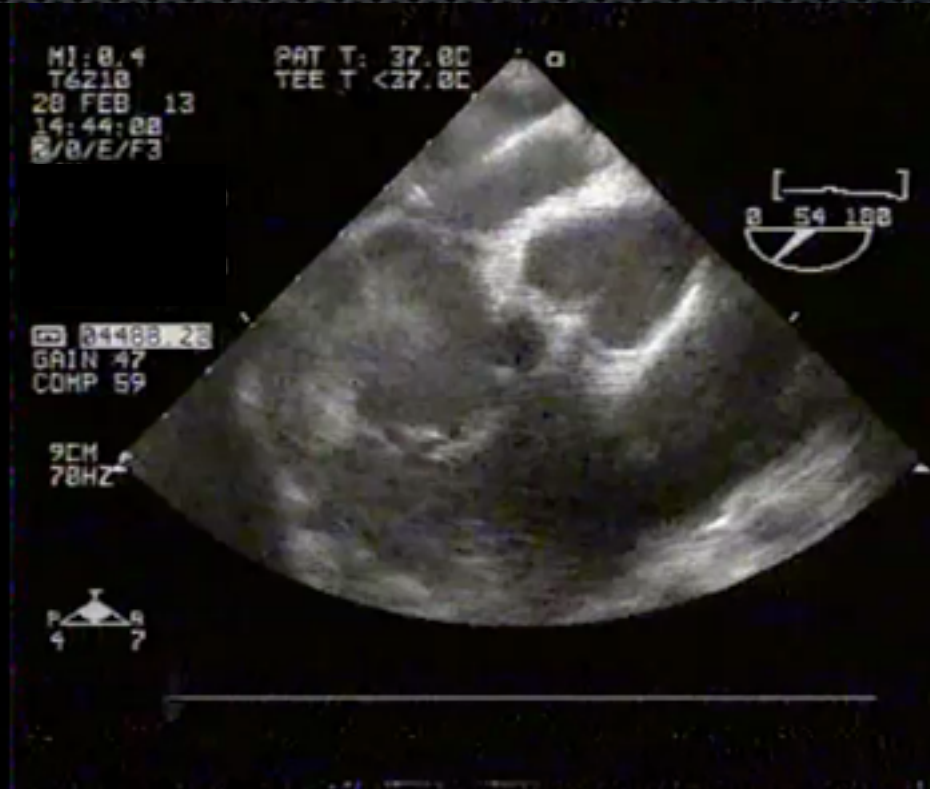
T
R
L
4 7



- ✦ Transvenous approach was done to do the balloon sizing
- ✦ Balloon sizing diameter 17mm



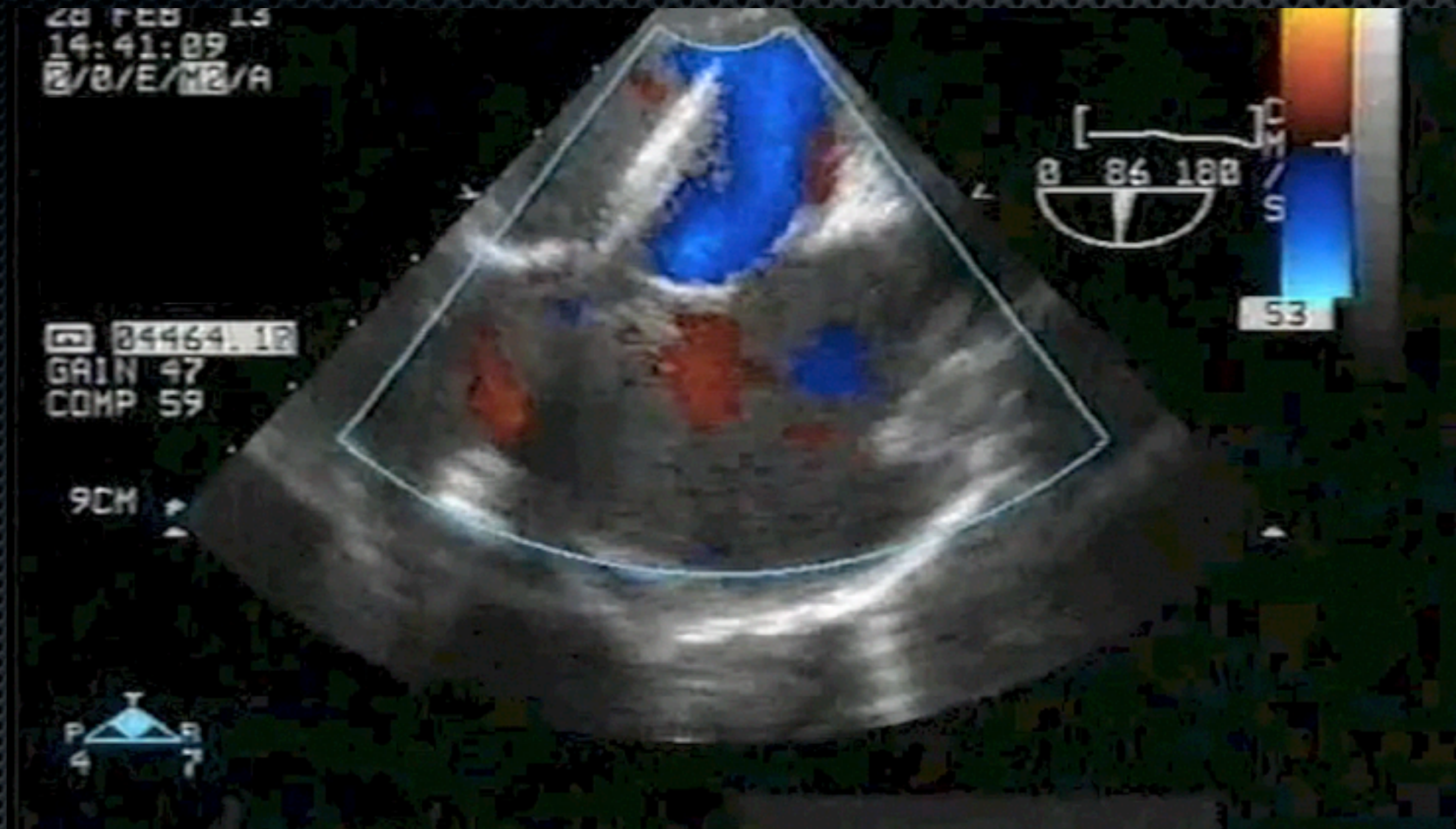
- ✦ The device used was ASO no. 20
- ✦ The device was not properly stowed



- The atrial septum was torn



Bigger device was inserted (ASO no.26)



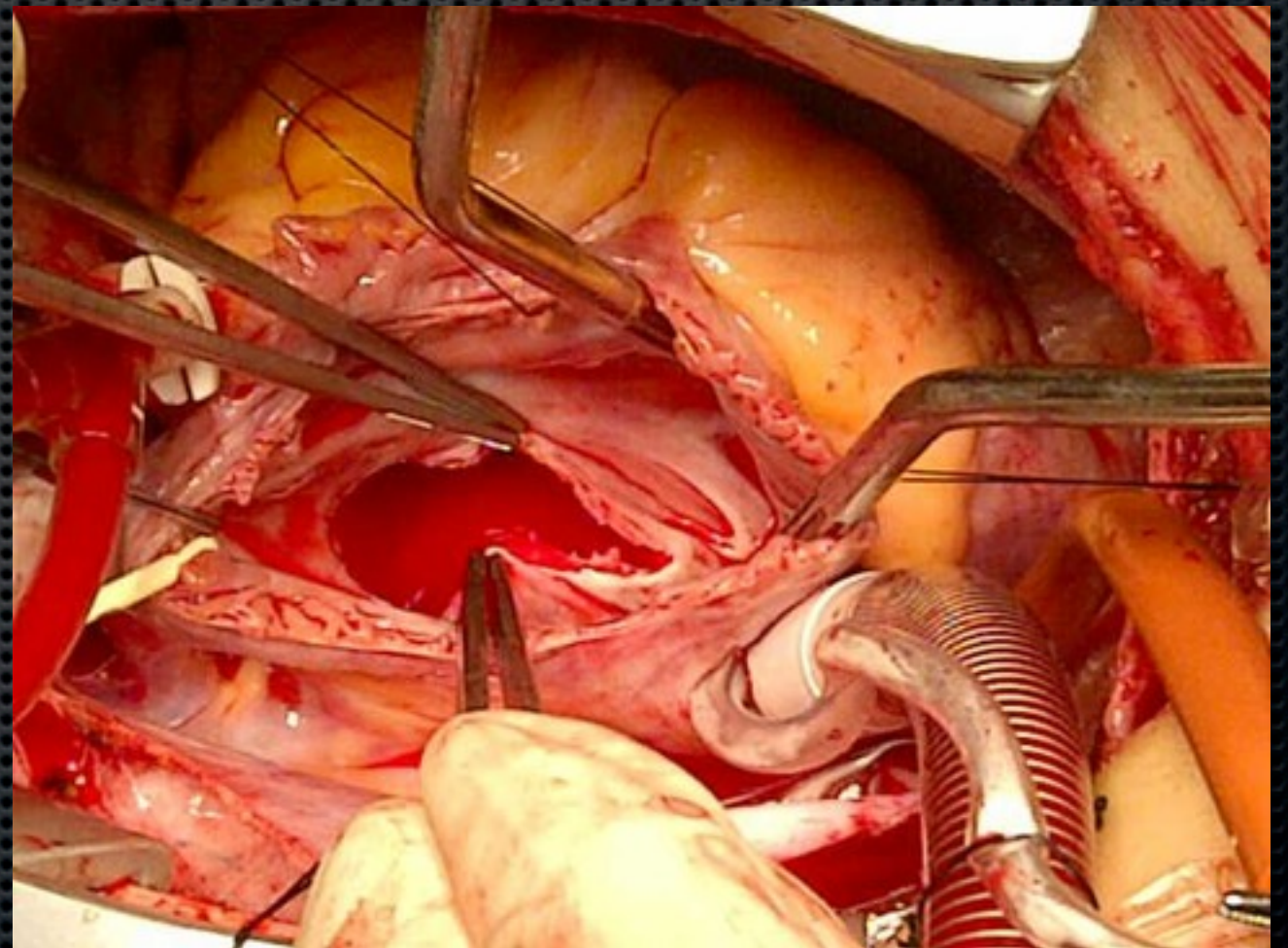
There was tearing expansion (31mm)

The Case

- However, The ASO implantation in this patient was failed during the procedure because of the expanding ASD diameter due to loss of the previously thin septum
- Therefore, we decide to close the ASD surgically.

ASD Closure

- ✦ From the operation report, we found that the diameter of ASD secundum is expanding from 16mm to 40mm with new tear towards the inferior vena cava. Then the defect were closed with pericardial patch.



Discussion

- ✦ There are two primary considerations needed for implanting the device, which is:
 - ✦ Absolute size of ASD
 - ✦ Amount of supporting rim of the atrial septum
- ✦ These can be achieved by echocardiography or catheterization laboratory as **sizing balloon**

- Some complications may followed the procedures in sizing phase, implanting phase, or post implanting phase



Balloon Sizing

- ✦ Balloon sizing has been considered as integral part of trans-catheter closure of ASD with ASO
- ✦ Gold Standard
- ✦ NOT complication-free
 - ✦ enlargement of defect
 - ✦ bradycardia and hypotension
 - ✦ **damaged interatrial septum**

Discussion

- Complication such as atrial septal tearing by balloon sizing have been reported



Torn Atrial Septum during Transcatheter Closure of Atrial Septal Defect Visualized by Real-Time Three-Dimensional Transesophageal Echocardiography

Yasufumi Kijima, MD, Manabu Taniguchi, MD, Teiji Akagi, MD, Koji Nakagawa, MD, Kengo Kusano, MD, Hiroshi Ito, MD, and Shunji Sano, MD, *Okayama, Japan*

Echocardiographic visualization of laceration of atrial septum during balloon sizing of atrial septal defect[☆]

Ahmed A. Alsaileek*, Ahmad Omran, Michael Godman, Hani K. Najm

King Abdulaziz Cardiac Center, National Guard Health Affairs, Riyadh, Saudi Arabia

Sizing Balloon-Induced Tear of the Atrial Septum

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S. Harikrishnan, MD, Namboodiri K.K. Narayanan, MD, Sivasankaran Sivasubramonian, MD

1.Kijima Y et.al. Journal of the american society of echocardiography. 2010.

2.Alsaileek AA et.al. Eur J Echocardiogr. 2007 Mar;8(2):155-7

3. Harikrishnan S. Journal of Invasive Cardiology 2005; 17 (10)

Discussions

- ✦ The possible causes of atrial tearing
 - ✦ Sizing balloon manipulation
 - ✦ passing the guide wire through a small atrial septum fenestration
 - ✦ over stretching the sizing balloon

Discussions

- ✦ In our case, Balloon over-stretching until waist is developed or balloon manipulation has been suspected of the cause.
- ✦ TEE provide proofed data to evaluate size the secundum ASD prior device implantation

Take Home Message

- ✦ TEE and ICE vs angiography
- ✦ Less over-stretching vs smaller ASO device size
- ✦ ASO device increase up to 2mm is accepted



