La Fermeture d' Auricule Gauche: de la salle de cathé au cabinet

CNCH 08/04/2021

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Hôpital Européen
MARSEILLE | *L'humain au cœur de nos soins*

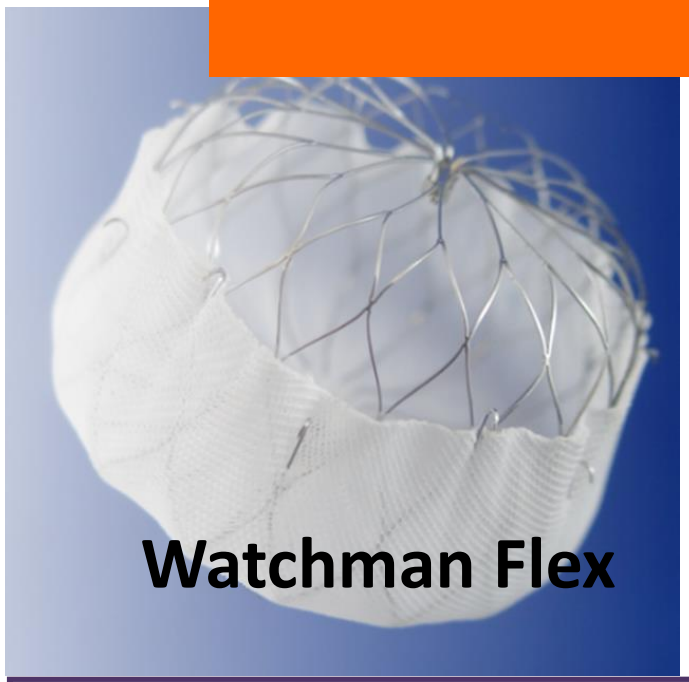
Procédure

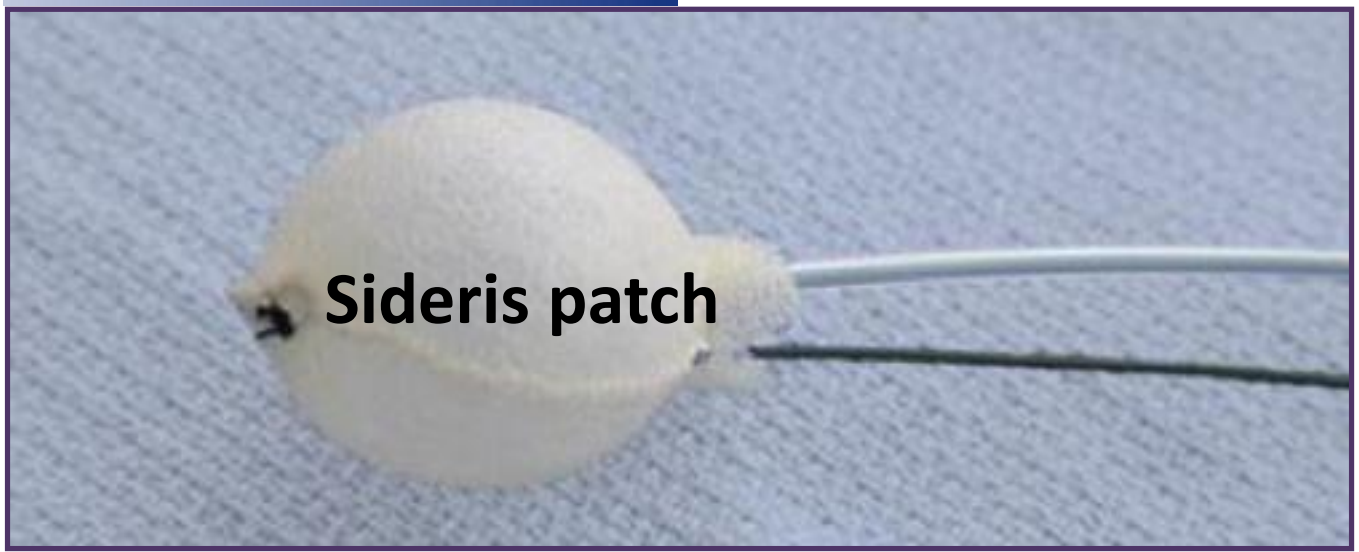
- Hospitalisation de 48/72h
- Anesthésie générale
- Guidance échographique (ETO)
- Sortie à J2 après ETT de contrôle sous trt antiplaquettaires + prophylaxie contre l’endocardite 1 an et progamme des contrôles echo

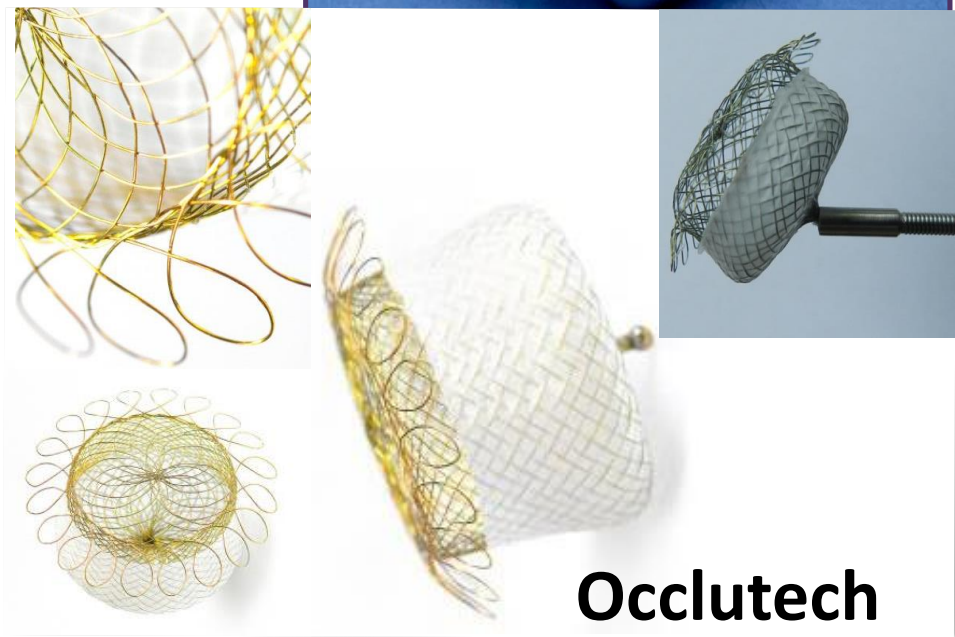
Choix de la prothèse

- Anatomie++
- Profondeur
- Peu de patients contre indiqué à une prothèse en pratique

2 concepts: exclure majorité auricule

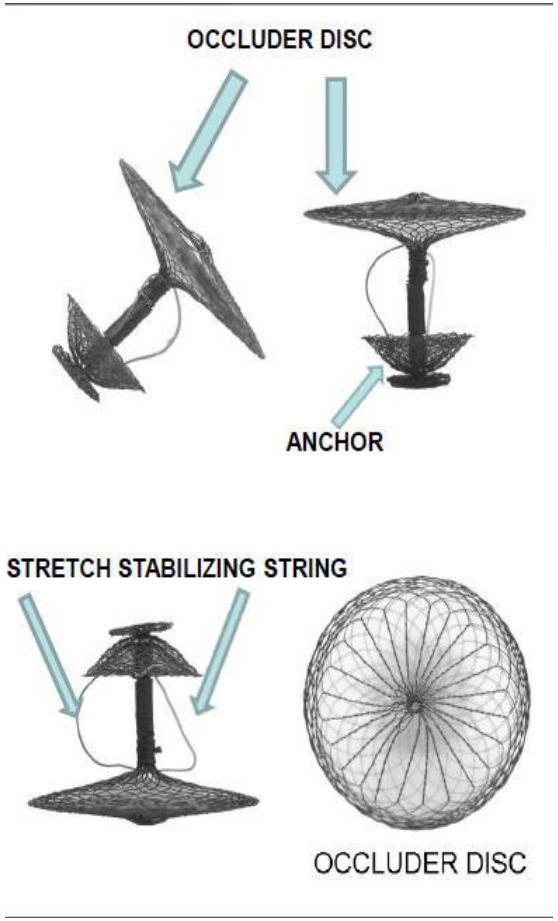






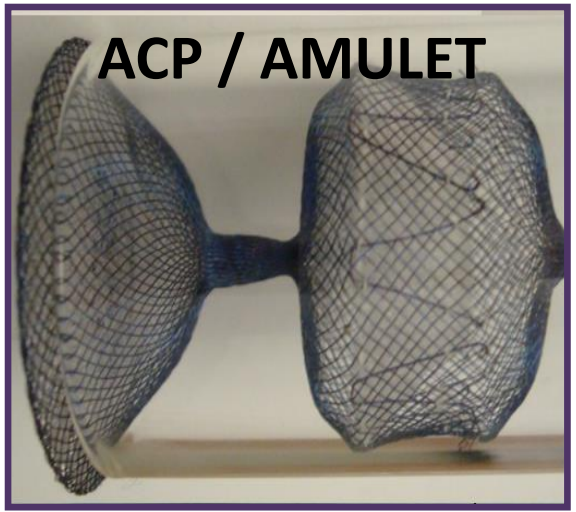
2 concepts: occlure l'orifice de l'auricule

PFM



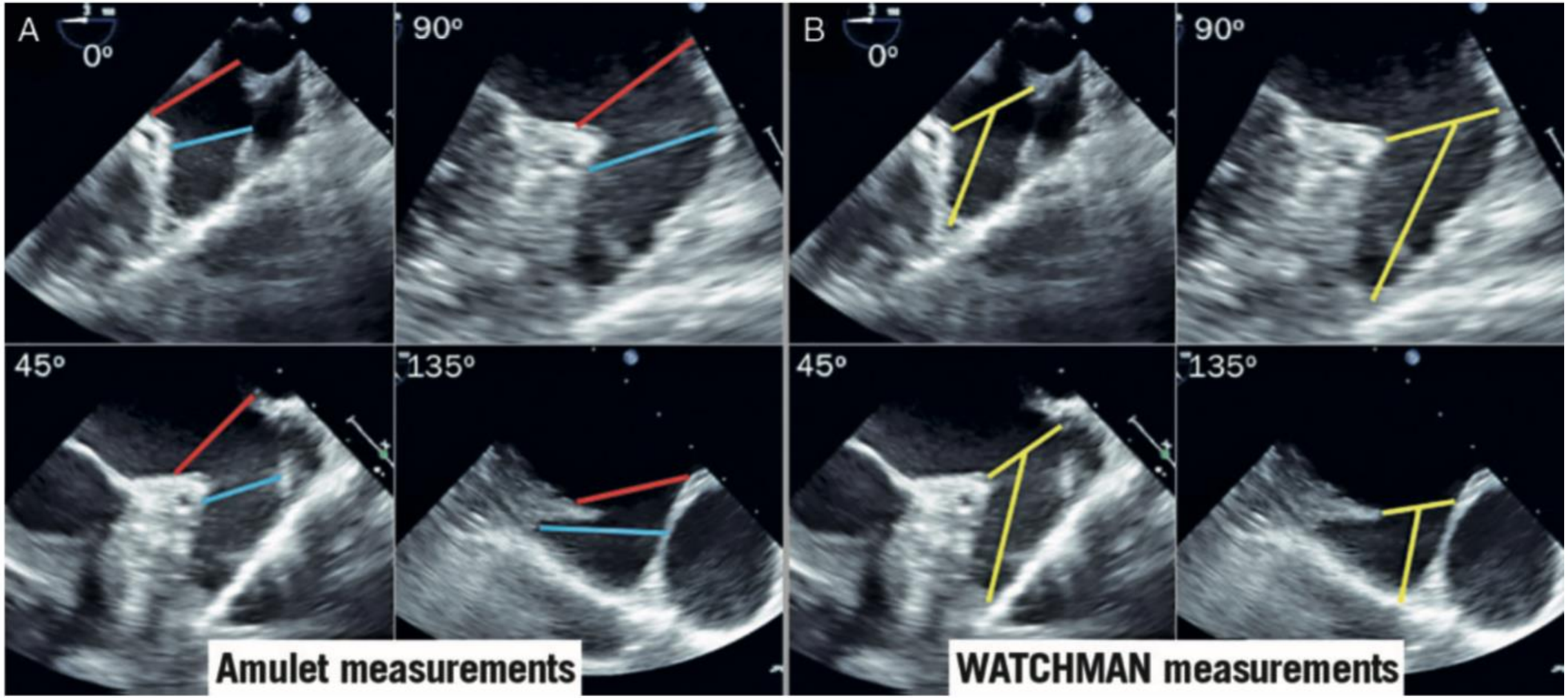
Lambre Lifetech

ACP / AMULET



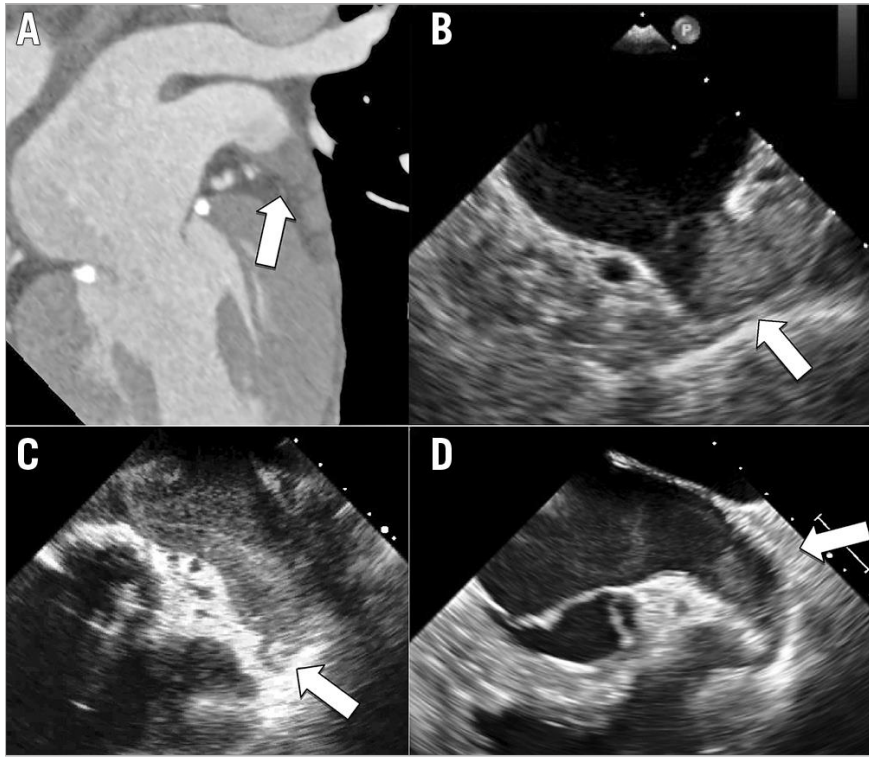
Ultrasept

Choix de la prothèse

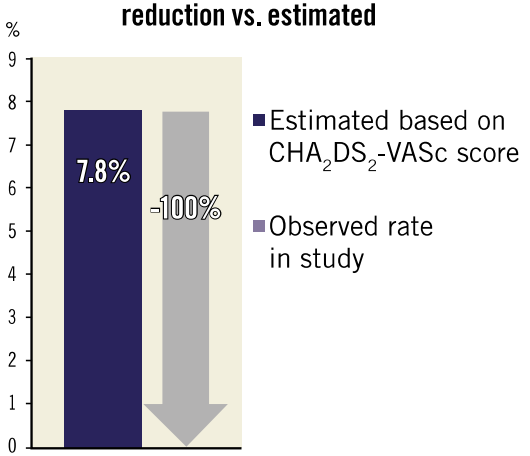


EHRA/EAPCI consensus statement on LAA occlusion update

Thrombus “malin” .. Contre -indication?



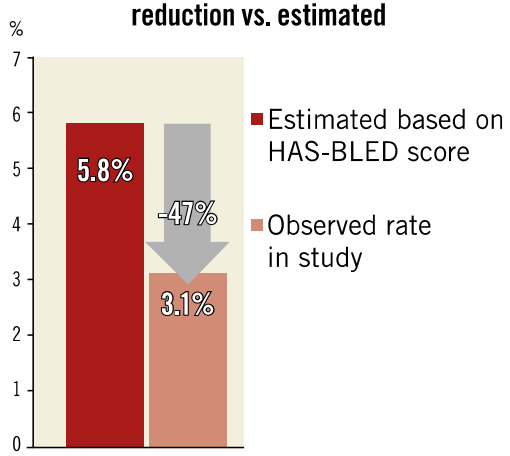
Effectiveness in thromboembolic events reduction vs. estimated



Total patients	Total patient-years	CHA_2DS_2-VASc score
28	32	4

Estimated stroke rate per CHA_2DS_2-VASc	Actual annual thromboembolic events rate
7.8%	0%

Effectiveness in bleeding reduction vs. estimated



Total patients	Total patient-years	HAS-BLED score
28	32	3

Estimated bleeding rate per HAS-BLED	Actual annual major bleeding rate
5.8%	3.1%

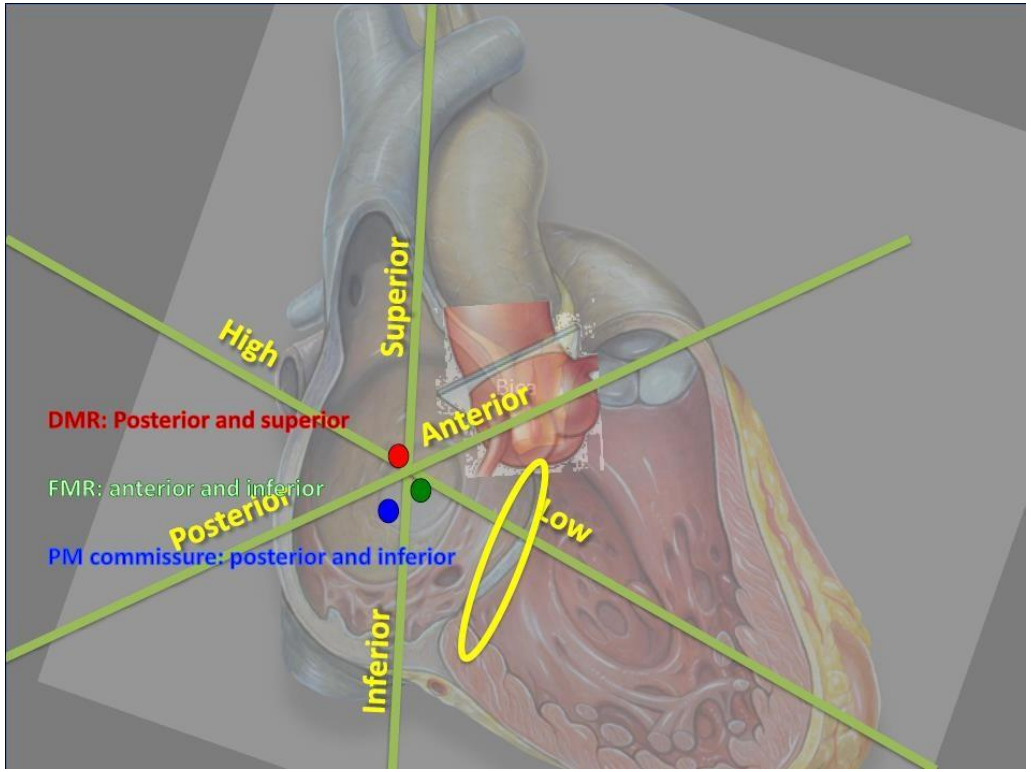
Tarantini et al. Eurointervention 2018

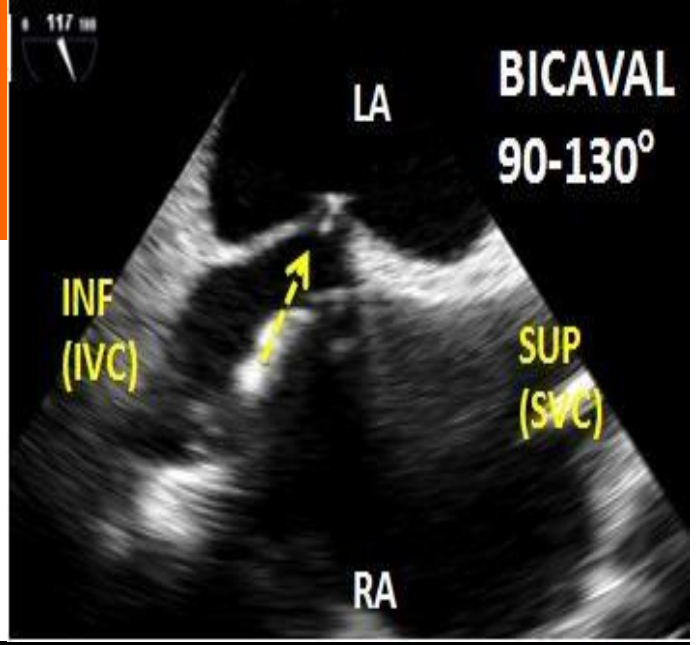
Technique de pose

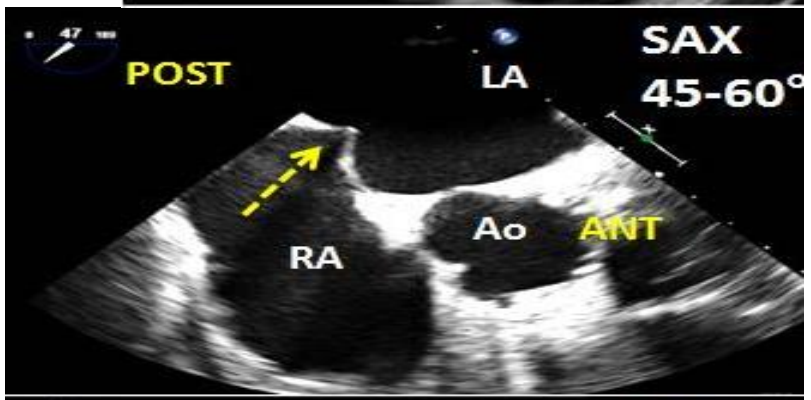
- Ponction veineuse (optionnel préfermeture proglide)
- Ponction trans-septal (Gaine SL1 ou SLO, aiguille BRK Xs)
- Ponction infero-posterieure guidée par ETO (coupe bicavale pour hauteur et 45° pour antero-post)

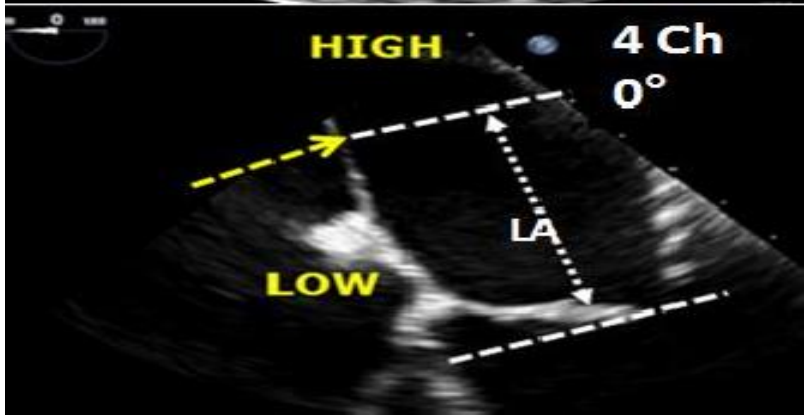
Ponction trans-septale

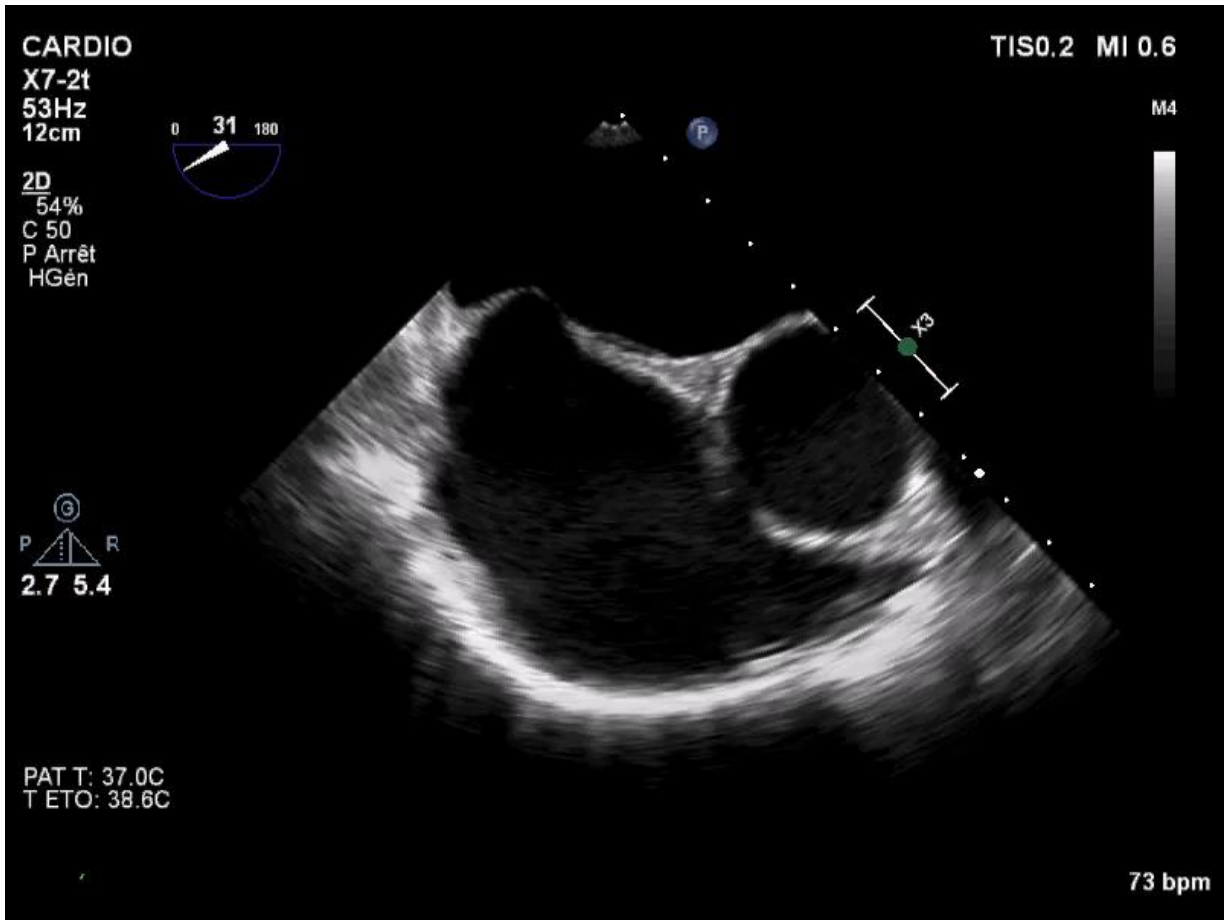
Ponction spécifique écho guidée

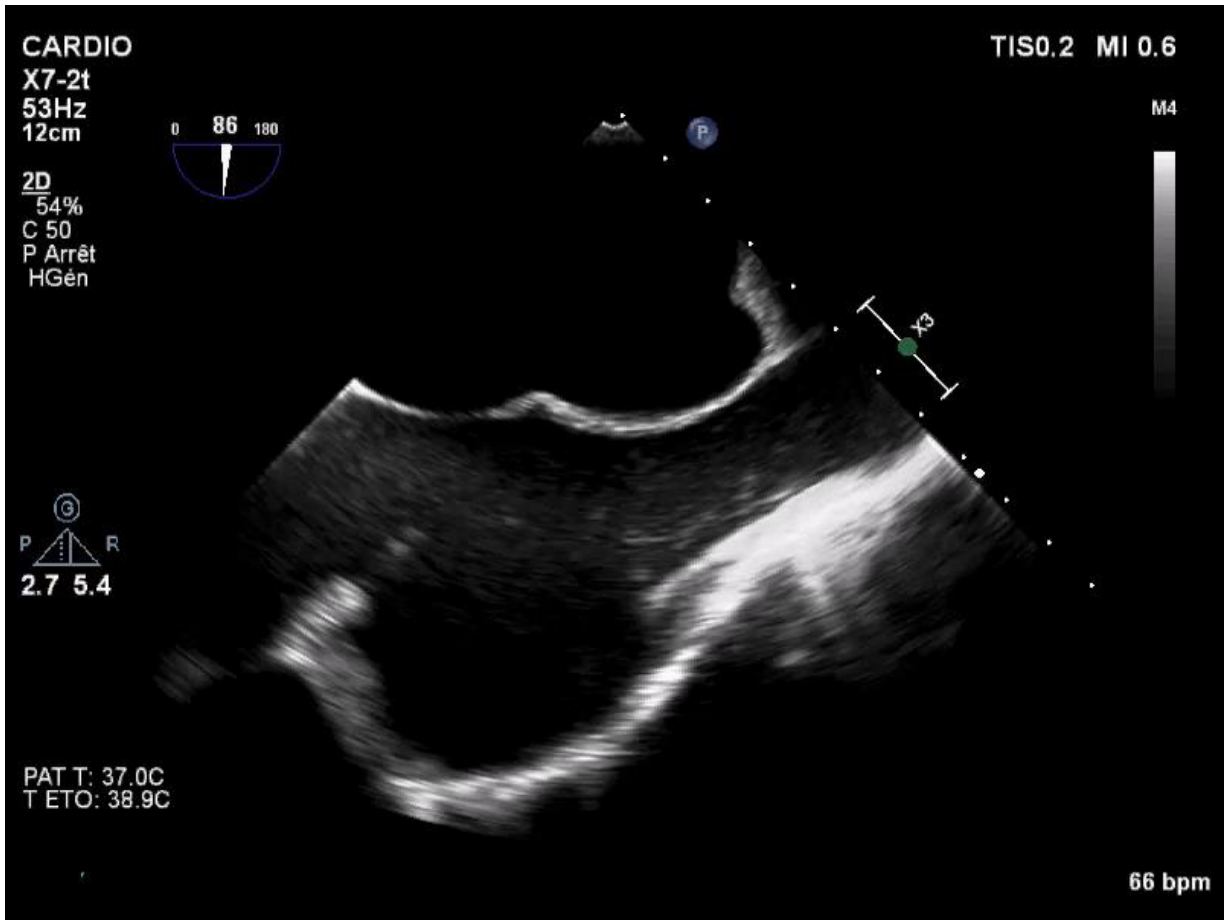


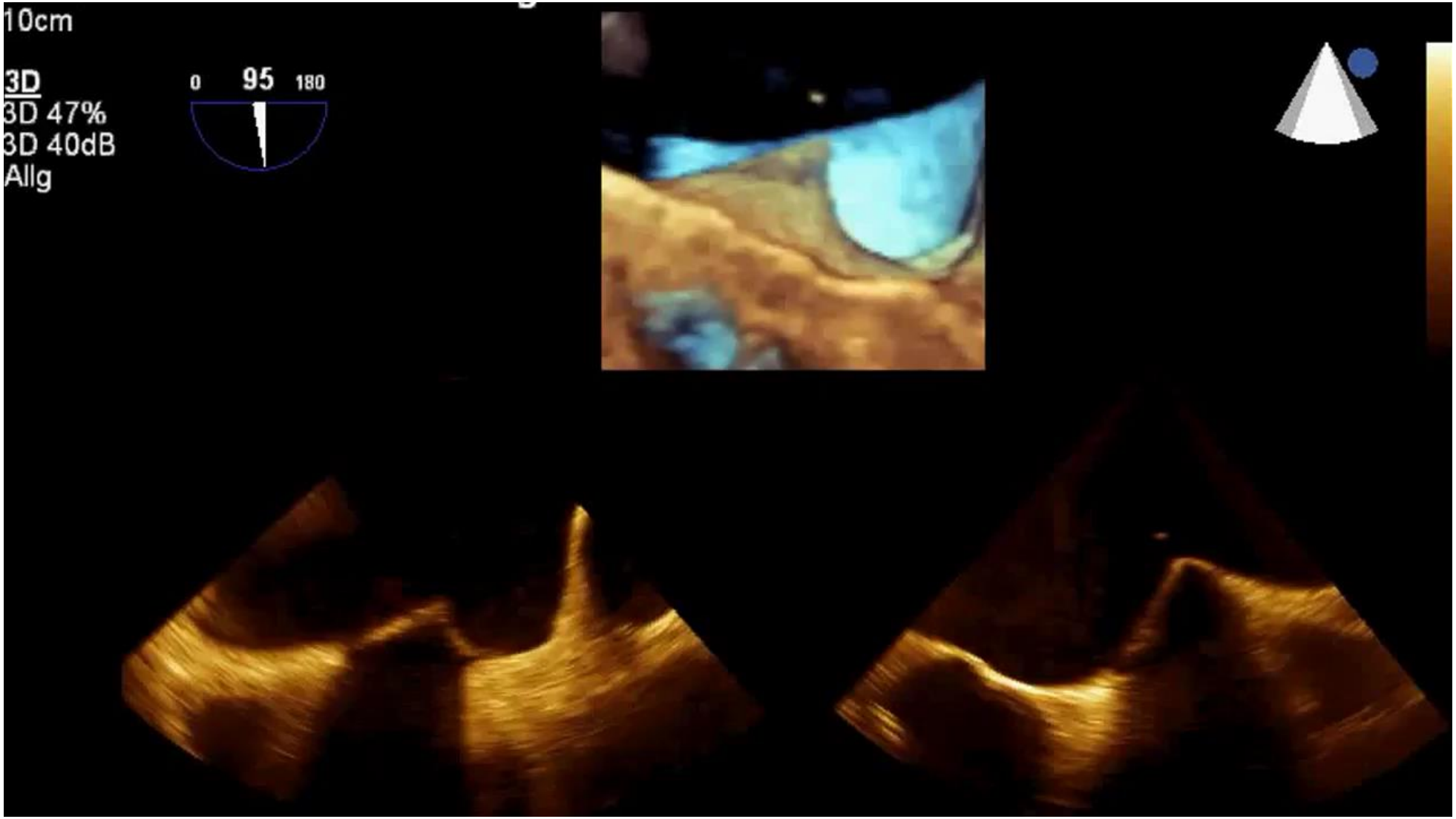


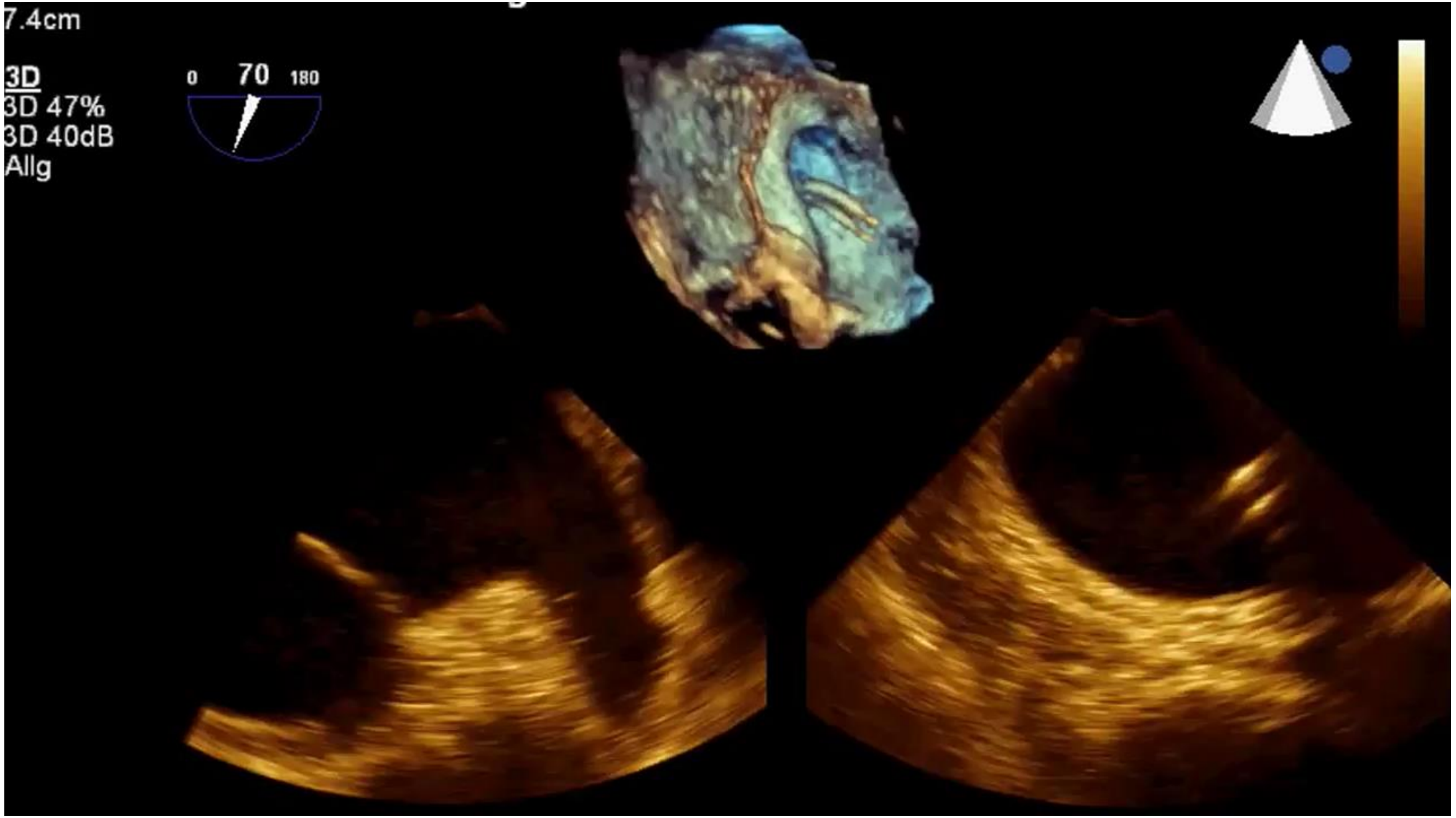


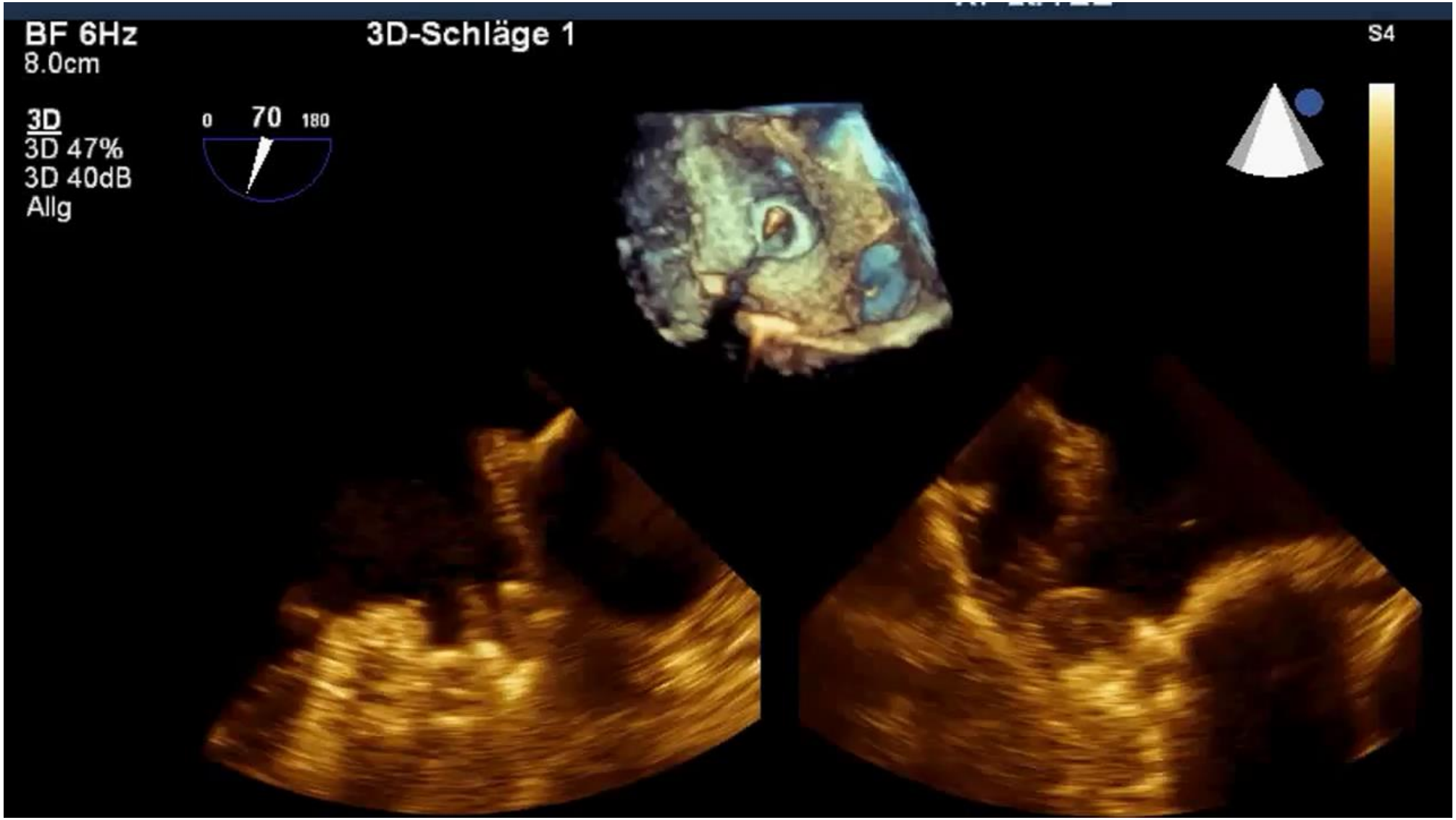



CARDIO
X7-2t
53Hz
12cm
2D
54%
C 50
P Arrêt
HGén
TIS0.2 MI 0.6
M4
0 31 180
2.7 5.4
PAT T: 37.0C
T ETO: 38.6C
73 bpm

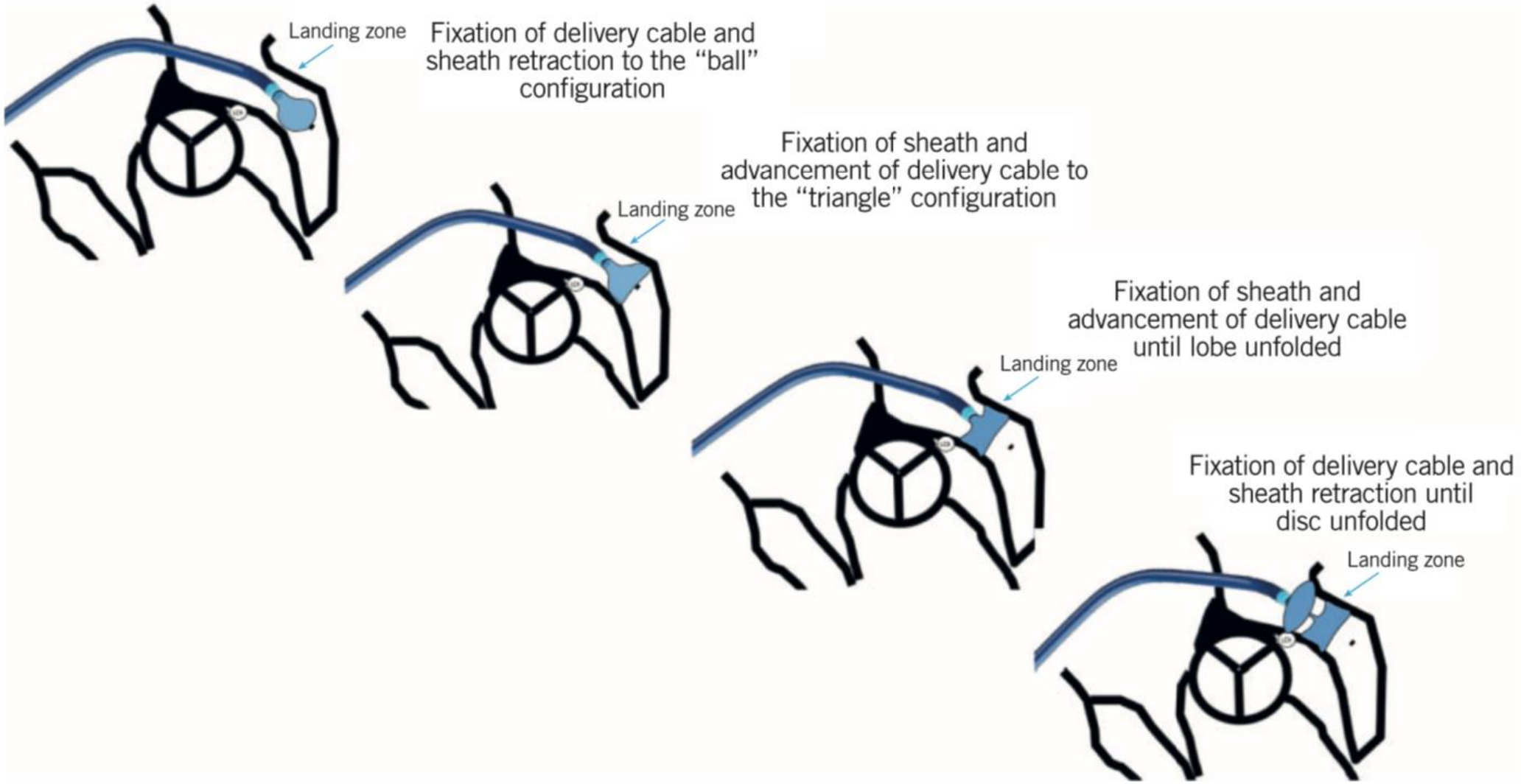

CARDIO
X7-2t
53Hz
12cm
2D
54%
C 50
P Arrêt
HGén
TIS0.2 MI 0.6
M4
0 86 180
2.7 5.4
PAT T: 37.0C
T ETO: 38.9C
66 bpm


10cm
3D
3D 47%
3D 40dB
Allg
0
95
180


7.4cm
3D
3D 47%
3D 40dB
Allg
0
70
180

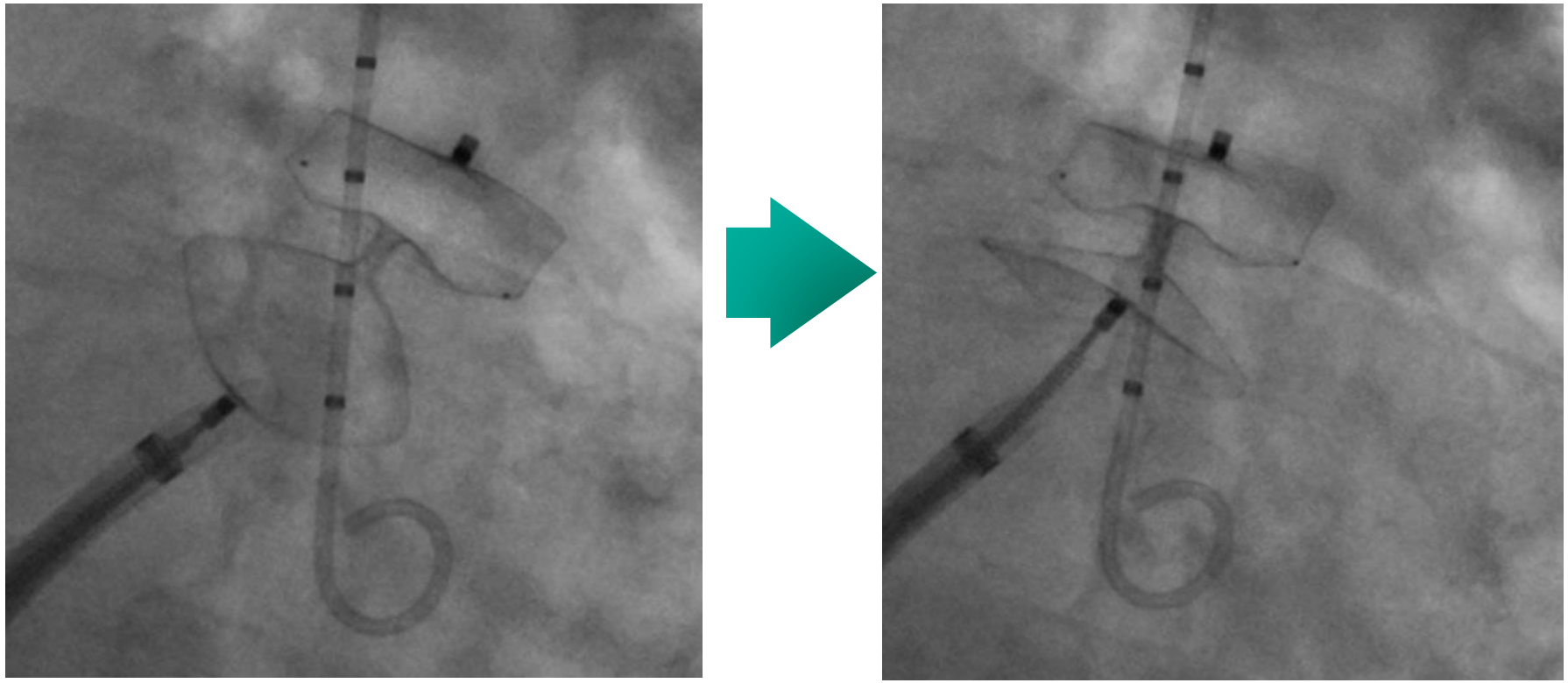

BF 6Hz
8.0cm
3D-Schläge 1
S4
3D
3D 47%
3D 40dB
Allg
0
70
180

Déploiement étape par étape



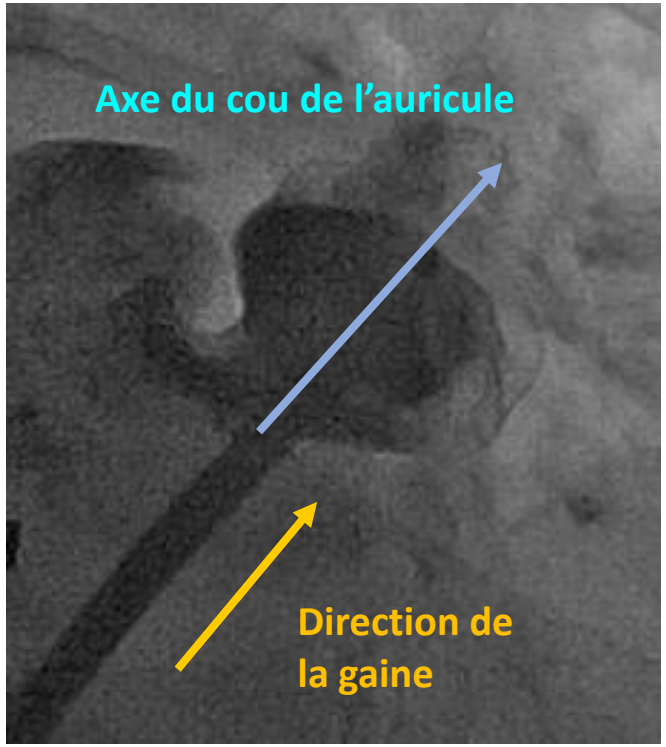
Déploiement: Disque

- Rétracter la gaine tout en maintenant une légère tension sur le câble de pose.



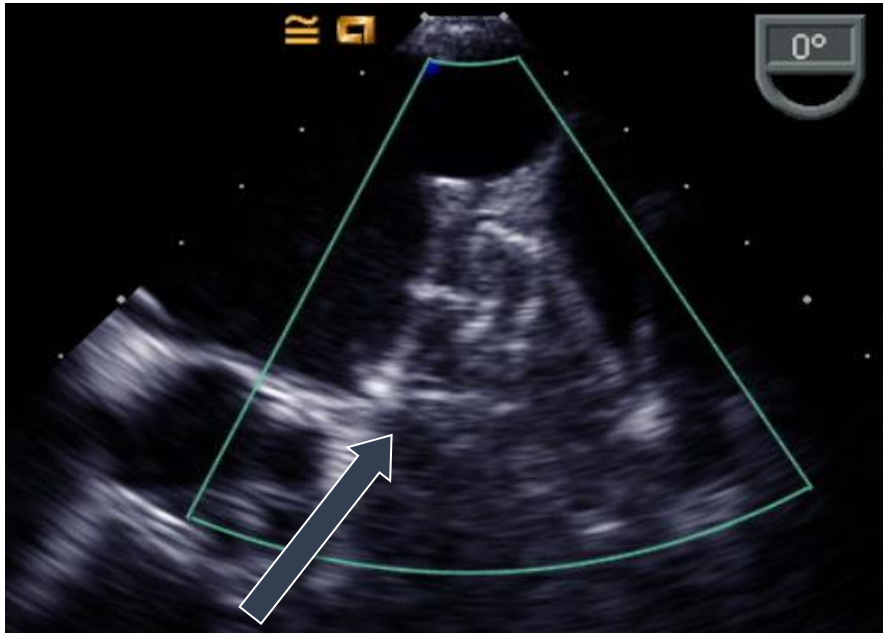
Bon positionnement

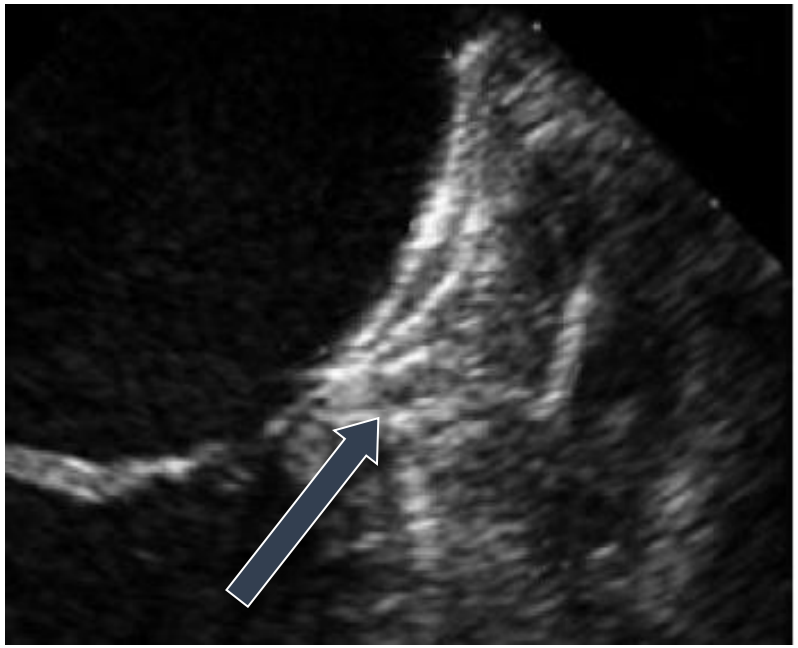
axe du lobe aligné avec axe cou auricule



Bon positionnement stabilité

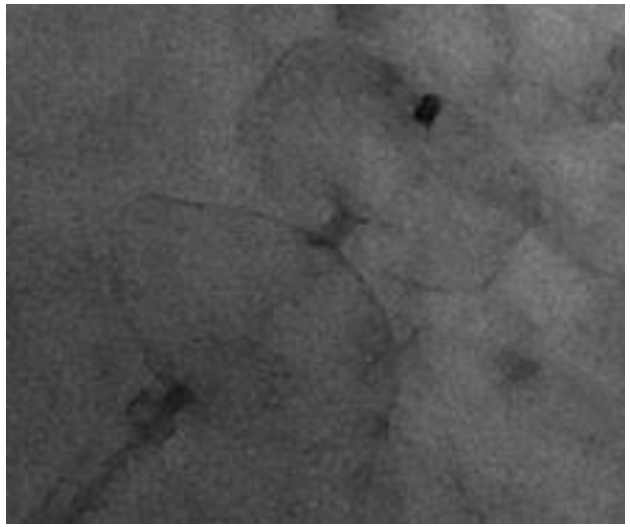
2/3 du lobe sont distal par rapport à l’artère circonflexe gauche



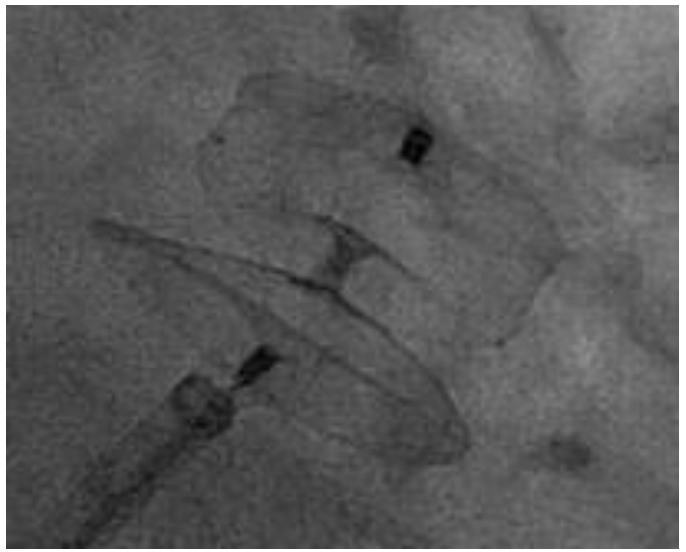


Bon positionnement stabilité

- Examen final (optionnel):
  - Maintenir une légère tension sur le dispositif afin d'évaluer la stabilité.
  - Ne pas exercer un fort « wiggle test » (ne pas exercer de poussée sur le câble).
  - Réévaluer les cinq signes de stabilité après le test de traction.



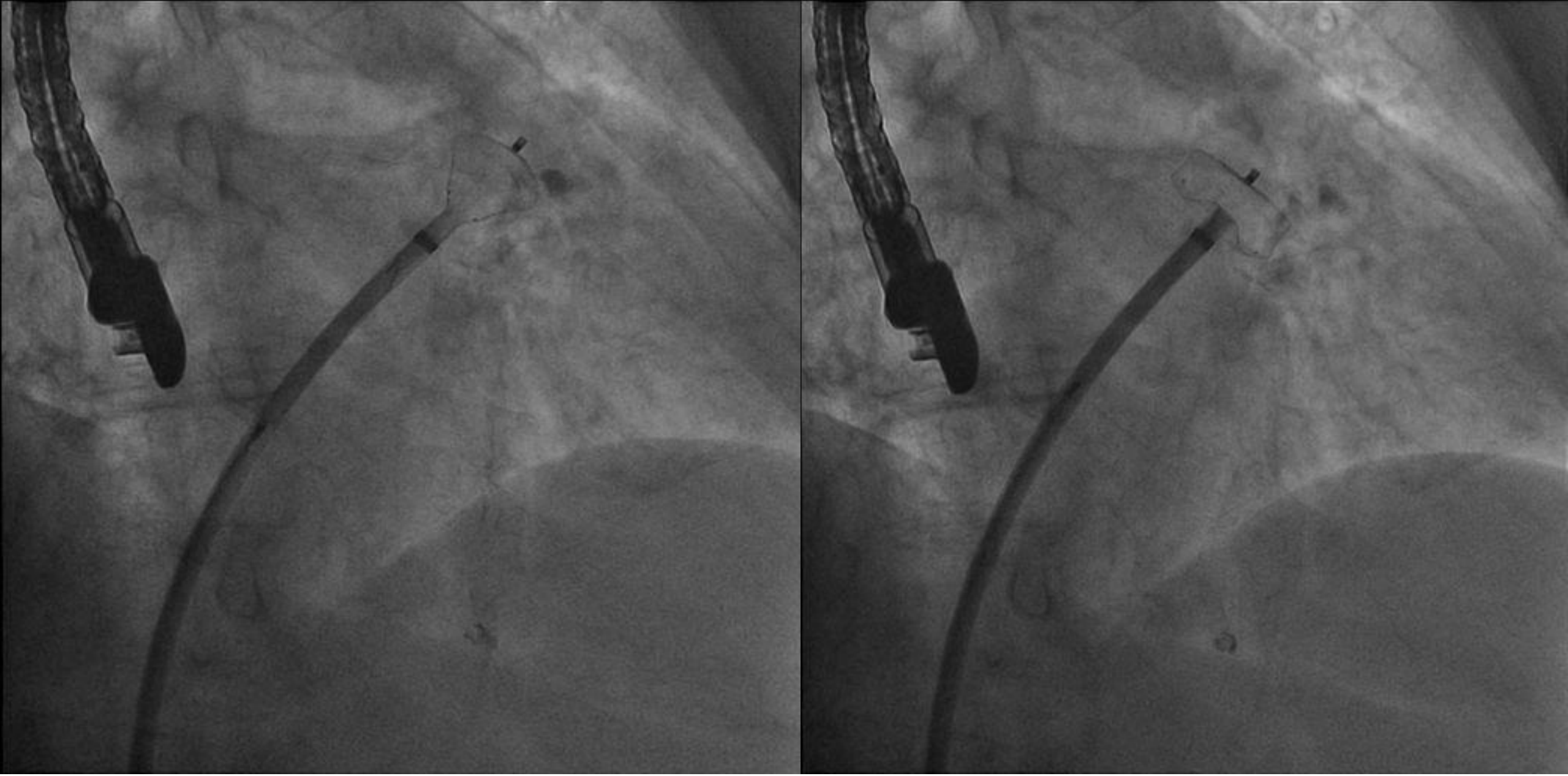
Appliquer une légère tension sur le dispositif

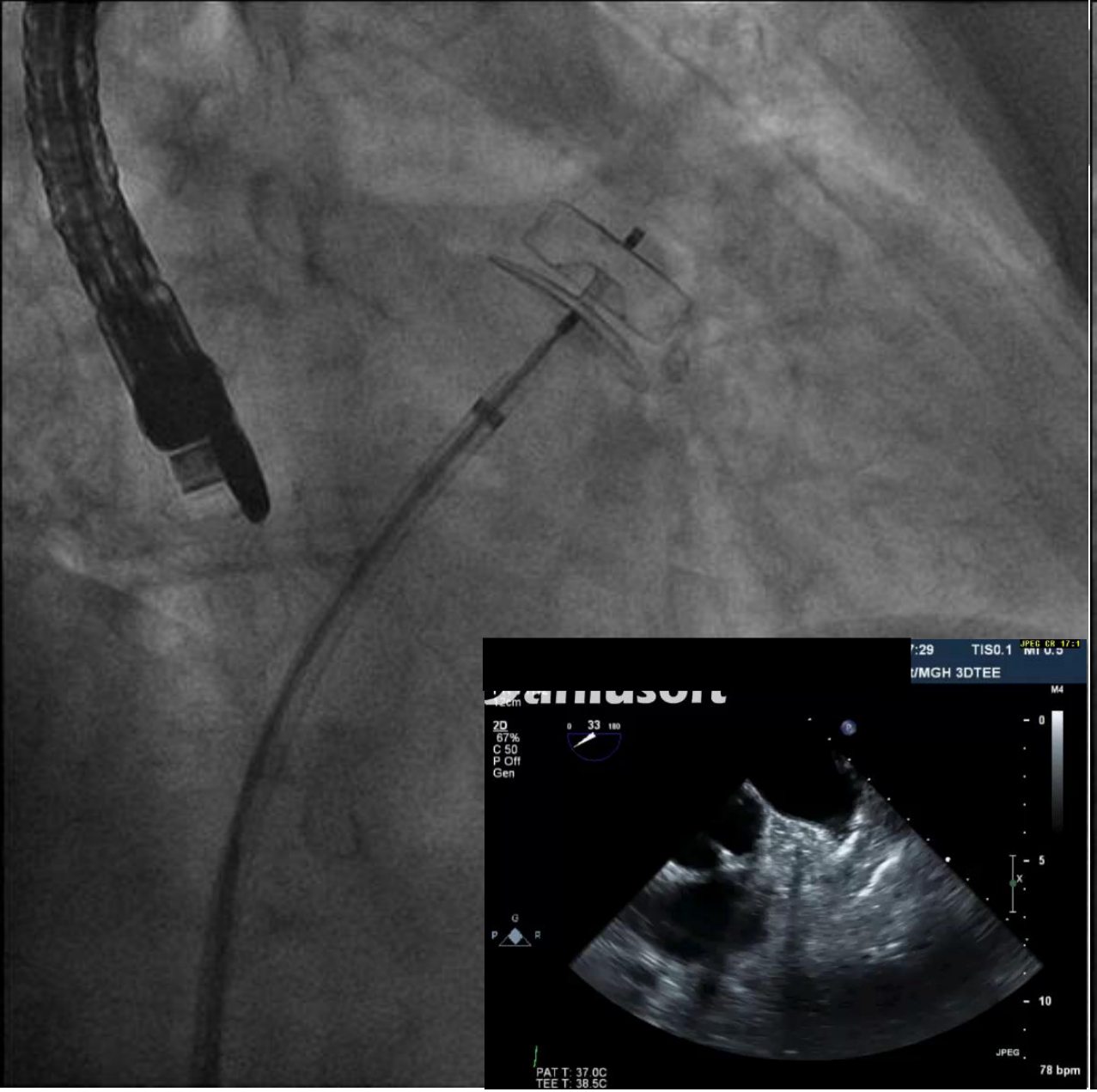


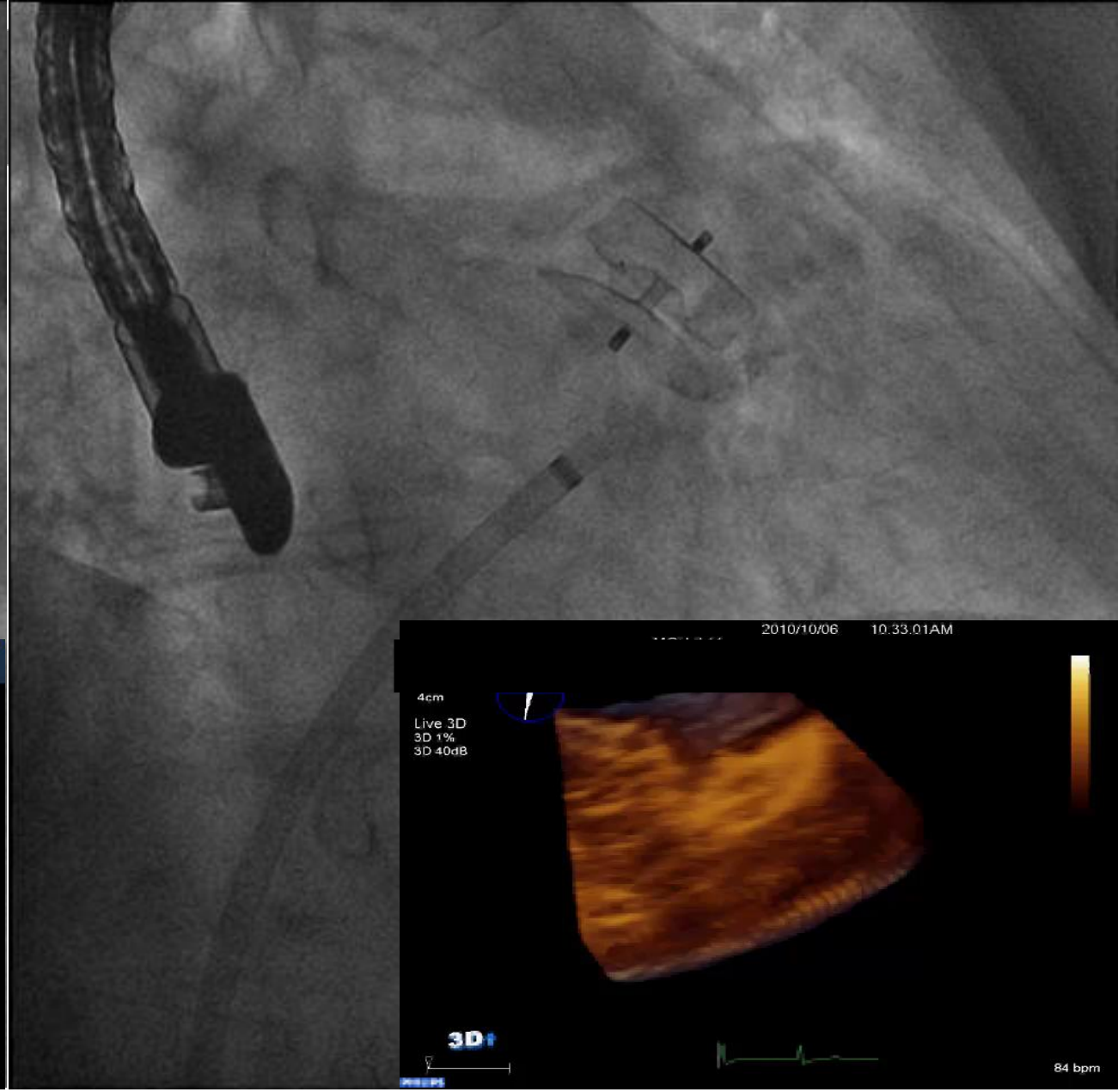
Réévaluer les cinq signes de stabilité

Cas clinique

- Patient, 75ans
- Antécédent hémorragie digestive et AVC
- FA
- Angiodysplasie grêlique
- Proposition de fermeture d’auricule gauche



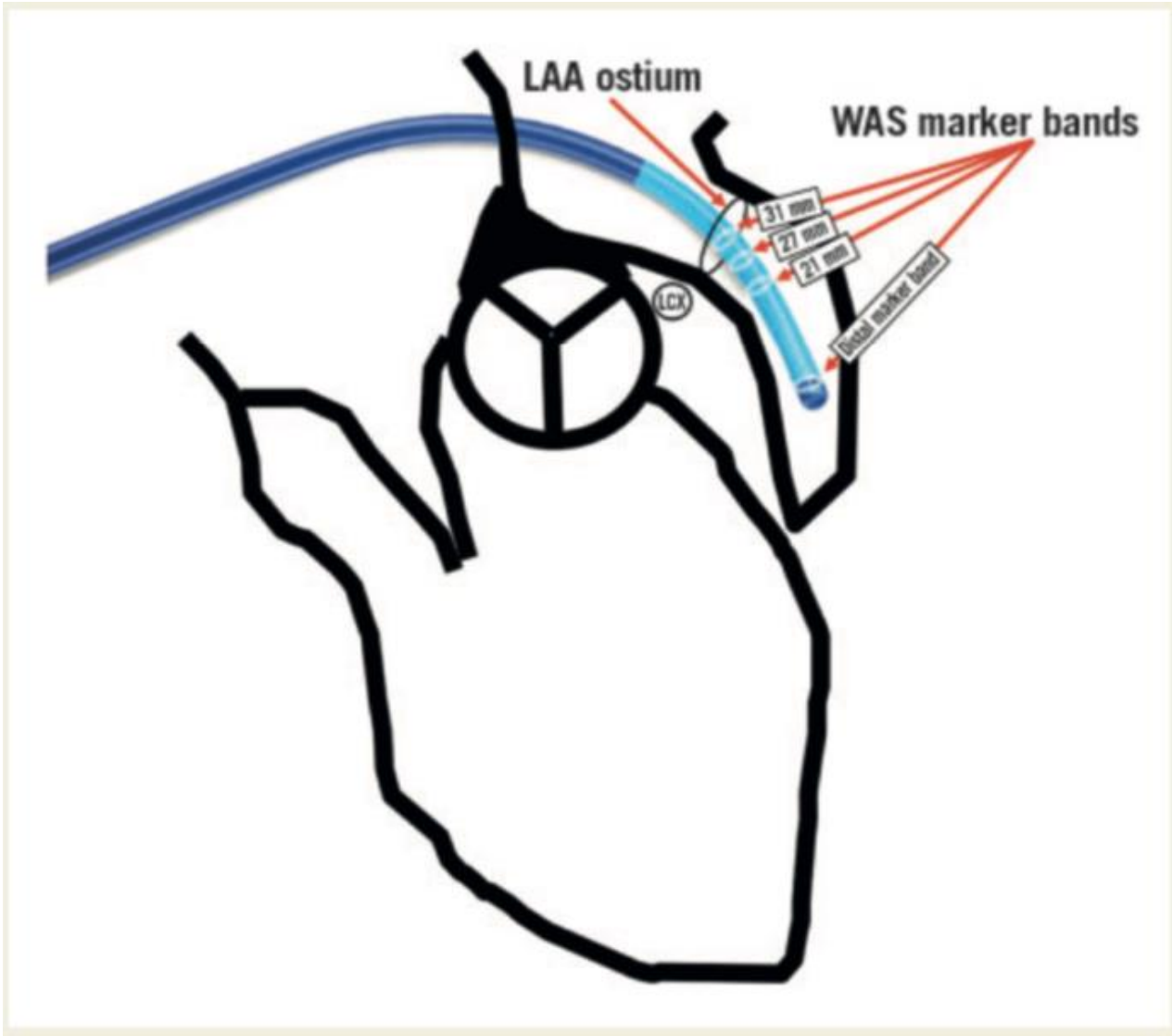

:29 TIS0.1
VMGH 3DTEE
2D
67%
C 50
P Off
Gen
33
M4
0
5
10
JPEG
PAT T: 37.0C
TEE T: 38.5C
78 bpm


2010/10/06 10.33.01AM
4cm
Live 3D
3D 1%
3D 40dB
3D
84 bpm

Watchman Flex

- Mesure zone maximale ostium
- Mini 17 max 31
- Taille prothèse = profondeur 1er lobe

Positionnement marqueurs sur ostium



Critères stabilité: PASS

Position – après ostium LAA

Anchor – fixations déployées

Size –compression 8-20%

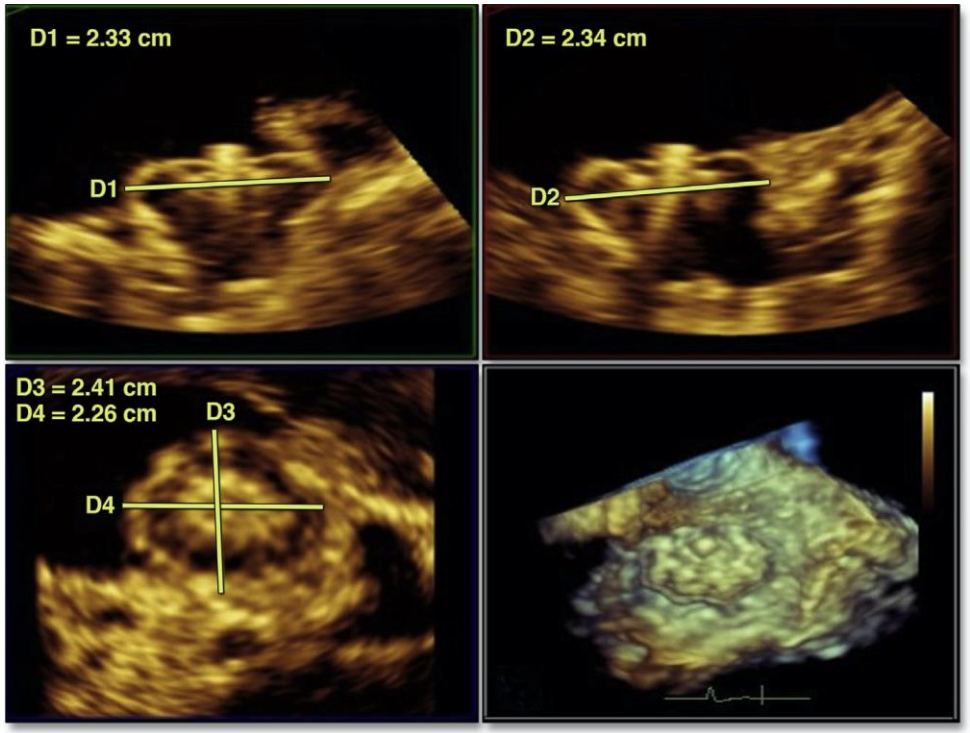
Seal – Ostium couvert = occlusion tous les lobes

Critères de positionnements

TABLE 3 Criteria of an Appropriate Device Position for Different Endoluminal Devices

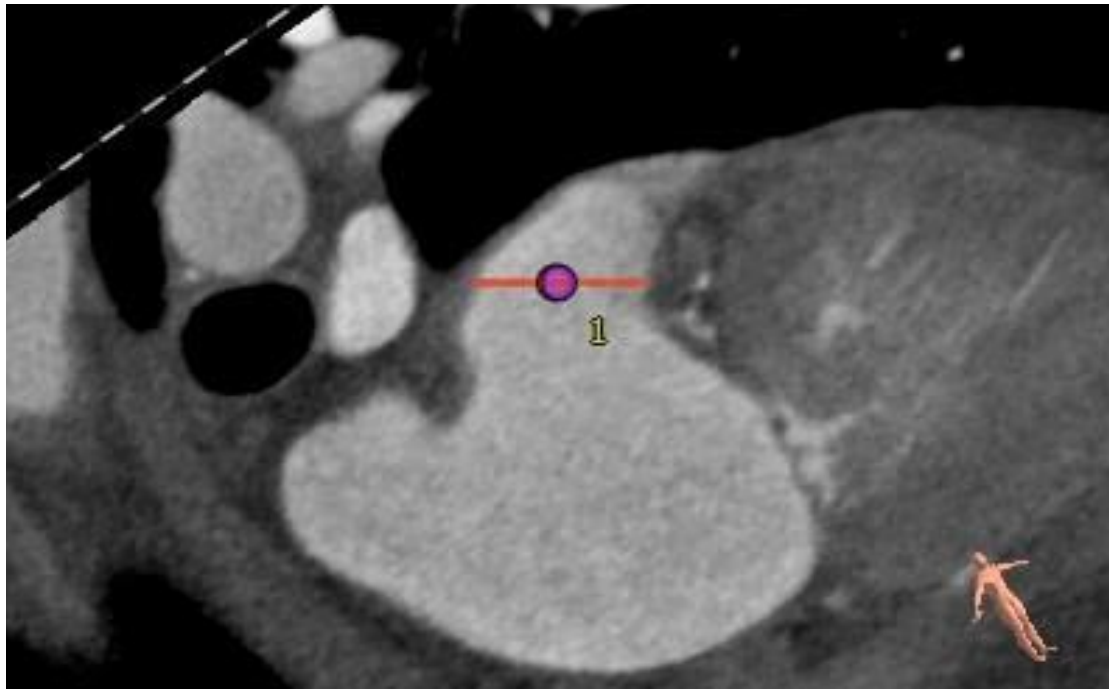
Device	Criteria of an Appropriate Device Position
LAA occluder device	• Position symmetrically in the center of the LAA below the LAA ostium or at the ostial plane • 8%-20% device compression (some recommend a higher grade of compression of 15%-30%) (10) (**Figure 7**) • Fixations barbs should be in contact with the LAA wall • The device should not protrude >4-7 mm beyond the LAA ostium (depending on device size as outlined in the manufacturer's instructions for use)
First generation LAA plug device	• Two-thirds of the lobe should be positioned distal to the circumflex coronary artery • The distal part of the lobe should have the appearance of a flat tent, thus indicating some amount of compression on the lobe • The disc should cover the LAA ostium with a concave appearance • The flexible waist that connects the disc and the lobe should be clearly visible • Fixation anchors should be engaged with the LAA wall
Flexible LAA occlusion device	• The hub of the occluder on the left atrial side should be located proximal to the landing zone • The anchors (best visualized in fluoroscopy) should be placed ~5 mm distal to the landing zone • A distal contrast injection provides confidence in device position, stability, and occlusion • Landing zone = distal occluder margin

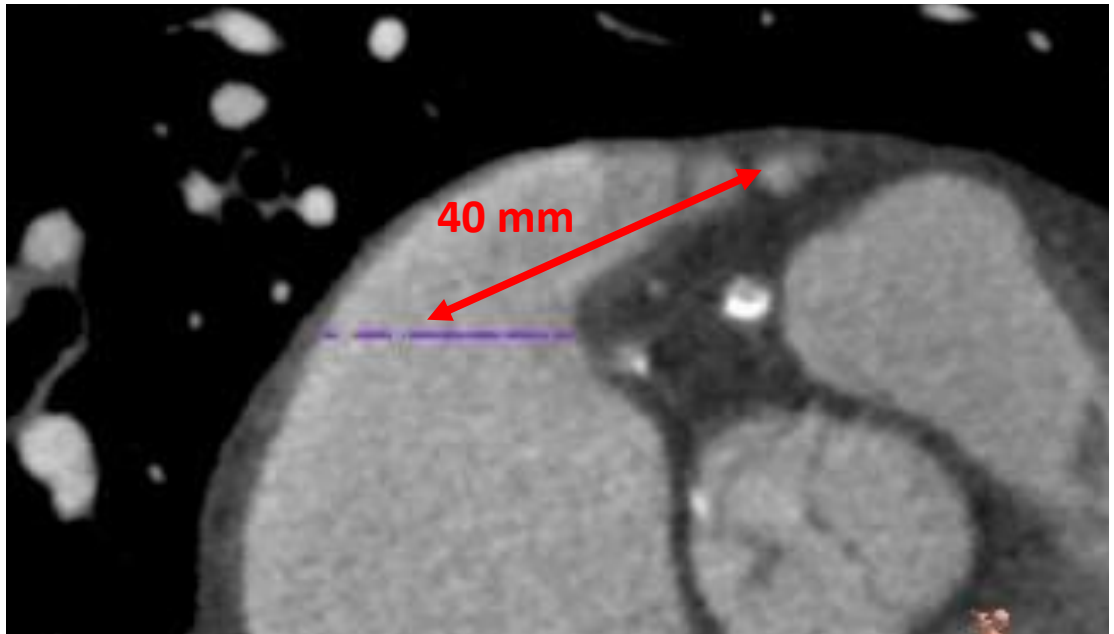
FIGURE 7 Measurement of Device Compression After Implantation of a 27-mm LAA Occluder Device

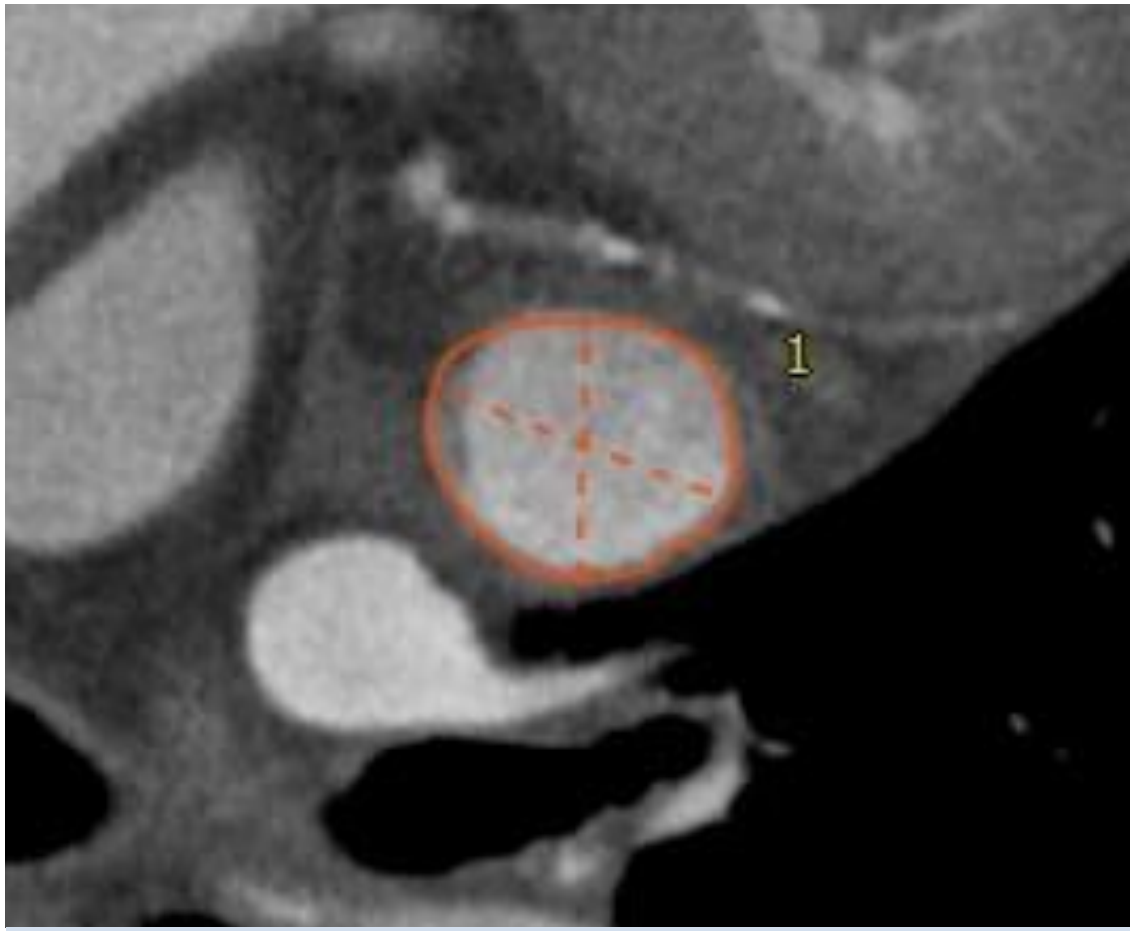


Cas clinique

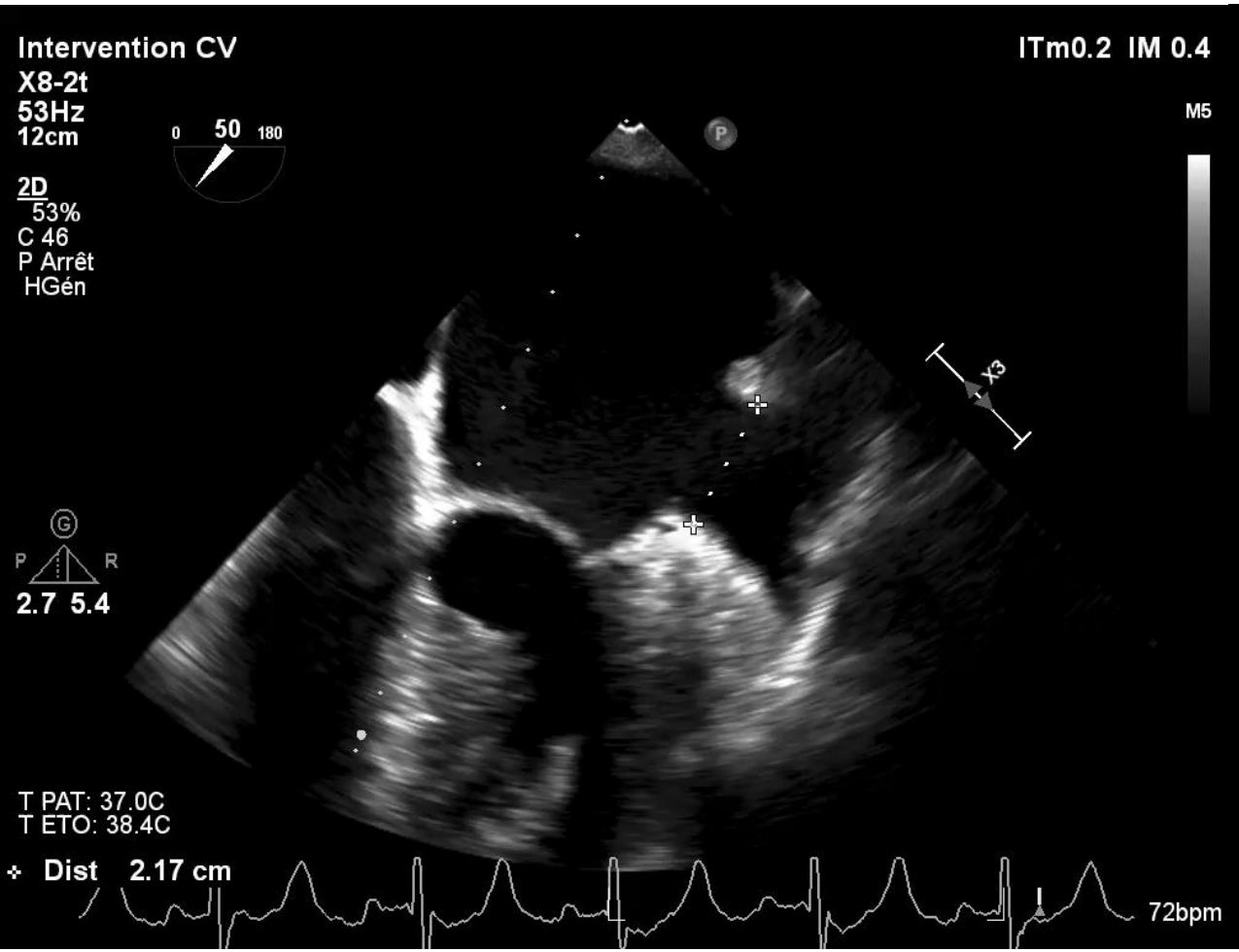
- Patient, 65 ans
- Antecédent de néo vésical (chirurgie et Rx)
- FA
- Hématuries itératives sévères et irréductibles
- Proposition de fermeture d’auricule gauche

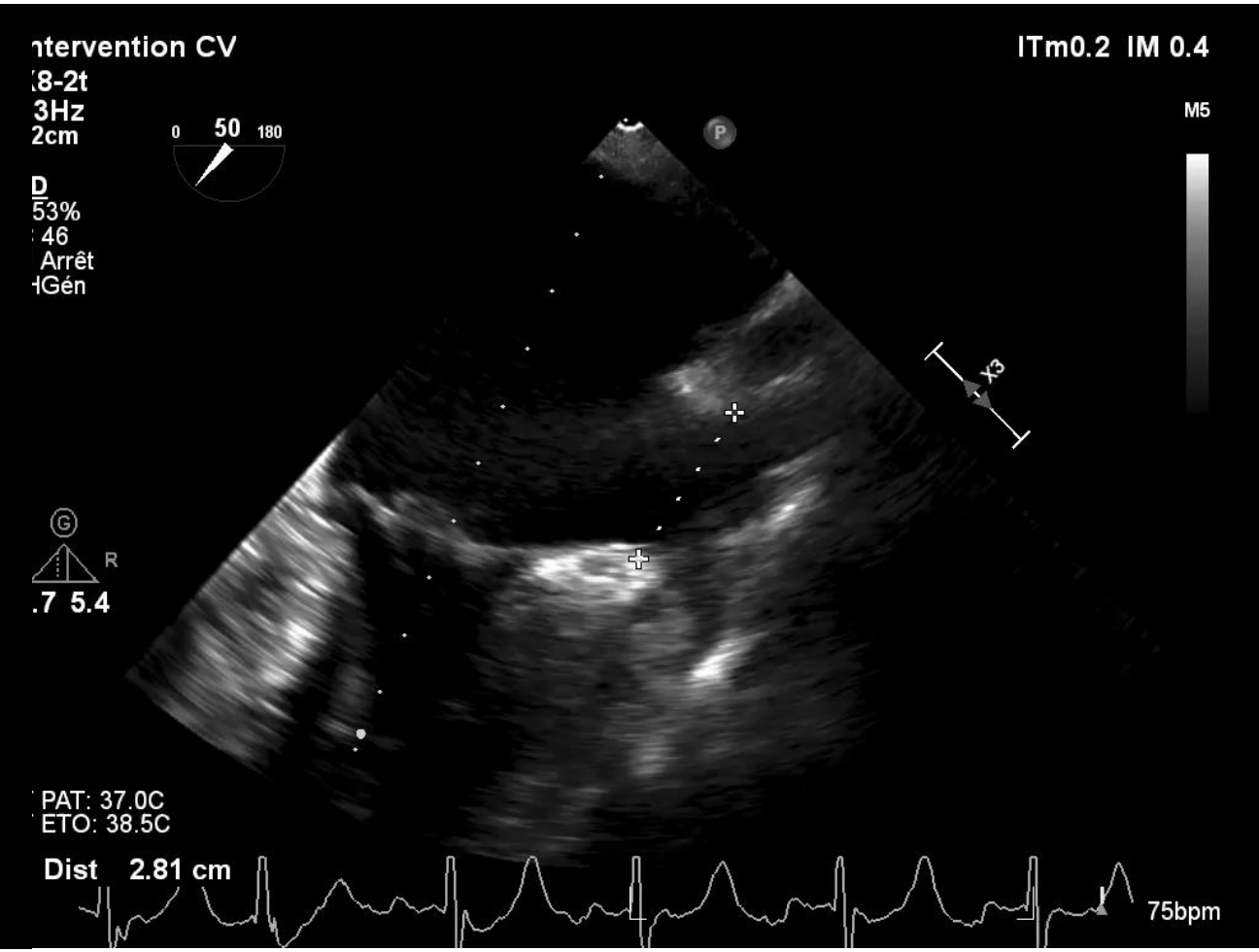


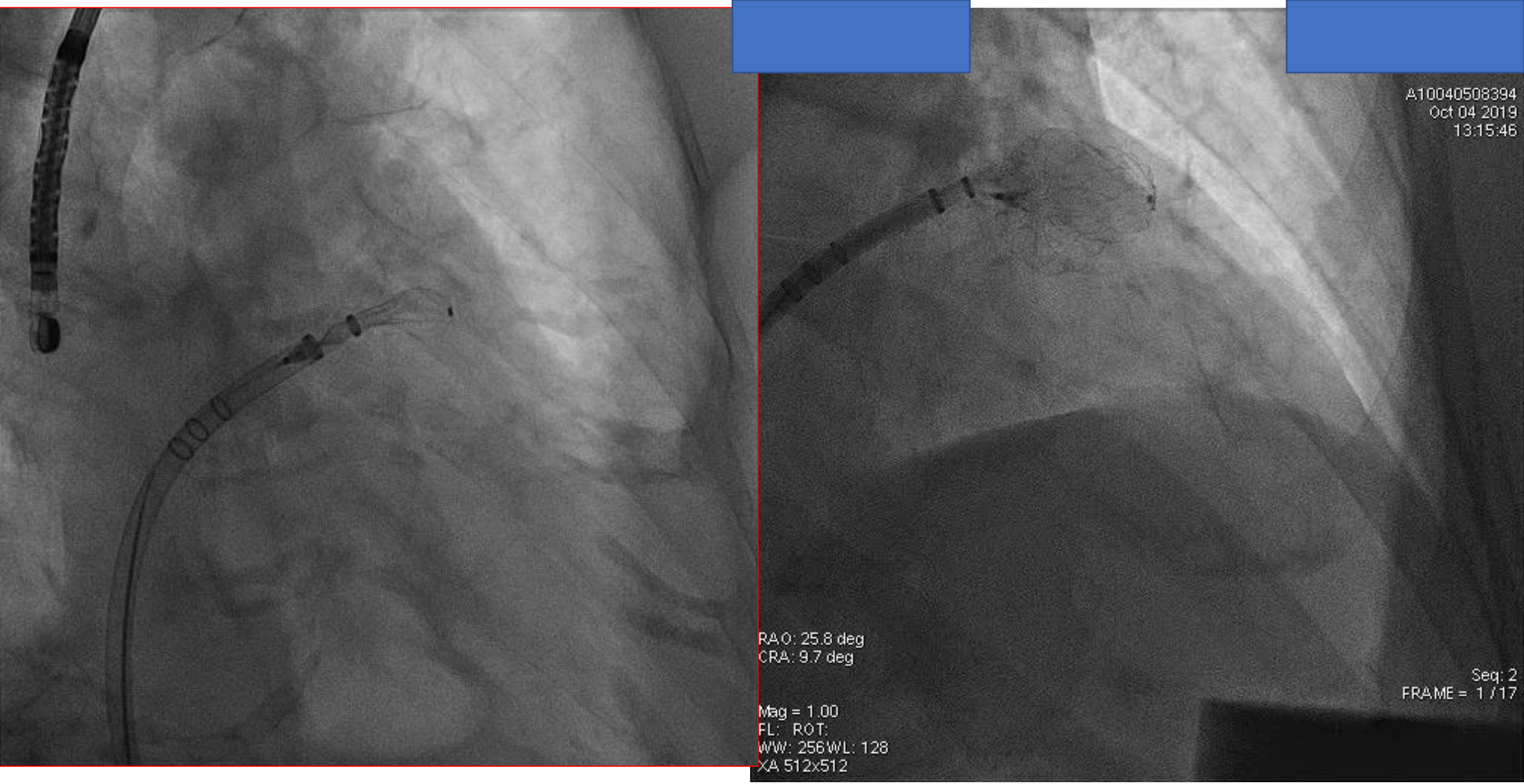


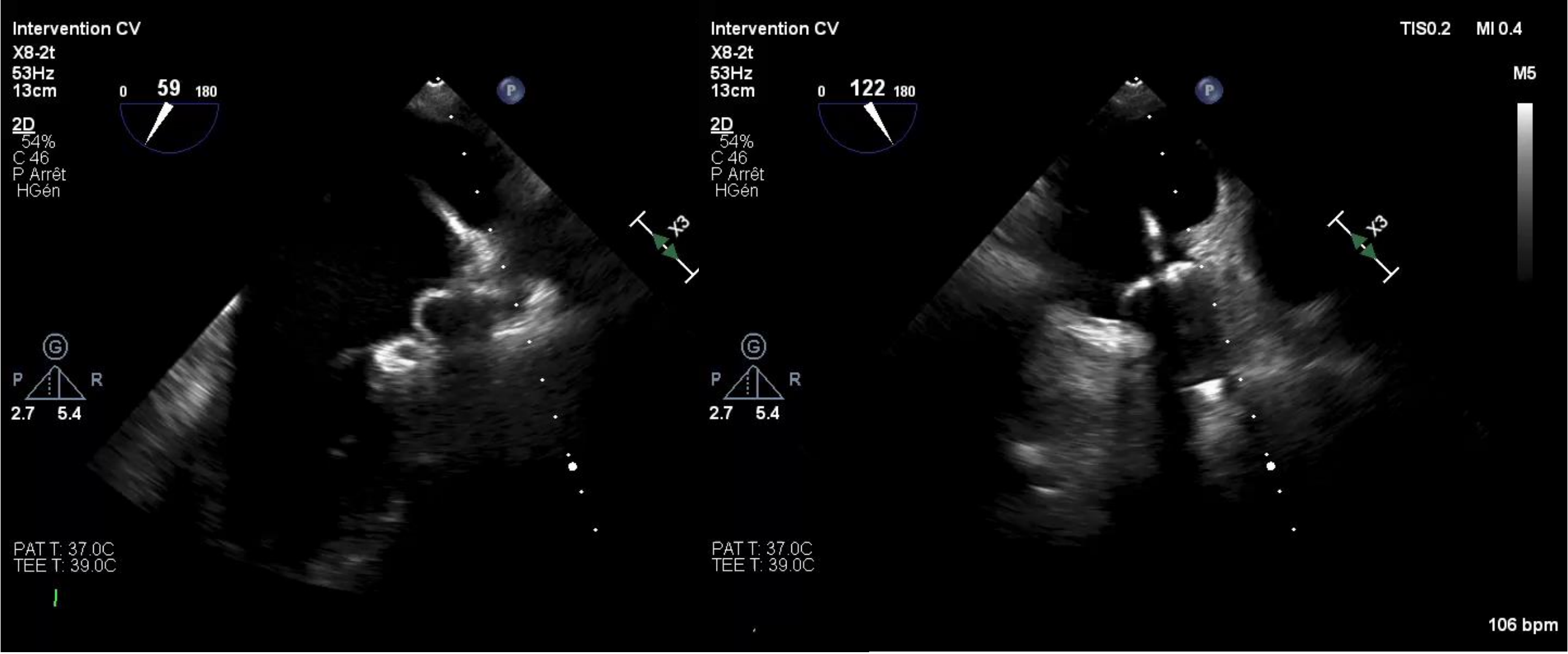


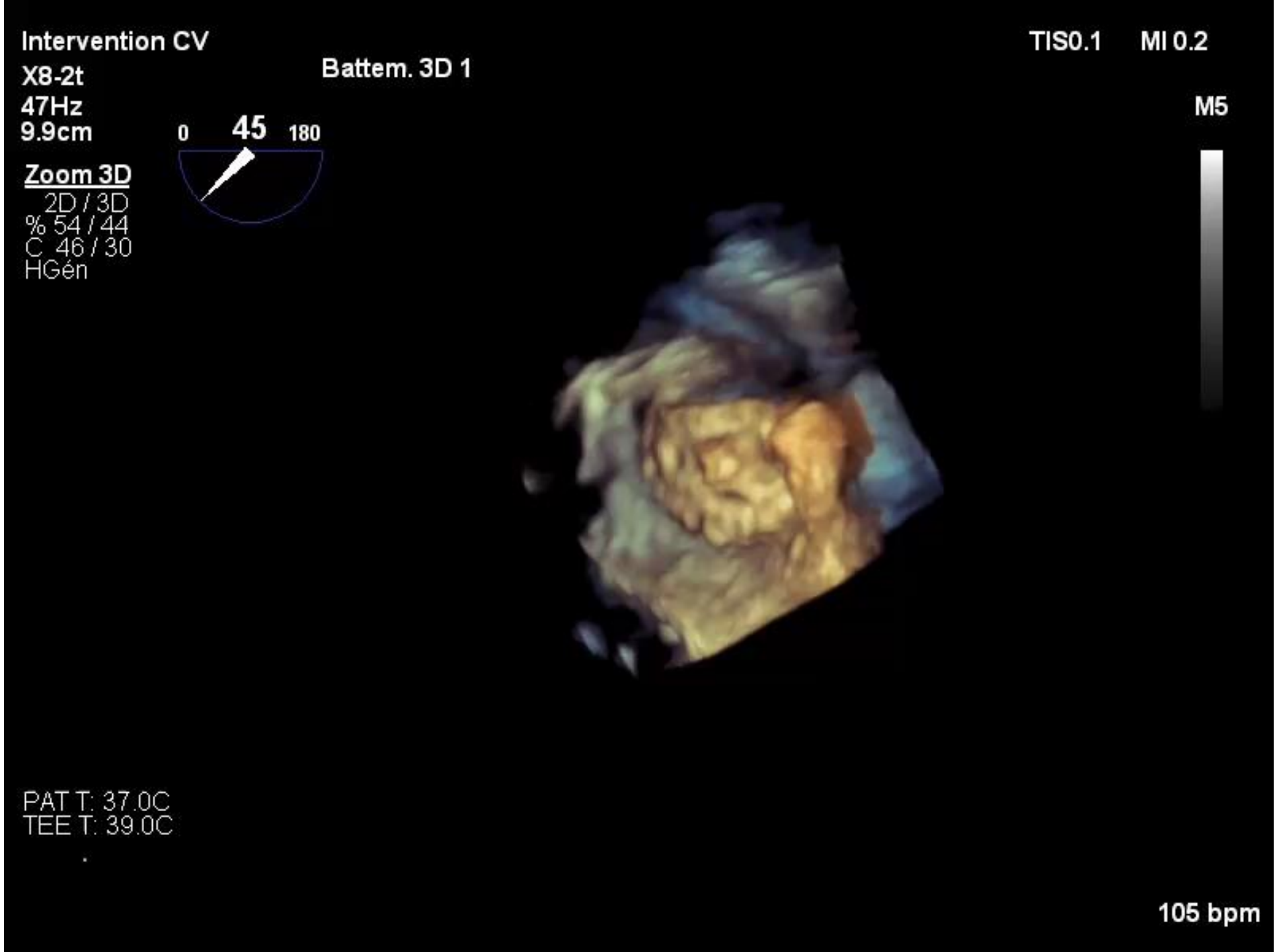
1	Orifice Measurement	Min Diameter	23,4 mm
		Max Diameter	29,5 mm
		Avg Diameter	26,5 mm
		Area derived Ø	26,1 mm
		Perimeter derived Ø	26,5 mm
		Area	536,4 mm²
		Perimeter	83,4 mm

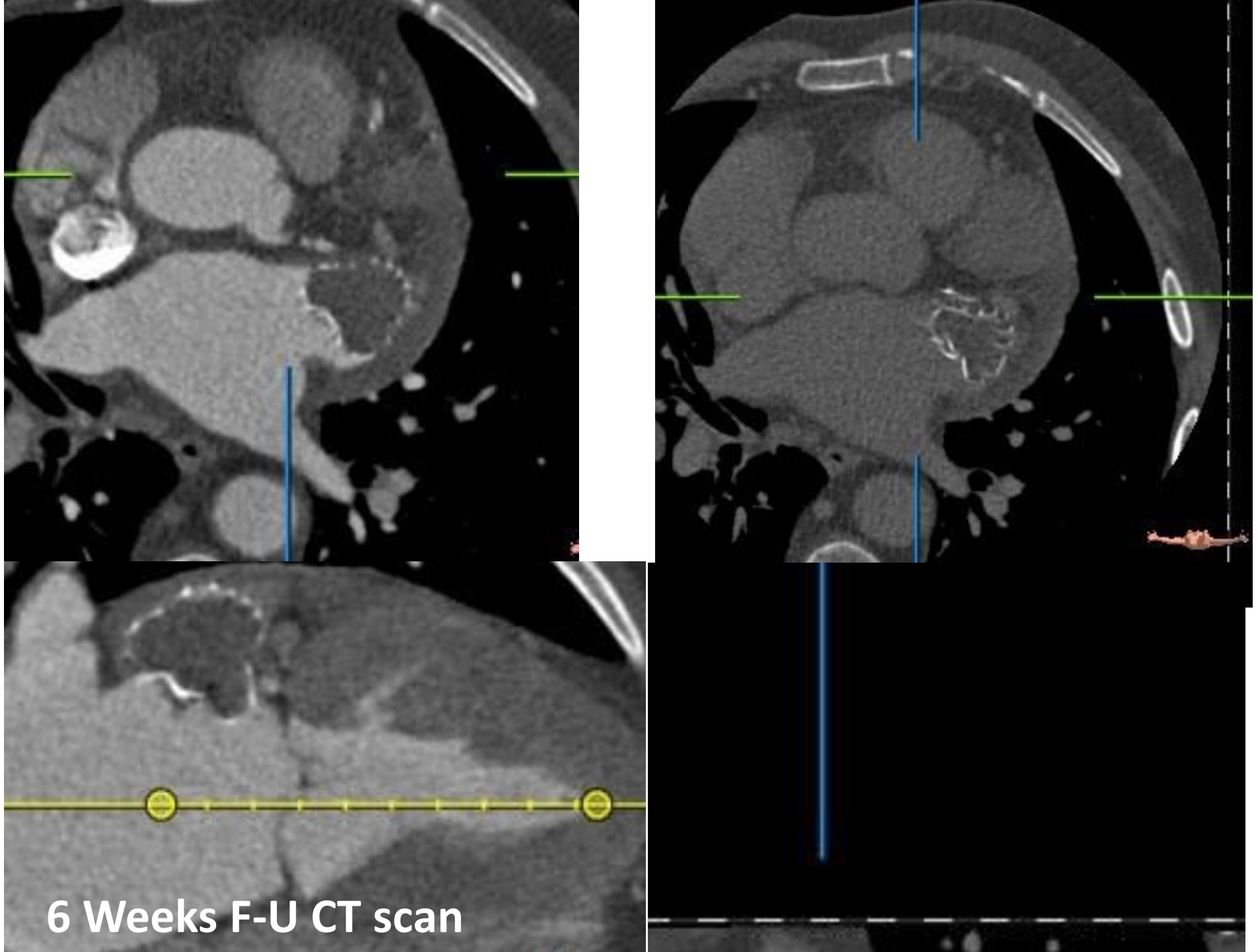

Intervention CV
X8-2t
53Hz
12cm
2D
53%
C 46
P Arrêt
HGén
ITm0.2 IM 0.4
M5
0 50 180
X3
P R
2.7 5.4
T PAT: 37.0C
T ETO: 38.4C
Dist 2.17 cm
72bpm


ntervention CV
8-2t
3Hz
2cm
D
53%
46
Arrêt
HGén
ITm0.2 IM 0.4
M5
0 50 180
X3
R
.7 5.4
PAT: 37.0C
ETO: 38.5C
Dist 2.81 cm
75bpm


A10040508394
Oct 04 2019
13:15:46
RAO: 25.8 deg
CRA: 9.7 deg
Seq: 2
FRAME = 1 / 17
Mag = 1.00
FL: ROT:
WW: 256 WL: 128
XA 512x512


Intervention CV
X8-2t
53Hz
13cm
0 59 180
2D
54%
C 46
P Arrêt
HGén
X3
G
P R
2.7 5.4
PAT T: 37.0C
TEE T: 39.0C
Intervention CV
TIS0.2 MI 0.4
X8-2t
53Hz
13cm
0 122 180
M5
2D
54%
C 46
P Arrêt
HGén
X3
G
P R
2.7 5.4
PAT T: 37.0C
TEE T: 39.0C
106 bpm


Intervention CV
X8-2t
47Hz
9.9cm
Battem. 3D 1
0
45
180
TIS0.1
MI 0.2
M5
Zoom 3D
2D / 3D
% 54 / 44
C 46 / 30
HGén
PAT T: 37.0C
TEE T: 39.0C
105 bpm


6 Weeks F-U CT scan

Suivi écho post procédure

Table 8. Scientific rationale of recommendations for LAA closure imaging.

Recommendations	Consensus statement instruction	Symbol
Preprocedural imaging should be performed with either CCTA or TOE to rule out pre-existing LAA thrombus and anatomic suitability for LAA closure	"Should do this"	
Procedural imaging should be performed with either TOE or ICE guidance	"Should do this"	
Post-procedural imaging should be performed at 6-24 weeks post implantation to assess for DRT	"Should do this"	
Post-procedural imaging may be repeated after 12 months post implantation to assess for DRT	"May do this"	
Presence of DRT on the atrial side of the device should be treated with intensified anticoagulation to resolve thrombus	"Should do this"	

CCTA: cardiac computed tomography angiography; DRT: device-related thrombus; ICE: intracardiac echocardiography; TOE: transoesophageal echocardiography

- ETT avant sortie
  - Epanchement péricardique _ migration P
- ETO 6 à 12 semaines après implantation
  - Thrombus
  - Migration prothèse
  - Epanchement tardif
  - Fuite périprothétique
    - > ou < 5 mm

EHRA/EAPCI consensus statement on LAA occlusion update

Authors	Study population	Type of study	Type of LAA closure	Severity of leak*	Incidence of PDL or leak, %†	Association with thromboembolism
Osmancik et al. [6]	201 vs. 201	Prospective randomized trial (PRAGUE-17)	WATCHMAN™, WATCHMAN™ FLX, AMPLATZER™ Amulet™	≤5 mm, >5 mm	>5-mm leak was seen in 4 (2.2%) patients, 1- to 5-mm leaks in 20 (11.2%), and no leak in 154 (86.5%)	Not available
Doshi et al. [52]	400	Prospective observational registry (PINNACLE FLX)	WATCHMAN™ FLX	≥5 mm as significant PDL	0% for ≥5 mm 10.5% with identifiable leaks	Only 2 strokes total, 7 DRTs
Landmesser et al. [14] Hildick-Smith et al. [15]	1,088	Prospective observational registry	AMPLATZER™ Amulet™	None, small (<3 mm), medium (3–5 mm), large (>5 mm)	1.6% were ≥3 mm	No PDL in 18 DRTs
Nguyen et al. [24]	77	Prospective observational registry	WATCHMAN™ & AMPLATZER™ cardiac plug, Amulet™	Passage of contrast into LAA in CCTA	56.7% (no PDL of >5 mm observed)	The incidence of MACE was 12.0 versus 4.3% between patients with PDL and without PDL (p = ns)
Pracon et al. [27]	99	Prospective observational registry	WATCHMAN™ & AMPLATZER™ cardiac plug	≥5 mm	8%	No association with DRT (0 of 7 DRT)
Fink et al. [30]	48	Retrospective study	LARIAT®	Major (>5 mm), intermediate (3–5 mm), minor (<3 mm)	34% at median 183 days (11% major, 14% intermediate, 9% minor)	Only 1 thromboembolism case (without residual leak)
Saw et al. [23]	339	Retrospective study	AMPLATZER™ cardiac plug	Minimal (<1 mm), mild (1–3 mm), moderate (3–5 mm), severe (>5 mm)	12.5% (39/339) (2/39 were severe PDL)	No association
Boersma et al. [26]	1,025	Prospective observational registry (EWOLUTION)	WATCHMAN™	≤5 mm, >5 mm	8.6%; 7.9% ≤5 mm, 0.7% >5 mm	No association
Tzikas et al. [53]	1,047	Prospective observational registry	AMPLATZER™ cardiac plug	Trivial (<1 mm), mild (1–3 mm), or significant (>3 mm)	11.6% total. trivial, mild, and significant in 4.3, 5.4 and 1.9%	No association for 9 strokes
Pillarisetti et al. [28]	478	Prospective observational registry	WATCHMAN™ (n = 219) & LARIAT® (n = 259)	Minor (≤5 mm) or major (>5 mm)	21% (Watchman), 33% (lariat) (p = 0.019)	No association in both devices
Aryana et al. [35]	72	Prospective observational registry	Surgical suture ligation	Passage of contrast into LAA in CCTA	24% (17/72)	Significantly increased risk of ischemic stroke and systemic embolization (1/46 of complete closure vs. 4/17 of incomplete ligation vs. 0/9 of LAA stump, p = 0.006)
Holmes et al. [9]	407	Prospective randomized trial (PREVAIL)	WATCHMAN™ (n = 269) & oral anticoagulants (n = 138)	<5 mm and ≥5 mm	10% <5 mm	No association
Price et al. [17]	154	Retrospective study	LARIAT®	Major ≥5 mm), Minor (<5 mm)	Total 20%; 14% (9/63) minor, 6% (4/63) major	No association

Authors	Study population	Type of study	Type of LAA closure	Severity of leak*	Incidence of PDL or leak, %†	Association with thromboembolism
Reddy et al. [54]	150	Prospective non-randomized study (ASAP)	WATCHMAN™	Minor (<1 mm), moderate (1–3 mm) or major (>3 mm)		No association with total 4 strokes 6 DRT with 1 stroke
Bartus et al. [16]	89	Prospective observational registry	LARIAT®	<2 mm, 2–3 mm	4% (3/85) <2 mm, 1% (1/85) 2–3 mm	No events during follow-up period
Holmes et al. [7], Viles-Gonzalez et al. [25]	485	Prospective randomized study (PROTECT-AF)	WATCHMAN™	Minor (<1 mm), moderate (1–3 mm) or major (>3 mm)	Total 32.1%	No association
Kanderian et al. [34]	137	Retrospective study	Surgical excision (n = 52), exclusion by suture (n = 73), or stapler (n = 12)	Persistent LAA flow	34% (47/137); 61% (44/73) in suture exclusion, 25% (3/12) in stapler exclusion	11 versus 15% of stroke/TIA between successful versus unsuccessful closure (p = 0.61)

Gestion des complications

Leaks after Left Atrial Appendage Closure: Ignored or Neglected?

INCIDENCE cumulée 5 à 32%

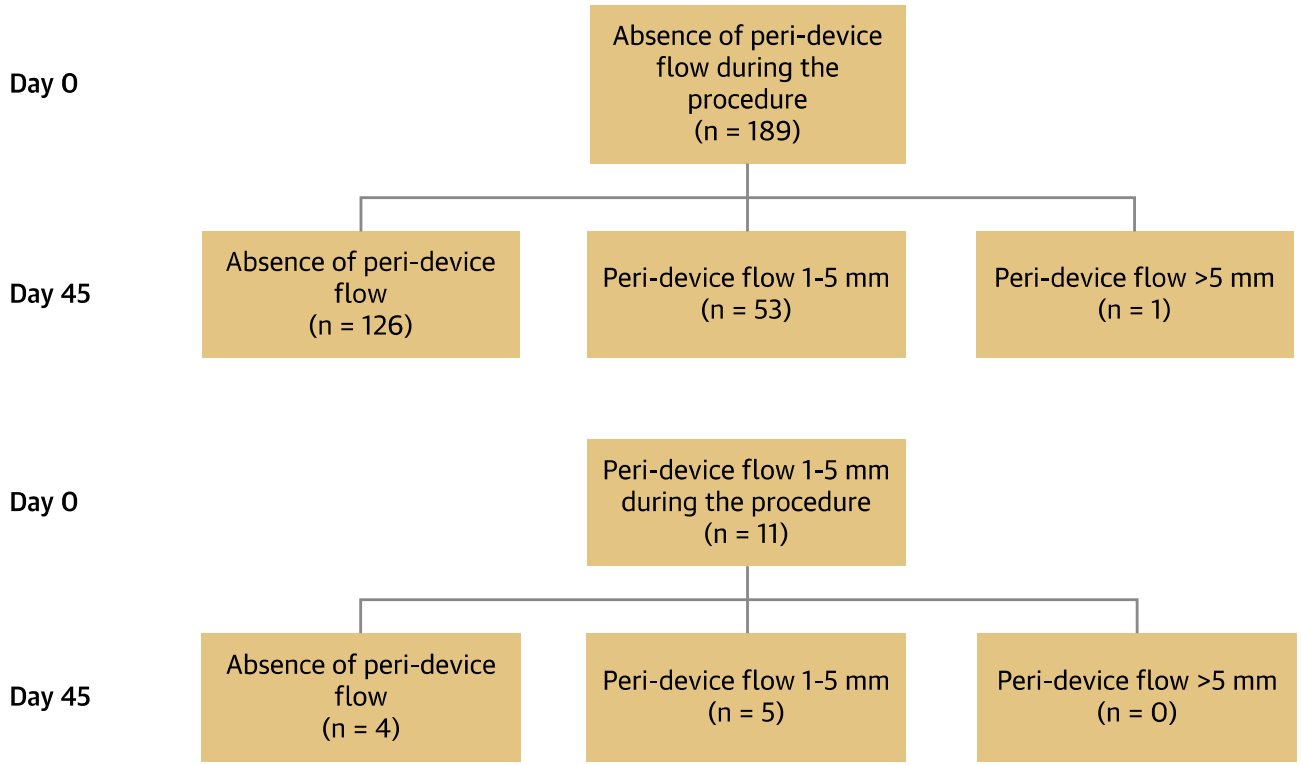
Critère sévérité si > 5 mm

Indication anticoagulation si sévère ? (WATCHMAN)

Sunn-Joo Jang, Chiu Wong, Bobak Mosadegh Cardiology 2020

Evolutivités des fuites …

FIGURE 1 **Peri-Device Flow During the Procedure and at 45 Days**



Among 189 patients who underwent 45-day transesophageal echocardiography, only 1 patient had peri-device flow >5 mm.

JACC: CARDIOVASCULAR IMAGING, VOL. 13, NO. 11, 2020
NOVEMBER 2020:2457–79

Fuites périprothétiques

Table 2 Baseline Descriptive Anatomy of Left Atrial Appendage

Anatomy of LAA	Baseline TEE
Maximum LAA ostium width, mm	
Mean ± SD	21.9 ± 4.1
Minimum, maximum	12.1, 38.8
Maximum LAA ostium length, mm	
Mean ± SD	49.4 ± 9.1
Minimum, maximum	24.9, 85.7
LAA area measured at 0°, mm^2	
Mean ± SD	580.0 ± 204.8
Minimum, maximum	173.0, 1261.0
LAA pulsed wave peak velocity, cm/s	
Mean ± SD	35.5 ± 18.4
Minimum, maximum	1.4, 117.2

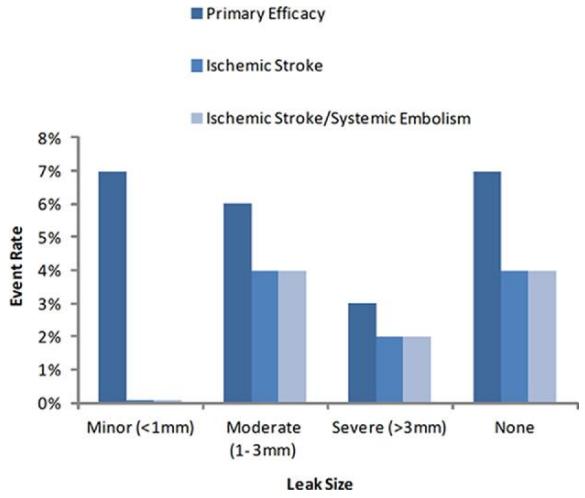
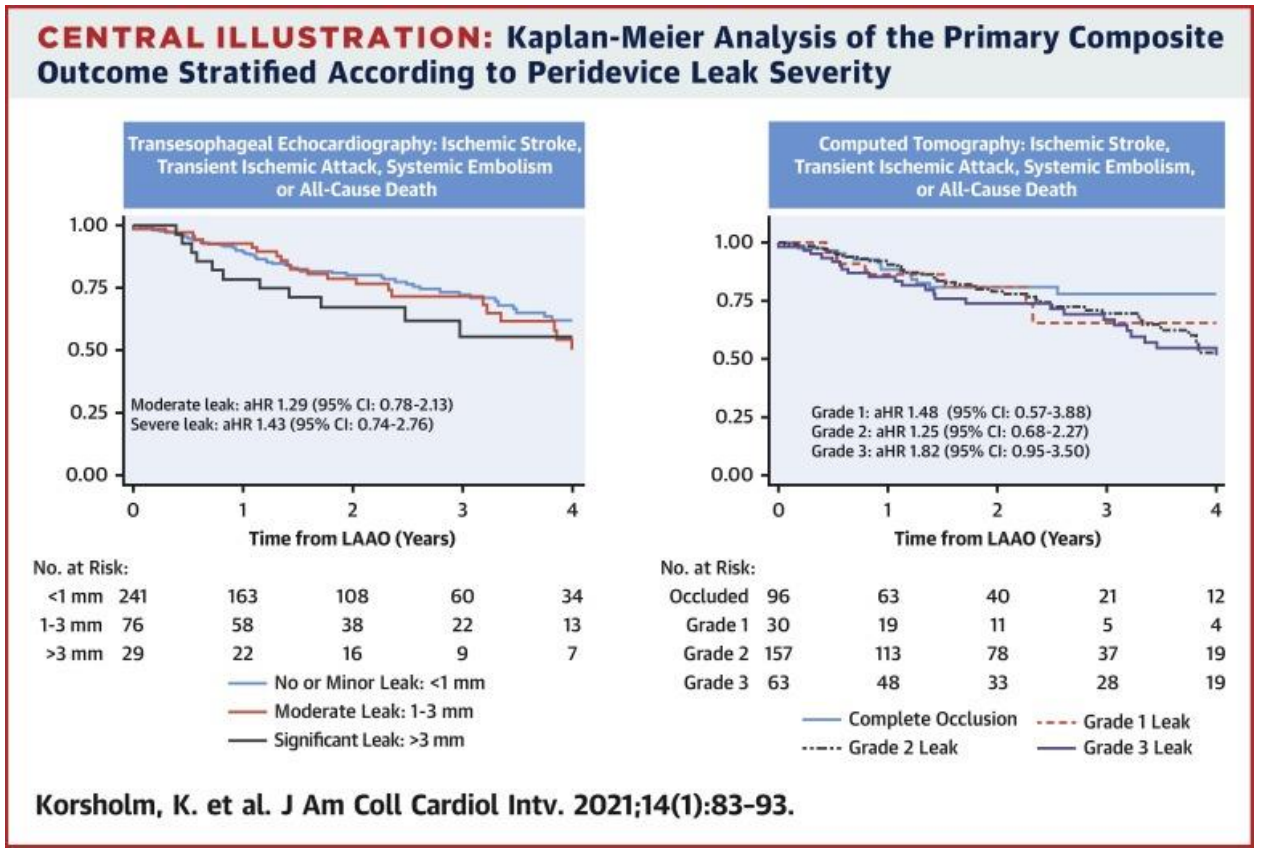


Figure 3 Primary Efficacy Endpoint Rates by Leak Severity

Comparison of primary efficacy **(dark blue bars)**, ischemic stroke **(medium blue bars)**, and a composite endpoint of stroke and systemic embolization **(light blue bars)**, showing no significant statistical relationship between the presence or severity of peri-device flow.

JACC 2012 **Viles-Gonzalez *et al.***
Peri-Device Leak After Watchman Implantation

>> Pas d'impact clinique



Korsholm, K. et al. J Am Coll Cardiol Intv. 2021;14(1):83-93.

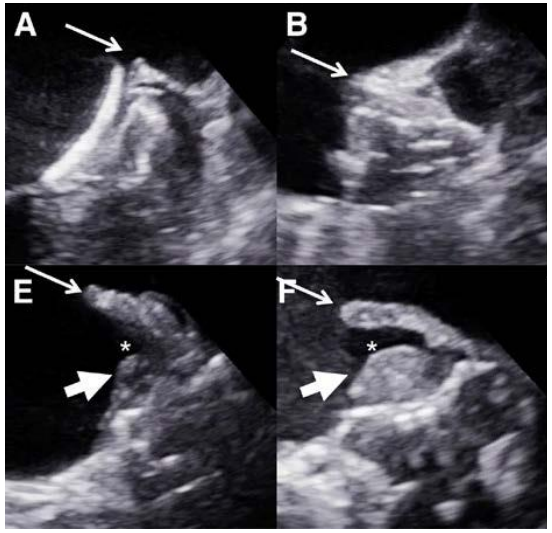
Complications: related device thrombus

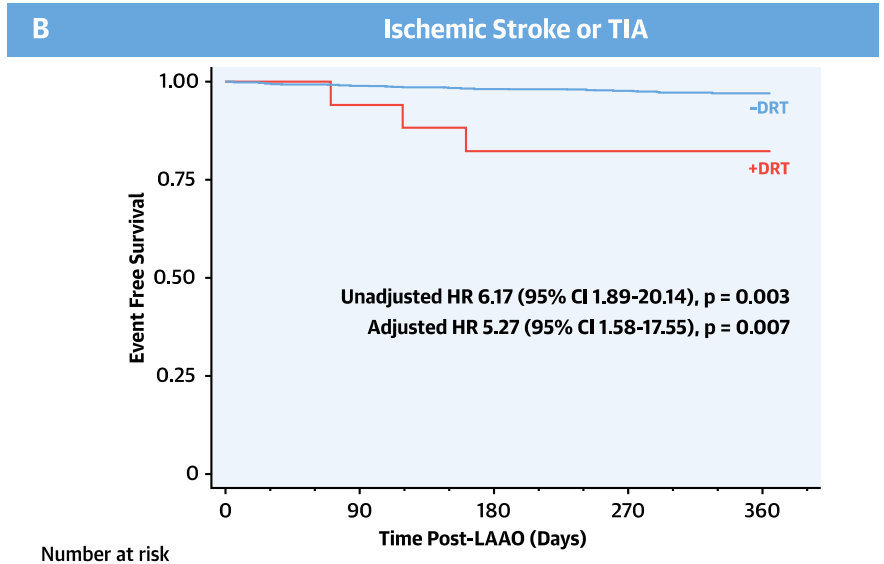
Table 7. Incidence of device-related thrombus (DRT) and strokes.

Study	N	Device	DRT	TOE time	Associated stroke
PROTECT[90]	478	WATCHMAN	4.2%	–	3/20 (15%)
ASAP[91]	150	WATCHMAN	4.0%	mean 164 days	1/6 (16.7%)
ACP Multicentre[92]	339	ACP	3.2%	mean 7 months	0%
Lempereur et al [93]	2,118	WATCHMAN, ACP, Amulet	3.9%	–	TIA 2.4% Stroke 4.9%
Lakkireddy et al[94]	712	LARIAT	2.5%	–	–
Pillarisetti et al[95]	259 219	LARIAT WATCHMAN	1.6% 3.7%	–	–
EWOLUTION[96]	1,025	WATCHMAN	3.7%		0/28 (0%)
Amulet PMR[97]	1,088	Amulet	1.5%	Mean 67 days	1/10 (10%)
PROTECT, PREVAIL, CAP, CAP2[98]	1,739	WATCHMAN	3.7%	45 days and 12 months	17/65 (26.2%)

DRT: device-related thrombus; TIA: transient ischaemic attack; TOE: transoesophageal echocardiography

EHRA/EAPCI consensus statement on LAA occlusion update





Aminian, A. et al. J Am Coll Cardiol Intv. 2019;12(11):1003-14.

Présence de thrombus > risque AVC / AIT HR 5,27

Complications: thrombus

Table 1. Characteristics of the Study Cohort

Variable	Overall	DRT (n=7)	No DRT (n=92)	*P* Value
Female, n (%)	42 (42.4)	1 (14.3)	41 (44.6)	0.23
Age, y	74.0 (IQR, 68.0–80.0)	75.0 (IQR, 71.0–87.0)	74.0 (IQR, 67.0–80.0)	0.19
Hypertension	88 (88.9%)	7 (100%)	81 (88%)	1.0
Diabetes mellitus	27 (27.3%)	7 (100%)	27 (29.3%)	0.19
Current smoker	9 (9.1%)	1 (14.3%)	8 (8.7%)	0.50
History of coronary artery disease	43 (43.4%)	4 (57.1%)	39 (42.4%)	0.46
Heart failure	38 (38.4%)	3 (42.9%)	35 (38%)	1.0
Prior thromboembolism*	33 (33.3%)*	5 (71.4%)*	28 (30.4%)*	0.04*
Permanent atrial fibrillation	37 (37.4%)	7 (100%)	37 (40.2%)	0.05
CHA_2DS_2-VASc	4.0 (IQR, 3.0–5.0)	4.0 (IQR, 3.0–5.0)	4.0 (IQR, 3.0–5.0)	0.81
HAS-BLED	2.0 (IQR, 1.0–3.0)	3.0 (IQR, 2.0–4.0)	2.0 (IQR, 1.0–3.0)	0.07
Platelet count, tys/μL	178.0 (IQR, 150.0–227.0)	156.0 (IQR, 132.0–224.0)	180.0 (IQR, 150.5–230.8)	0.41
eGFR, mL min^{-1} 1.73 m^{-2}	61.3 (IQR, 51.9–79.9)	55.4 (IQR, 42.0–88.2)	62.0 (IQR, 52.2–79.1)	0.74
Ejection fraction, %*	60.0 (IQR, 55.0–66.0)*	50.0 (IQR, 35.0–55.0)*	60.0 (IQR, 55.0–66.0)*	<0.01*
Moderate-to-severe mitral insufficiency	23 (23.3%)	2 (28.6%)	21 (22.8%)	0.66
Left atrial area, cm^2	28.0 (IQR, 24.0–32.0)	30.0 (IQR, 25.2–35.0)	28.0 (IQR, 24.0–32.0)	0.47
Device type (ACP/Amulet)	58 (58.6%)	3 (42.9%)	55 (59.8%)	0.44
Device size, mm*	26.0 (IQR, 24.0–28.0)*	30.0 (IQR, 27.0–33.0)*	25.0 (IQR, 24.0–28.0)*	<0.01*
Deep implantation*†	42 (42.4%)*	6 (85.7%)*	36 (39.1%)*	0.04*
P-DAPT duration, weeks	13.0 (IQR, 7.3–26.0)	12.4 (IQR, 6.0–49.7)	13.0 (IQR, 7.3–26.0)	0.77
Peridevice leak	8 (8.1%)	0 (0%)	8 (8.7%)	1.0

ACP indicates Amplatzer cardiac plug; DRT, device-related thrombus; eGFR, estimated glomerular filtration rate; IQR, interquartile range; and P-DAPT, postimplantation dual antiplatelet therapy.

Facteurs Risques

. FEVG basse

. Tabac

. Contraste spontané

. ATCD thromboembolique

. Deep implantation

. Occlusion incomplète

Bientôt ??

Table 3. Periprocedural and 45-Day Outcomes

	SDD (n=72)	Non-SDD (n=118)	*P* value
Primary safety outcome*			
Periprocedural†	1/72 (1.4%)	7/118 (5.9%)	0.26
45 d‡	2/72 (2.8%)	11/118 (9.3%)	0.14
Ischemic stroke			
Periprocedural	0/72 (0%)	1/118 (0.8%)	1.0
45 d	0/72 (0%)	1/118 (0.8%)	1.0
Systemic embolism			
Periprocedural	0/72 (0%)	0/118 (0%)	
45 d	0/72 (0%)	0/118 (0%)	
Major bleeding requiring transfusion			
Periprocedural	1/72 (1.4%)	5/118 (4.2%)	0.41
45 d	2/72 (2.8%)	9/118 (7.6%)	0.21
Vascular complications requiring endovascular intervention			
Periprocedural	0/72 (0%)	1/118 (0.8%)	1.0
45 d	0/72 (0%)	1/118 (0.8%)	1.0
All-cause death			
Periprocedural	0/72 (0%)	0/118 (0%)	
45 d	0/72 (0%)	0/118 (0%)	
All-cause readmission			
Periprocedural	1/72 (1.4%)	9/118 (7.6%)	0.09
45 d§	6/72 (8.3%)	16/118 (13.6%)	0.27
DRT on 45-d TEE	0/65 (0%)	0/114 (0%)	
Peri-device flow >5 mm on 45-d TEE	0/65 (0%)	1/114 (0.9%)	1.0

Circulation: Cardiovascular Interventions

ORIGINAL ARTICLE

Safety and Feasibility of Same-Day Discharge After Left Atrial Appendage Closure With the WATCHMAN Device

Bryan E-Xin Tan, MD; Leela Krishna Teja Boppana, MD; Abdullah S. Abdullah, MD; Dmitry Chuprun, MD; Abrar Shah, MD; Mohan Rao, MD; Deepak L. Bhatt, MD, MPH; Jeremiah P. Depta, MD, MPHS

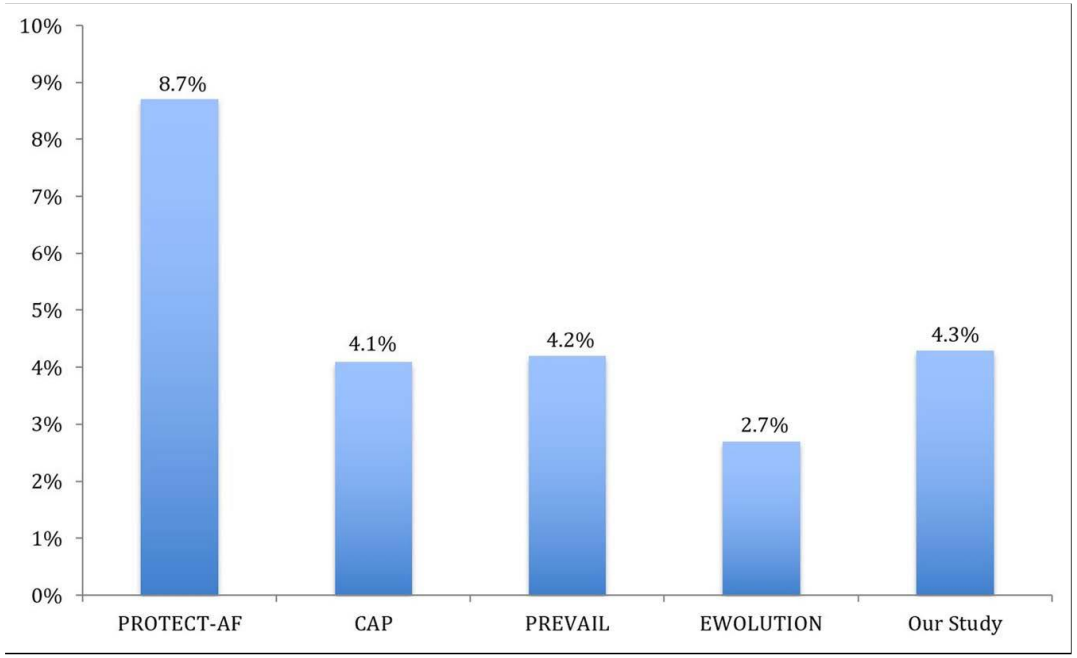


Figure 5. Seven-day procedure/device-related complications of our study compared with prior WATCHMAN studies.

Conclusion

- Technique simple et sûre
  - Importance de la sélection des patients et du couple Echographiste /cathétériseur
  - Courbe d'apprentissage – réduction des temps de gestes et d'hospitalisation

- Accessibilité et résultats dans une population fragile
  - Sélection des patients
  - Encadrement péri et post opératoire