

Le Trueview une nouvelle vision de l'échocardiographie

Franck Levy



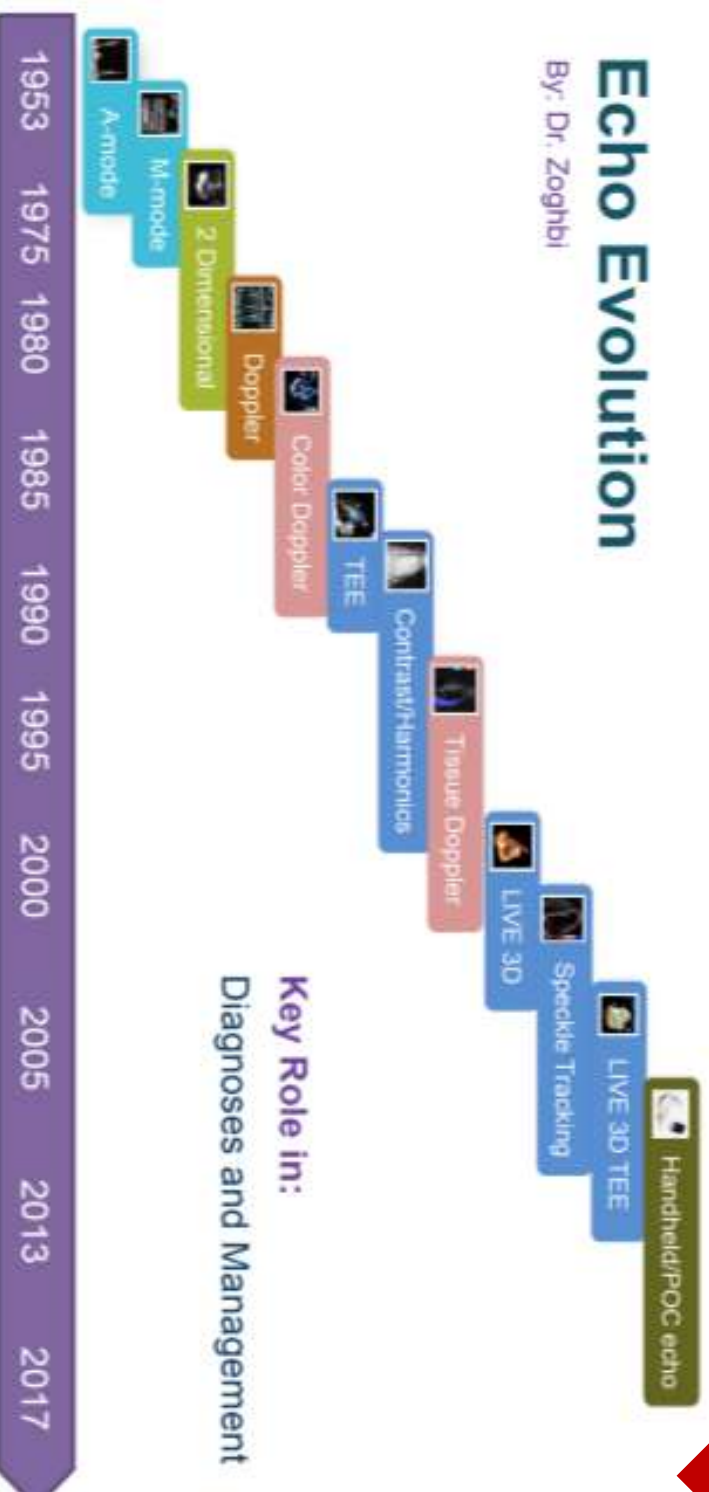
CENTRE CARDIO-THORACIQUE DE MONACO

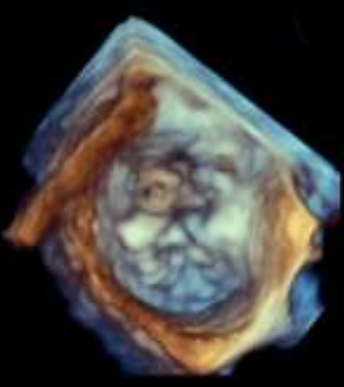
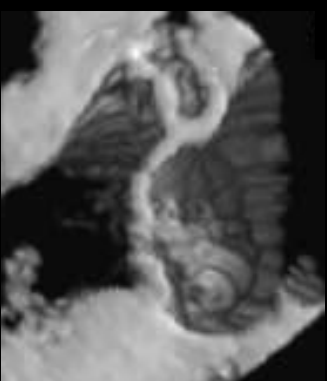


Et maintenant?

Echo Evolution

By: Dr. Zoghbi





1960

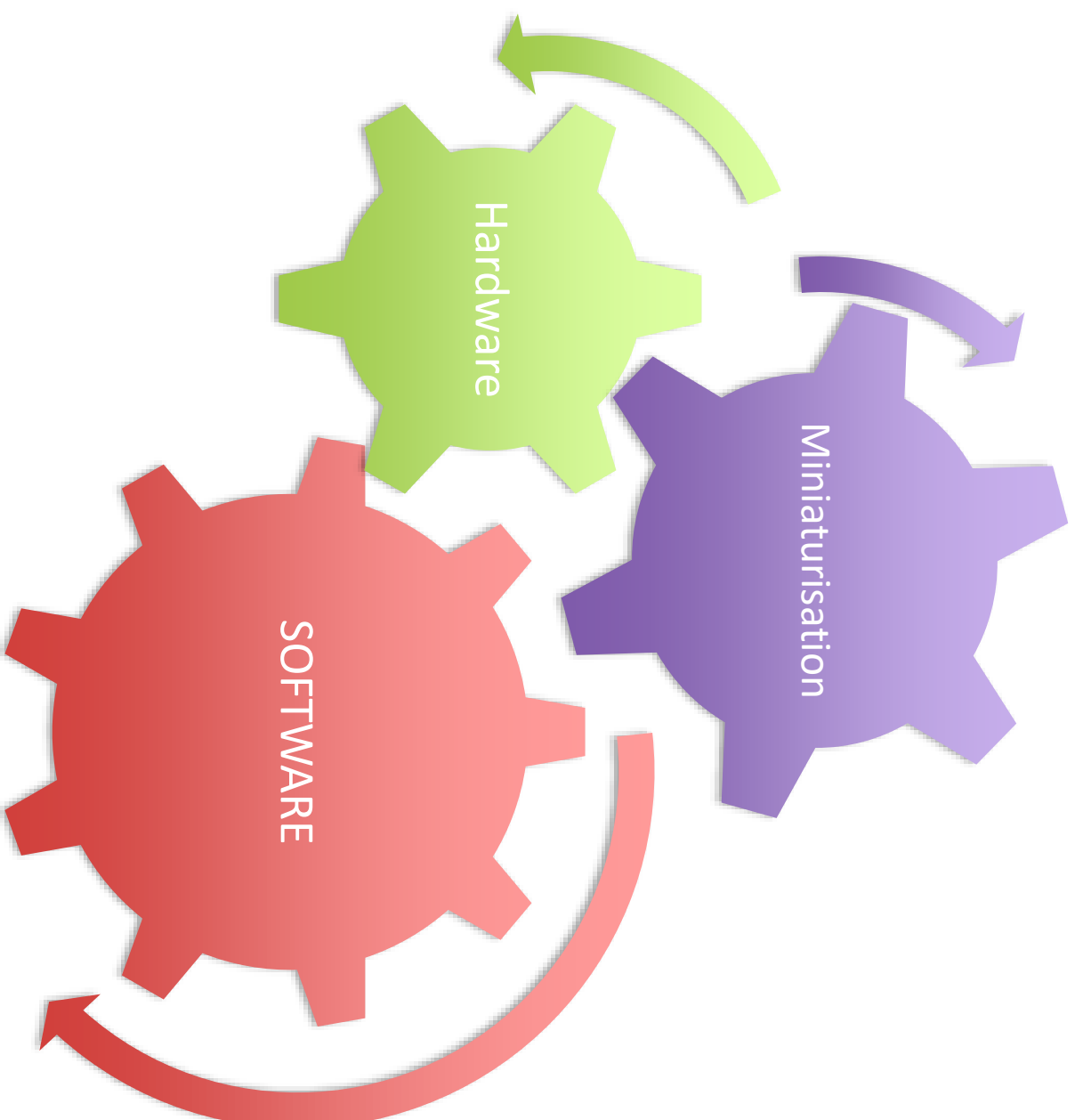
1975

1992

1995

2007







Sonos 7500



iE33



iE33 xMATRIX



EPIQ 7C



EPIQ 7
Cvx



X4-1



X3-1



X7-2t



X5-1



X8-2t

2002

2005

2007

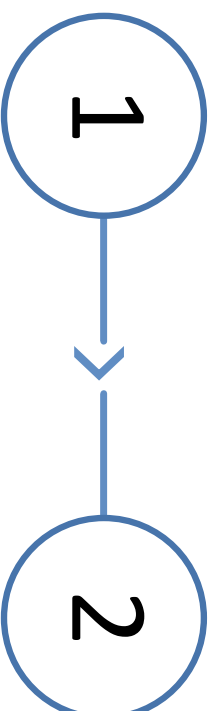
2010

2013

2017

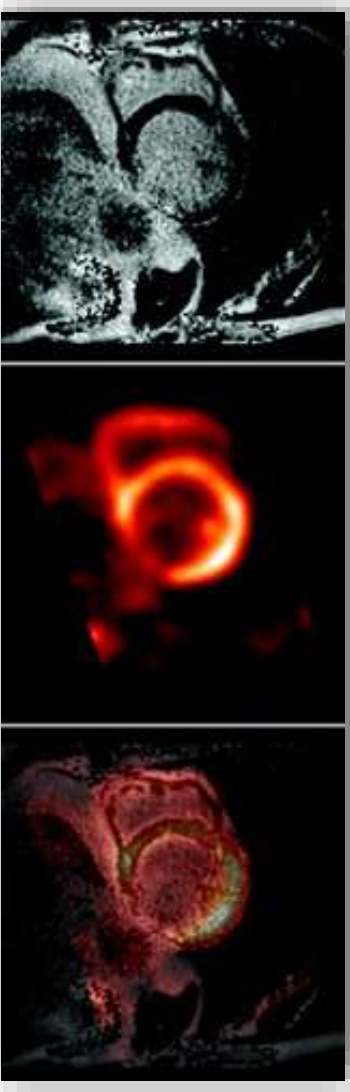
2019

Future of cardiovascular imaging



Anatomical imaging

Functional imaging

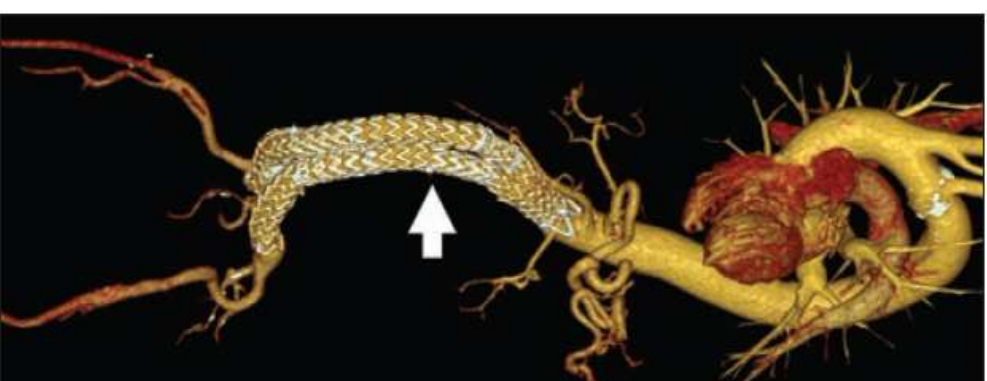


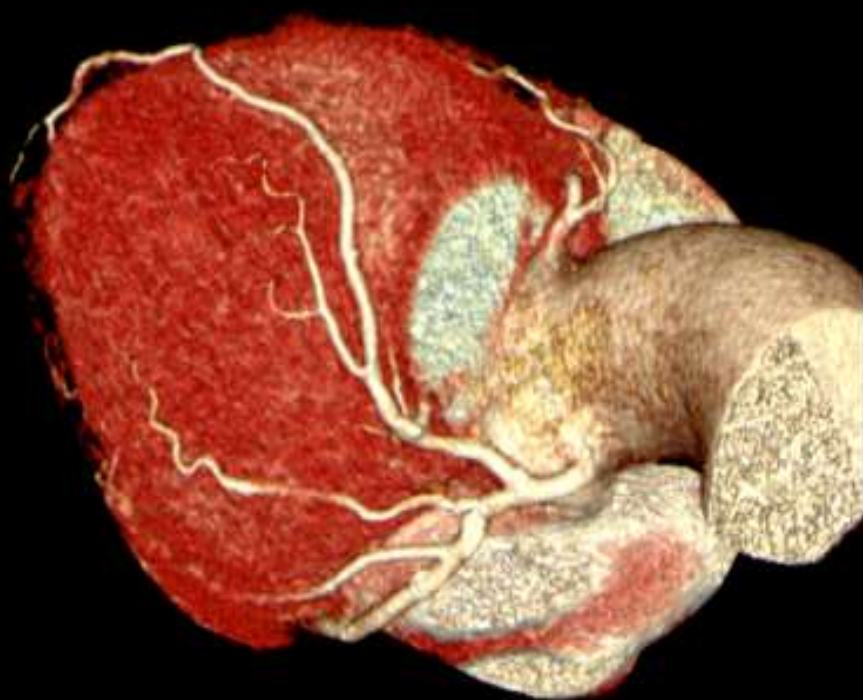


A

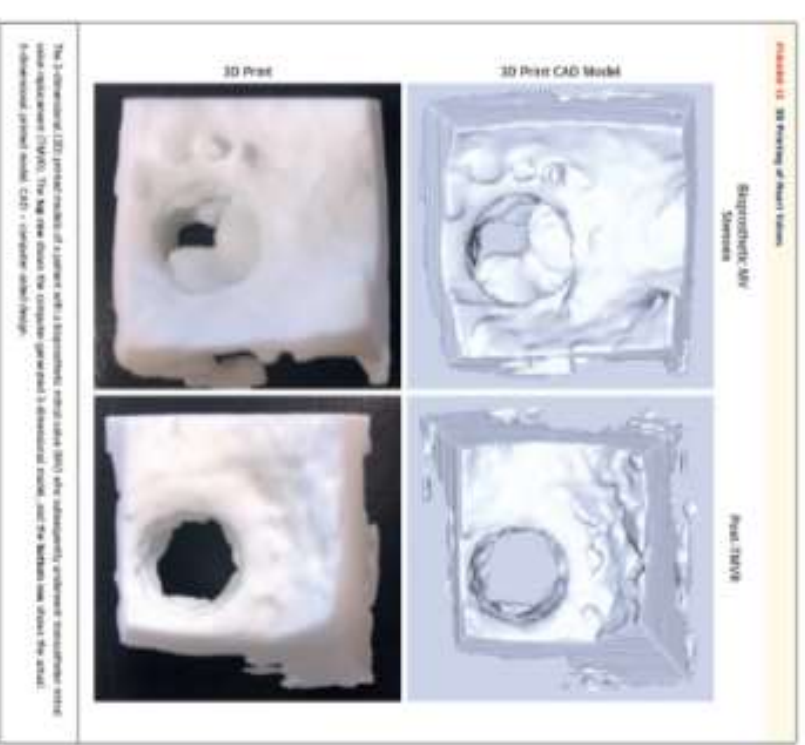


B

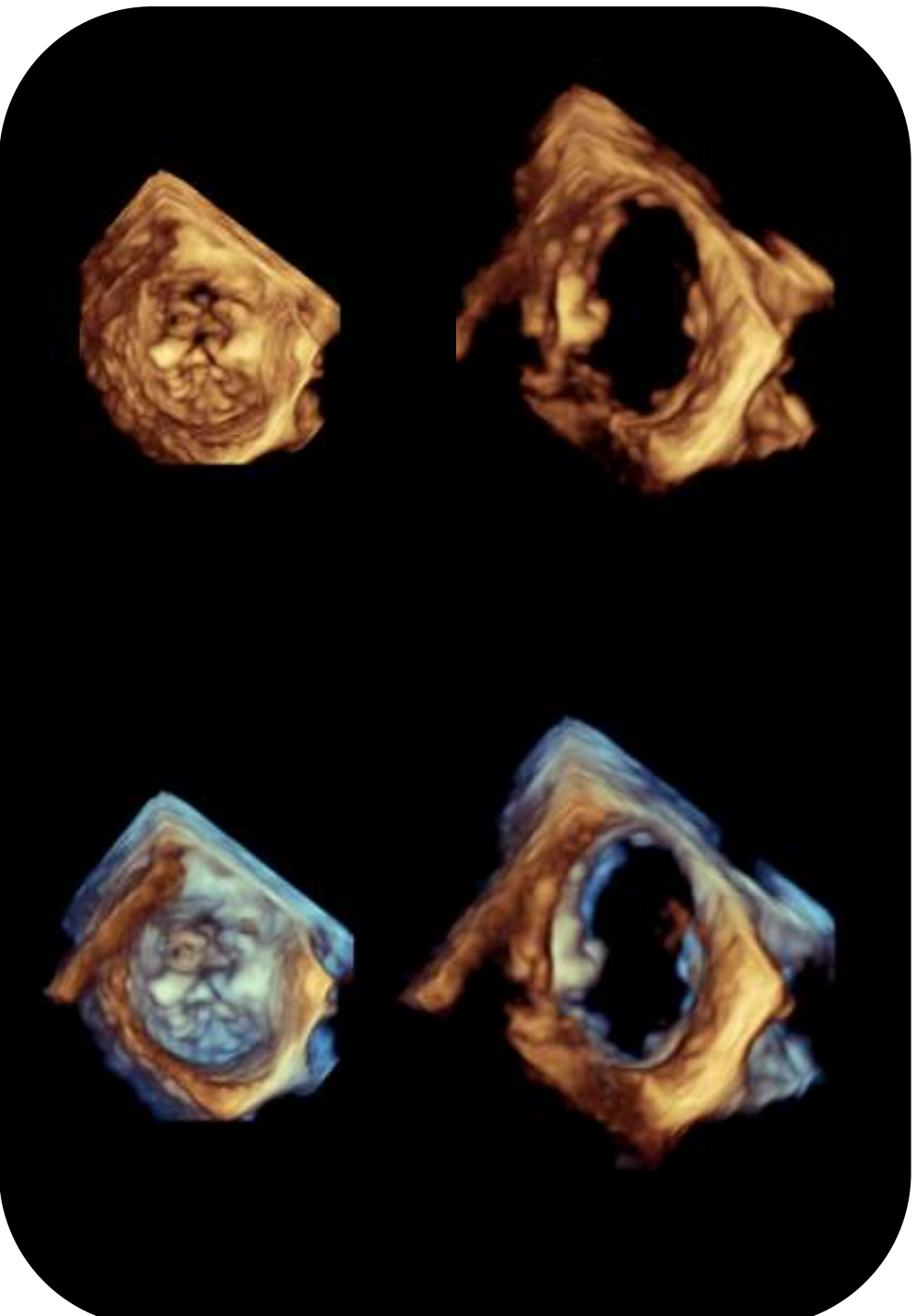




Virtual Reality and 3D printing



Evolution du rendu volumique

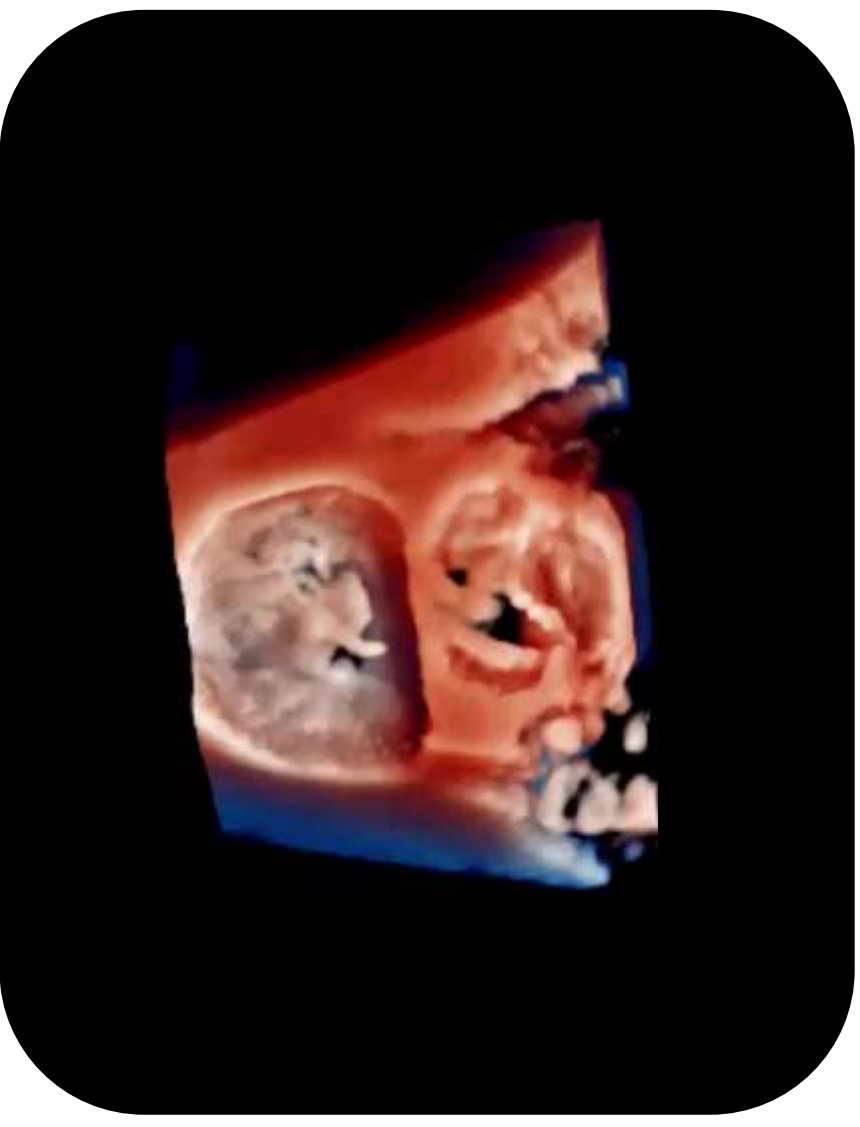


TrueVue

Photorealistic 3D rendering

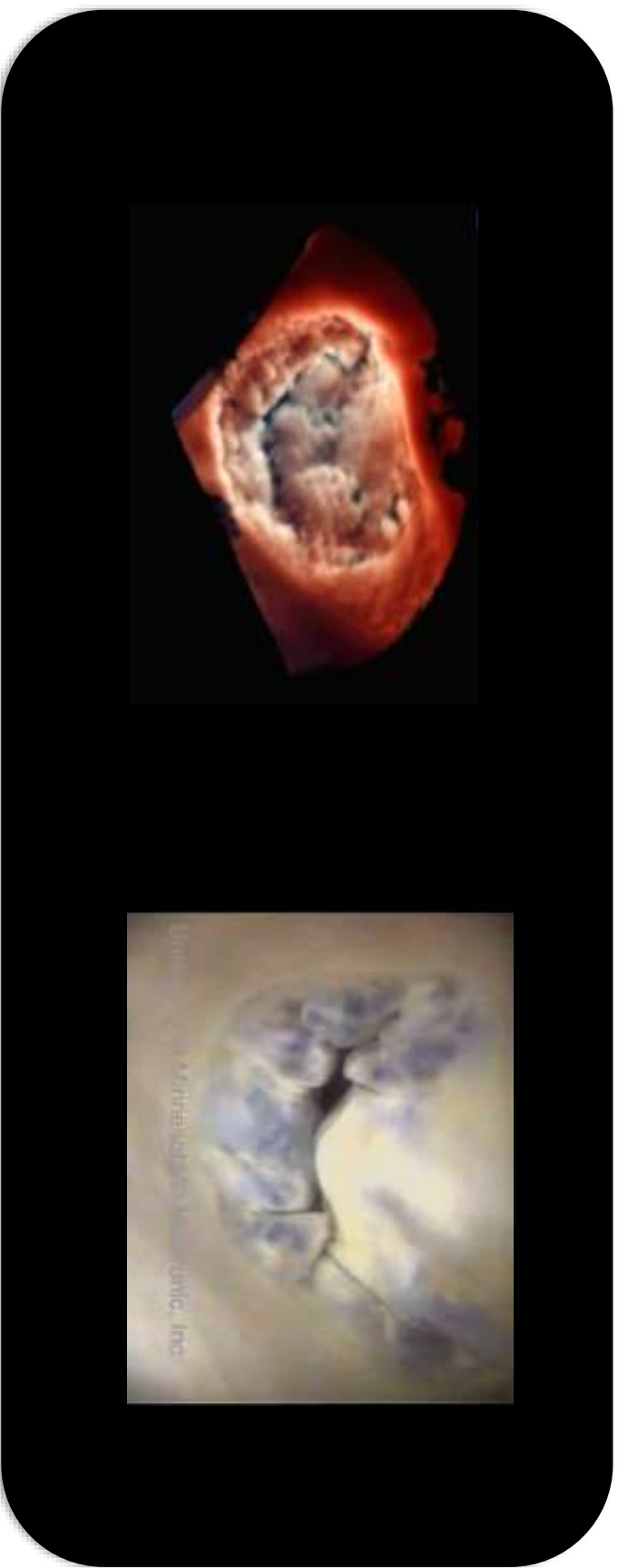
Virtual light source

Touchscreen user interface



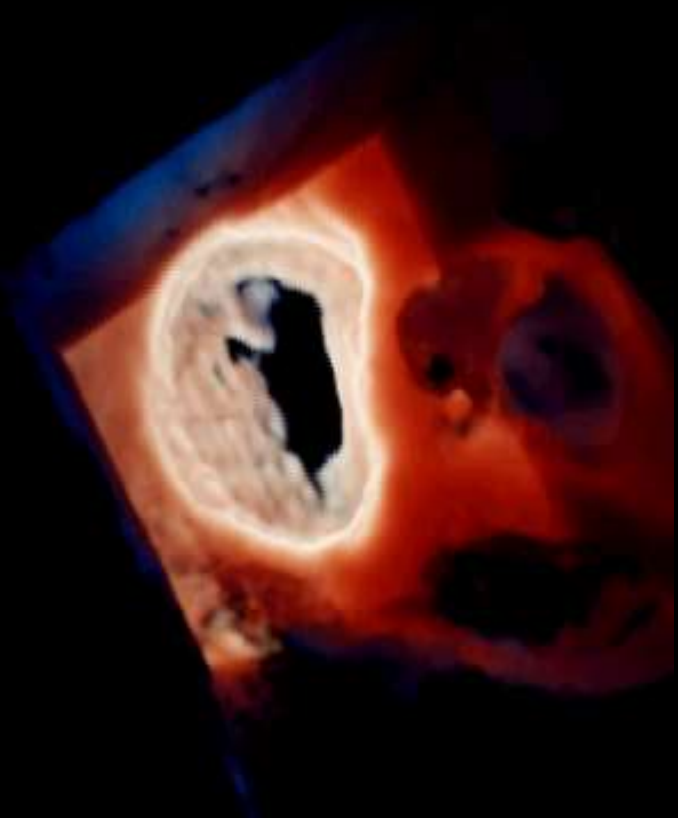


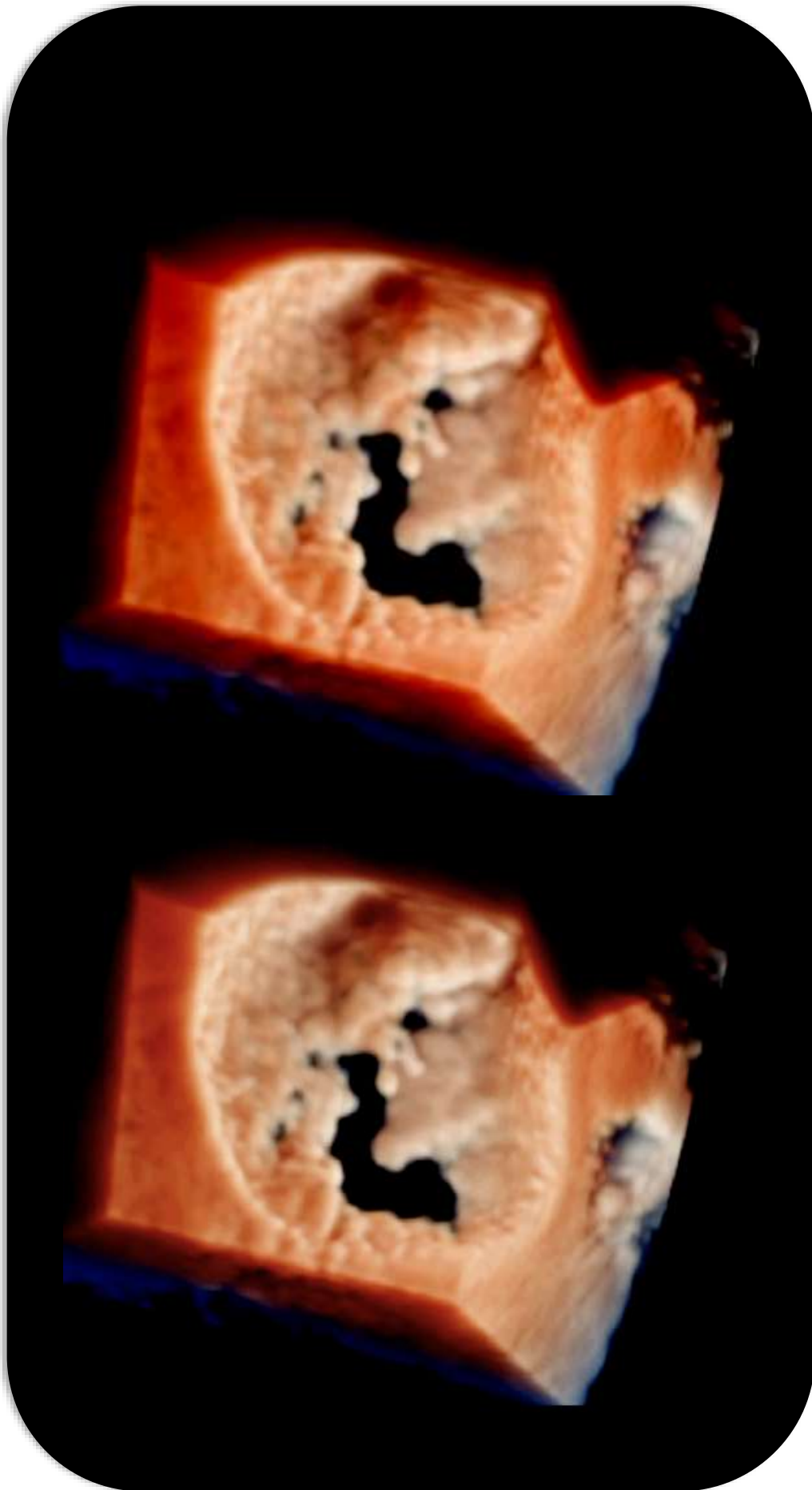
TrueVue



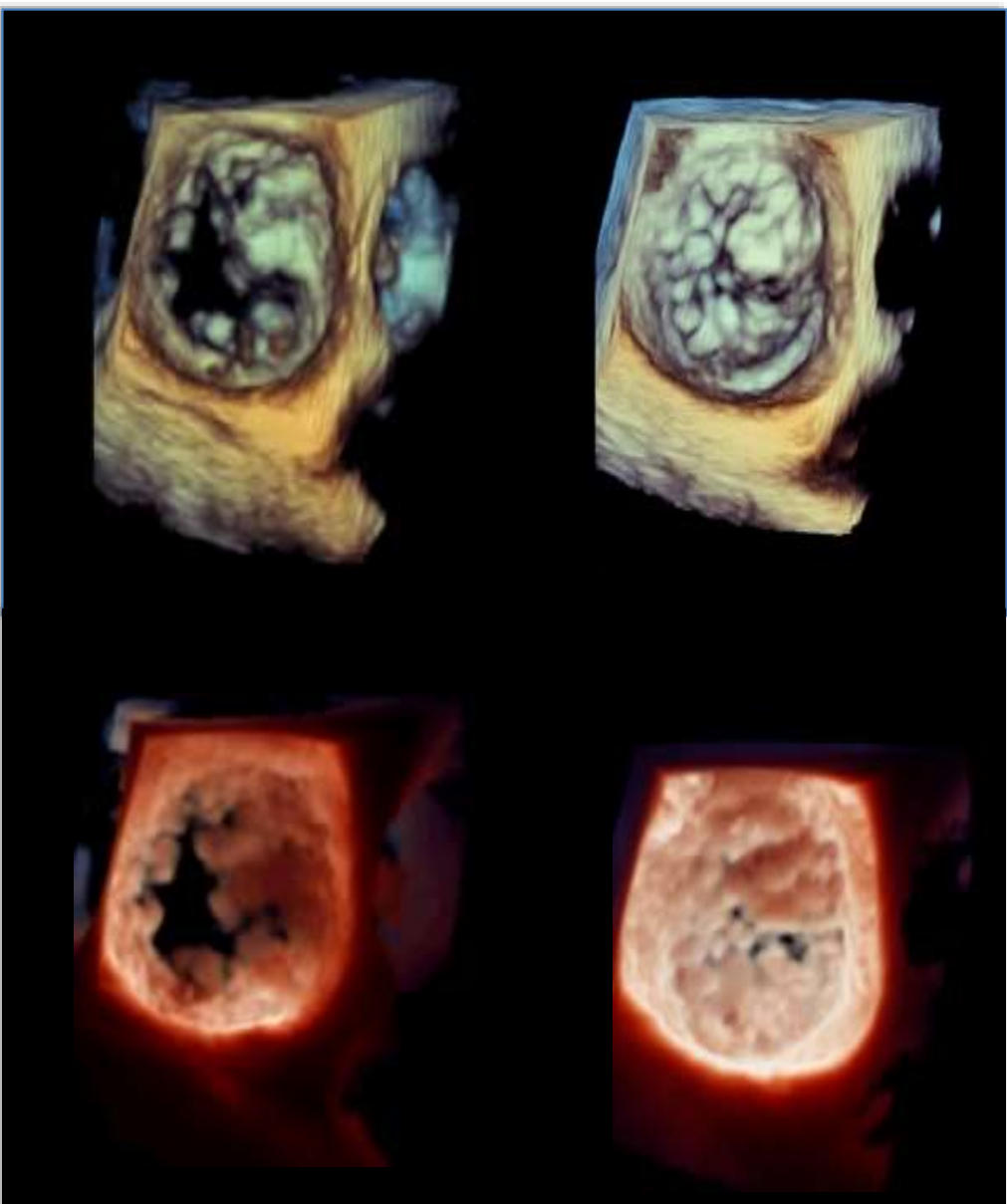
Tissue absorption creates shadows, highlights structures, and enhances depth perception.

TrueVue

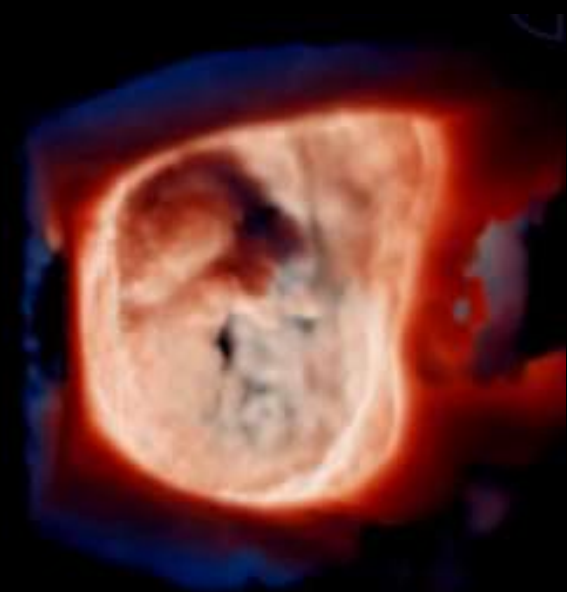


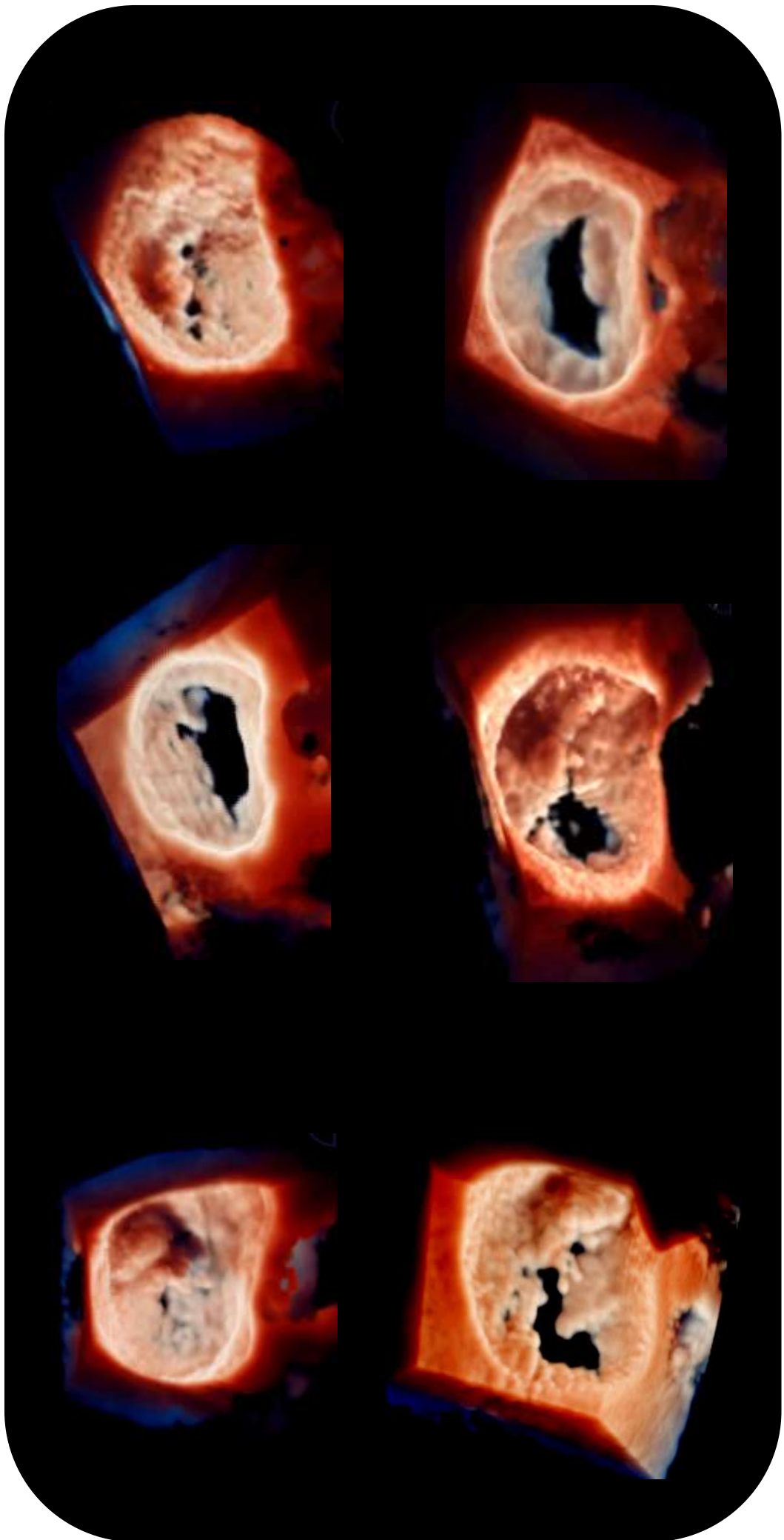


Texture de la valve

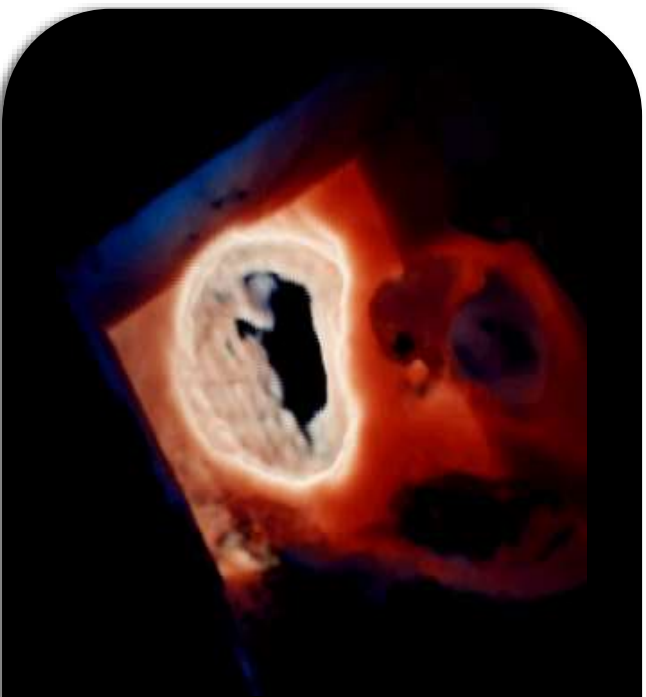


Tissue absorption
creates shadows,
highlights structures,
and enhances depth
perception.

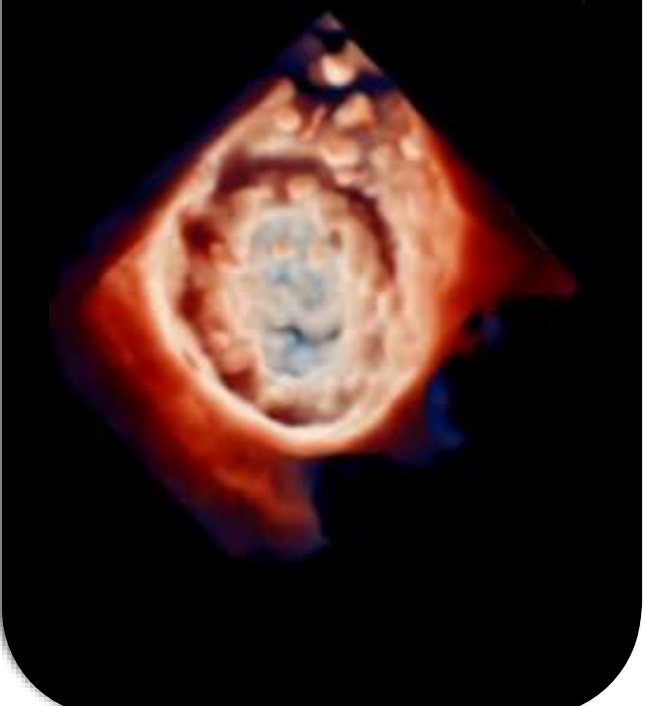




Pré op

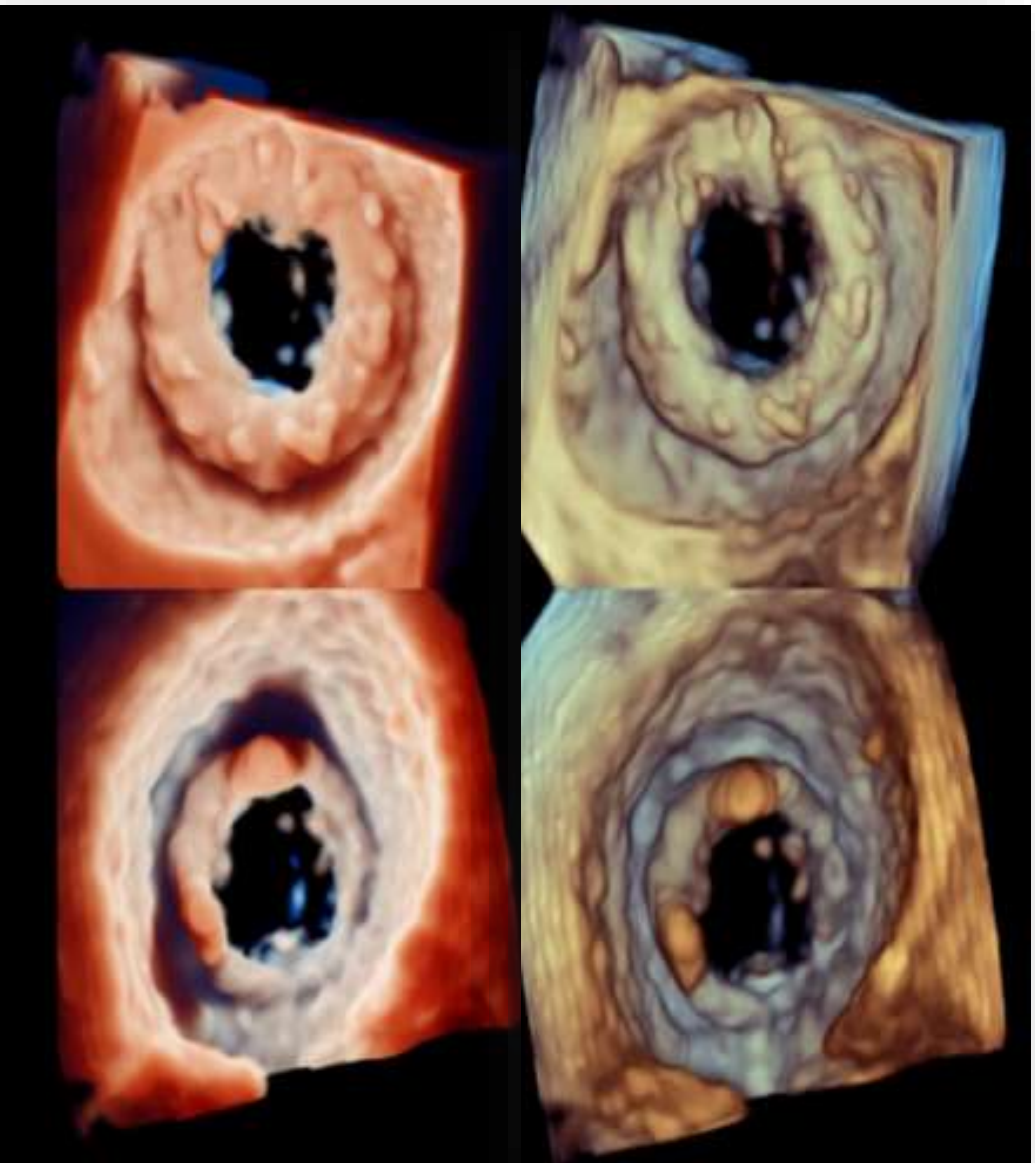


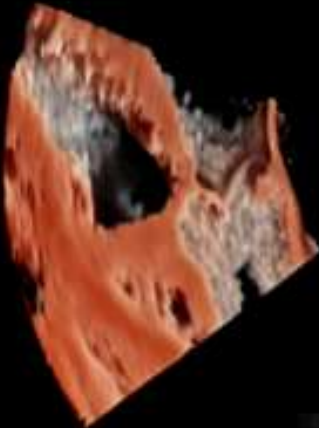
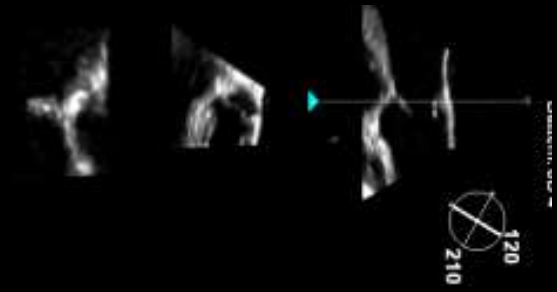
Post op



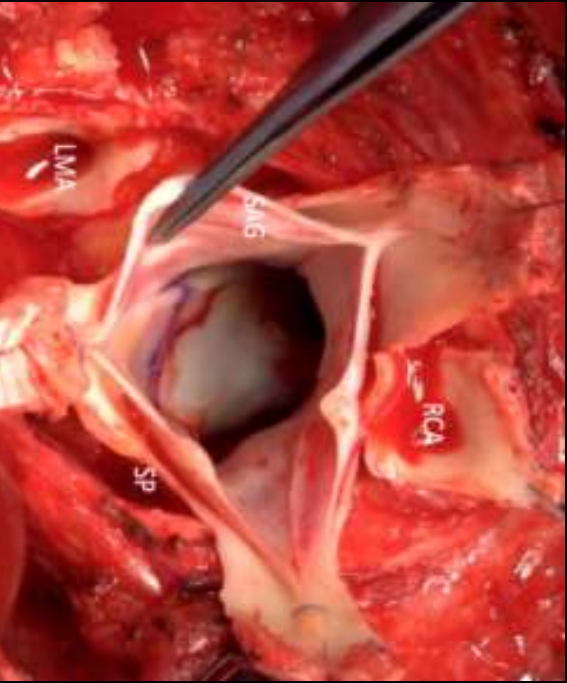
Réséction triangulaire
de p2
Petit fil visible sur p2
Bulles dans l'auricule

Bioprothèse mitrale mosaïc 33

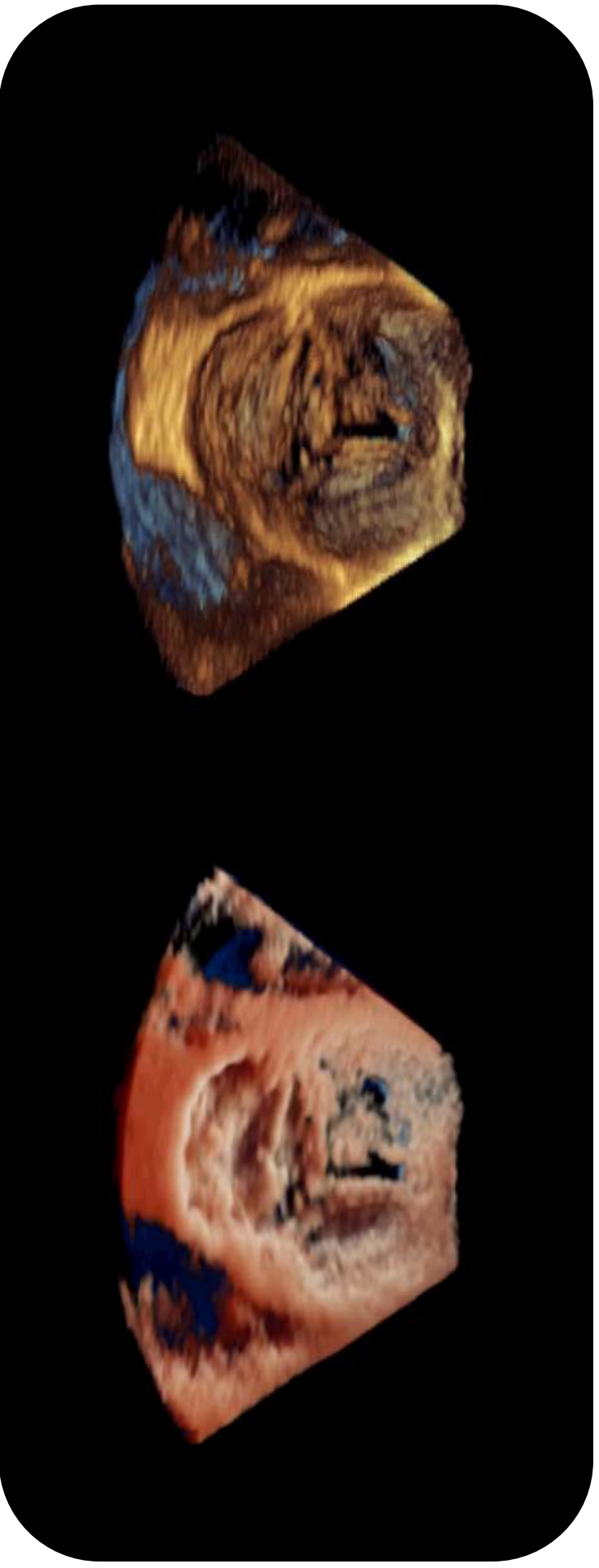




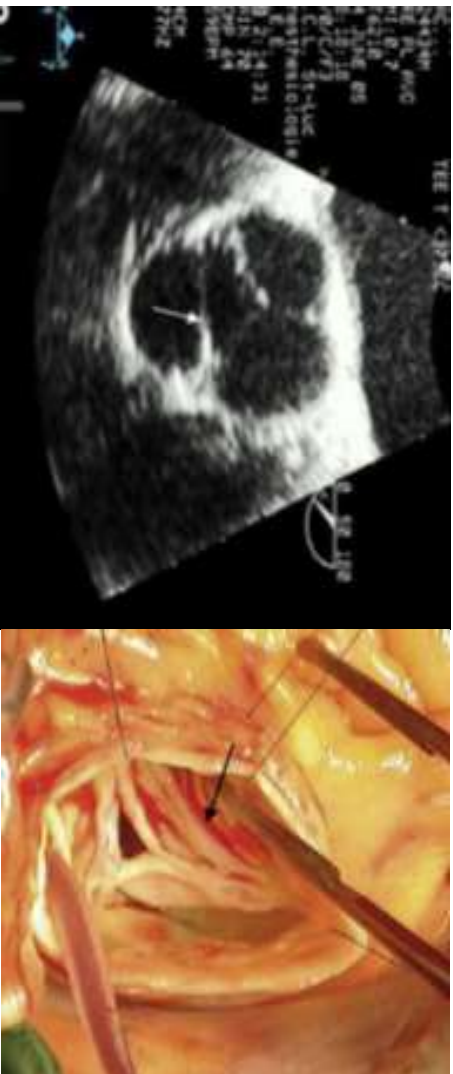
MD



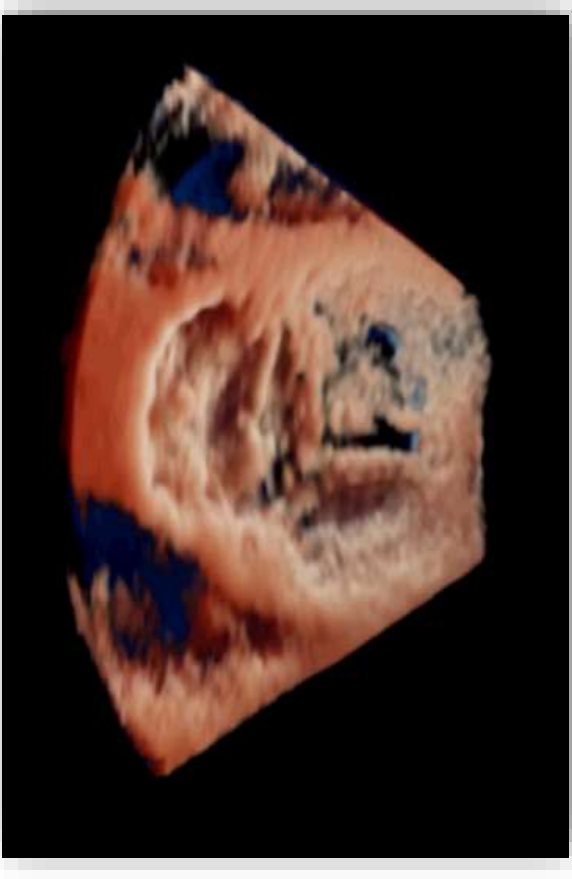
Prolapsus SAD



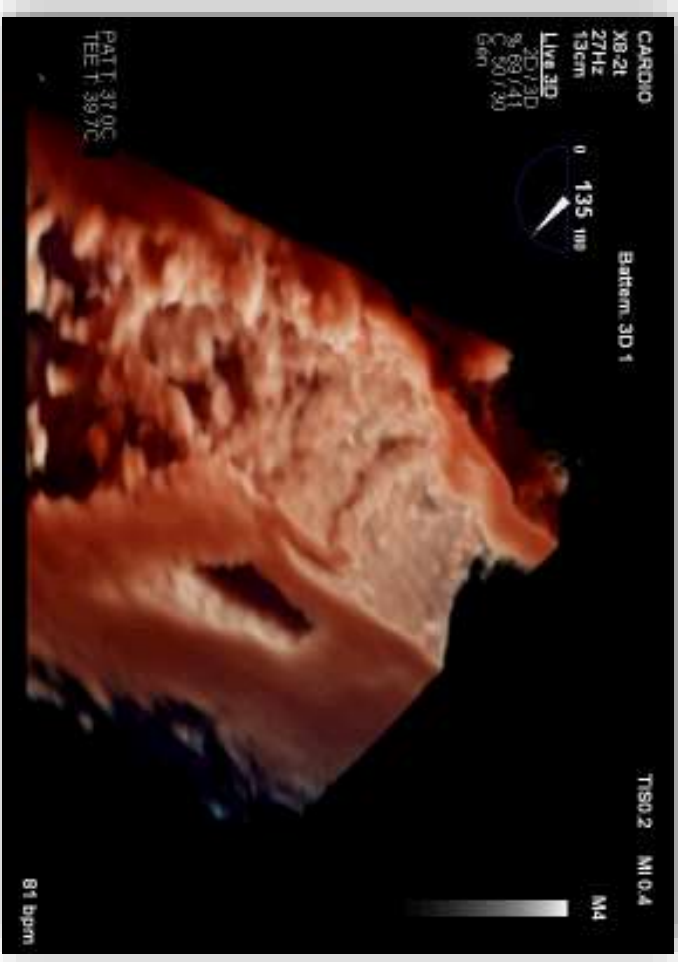
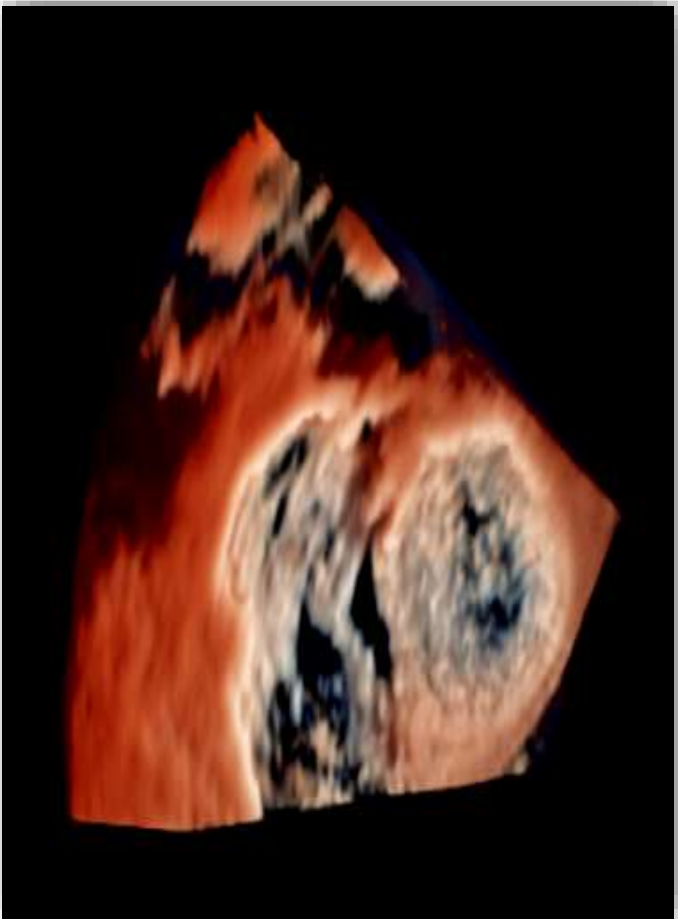
Presence of a fibrous band
very specific (93%)



El khoury, J Thorac Cardiovasc Surg 2011;141:917-25

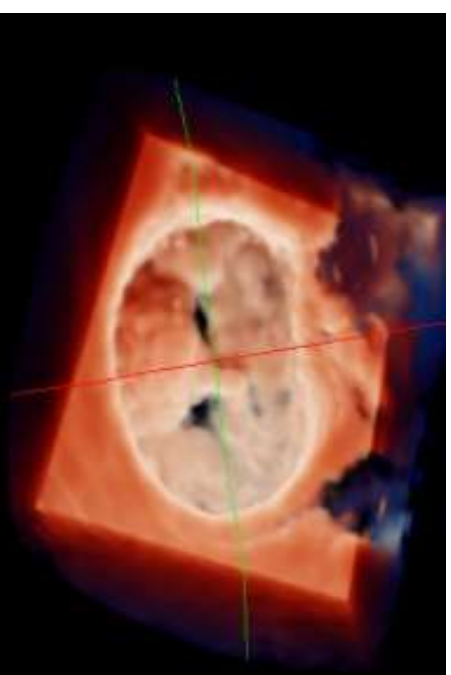
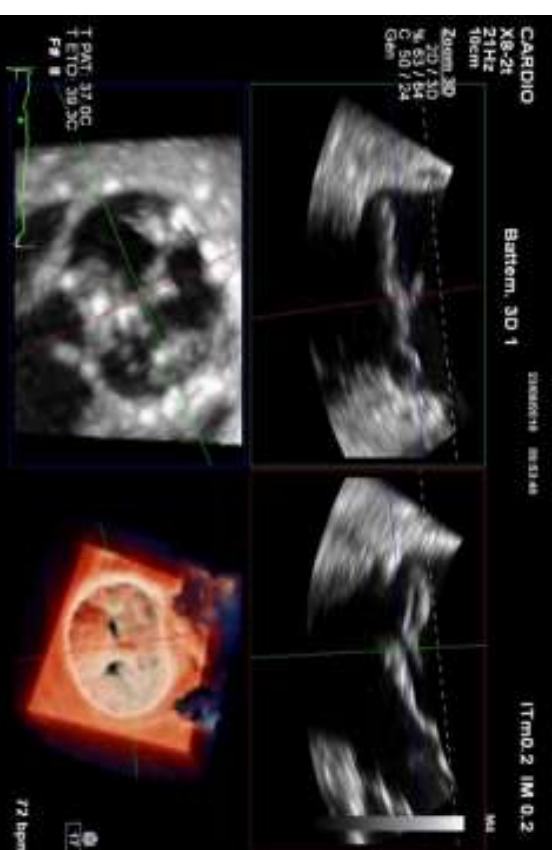
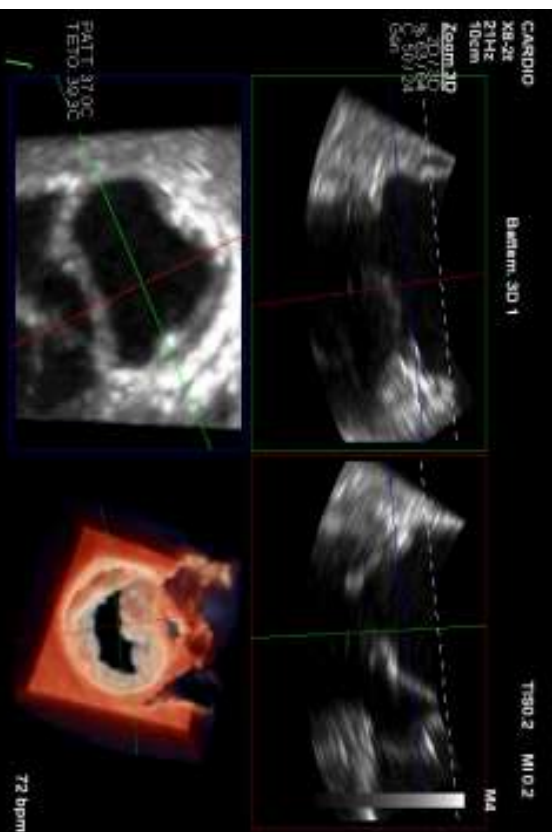


Bicuspidie de type 1 LR avec laio sévère symptomatique

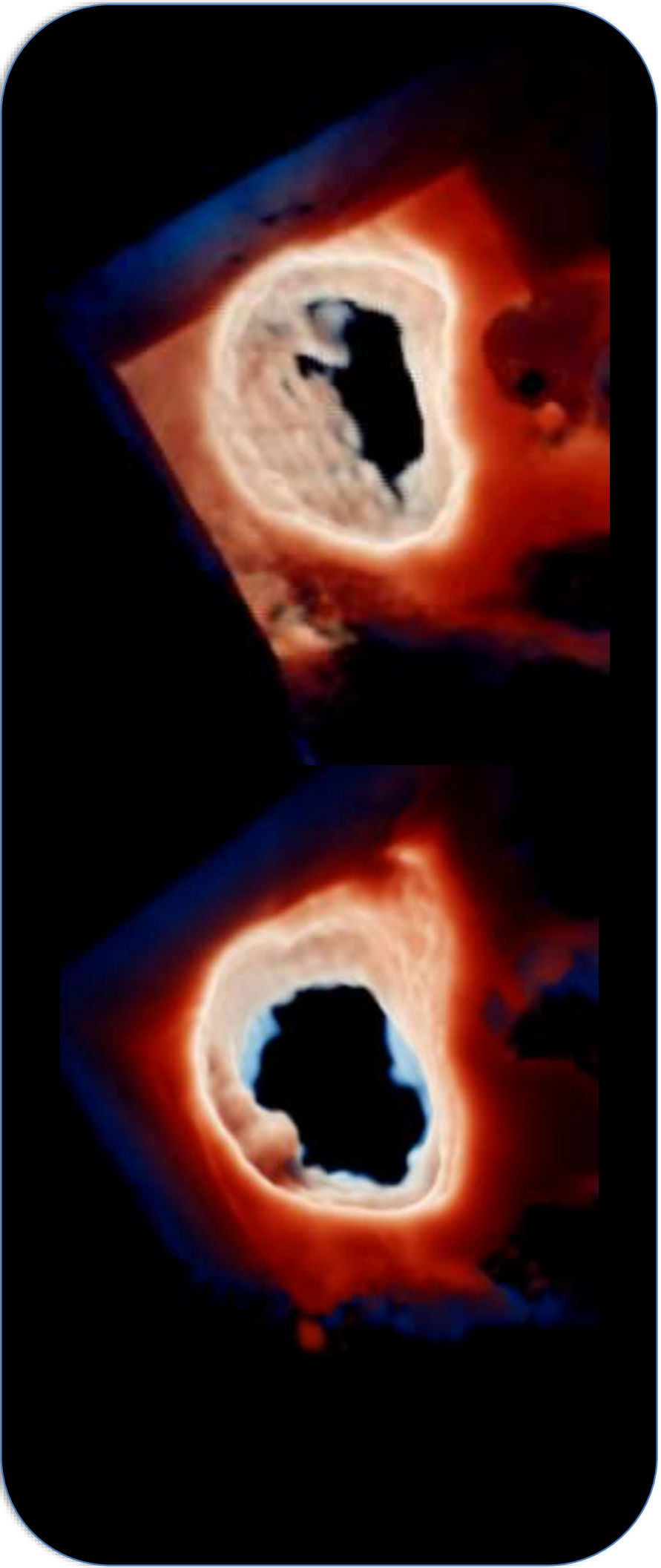


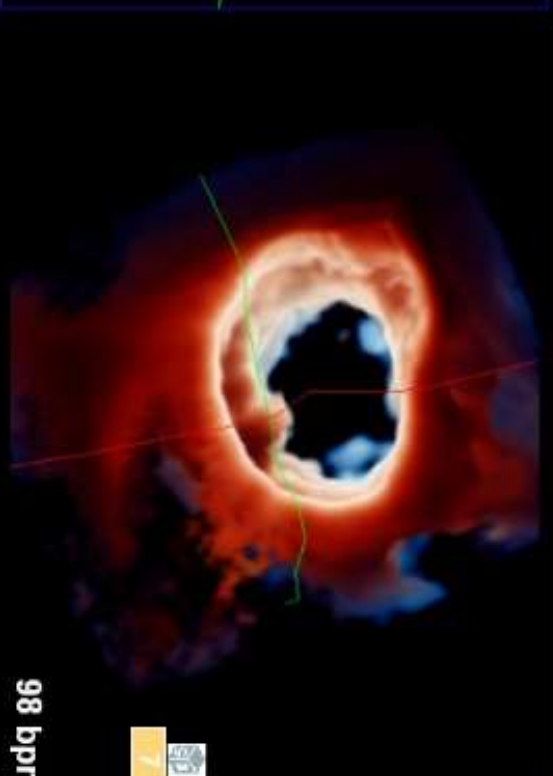
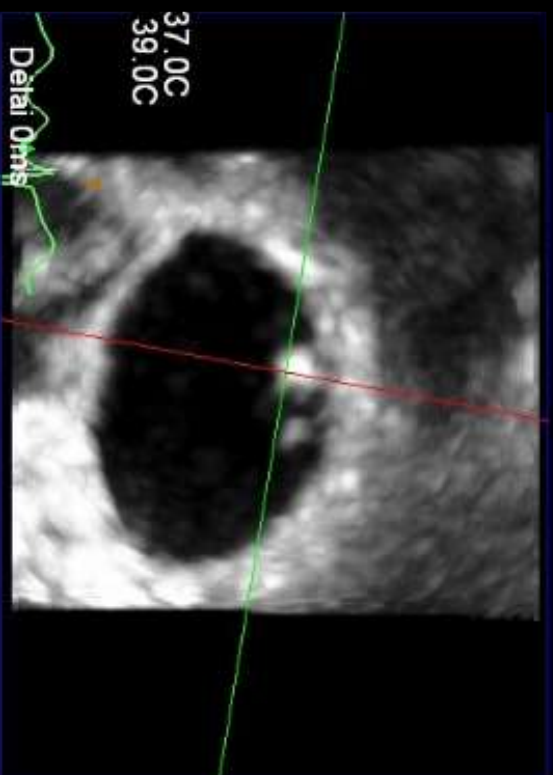
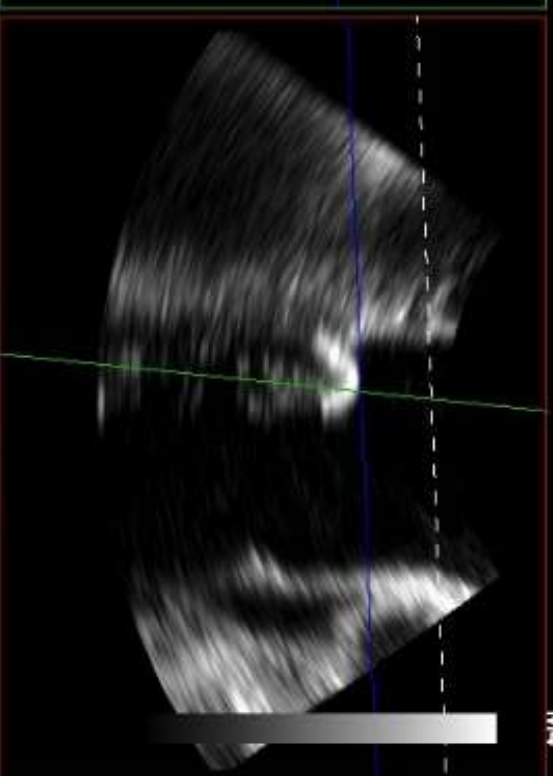
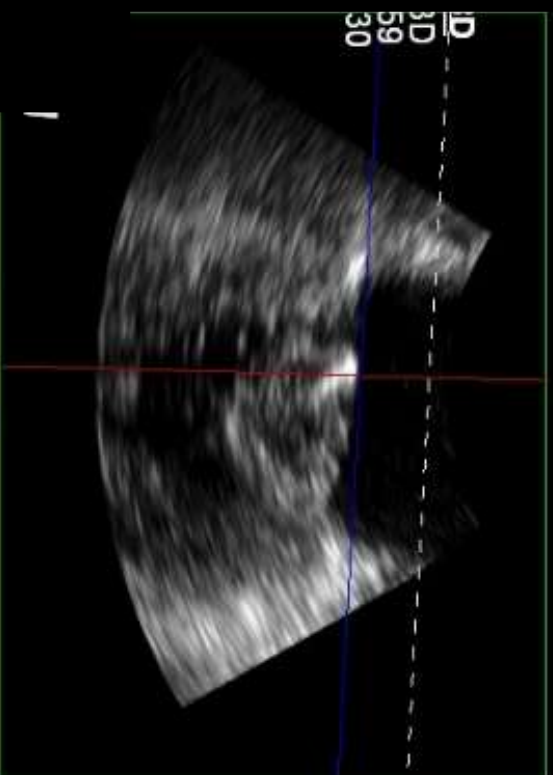
Real time image alignment

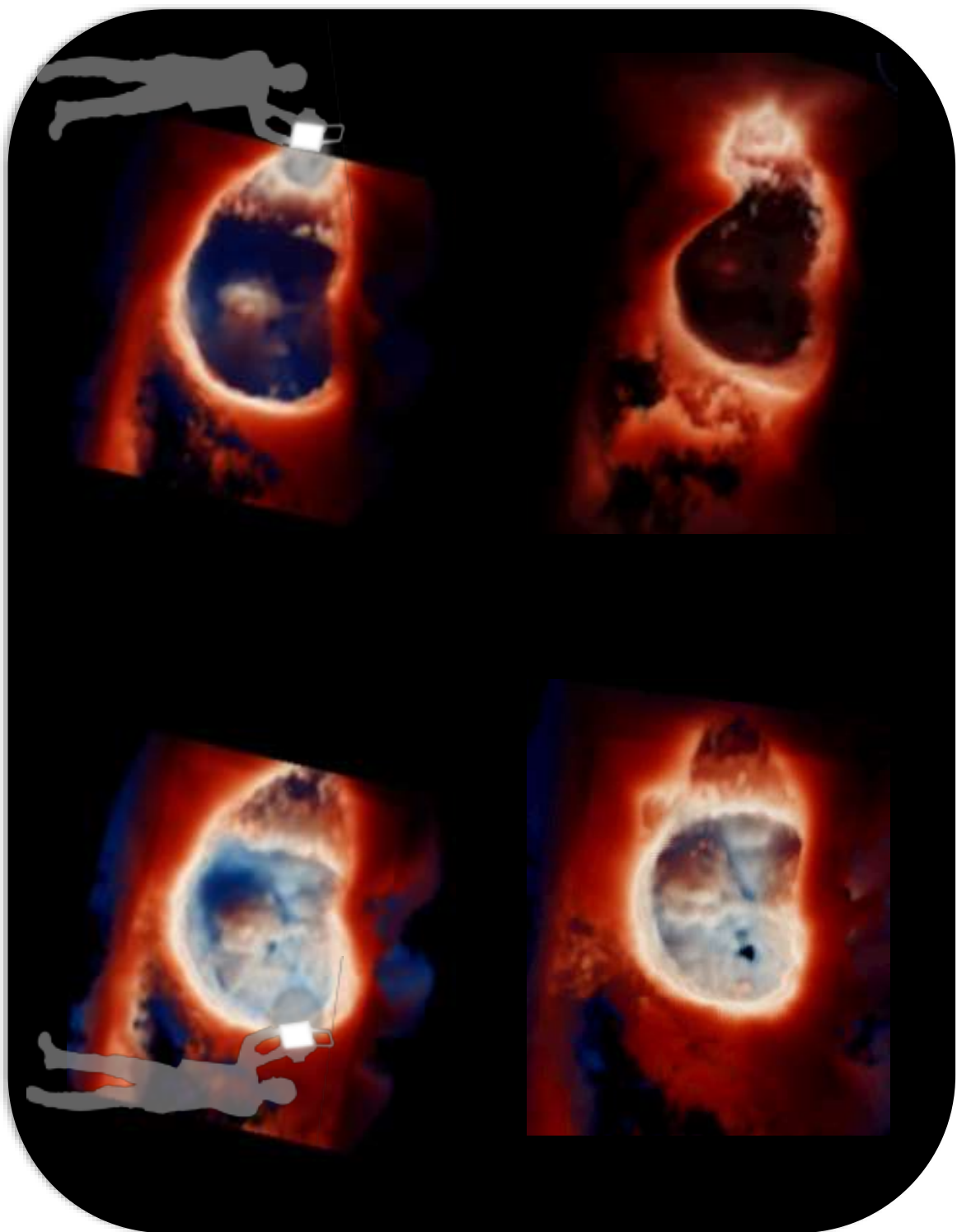
Multiview



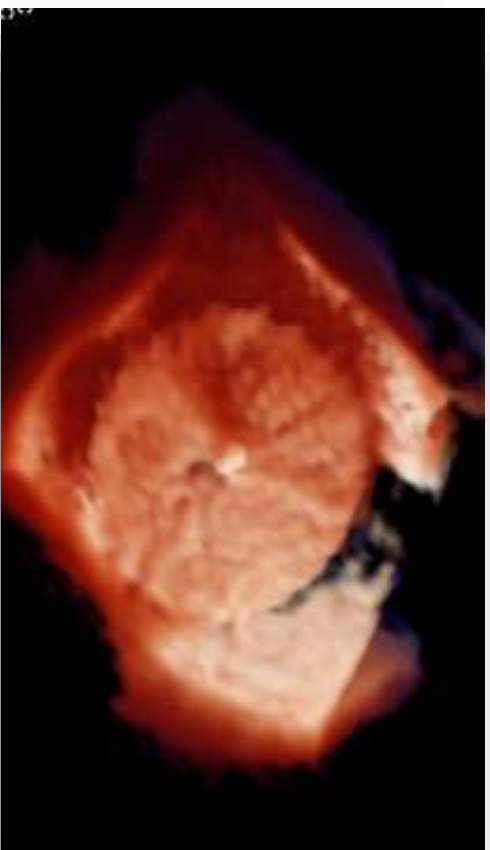
Annular calcifications?



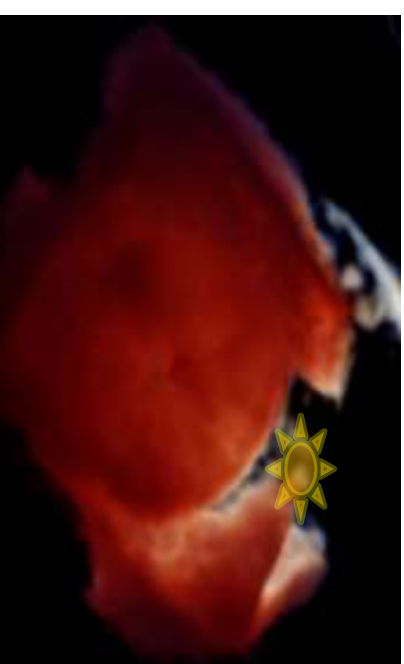
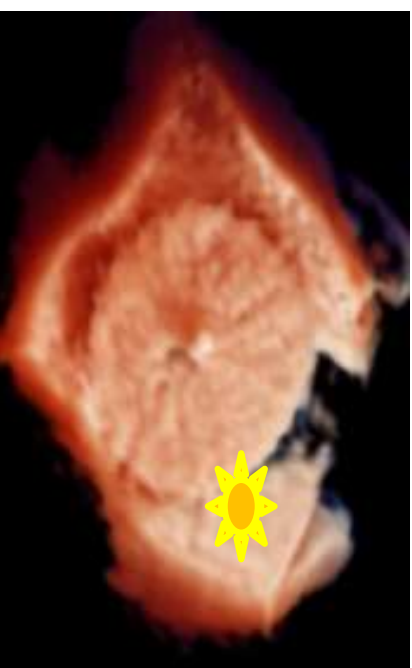
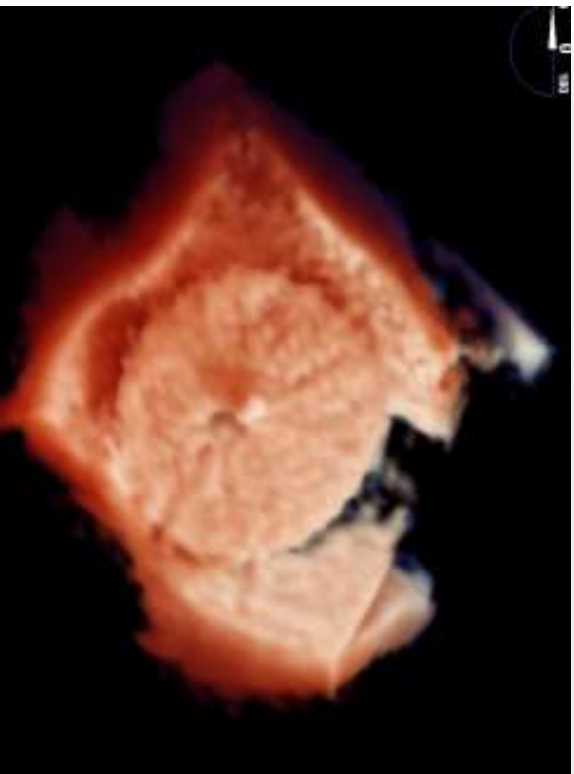




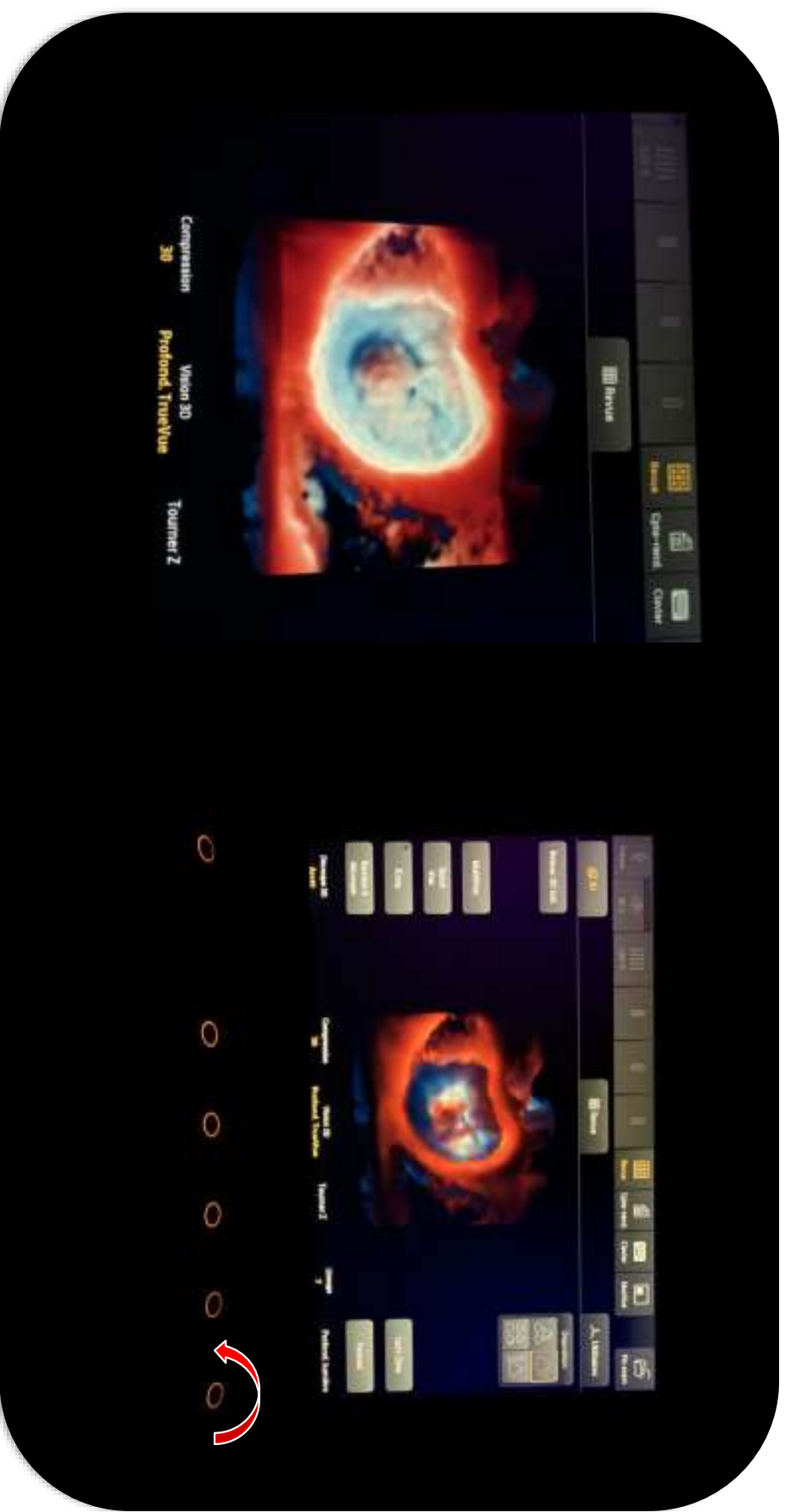
Positionnement de la source de lumière avec l'écran tactile



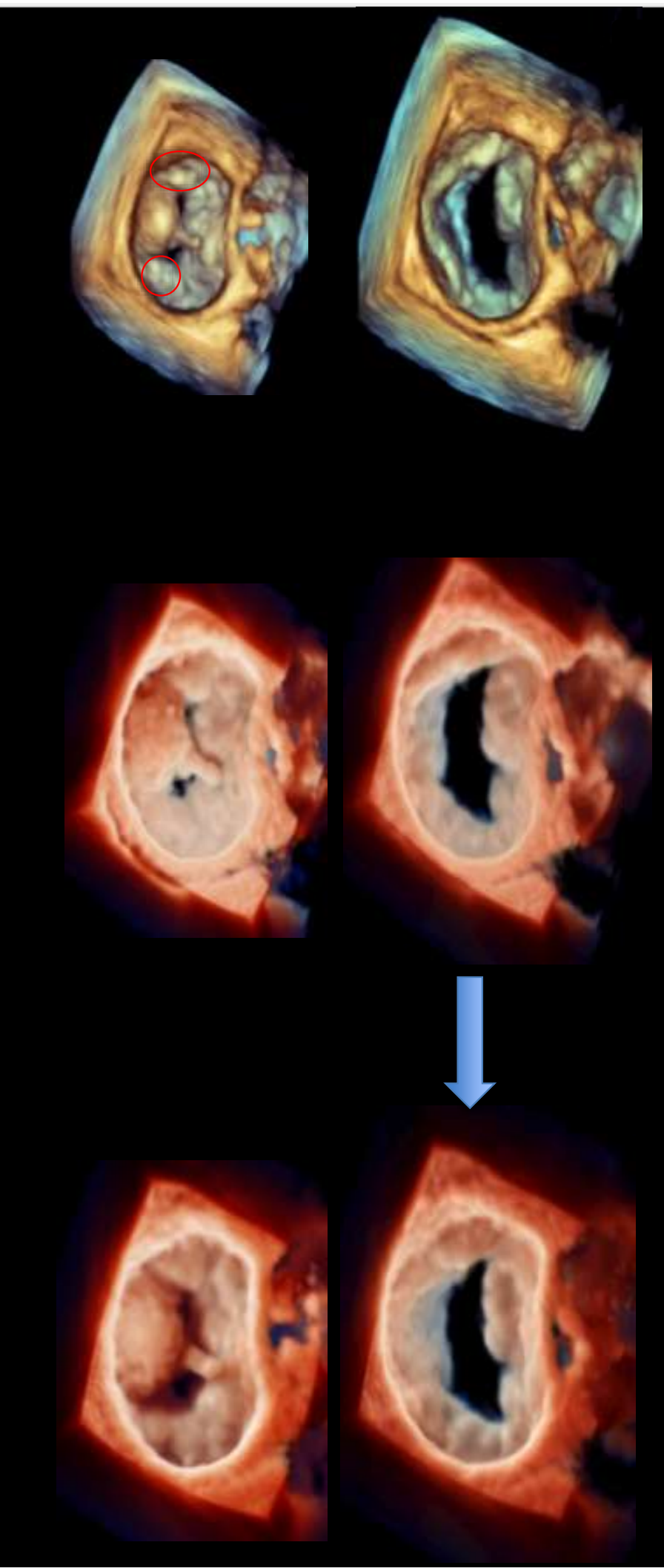
Positionnement de la source de lumière au premier plan ou en arrière plan

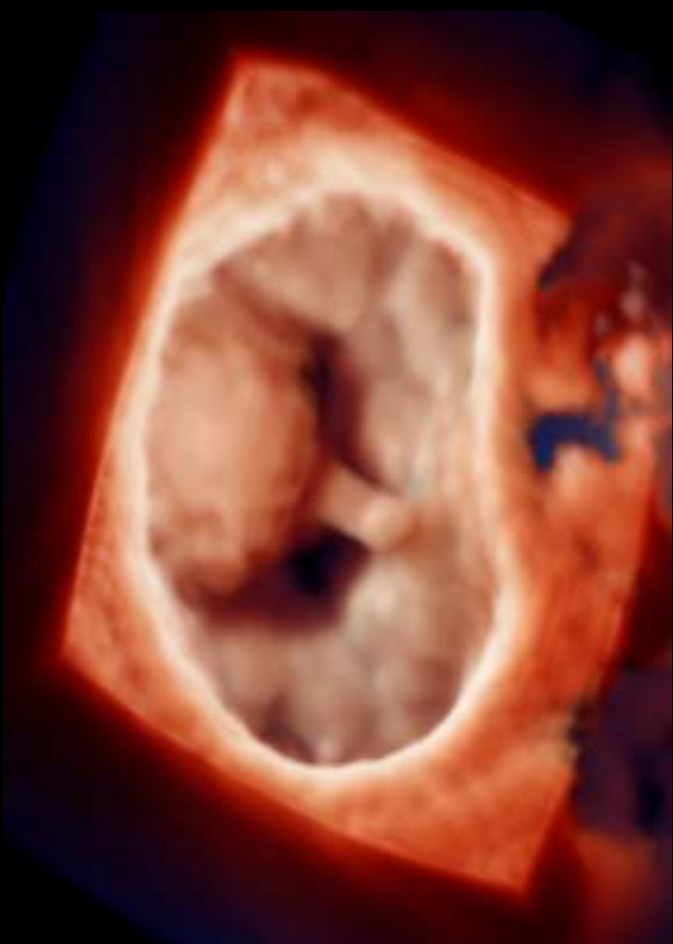
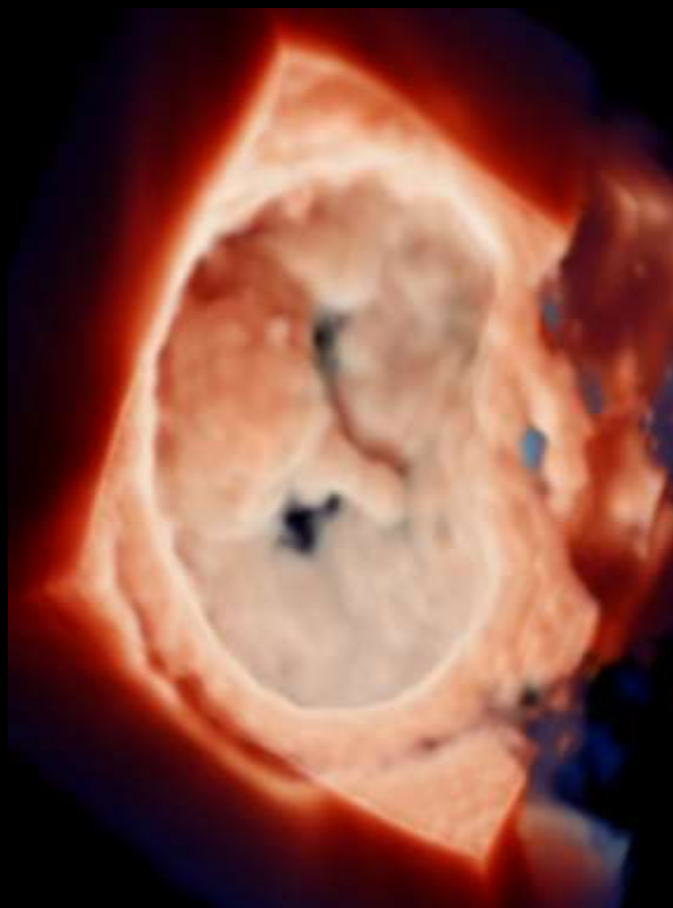


Positionnement de la source lumineuse

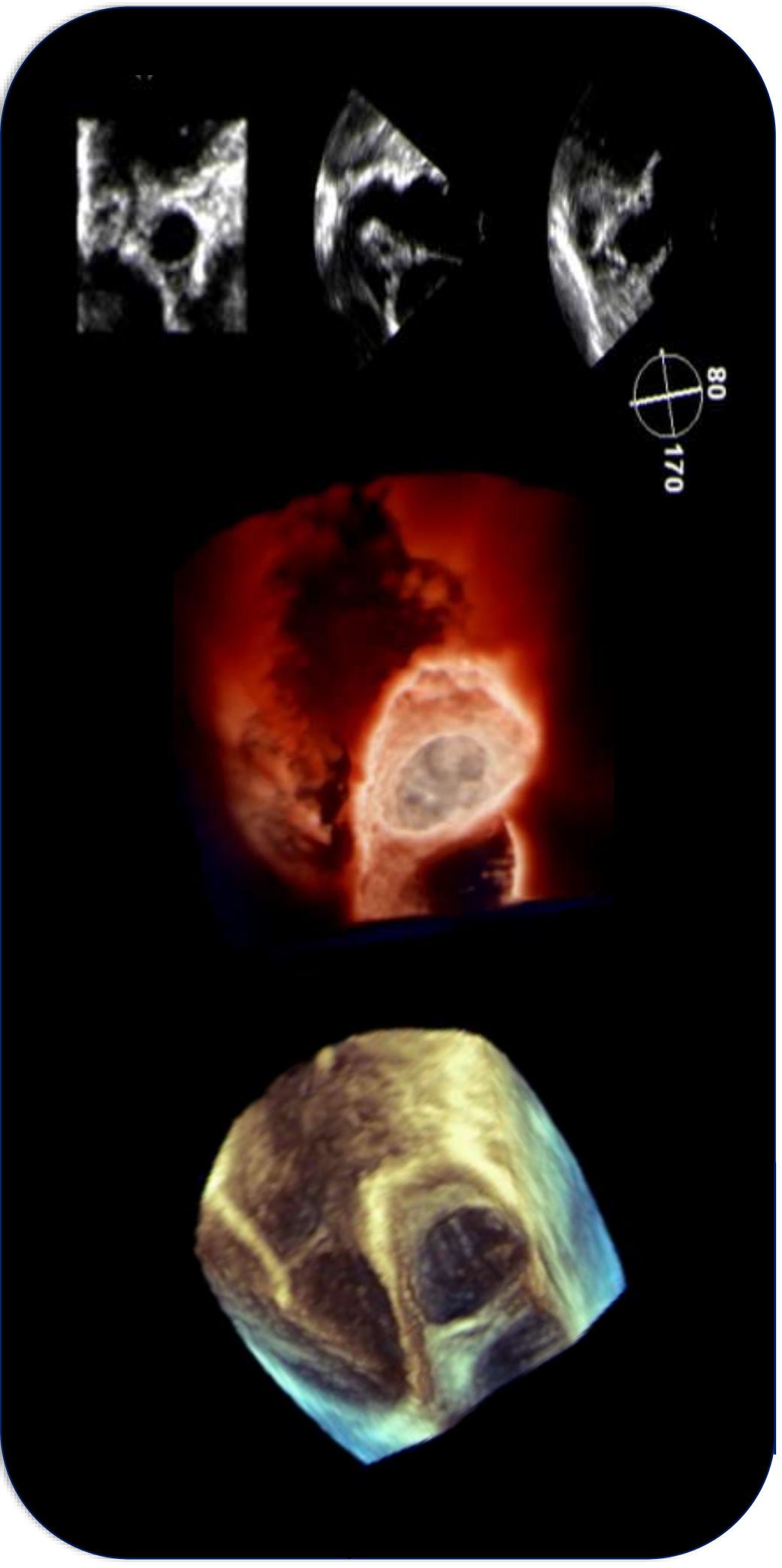


Attention à la position de la source lumineuse !





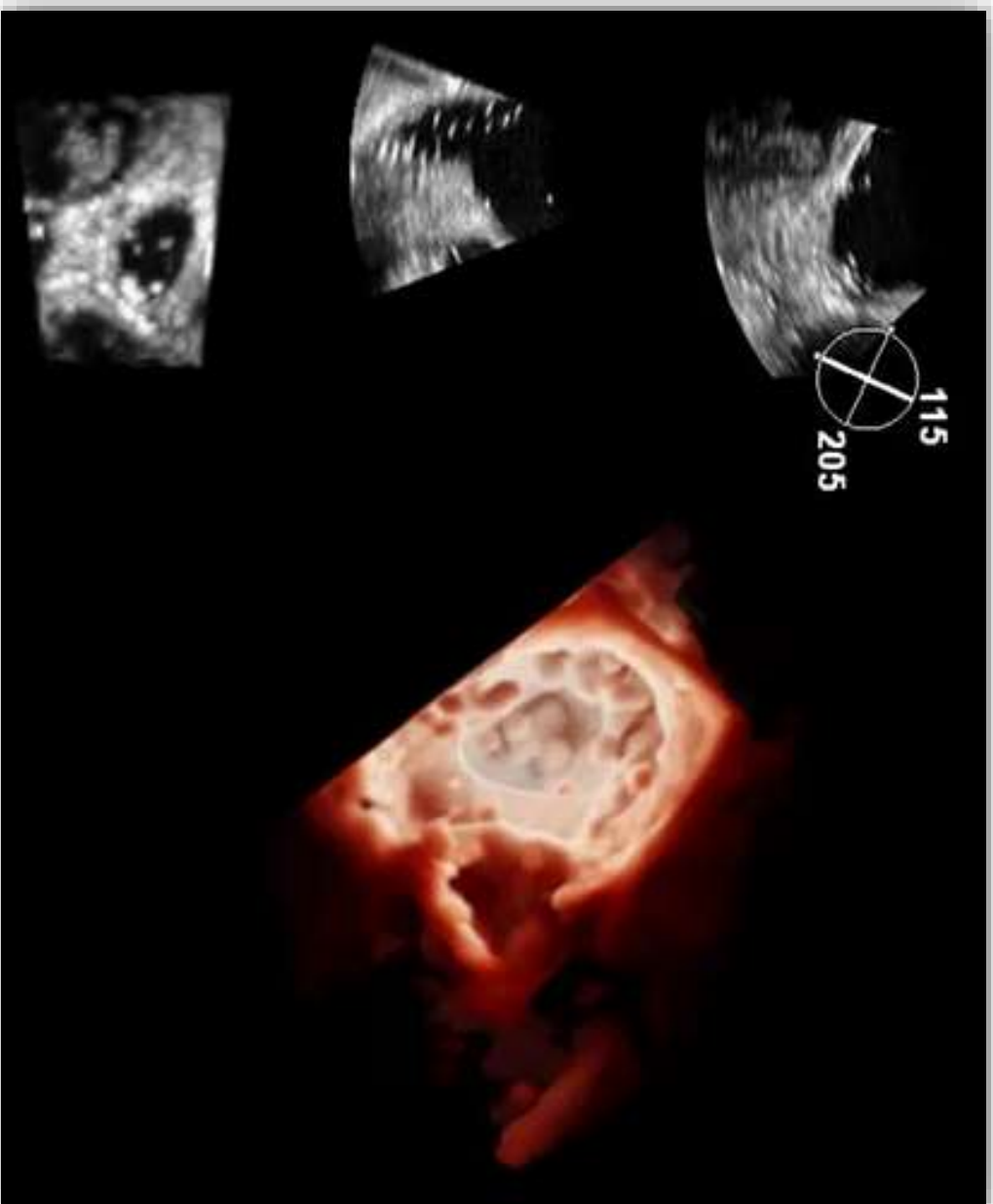
Left atrial appendage



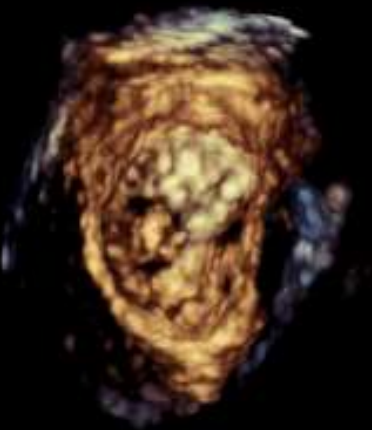
Contraste spontané



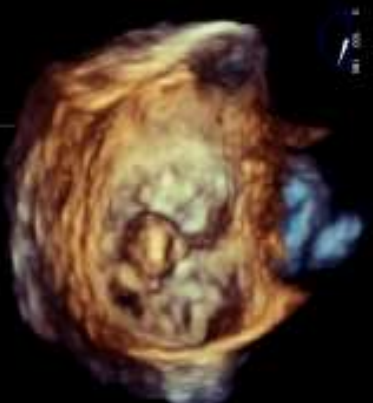
Bulles dans l'auricule après plastie mitrale



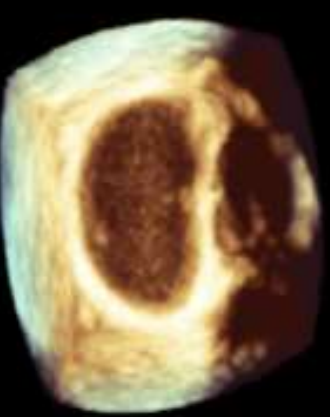
Gain/compression optimization



Insufficient



Optimal

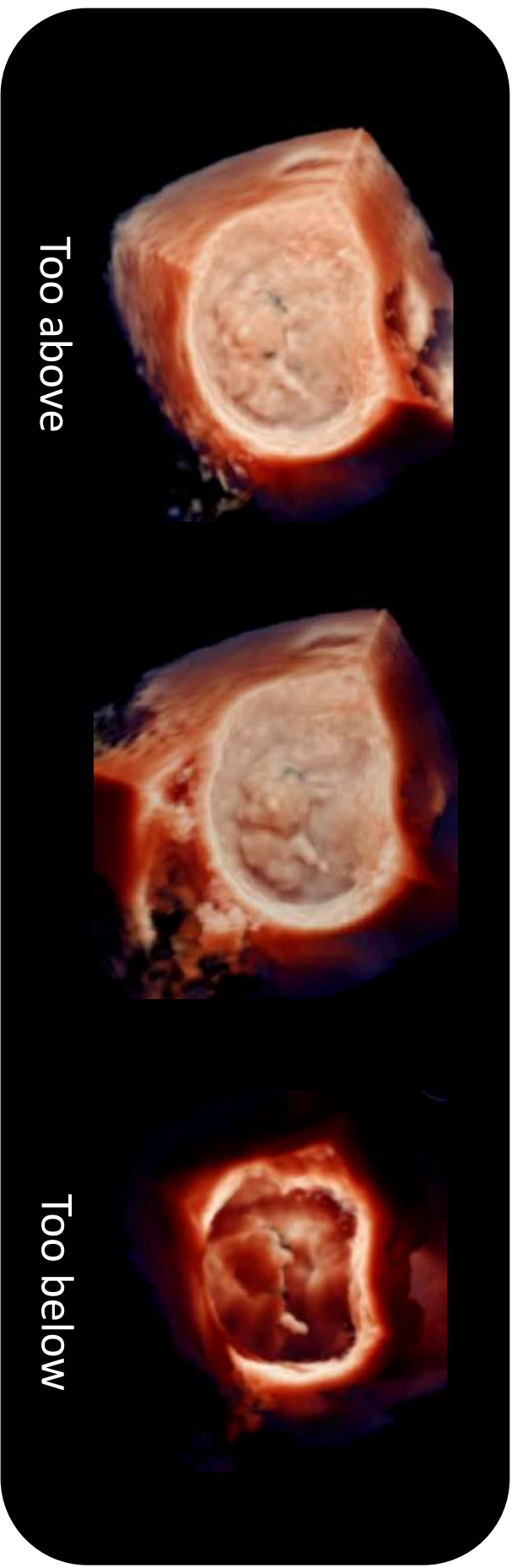


Excessive

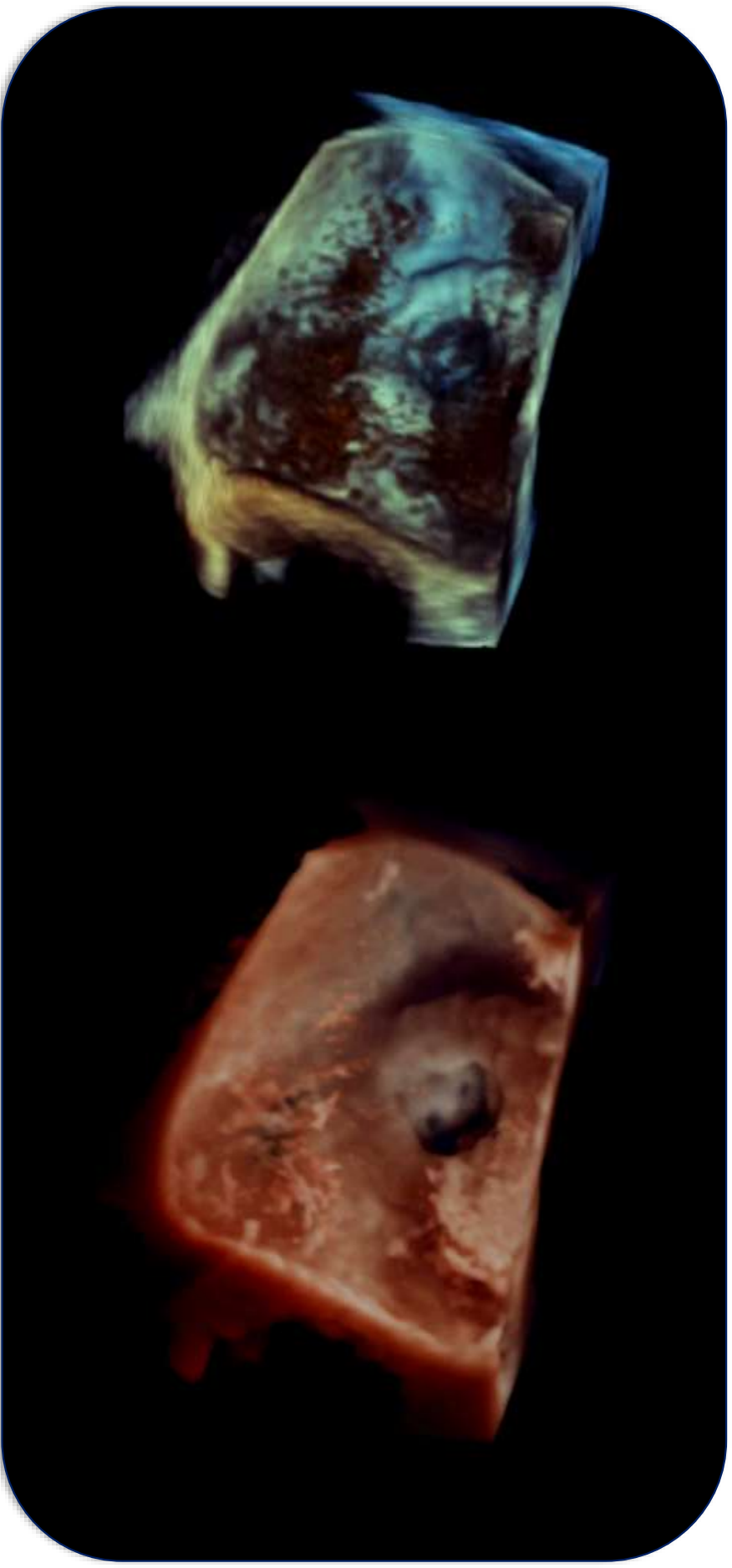
= disparition de structures

Modifie la taille et l'épaisseur des
structures +++

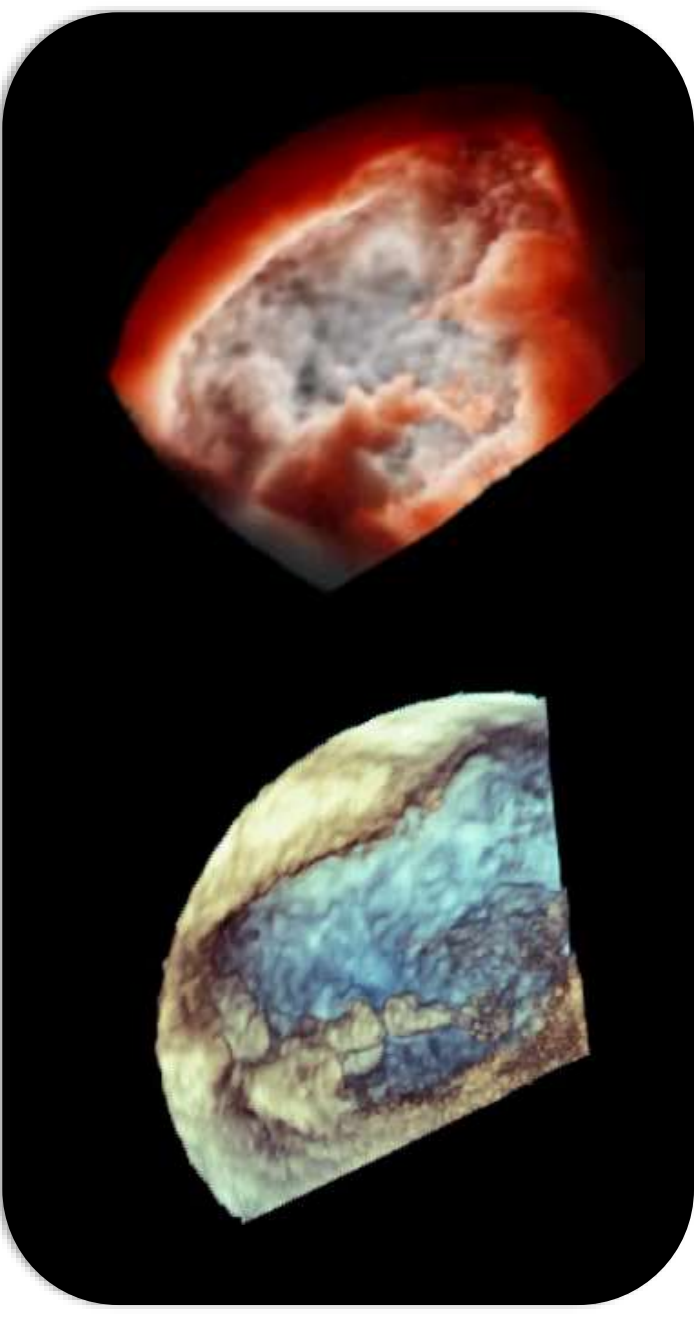
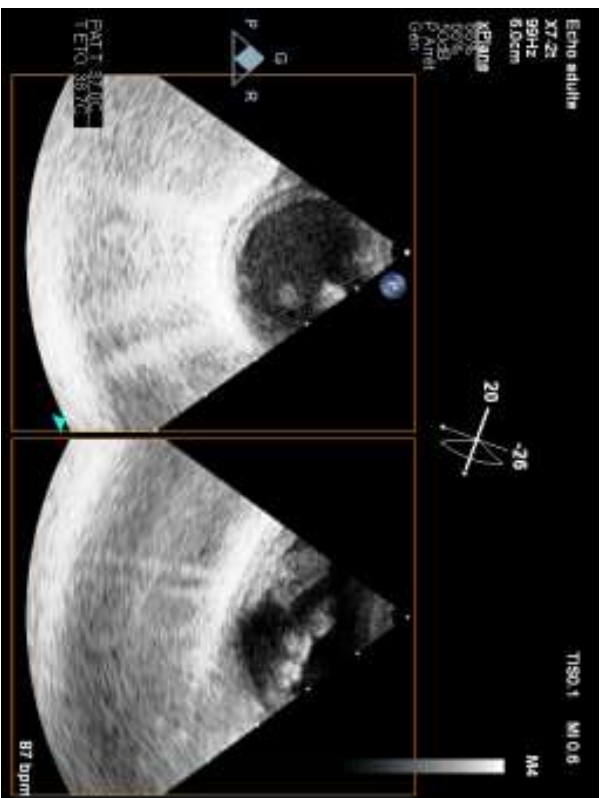
Optimisation de la profondeur de la lumière



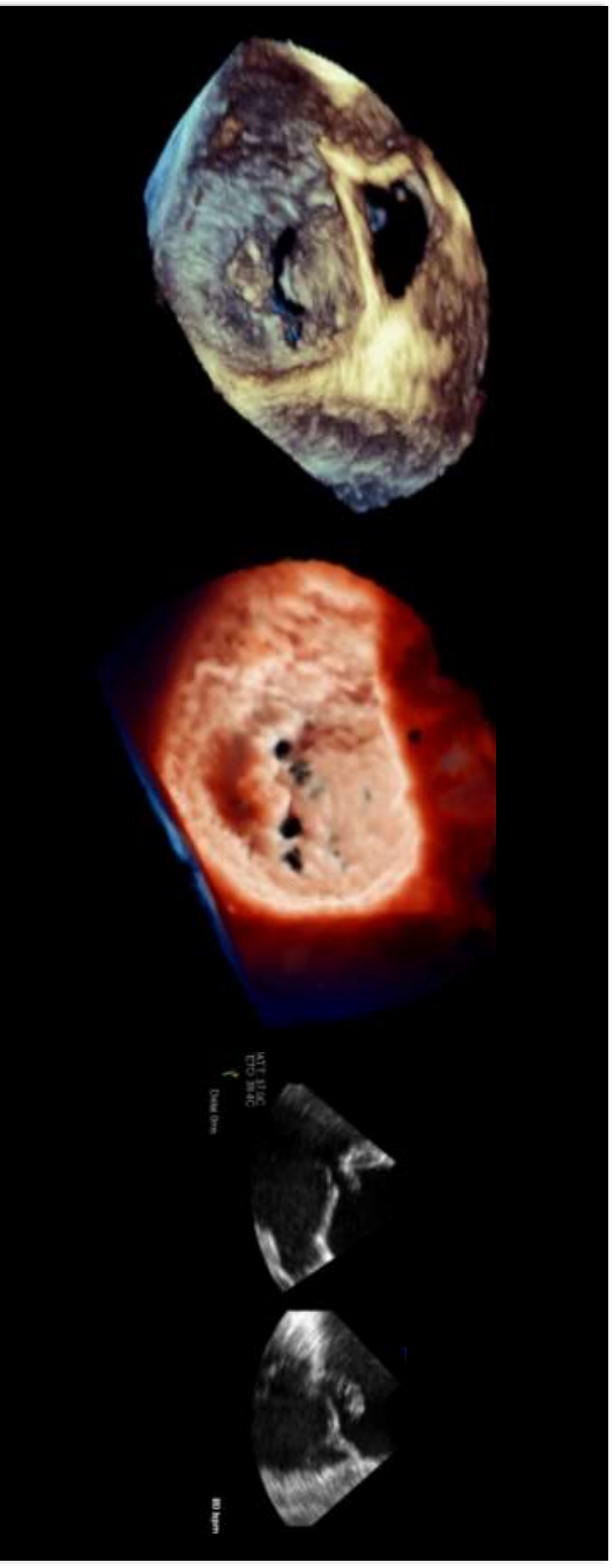
Jeu d'ombres

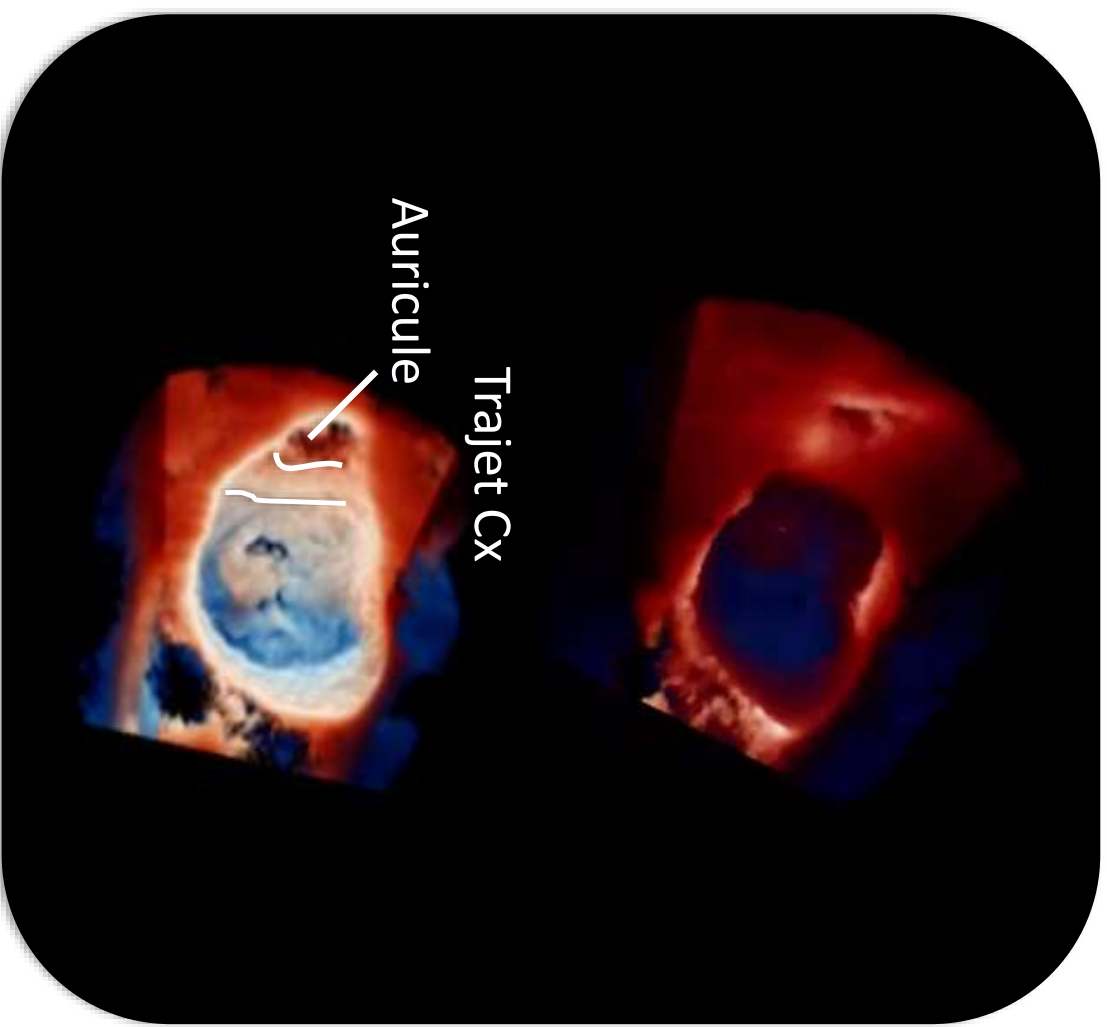
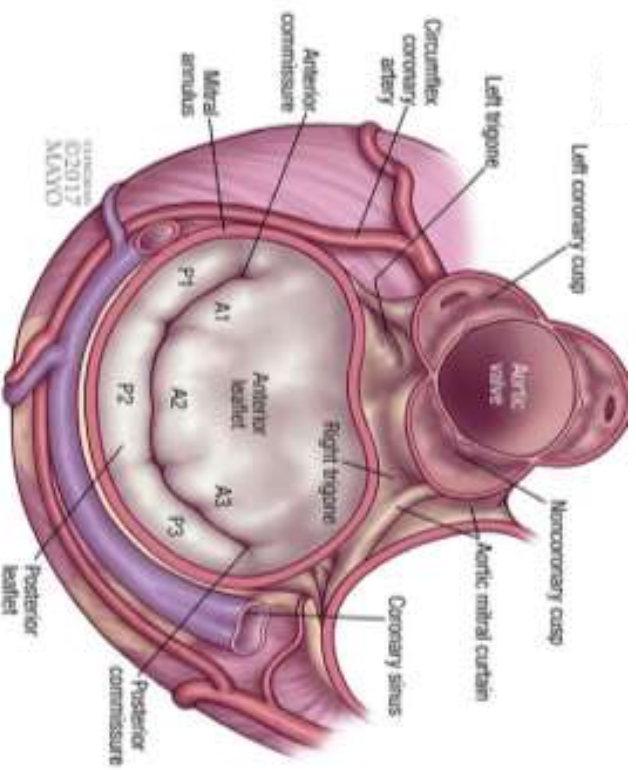


Athérome aortique

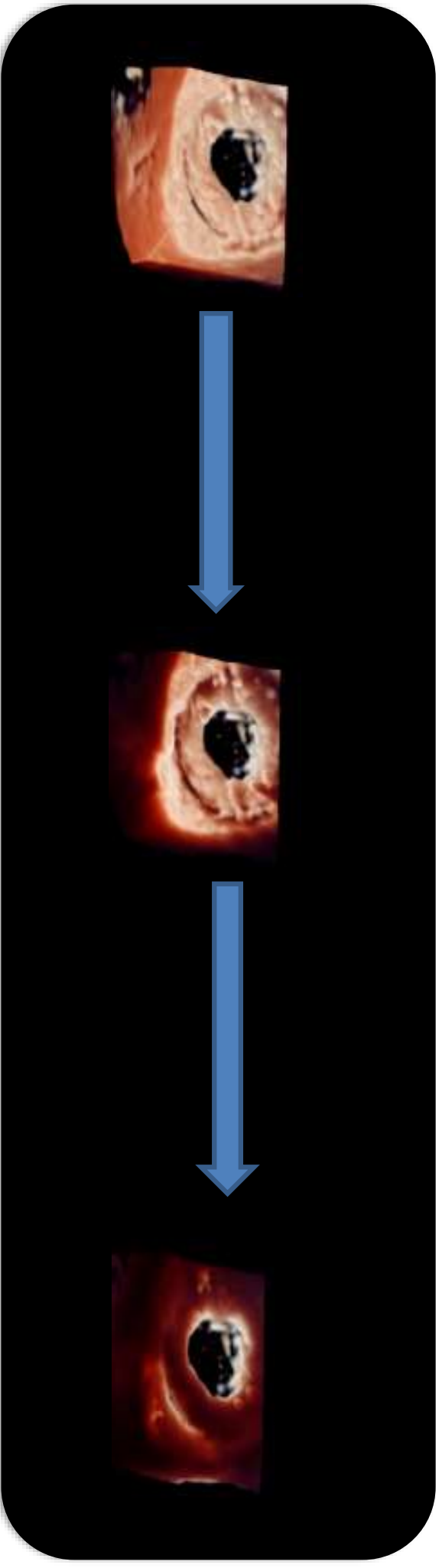


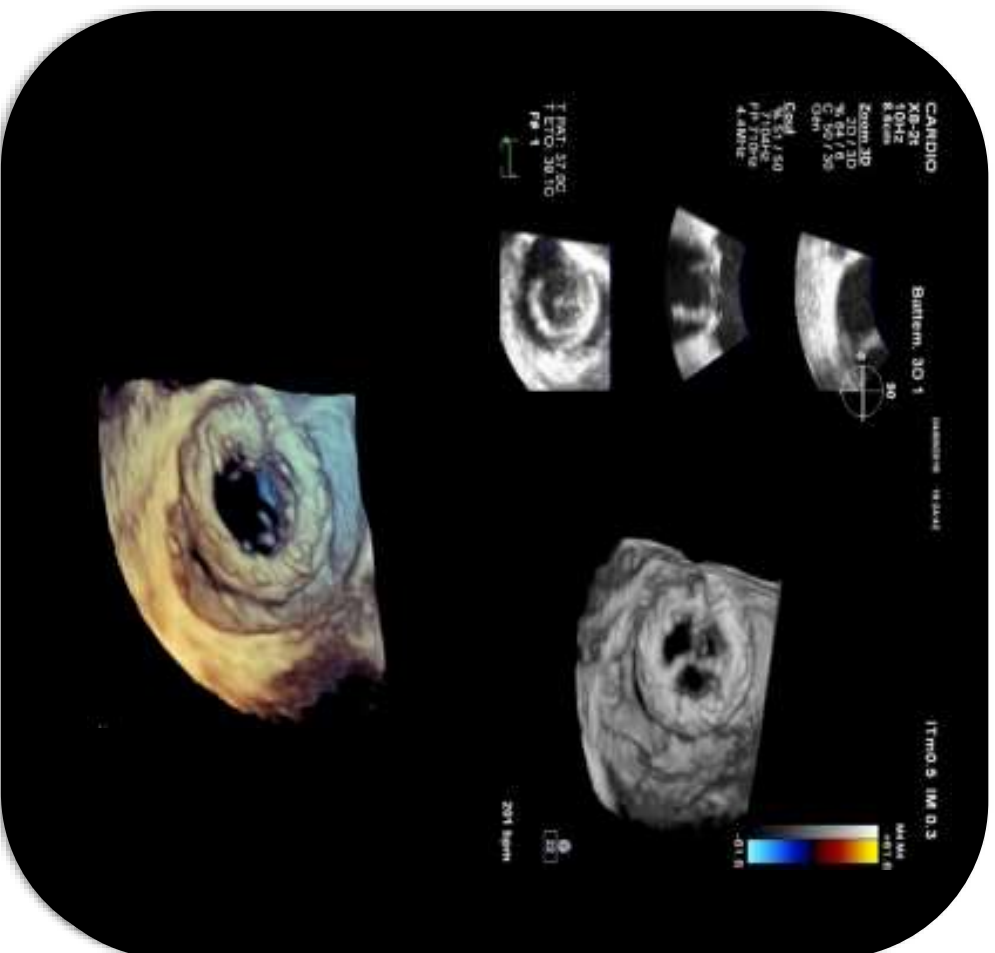
Ombre et hauteur de prolapsus





Déplacement de la source lumineuse



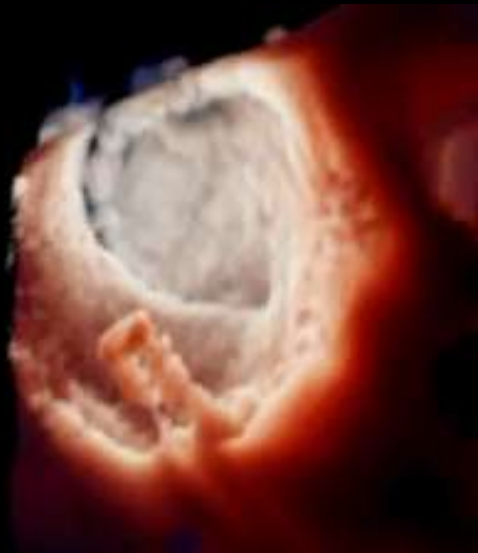


Aucune fuite para prothétique !!!

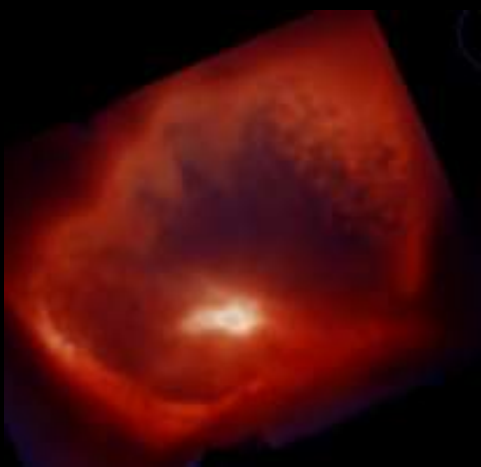
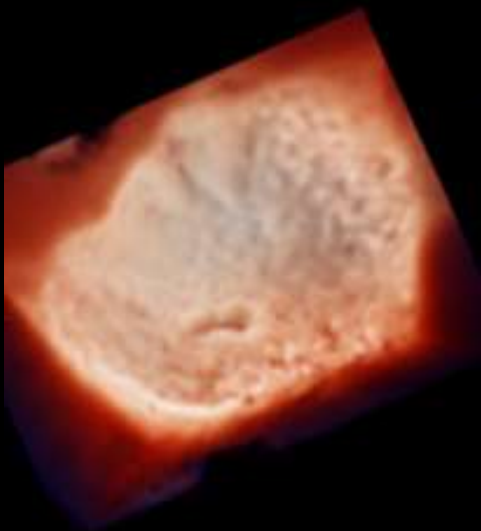
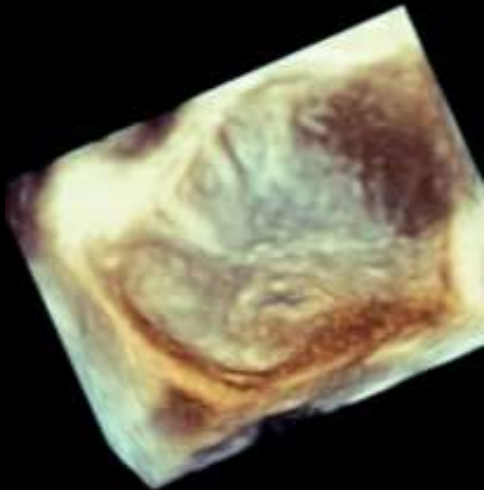
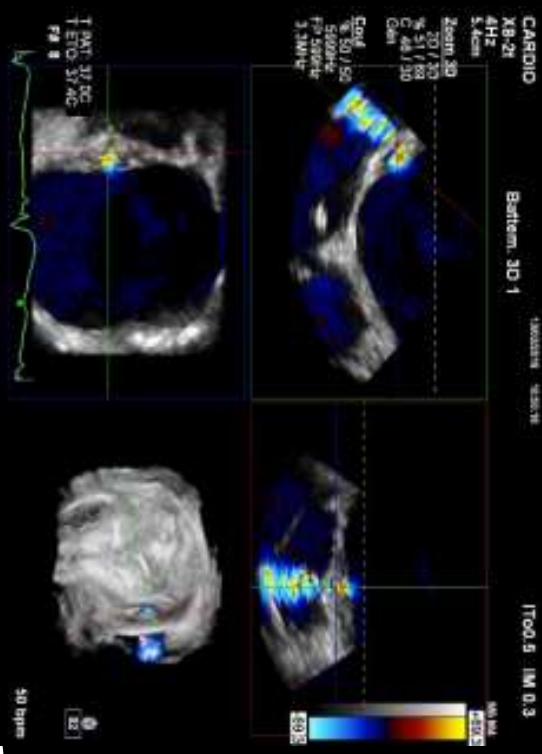
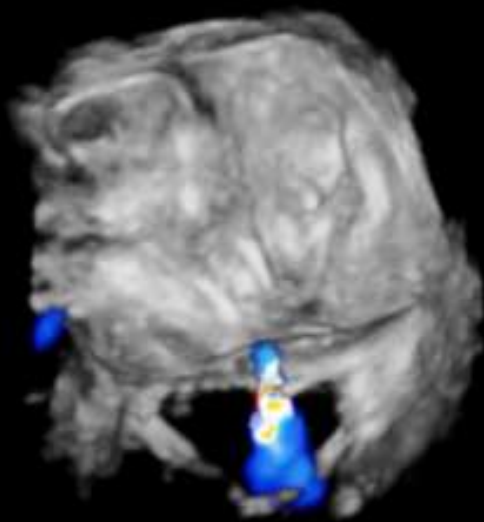
Les artefacts restent des artefacts
Même avec un traitement informatique !

Trans-illumination





7



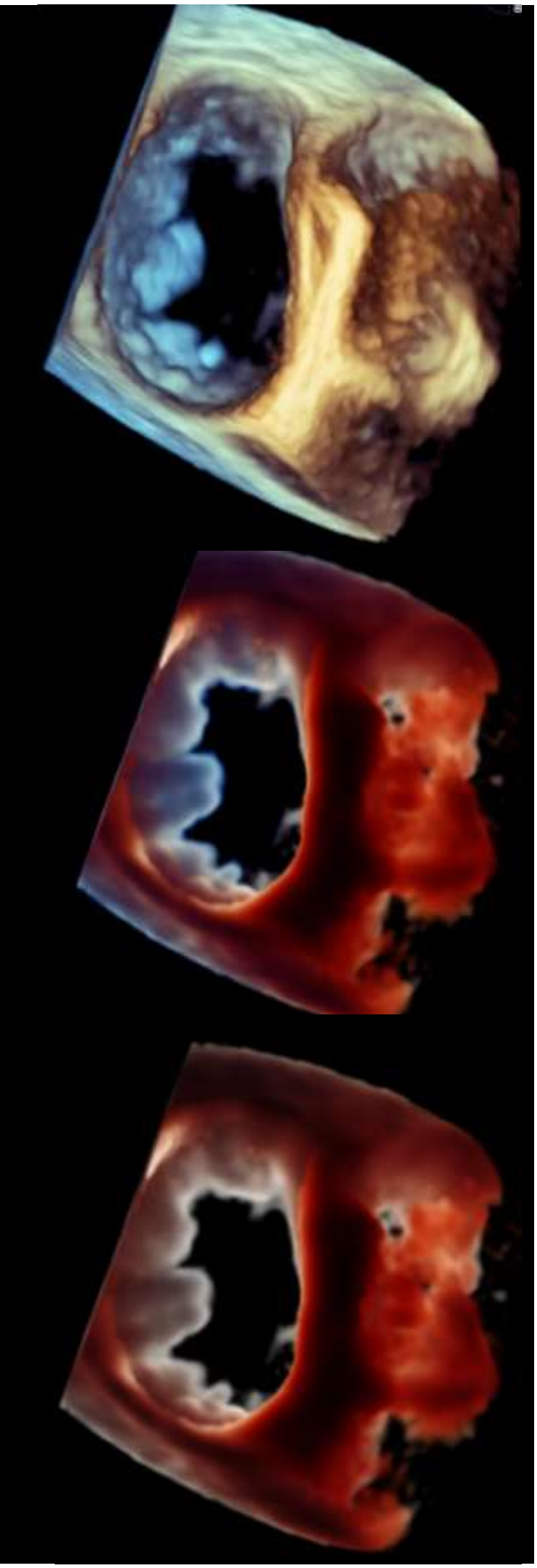
visualisation des indentations



Maladie de Barlow

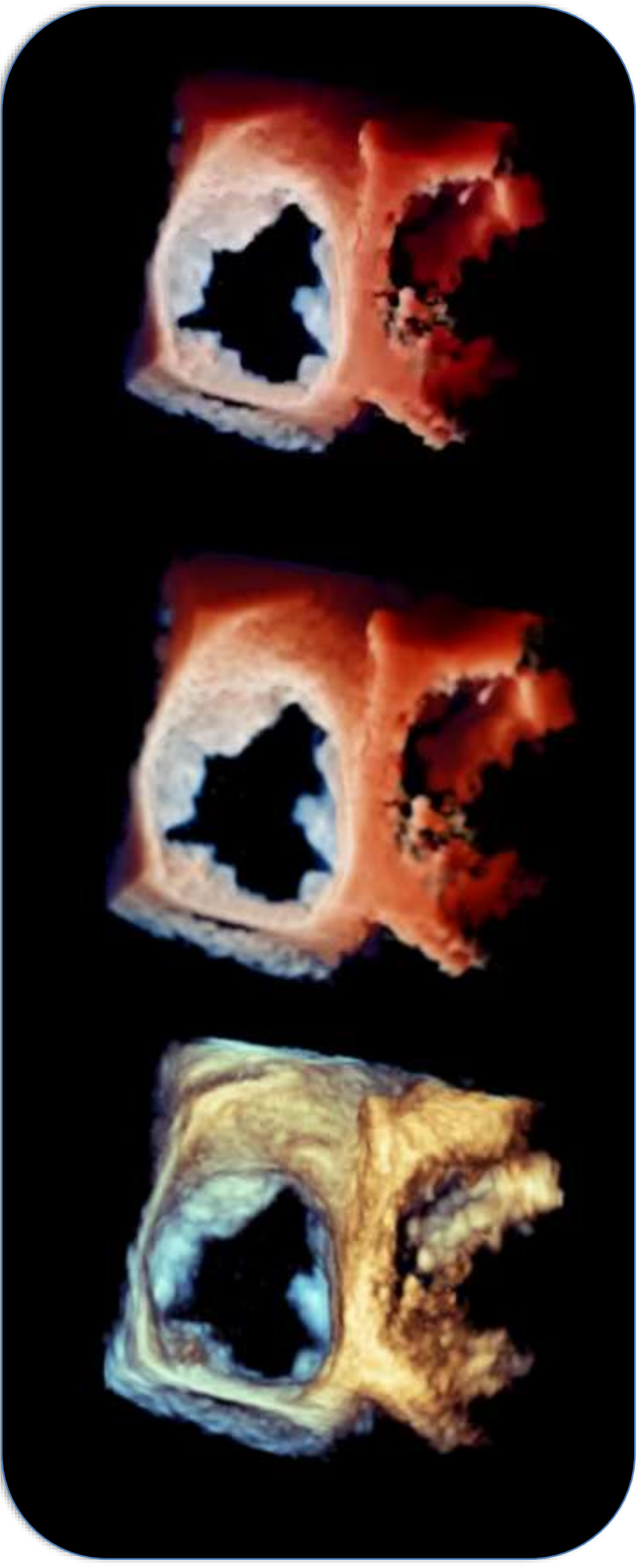


visualisation des indentations

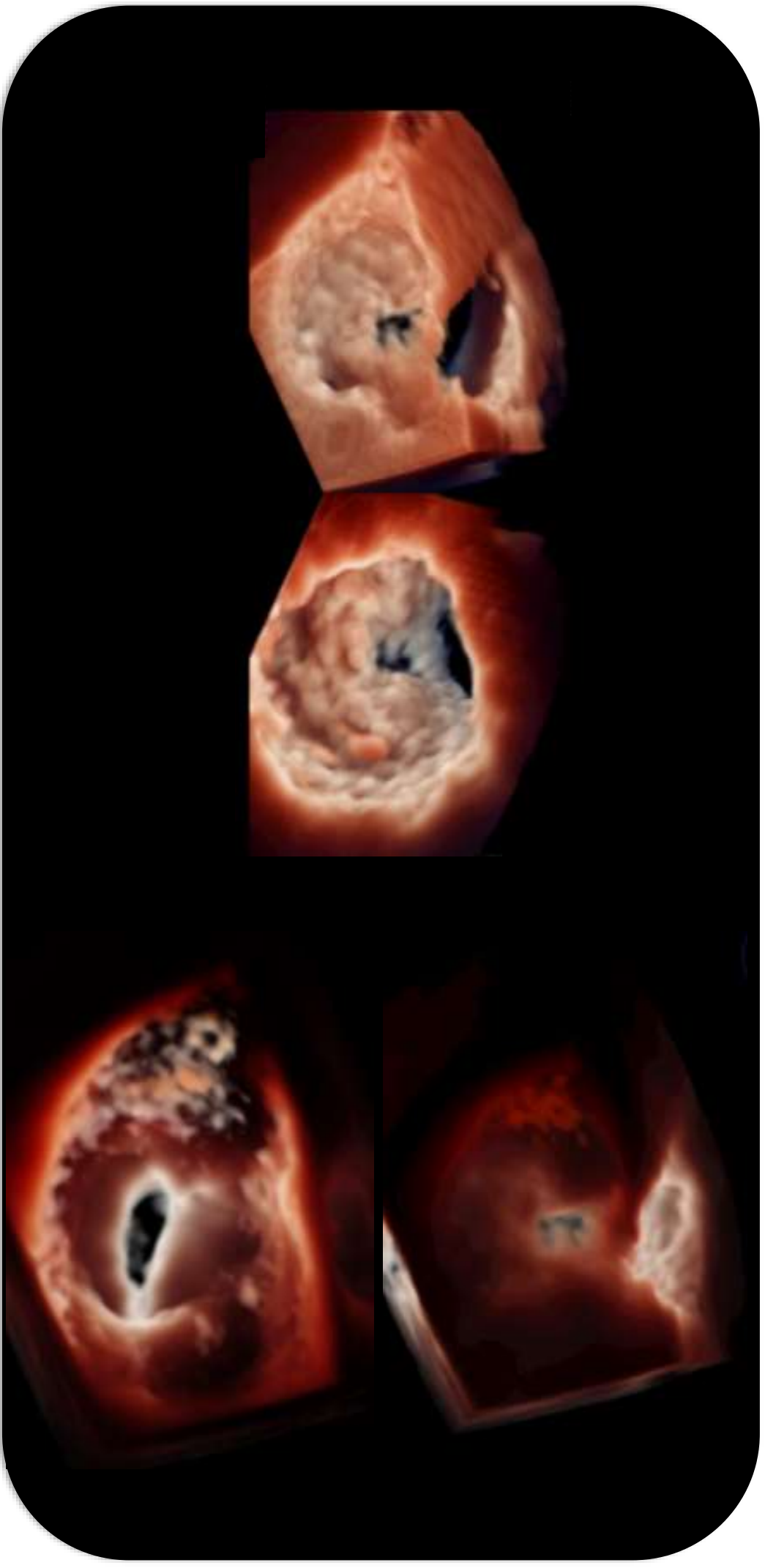


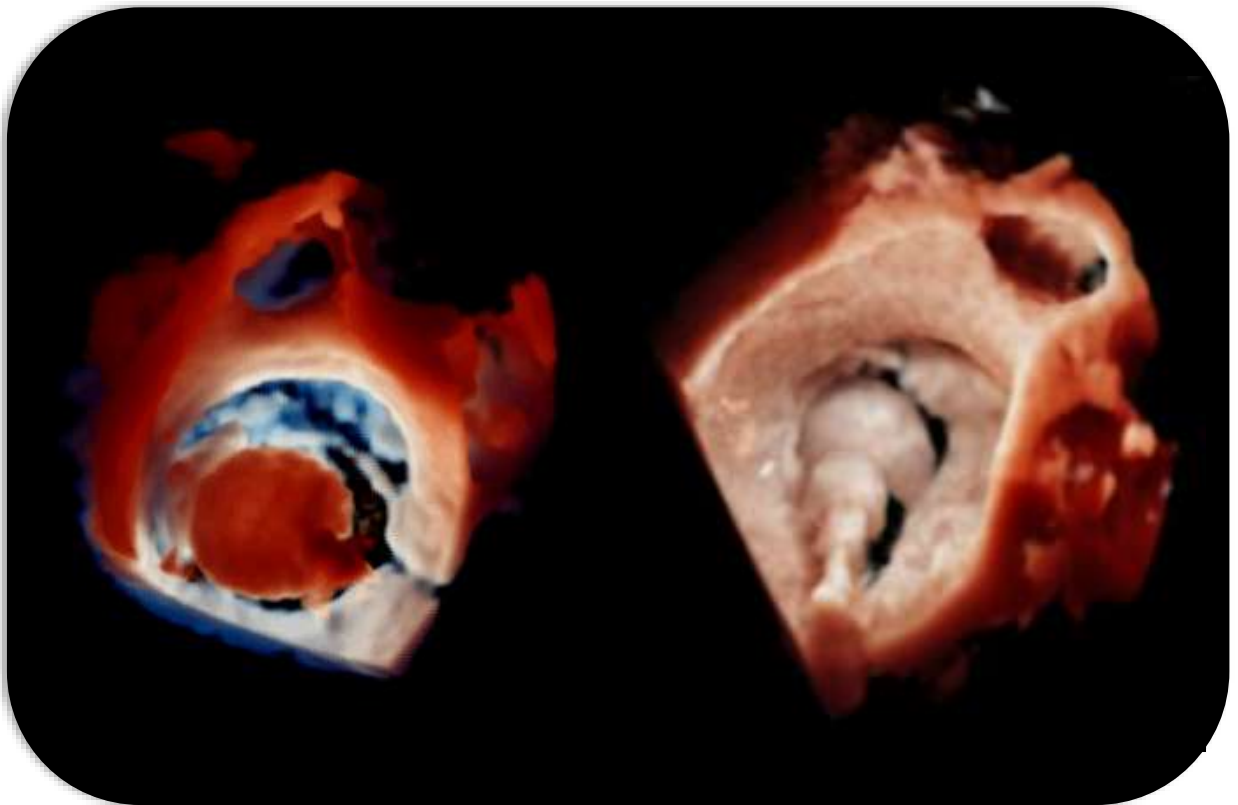
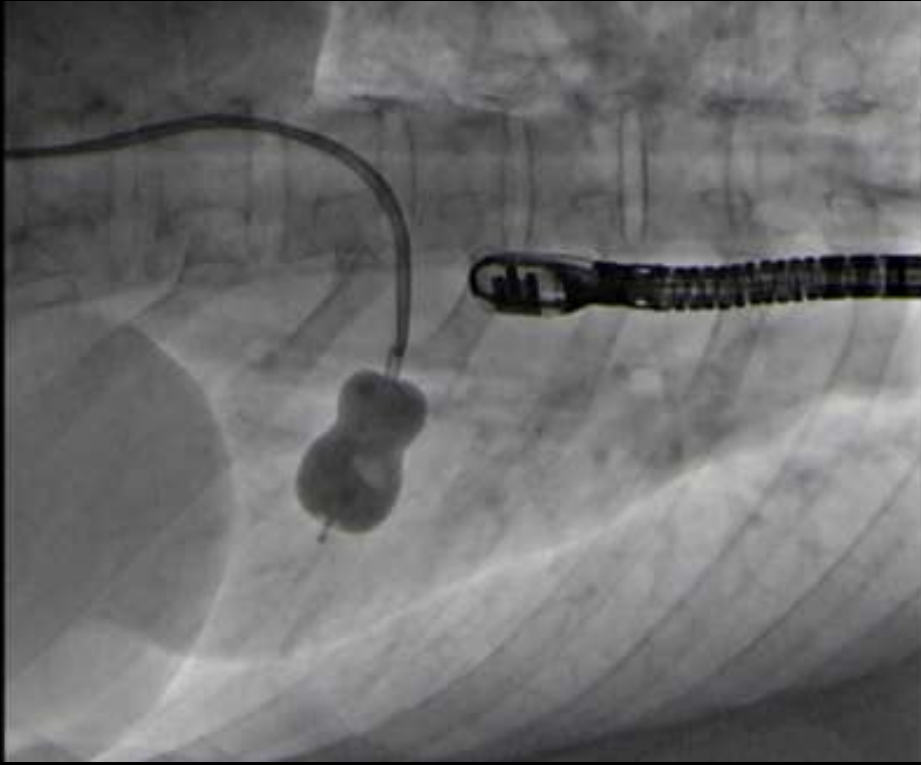


visualisation des indentations

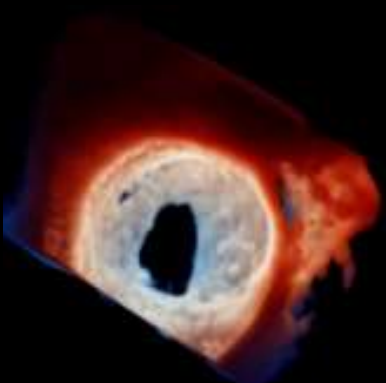


RM avec calcification de la CP

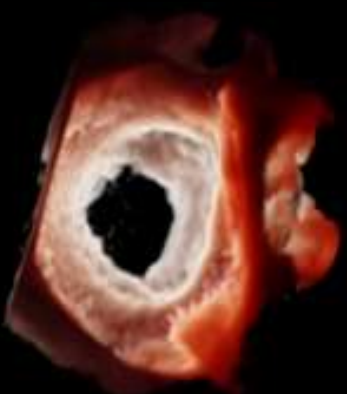
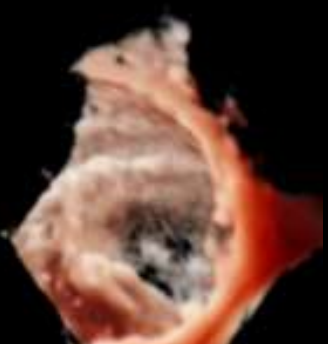




Pré



Post

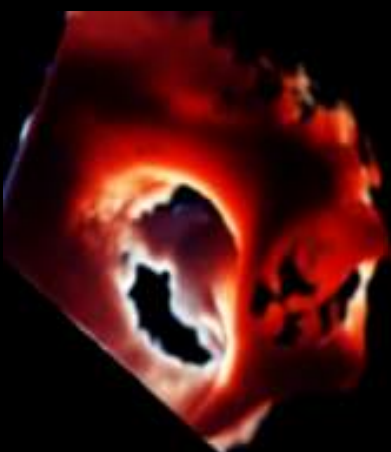
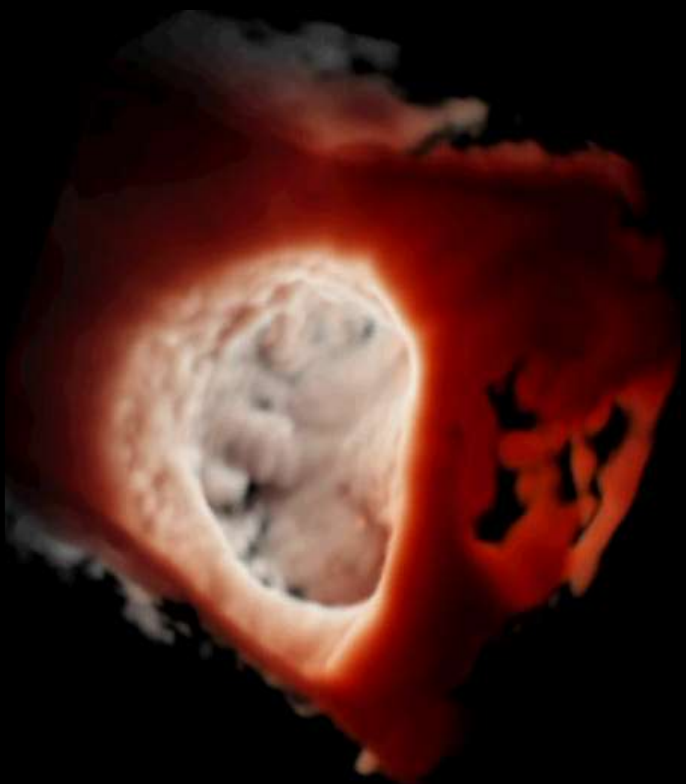
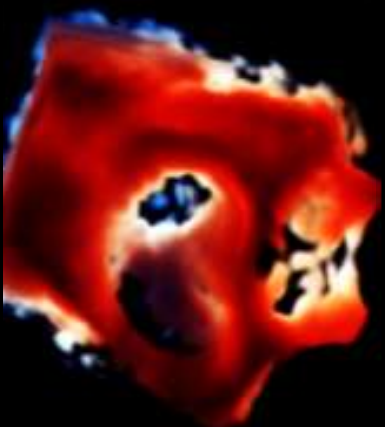


Texture et transillumination



mitracclip fuite fonctionnelle sévère sur CMD



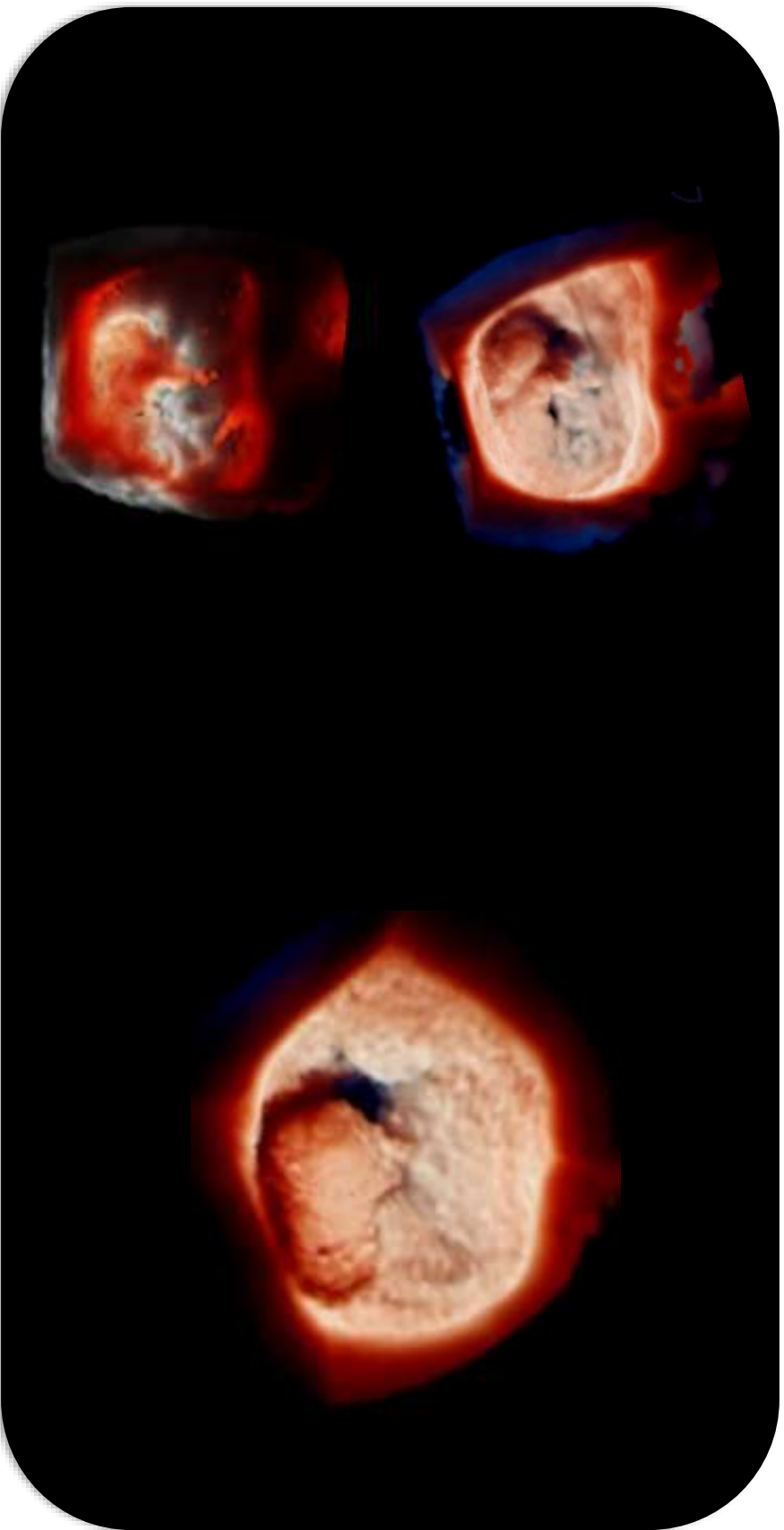


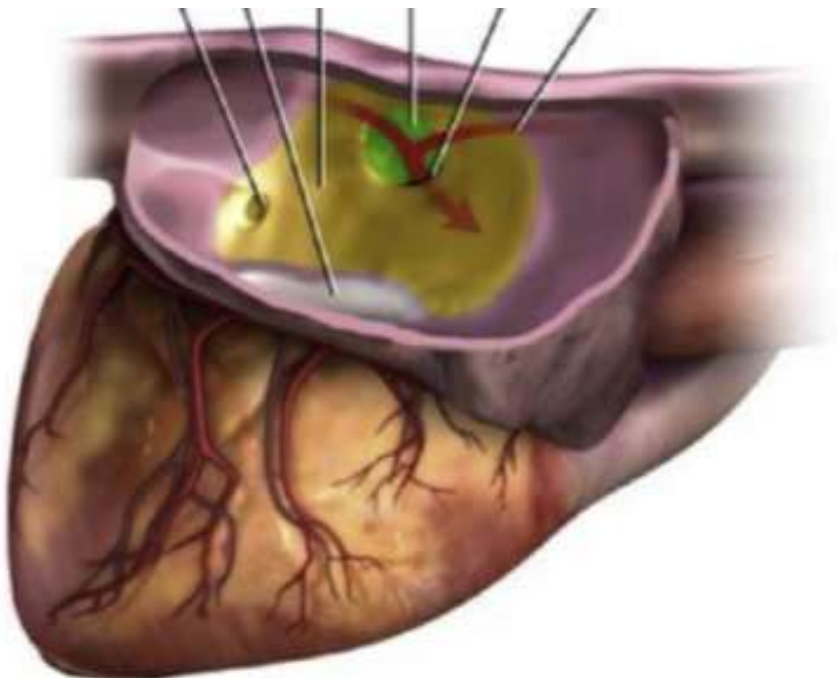
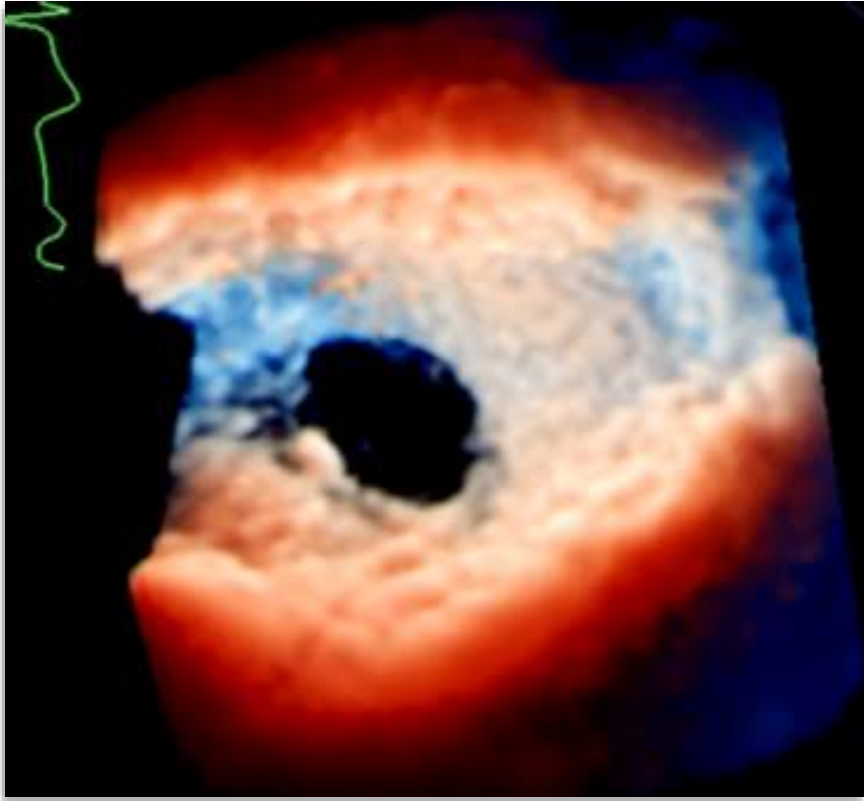
clip repair in porcine heart
circulation 2003 108 suppl IV 493

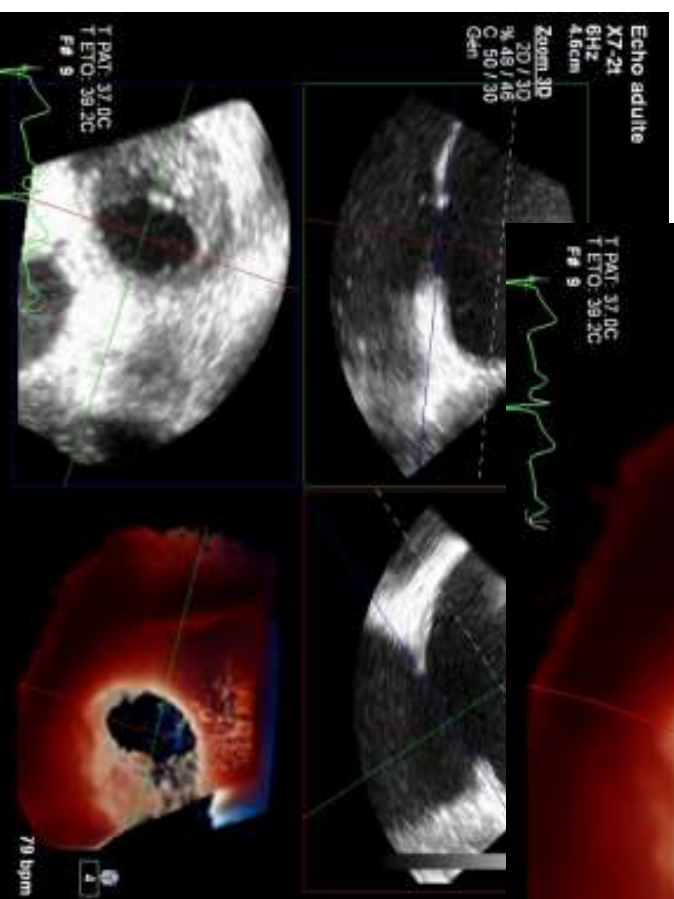
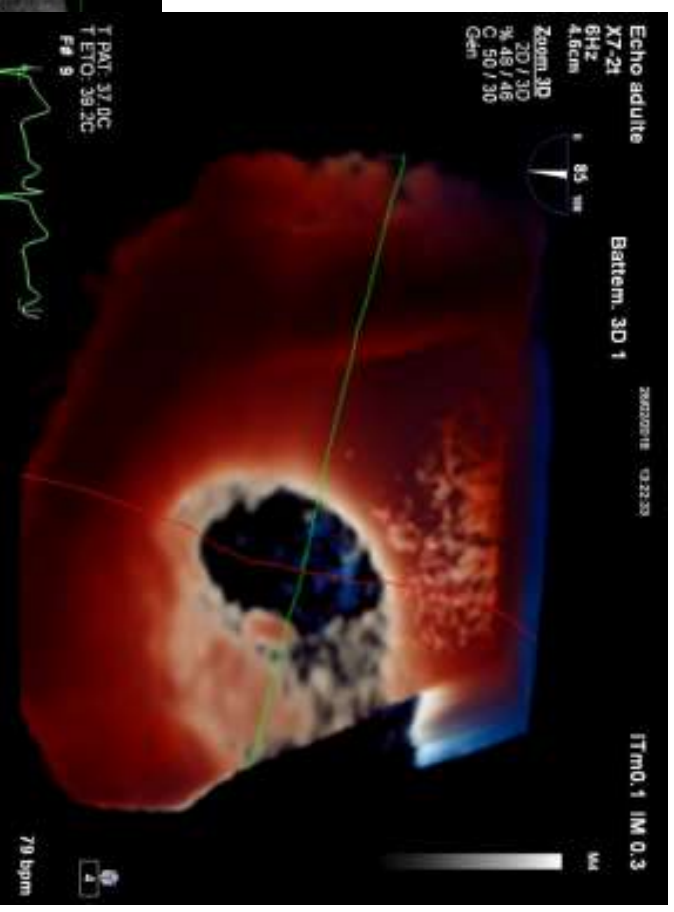
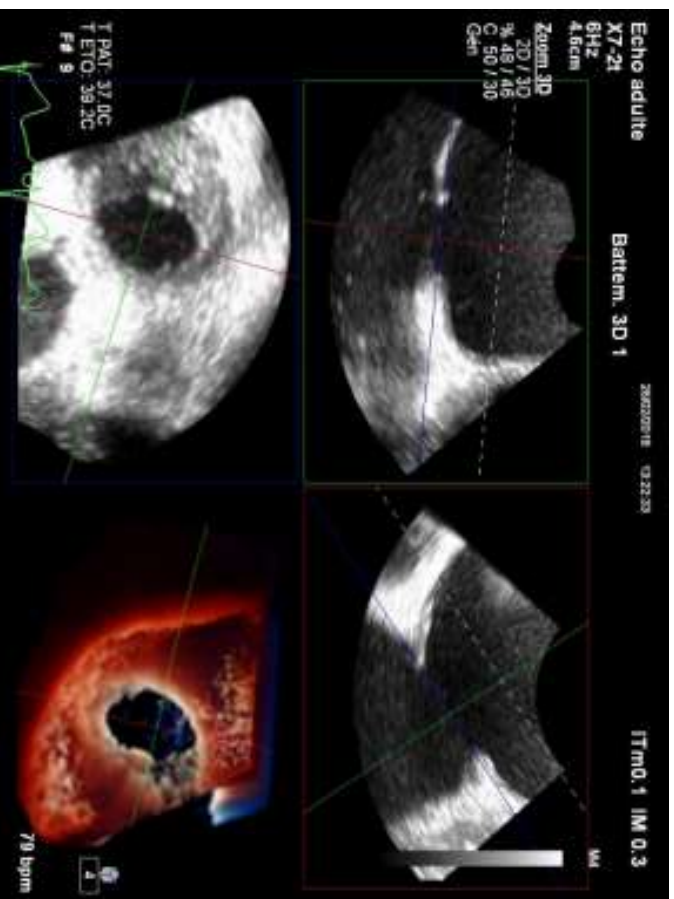


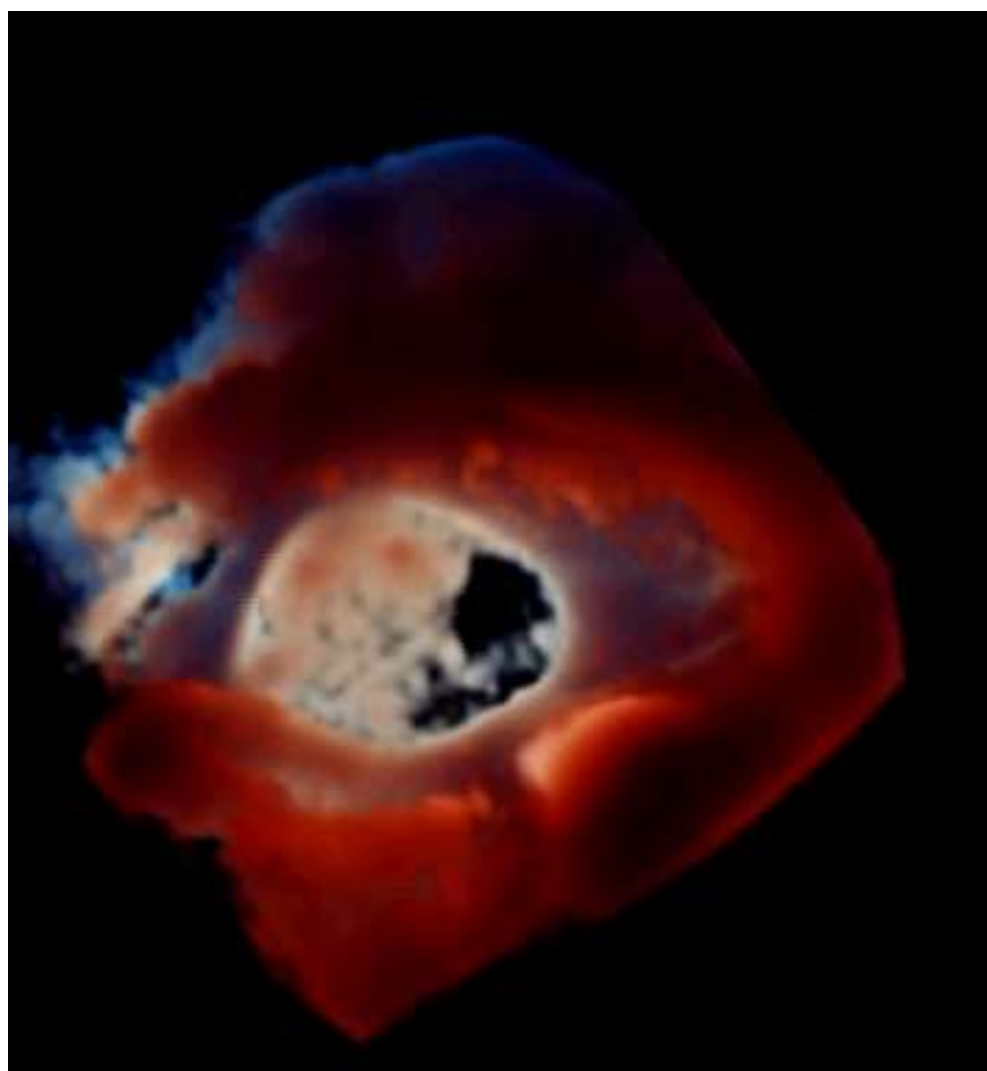
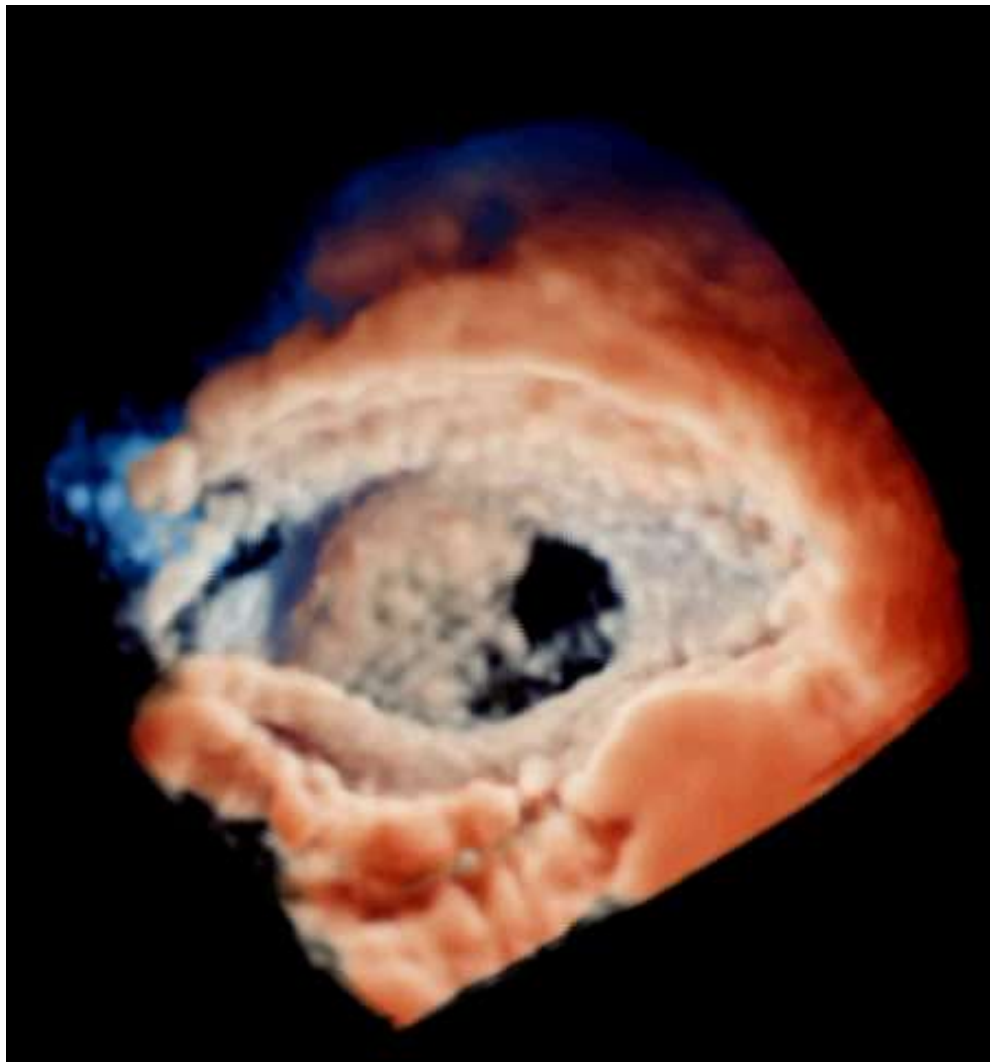
University of Minnesota, Minneapolis, MN

transillumination et prolapsus mitral









Echo adulte

X8-2t

10Hz

6.3cm

3D Zoom

2D / 3D

% 49 / 82

C 50 / 30

Gen

3D Beats 1

95

185

TISO.2

MI 0.2

M4

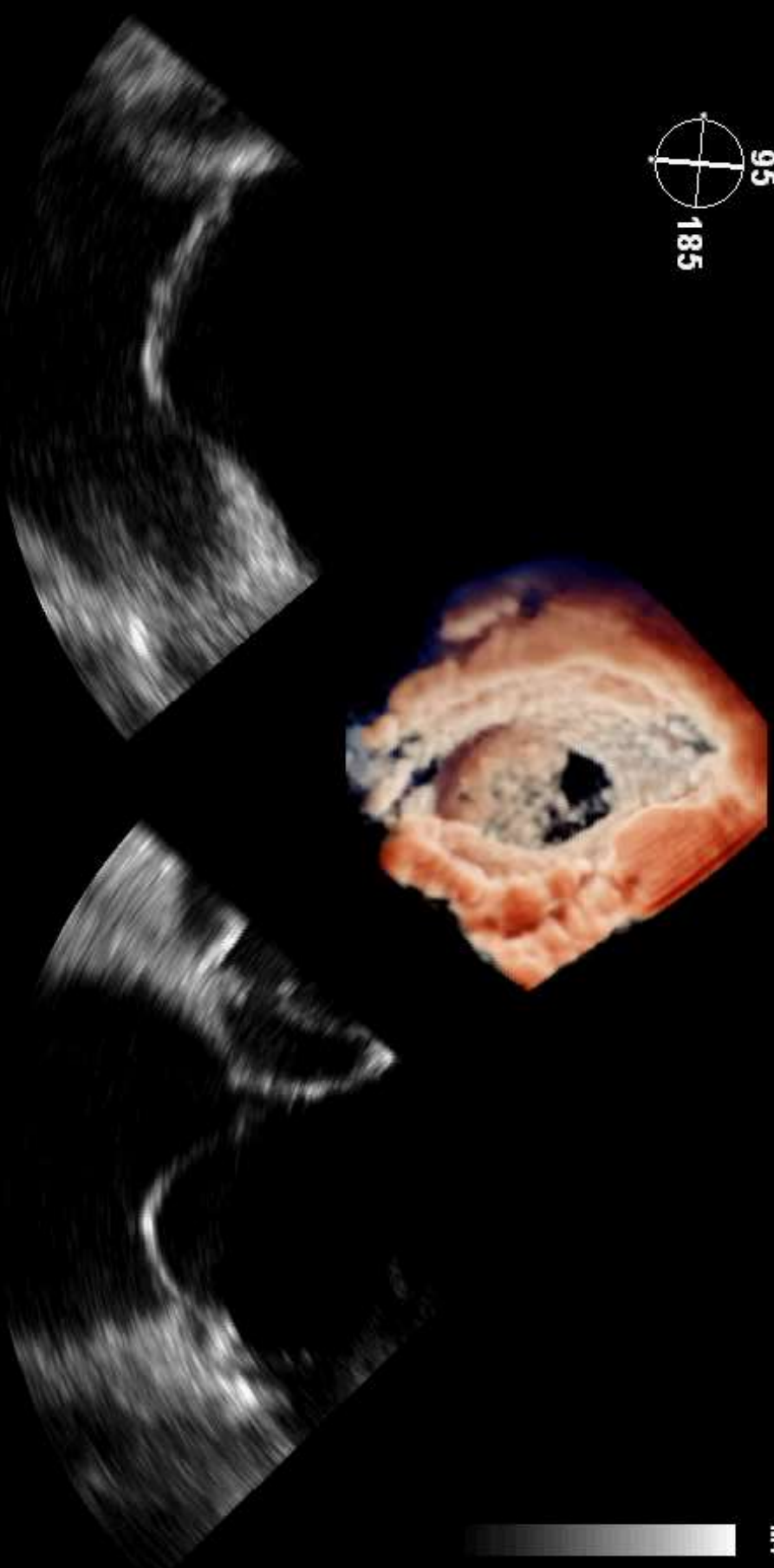


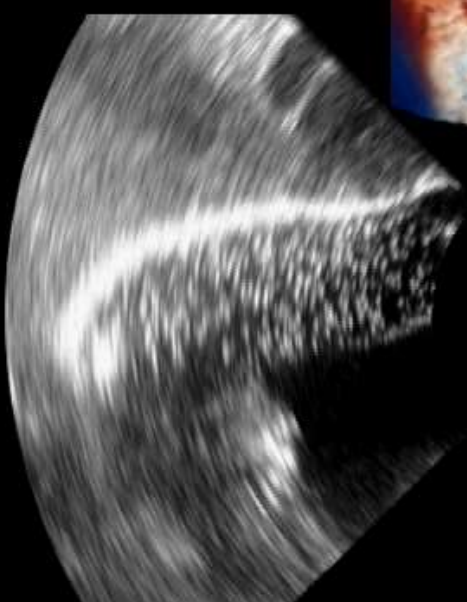
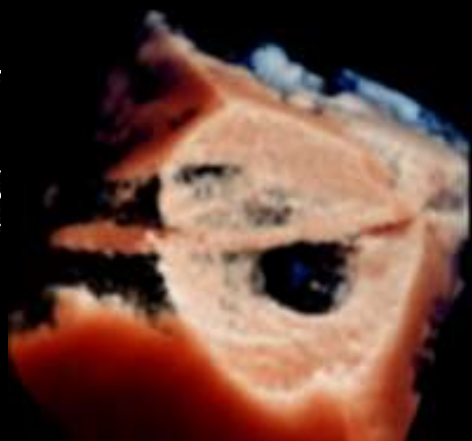
79 bpm

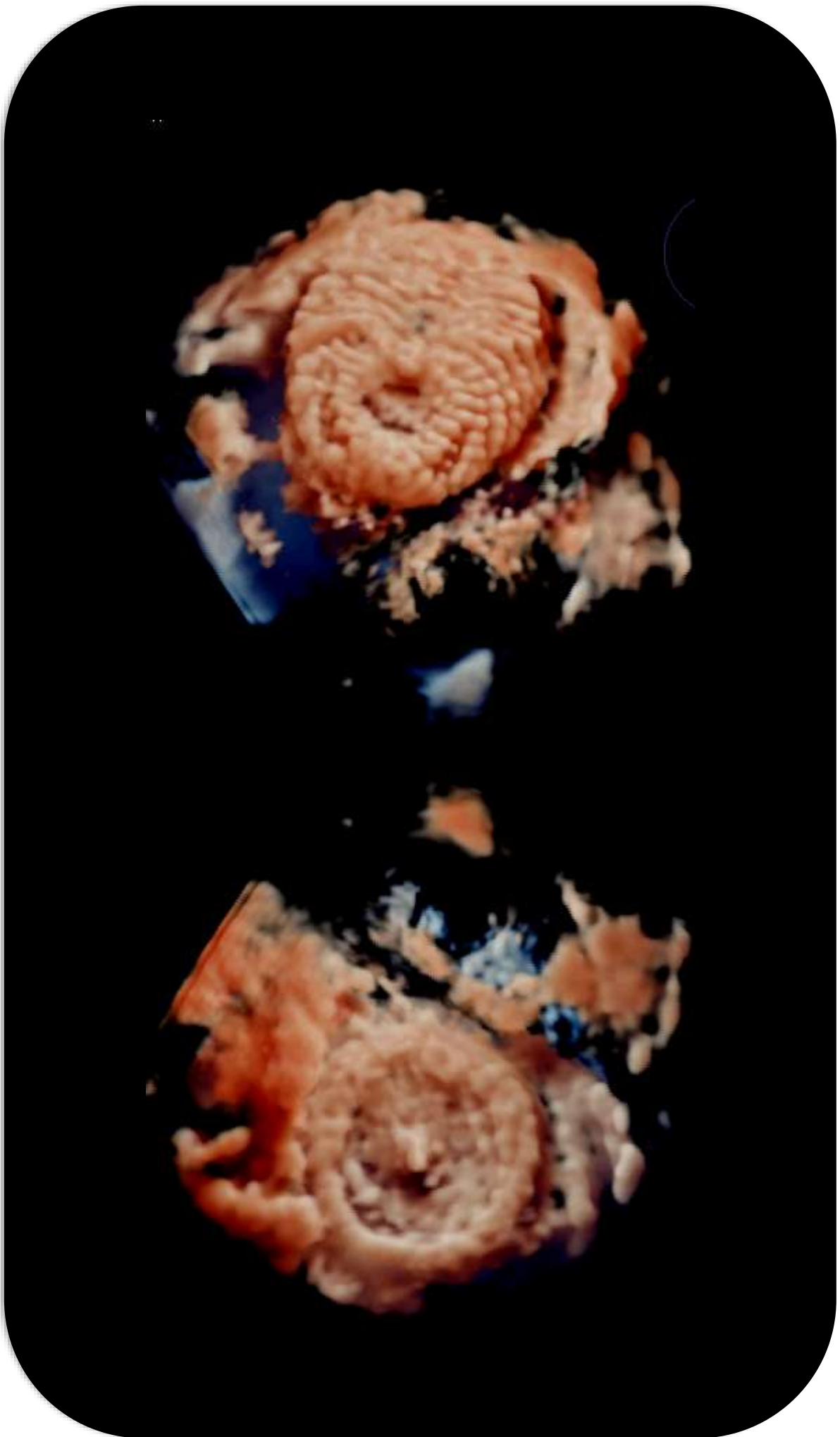
PAT T: 37.0C

TEE T: 39.0C

V









First Clinical Experience With 3-Dimensional Echocardiographic Transillumination Rendering

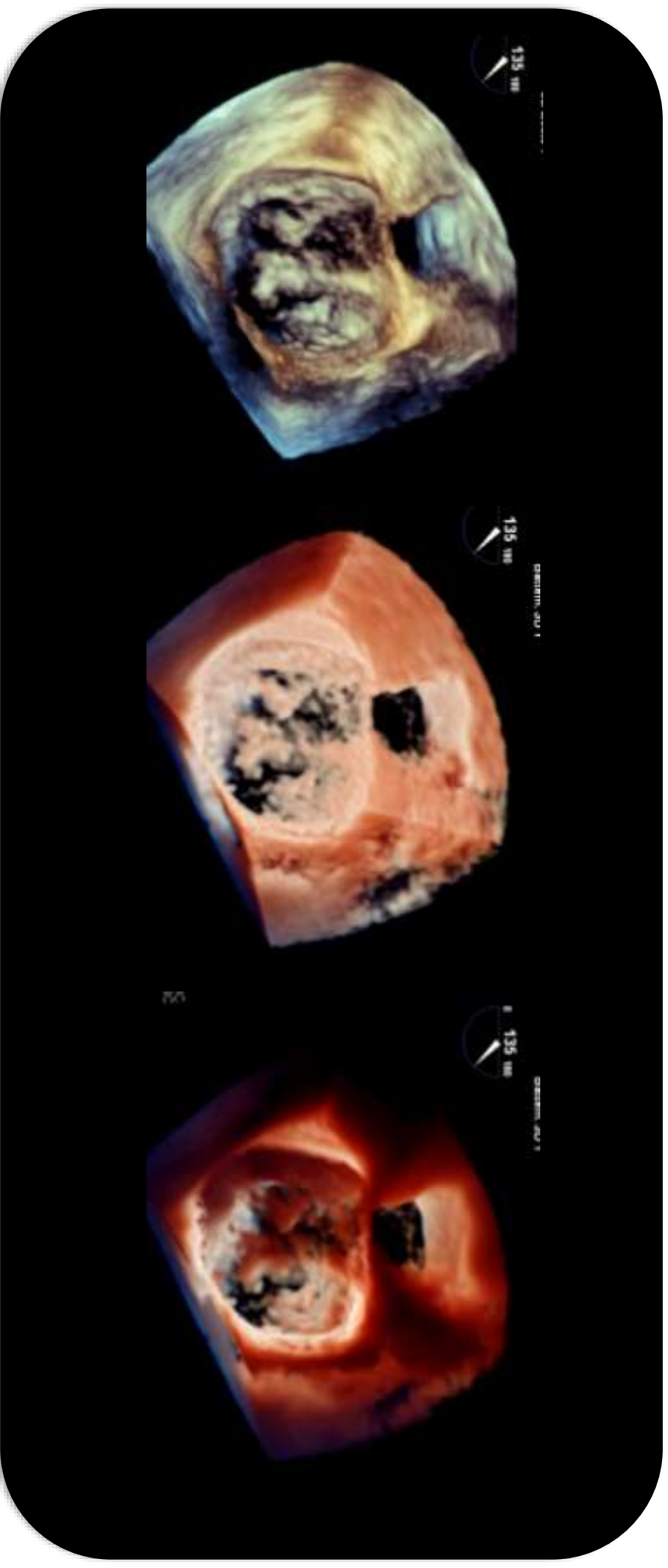
Davide Genovese, MD,^{a,b} Kaïma Addetta, MD,^a Kaïle Kebed, MD,^a Eric Kruse, RDCS,^a Megan Yamat, RDCS,^a Akhil Narang, MD,^a Amit R. Patel, MD,^a Luigi P. Badano, MD, PhD,^b Denisa Muraru, MD, PhD,^b Alexandra Gonçalves, MD, PhD,^c Victor Mor-Avi, PhD,^a Roberto M. Lang, MD^a

TABLE 1 Survey Results

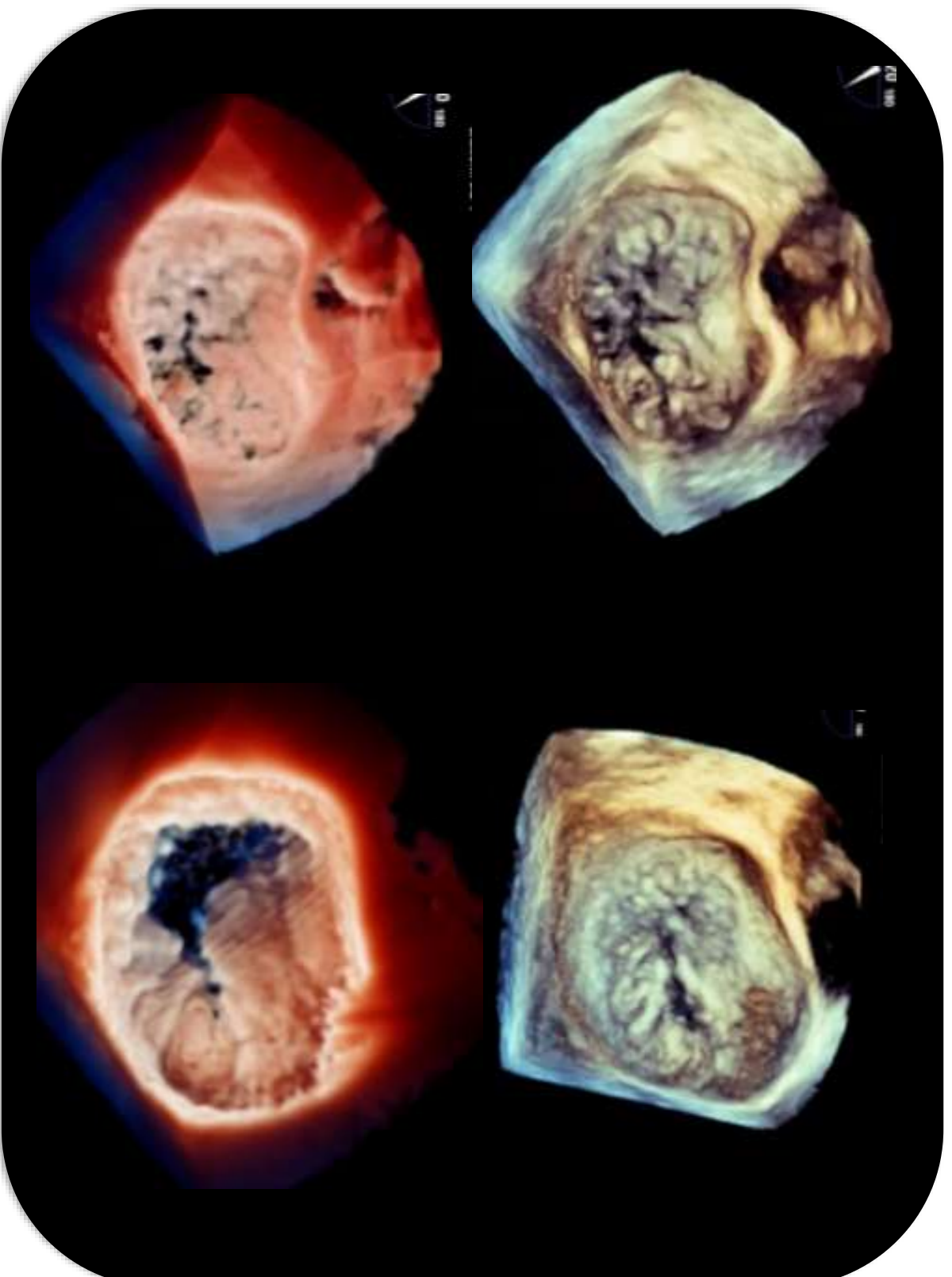
Score Summary (IQR)	All Readers				
	4.0 (3.0-5.0)				
	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5
	4.0 (3.0-4.0)	5.0 (4.3-5.0)	3.0 (3.0-4.8)	4.0 (2.5-4.8)	3.0 (3.0-4.0)
Number of cases scored ≥ 3 /total	26/30 (87)	30/30 (100)	24/30 (80)	22/30 (73)	23/30 (77)
Image features improved					
Delineation of borders and orifices/total	24/26 (92)	28/30 (93)	12/24 (50)	11/22 (50)	20/23 (87)
Delineation of cavities/total	15/26 (58)	27/30 (90)	12/24 (50)	12/22 (55)	7/23 (30)
Identification of structural abnormalities/total	19/26 (73)	23/30 (77)	15/24 (62)	9/22 (41)	15/23 (65)
Delineation of masses and their attachment/total	9/26 (35)	10/30 (33)	7/24 (29)	4/22 (18)	6/23 (26)

This table shows survey results of 30 cases scored by 5 readers who had never been exposed to T1 rendering. Scores of the perceived use of T1 compared to that of conventional rendering were derived using a Likert scale from 1 to 5 (where 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree), with median and interquartile ranges (IQR) (top). The number of cases that scored ≥ 3 and corresponding image features improved with T1 for each reader are presented as absolute numbers and % (bottom).

Limits



Barlow's disease



EMMANUEL
MACRON
evolution



Thank you for your attention

