

Structurel Hors TAVI: Le clip tricuspide

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Conflits d'intérêts

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Honoraires de proctor: Abbott Medical

Introduction

L'IT est une atteinte fréquente, cliniquement significative chez:

- 1.6 million d'individus aux USA
- 3.0 million d'individus en Europe

Prise en charge chirurgicale infrequente

- 500 chirurgies pour IT isolée par an aux USA



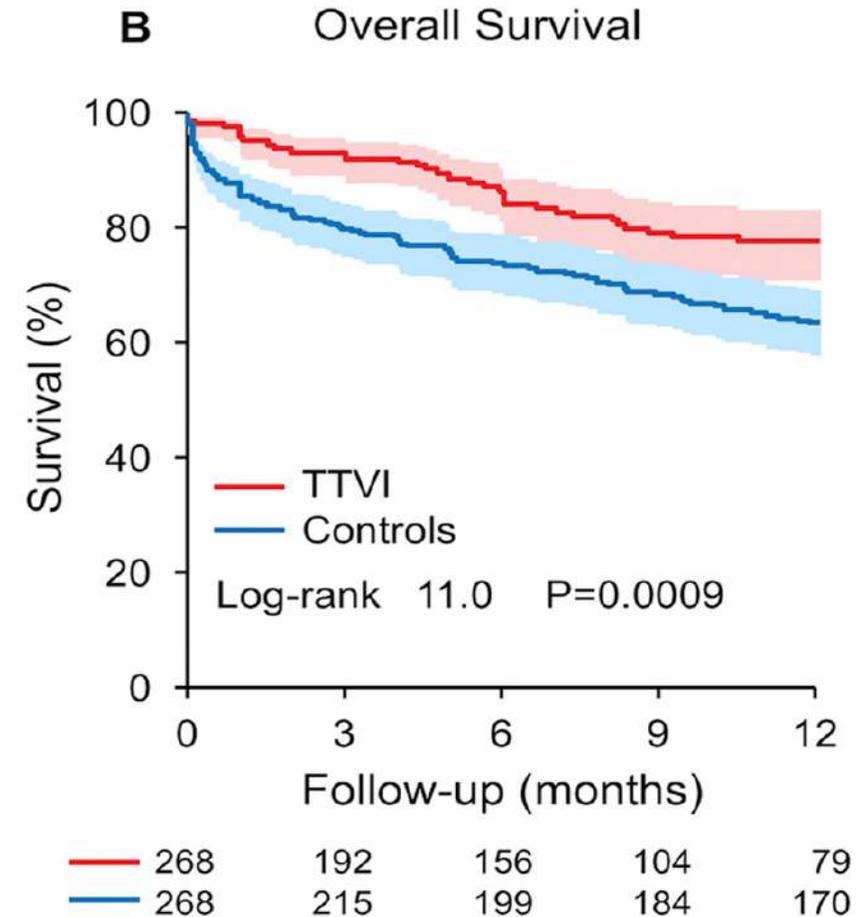
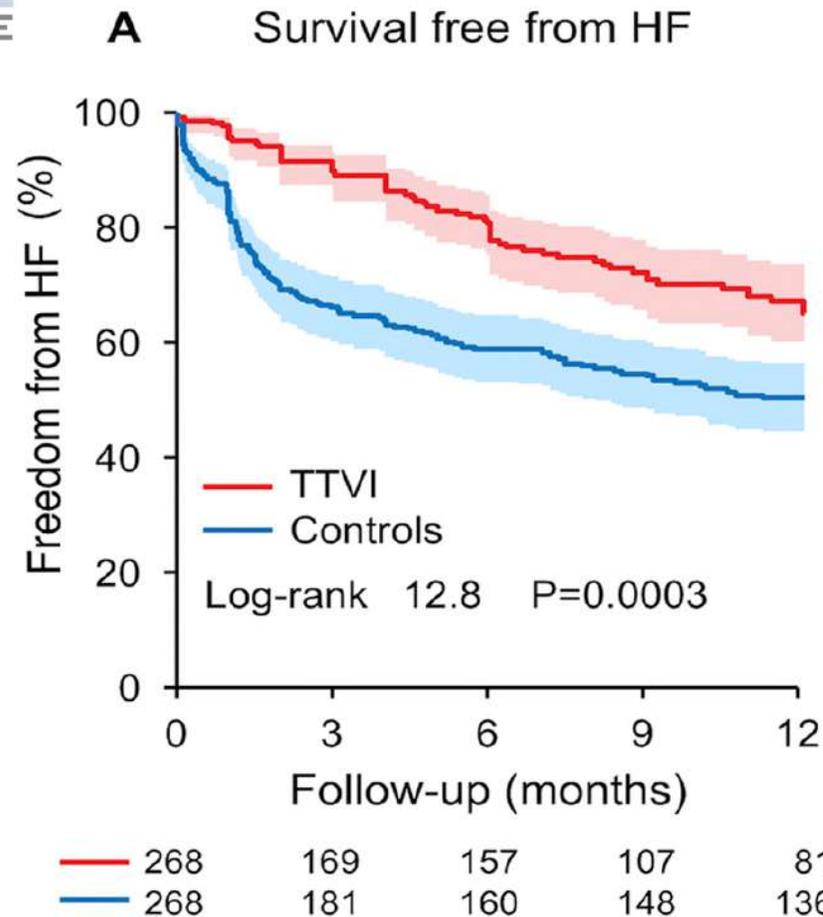
Propensity matching entre TTVR et traitement médical (Taramasso et al, JACC 2019)

- Patients du registre TriValve (472 patients)
- Cohorte de contrôle : 2 registres rétrospectifs de Mayo Clinic, Rochester, Minnesota and Leiden University Medical Center, The Netherlands (1179 patients)
- End-point primaire: mortalité toute cause confondue ou hospitalisation pour insuffisance cardiaque
- End-point secondaire: mortalité toute cause confondue
- Suivi total: 1 an



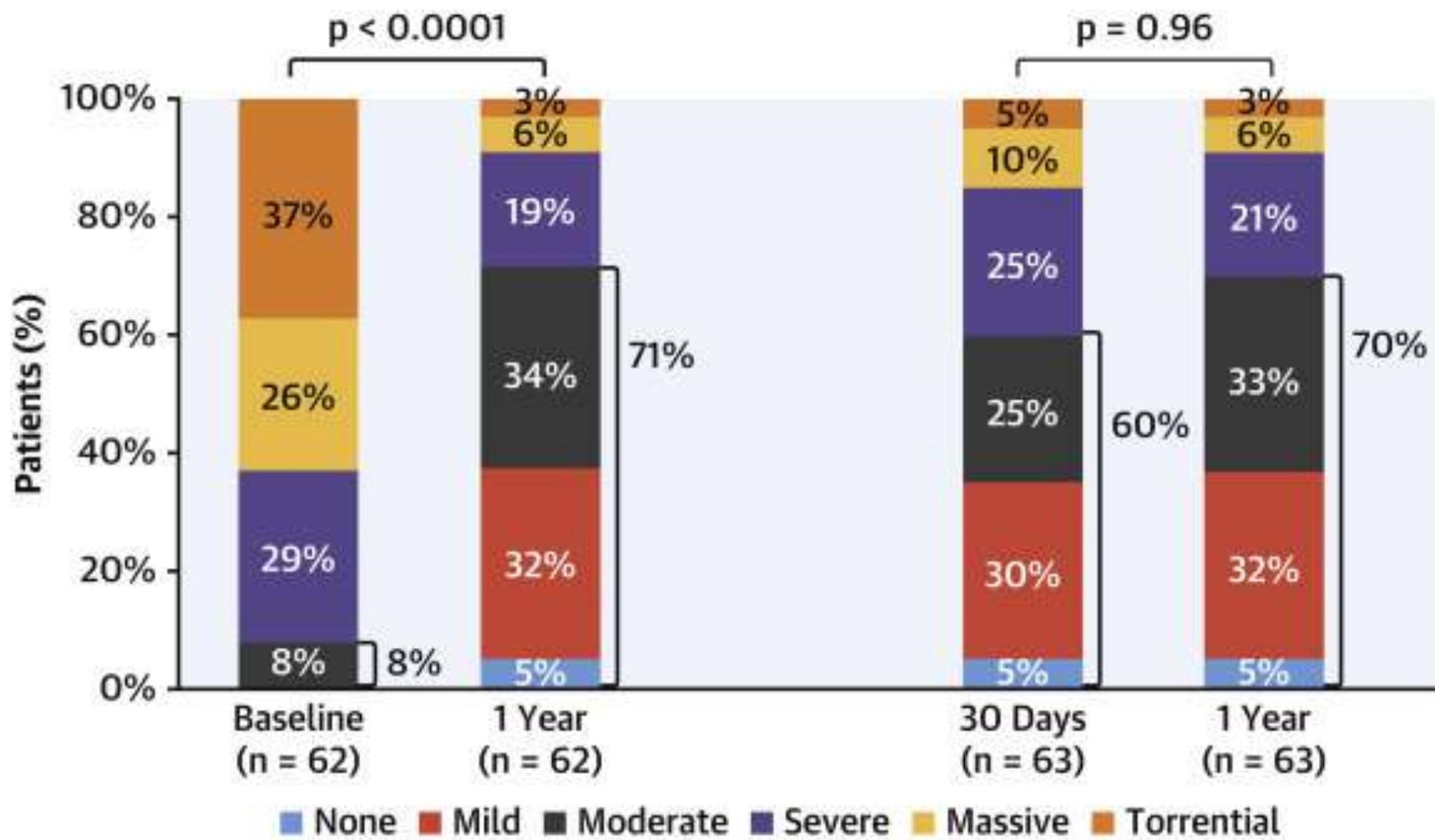
Transcatheter versus medical treatment of symptomatic severe tricuspid regurgitation.

Taramasso M¹, Benfari G², van der Bijl P³, Alessandrini H⁴, Attinger-Toller A⁵, Biasco L⁶, Lurz P⁷, Braun D⁸, Brochet E⁹, Connelly KA¹⁰, de Bruijn S¹¹, Denti P¹², Deuschl F¹³, Estevez-Loureiro R¹⁴, Fam N¹⁰, Frerker C¹⁵, Gavazzoni M¹⁶, Hausleiter JR⁸, Ho E¹⁷, Juliard JM⁹, Kaple R¹⁸, Besler C⁷, Kodali S¹⁹, Kreidel F²⁰, Kuck KH⁴, Latib A²¹, Lauten A²², Monivas V¹⁴, Mehr M⁸, Muntané-Carol G²³, Nazif T¹⁹, Nickening G²⁴, Pedrazzini G⁶, Philippon F²³, Pozzoli A¹⁶, Praz F²⁵, Puri R²³, Rodés-Cabau J²³, Scha Fer U¹³, Schofer J²⁶, Sievert H¹¹, Tang GHL²⁷, Thiele H⁷, Topilsky Y²⁸, Rommel KP⁷, Delgado V³, Vahanian A⁹, Von Bardeleben RS²⁰, Webb JG⁵, Weber M²⁴, Windecker S²⁵, Winkel M²⁵, Zuber M¹⁶, Leon MB¹⁹, Hahn RT¹⁹, Bax JJ³, Enriquez-Sarano M², Maisano F¹⁶.

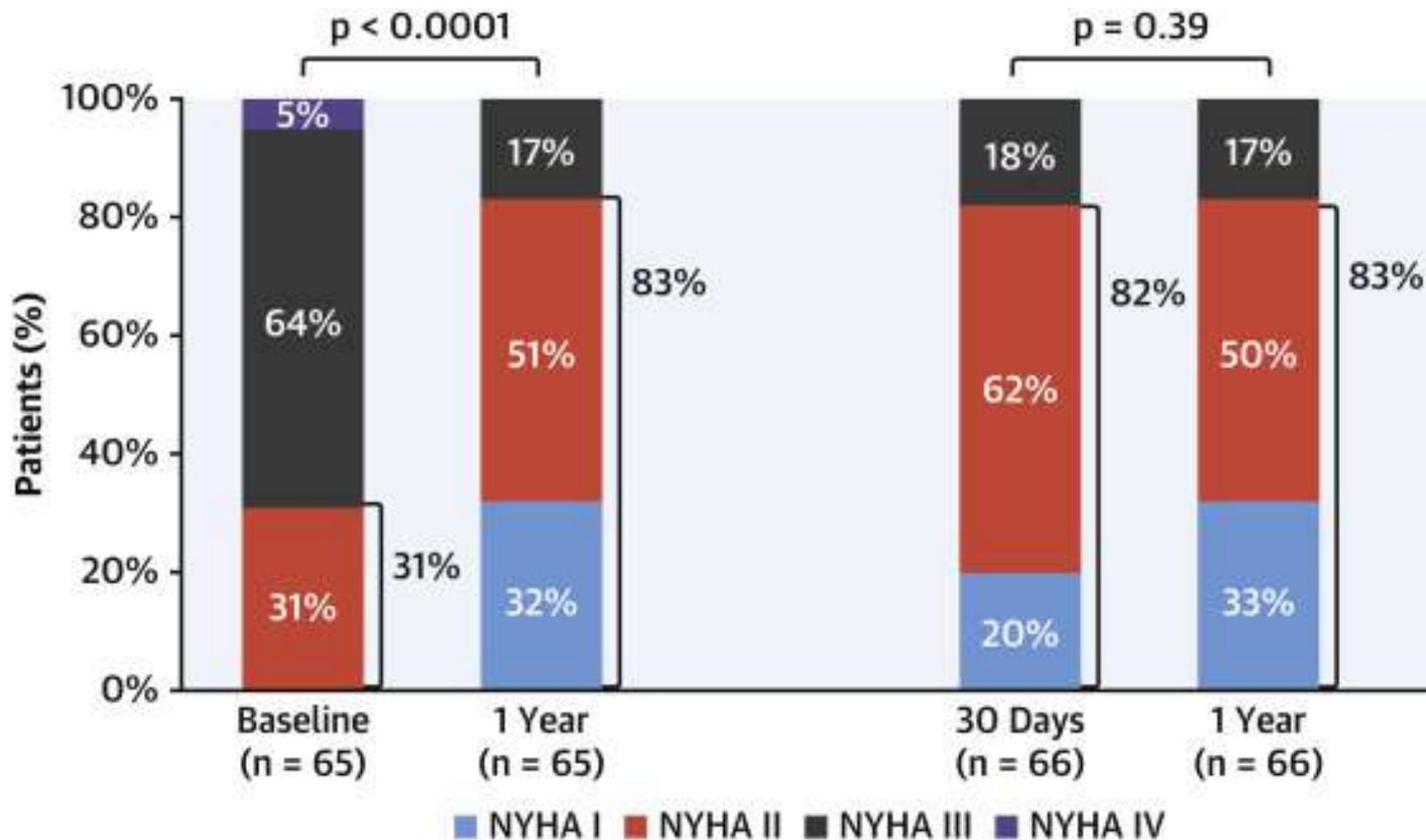


Le Triclip a-t-il fait ses preuves?

Résultats à 1an de l'étude TRILUMINATE (single-arm study)



TRILUMINATE study: amélioration clinique



TRILUMINATE study: paramètres échographiques

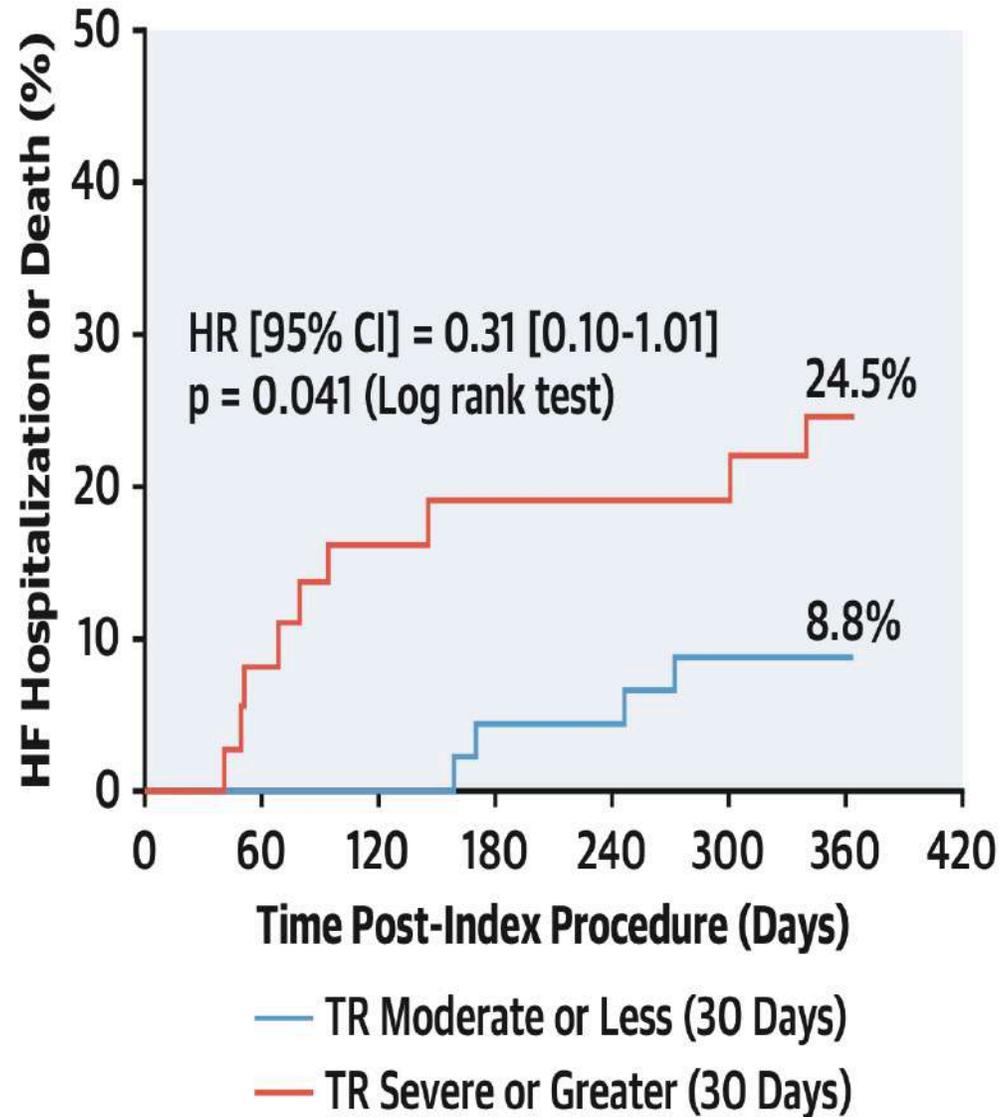
| | Baseline | 30 Days | 1 Year | p Value* Baseline Versus 1 Year | p Value* 30 Days Versus 1 Year |
|---|--------------|--------------|--------------|------------------------------------|-----------------------------------|
| Tricuspid regurgitation | | | | | |
| EROA, cm ² | 0.65 ± 0.03 | 0.40 ± 0.03 | 0.32 ± 0.05 | <0.0001 | 0.1053 |
| Regurgitant volume, ml/beat | 52.20 ± 2.35 | 34.83 ± 2.92 | 27.68 ± 3.08 | <0.0001 | 0.0607 |
| Regurgitation jet area, cm ² | 14.28 ± 0.69 | 9.18 ± 0.64 | 7.55 ± 0.56 | <0.0001 | 0.0007 |
| Vena contracta width, cm | 1.73 ± 0.07 | 1.00 ± 0.06 | 0.78 ± 0.05 | <0.0001 | <0.0001 |
| PISA radius, cm | 0.91 ± 0.03 | 0.68 ± 0.03 | 0.63 ± 0.04 | <0.0001 | 0.2092 |
| IVC diameter, cm | 2.29 ± 0.06 | 2.20 ± 0.06 | 2.06 ± 0.06 | 0.0014 | 0.0216 |
| Right heart remodeling | | | | | |
| RV end diastolic dimension, cm | 5.28 ± 0.07 | 4.93 ± 0.08 | 4.79 ± 0.08 | <0.0001 | 0.0319 |
| Tricuspid annular diameter S-L, cm | 4.34 ± 0.06 | 4.08 ± 0.06 | 4.03 ± 0.07 | <0.0001 | 0.4640 |
| Right atrial volume, ml | 129 ± 5.84 | 117 ± 6.03 | 116 ± 6.55 | 0.0166 | 0.8536 |
| RV fractional area change, % | 36.00 ± 0.85 | 36.77 ± 0.74 | 38.19 ± 0.57 | 0.0057 | 0.0649 |
| RV systolic pressure, mm Hg | 42.7 ± 1.08 | 42.0 ± 1.49 | 43.9 ± 2.30 | 0.5727 | 0.4525 |
| TAPSE, cm | 1.44 ± 0.03 | 1.49 ± 0.03 | 1.59 ± 0.04 | 0.0002 | 0.0069 |
| RV global longitudinal strain, % | -14.1 ± 0.64 | -12.9 ± 0.86 | -14.6 ± 0.86 | 0.5897 | 0.1083 |

TRILUMINATE study: outcomes dur

MACE à 1 an: 7.1%

Mortalité cardiovasculaire: 4.8%

Chirurgie tricuspide: 0%



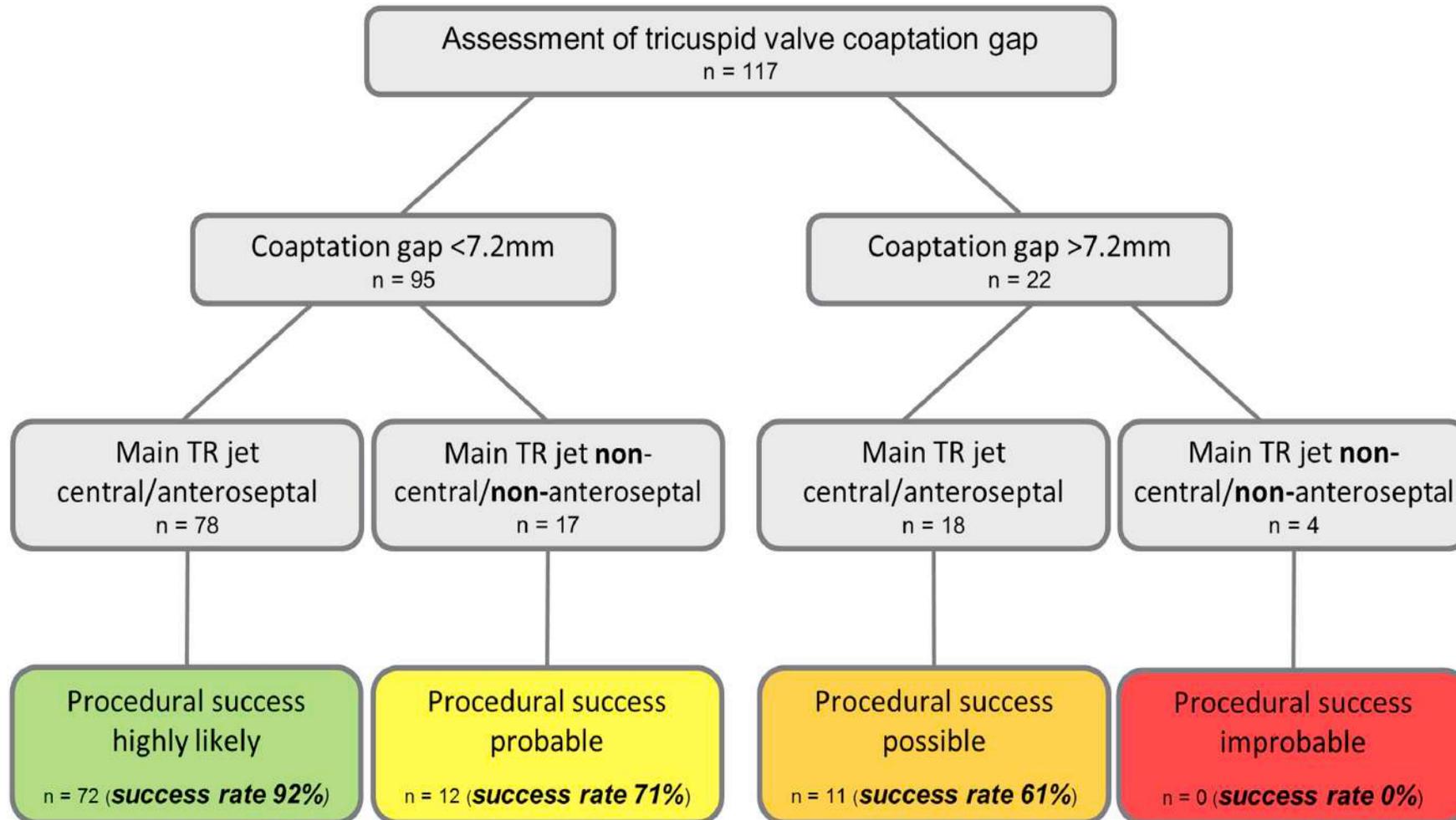
Nouveautés dans la sélection des patients

CRITÈRES ANATOMIQUES

Prédicteurs d'échec de procédure

| | Univariate | | Multivariate* | |
|---|-------------------|---------|------------------|---------|
| | OR (95% CI) | p Value | OR (95% CI) | p Value |
| Pacemaker or ICD lead | 1.53 (0.81-2.84) | 0.18 | | |
| LVEF | 1.00 (0.98-1.02) | 0.95 | | |
| TAPSE | 1.02 (0.95-1.10) | 0.55 | | |
| MR grade | 1.10 (0.84-1.44) | 0.48 | | |
| TR vena contracta | 1.76 (0.87-3.53) | 0.11 | | |
| TR coaptation gap >6.5 mm | 6.16 (3.19-12.18) | <0.001 | 1.23 (1.10-1.38) | <0.001 |
| TR EROA >0.695 cm ² | 4.79 (2.52-9.33) | <0.001 | 1.21 (1.09-1.35) | <0.001 |
| TR coaptation depth >9.75 mm | 3.17 (1.71-6.04) | <0.001 | 1.01 (0.90-1.44) | 0.83 |
| TR tenting area >3.15 cm ² | 4.78 (2.49-9.30) | <0.001 | 1.18 (1.01-1.37) | 0.035 |
| Noncentral or nonanteroseptal TR jet location | 2.38 (0.98-5.52) | 0.047 | 1.21 (1.04-1.41) | 0.013 |
| Tricuspid annular diameter | 1.03 (0.99-1.08) | 0.098 | 1.00 (0.99-1.00) | 0.60 |
| Concomitant mitral valve edge-to-edge repair | 0.66 (0.36-1.20) | 0.17 | | |
| Number of clips | 0.81 (0.57-1.12) | 0.20 | | |

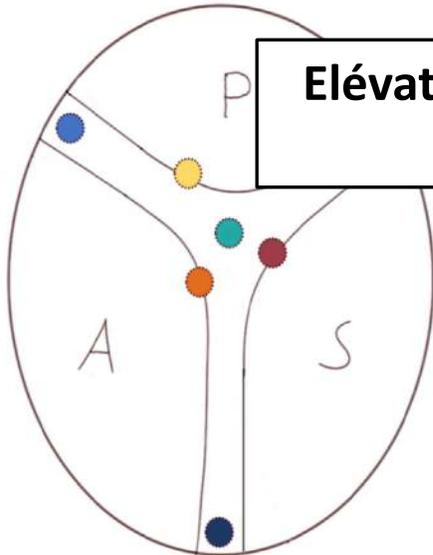
Probabilité de succès selon le profil



MitraClip chez les patients porteurs de PM/DAI

TRICUSPID VALVE CROSSING OF RIGHT VENTRICULAR LEAD

- posteroseptal commissure 16/33
- posterior leaflet 9/33
- septal leaflet 2/33
- anteroposterior commissure 2/33
- anteroseptal commissure 2/33
- anterior leaflet 1/33
- central 1/33



Élévation des seuils chez 3 patients (seuils moyens non modifiés)

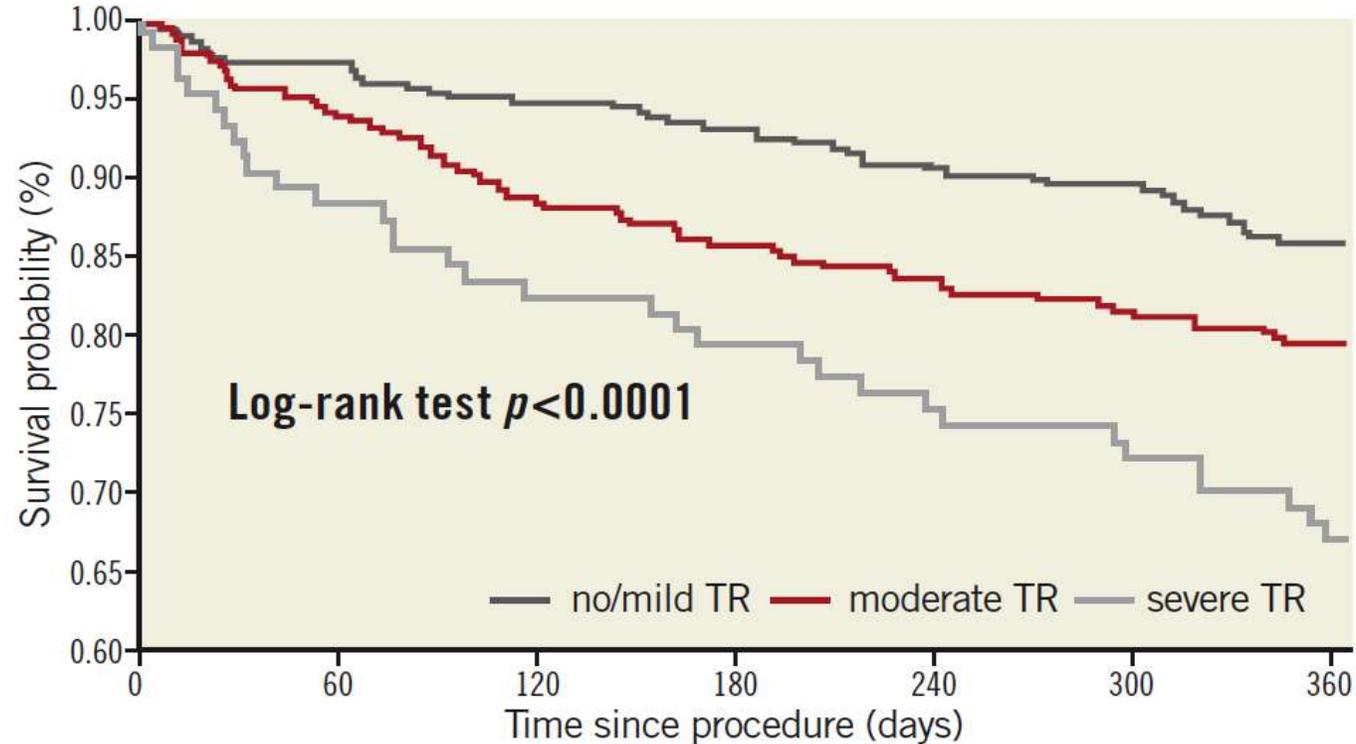
| Echocardiographic assessment | no RV lead | RV lead not contributing to TR | RV lead partially contributing to TR | RV lead primarily contributing to TR |
|--|--|--|---|--|
| <ul style="list-style-type: none"> • lead commissural vs. across leaflet body • TR jet location in relation to lead position • restricted leaflet | | | | |
| | | | n=14 ✓ | X |
| RV lead position | | commissural: 74% central: 5% leaflet body: 21% | commissural: 43% central: 0% leaflet body: 57%* | 12 patients excluded during study period |
| Clip placement | anteroseptal: 100% posteroseptal: 17% | anteroseptal: 100% posteroseptal: 20% | anteroseptal: 100% posteroseptal: 23% | |
| Procedural success | 87% | 85% | 85% | |
| Baseline EROA | 0.56 ± 0.32 cm ² | 0.52 ± 0.33 cm ² | 0.68 ± 0.22 cm ² | |
| EROA post procedure | 0.30 ± 0.37 cm ² | 0.29 ± 0.24 cm ² | 0.32 ± 0.17 cm ² | |

Nouveautés dans la sélection des patients

RÔLE DE L'IM

Que faire en présence d'IM et IT concomitantes?

Surmortalité post-clip dans le registre TRAMI (766 pts)



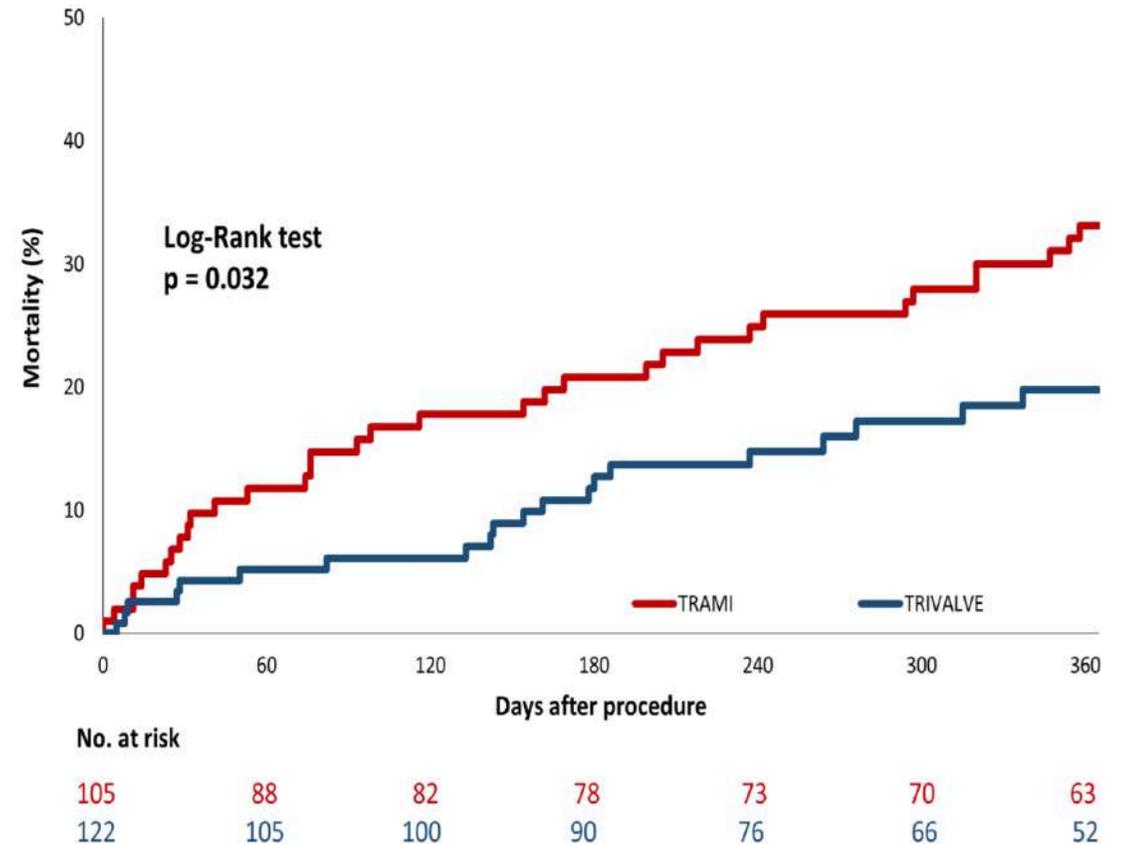
Traitement combiné tricuspide et mitral vs. mitral isolé en cas d'IM et IT sévères

IM + IT sévères dans:

- TRAMI: TMVR seul (106 pts)
- TriValve: TMVR + TMTVR (122 pts)

Analyse multivariée:

TMTVR : réduction de moitié de la mortalité (HR : 0.52;P=0.02)



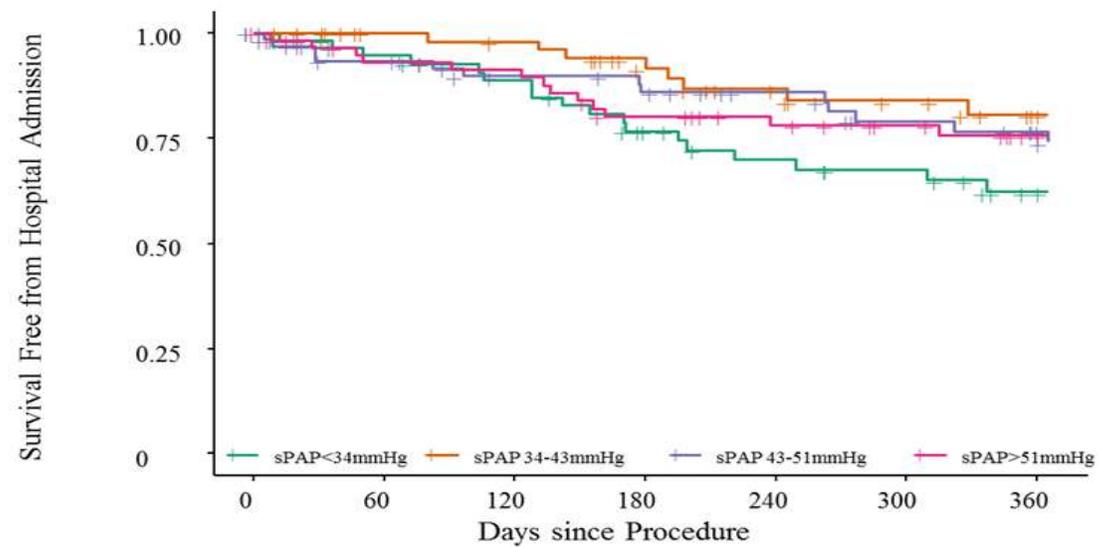
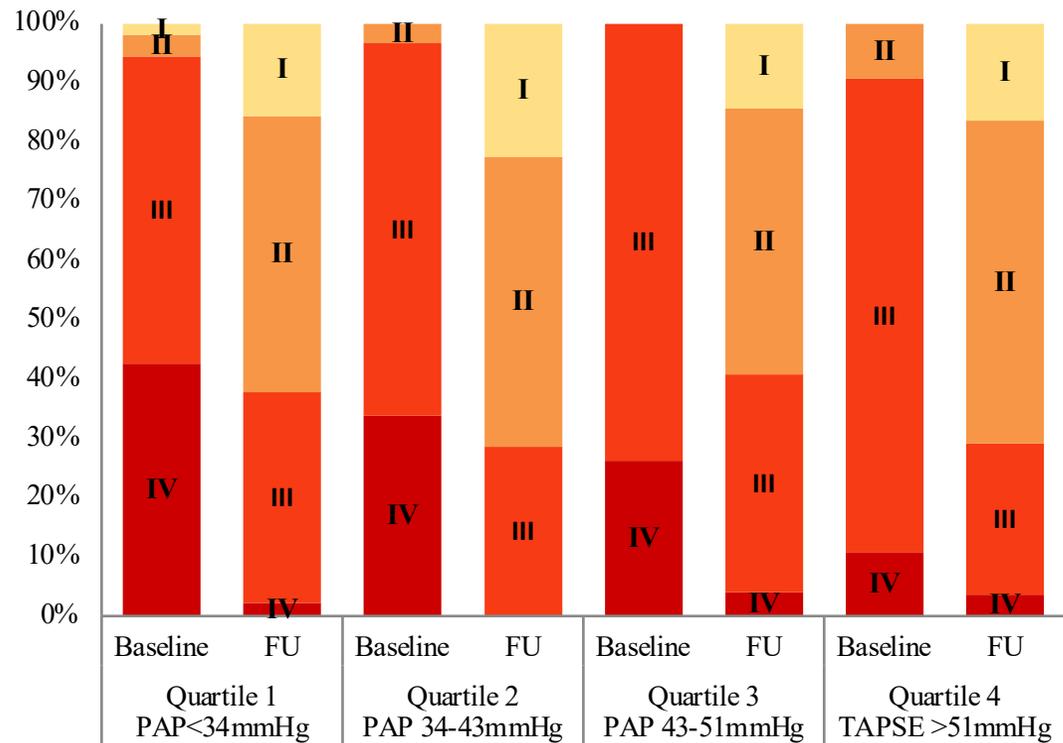
Nouveautés dans la sélection des patients

RÔLE DE L'HTAP

Doit-on traiter l'IT en présence d'une HTAP?

Données du registre TriValve:

- 244 patients ; - 4 quartiles selon la PAP échographique

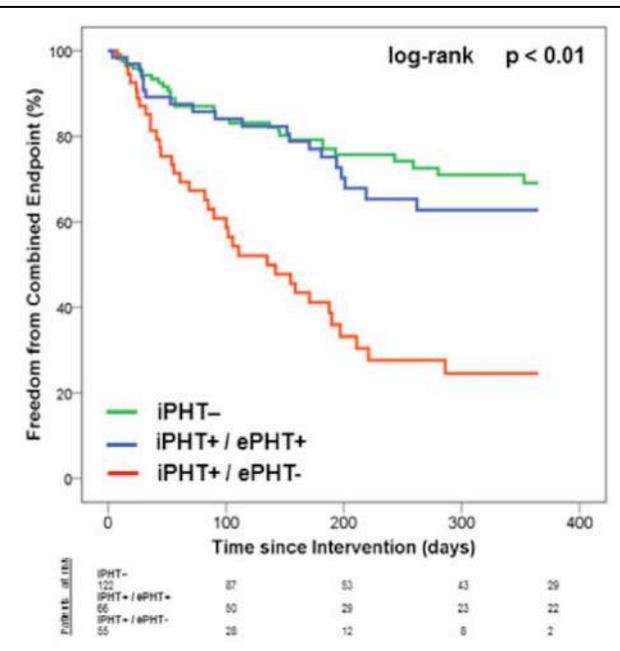
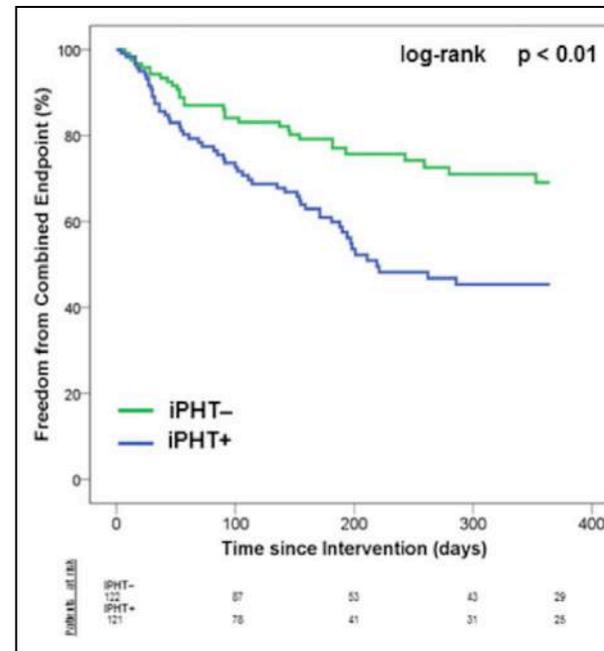
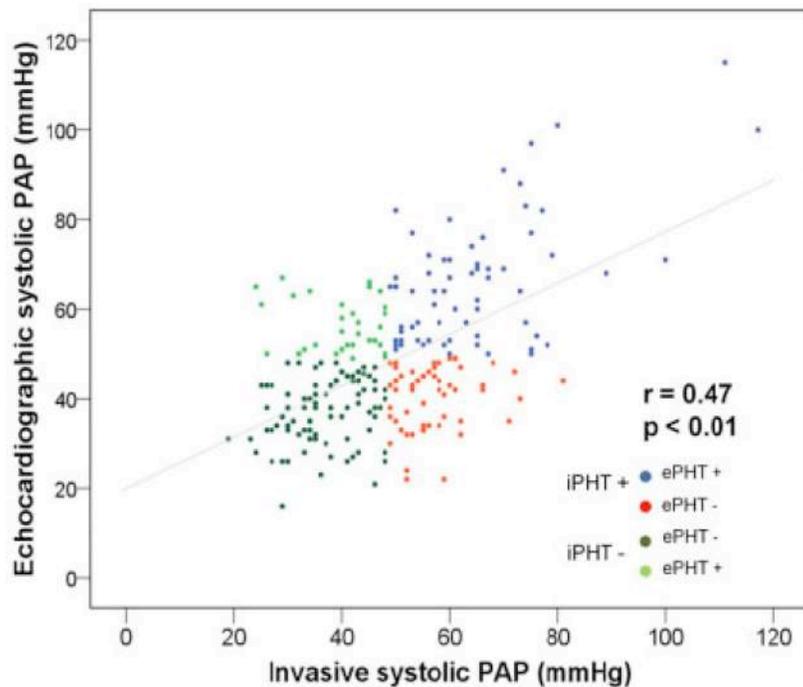


| No. at risk | 0 | 60 | 120 | 180 | 240 | 300 | 360 |
|-----------------|----|----|-----|-----|-----|-----|-----|
| sPAP < 34 mmHg | 61 | 50 | 45 | 37 | 30 | 27 | 20 |
| sPAP 34-43 mmHg | 57 | 50 | 48 | 40 | 32 | 27 | 22 |
| sPAP 43-51 mmHg | 65 | 54 | 47 | 44 | 39 | 33 | 31 |
| sPAP > 51 mmHg | 61 | 52 | 50 | 42 | 37 | 33 | 27 |

Clinical characteristics, diagnosis, and risk stratification of pulmonary hypertension in severe tricuspid regurgitation and implications for transcatheter tricuspid valve repair

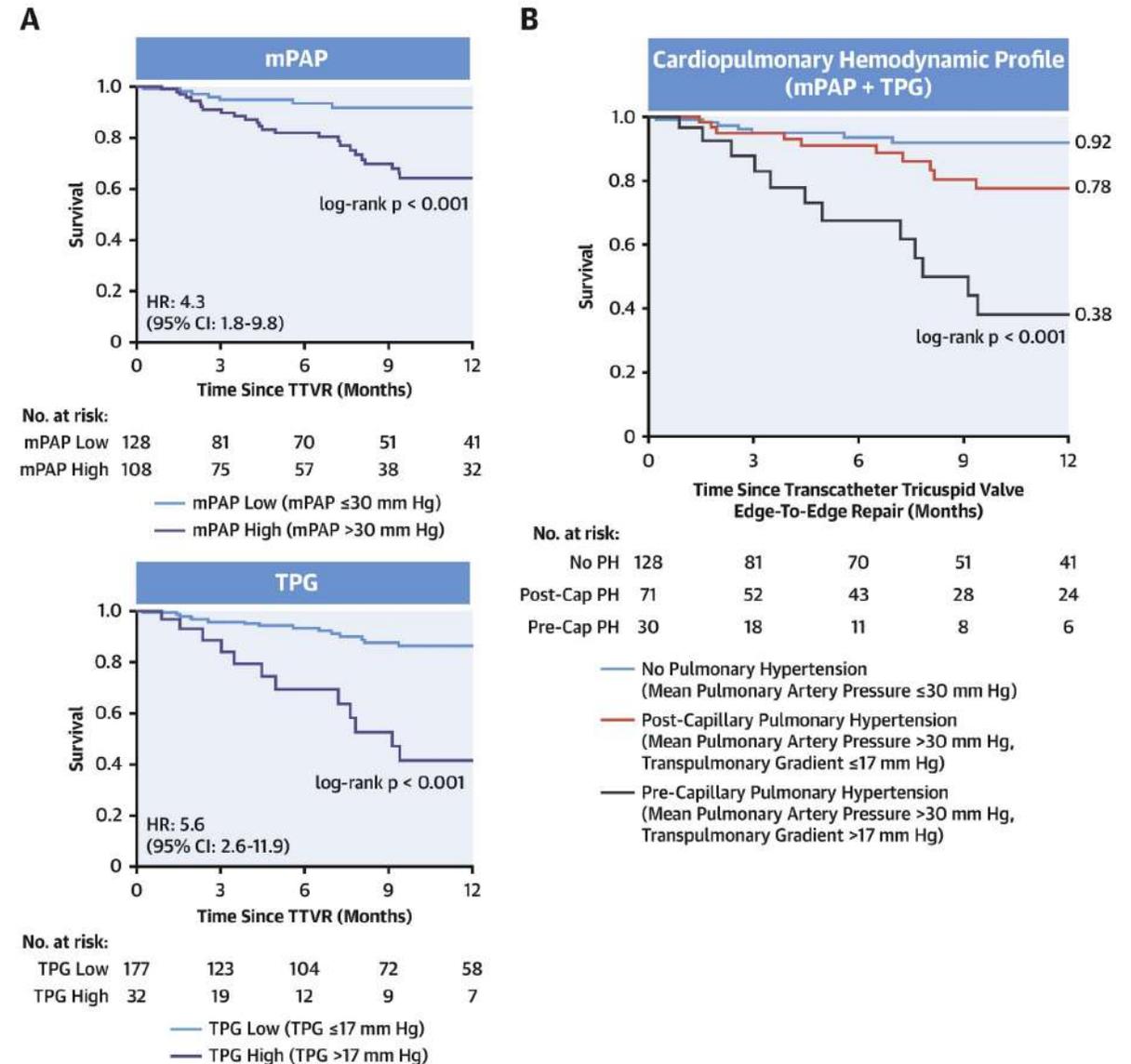
Philipp Lurz^{1*†}, Mathias Orban^{2,3†}, Christian Besler¹, Daniel Braun², Florian Schlotter¹, Thilo Noack⁴, Steffen Desch¹, Nicole Karam^{2,5}, Karl-Patrik Kresoja¹, Christian Hagl⁶, Michael Borger⁴, Michael Nabauer², Steffen Massberg^{2,3}, Holger Thiele¹, Jörg Hausleiter^{2,3‡}, and Karl-Philipp Rommel^{1‡}

Données combinées de Munich + Leipzig



CENTRAL ILLUSTRATION: Assessment of the Cardiopulmonary Hemodynamic Profile Predicts Survival After Transcatheter Tricuspid Valve Edge-to-Edge Repair

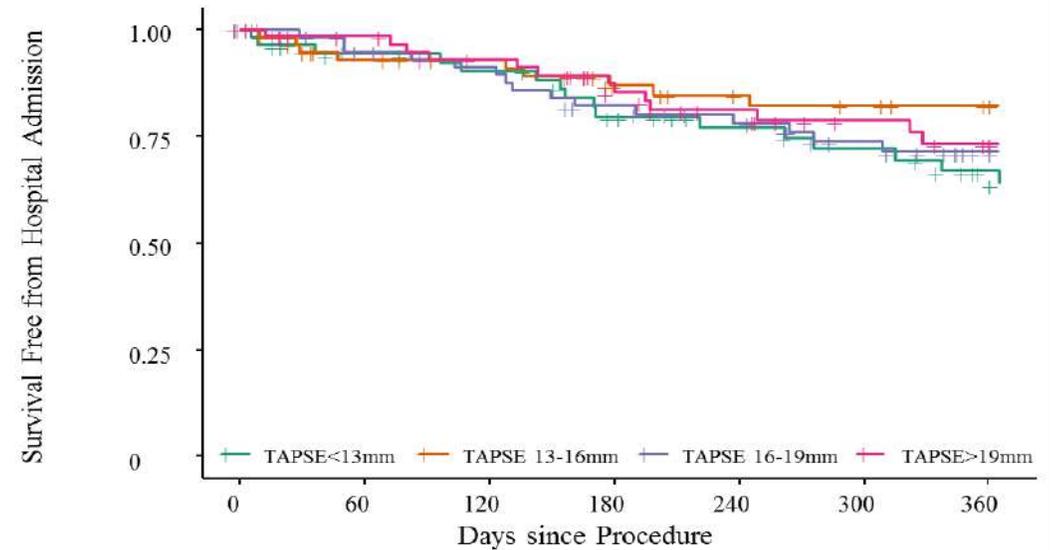
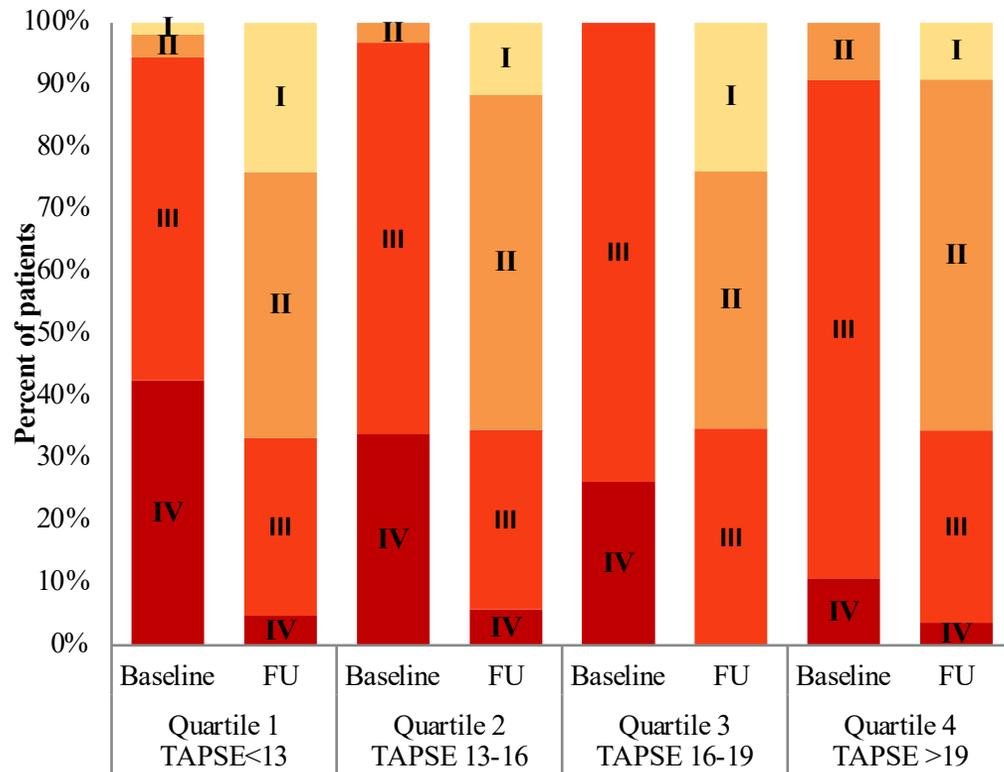
Intérêt de distinguer
HTAP pré et post-
capillaire!



Nouveautés dans la sélection des patients

RÔLE DE LA DYSFONCTION VD

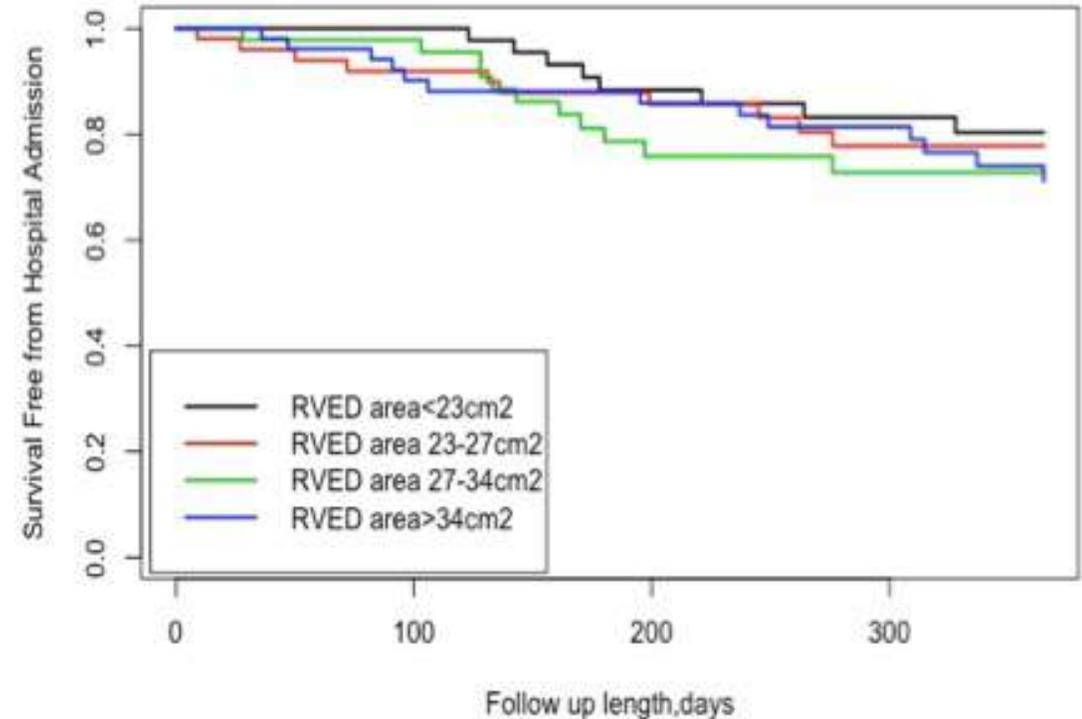
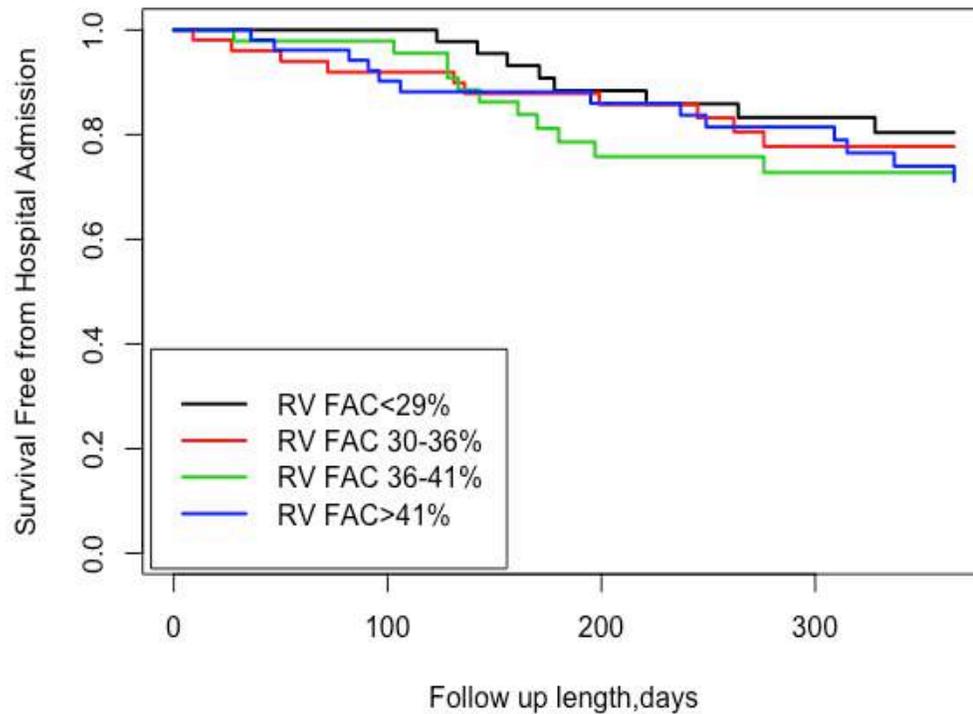
Données du registre TriValve



No. at risk

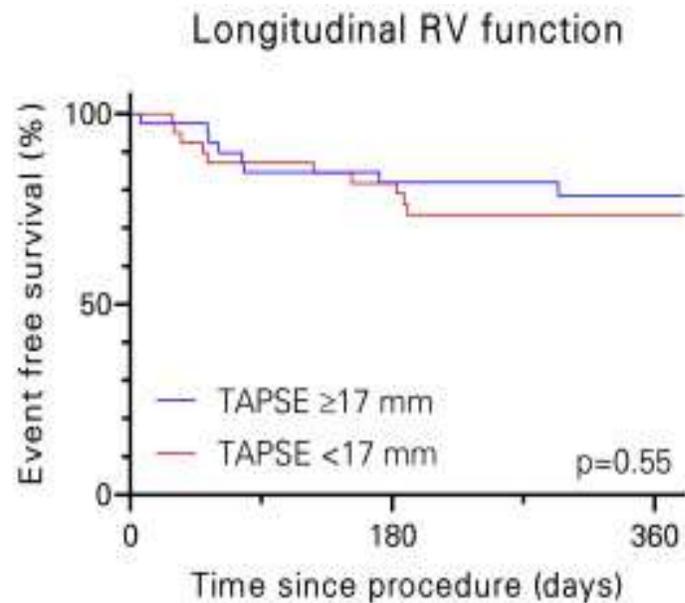
| | | | | | | | |
|---------------|----|----|----|----|----|----|----|
| TAPSE <13mm | 54 | 47 | 44 | 37 | 31 | 28 | 21 |
| TAPSE 13-16mm | 62 | 50 | 47 | 41 | 35 | 32 | 30 |
| TAPSE 16-19mm | 61 | 53 | 50 | 43 | 38 | 31 | 23 |
| TAPSE >19mm | 65 | 56 | 50 | 43 | 35 | 29 | 26 |

Paramètres supplémentaires

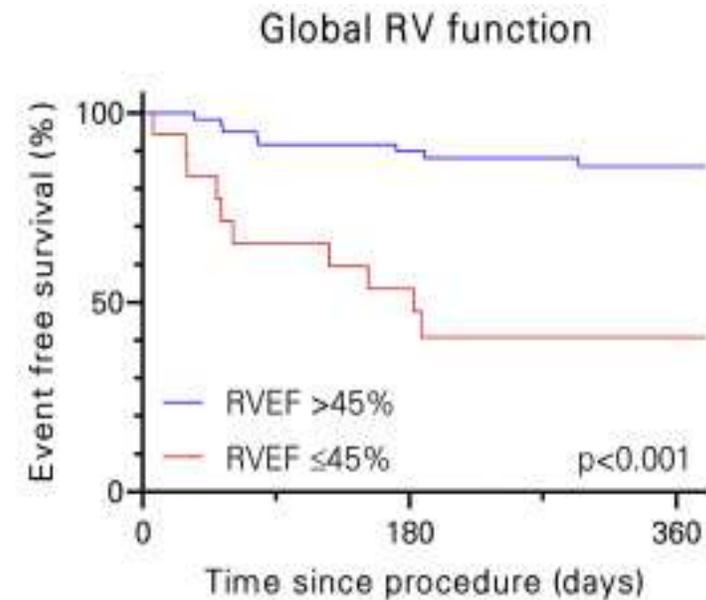


Rôle croissant de l'imagerie en coupe

79 patients traités par TTVR à Leipzig entre Juin 2016 et 2020
Evaluation IRM de la dysfonction longitudinale et globale



| | | | | |
|-------------|--------------------|----|----|----|
| No. at risk | TAPSE ≥ 17 mm | 39 | 31 | 21 |
| | TAPSE < 17 mm | 40 | 30 | 19 |



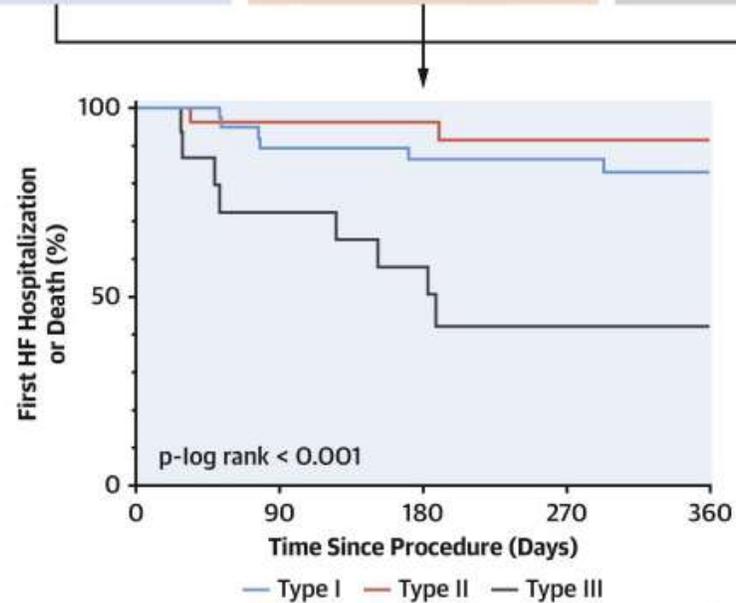
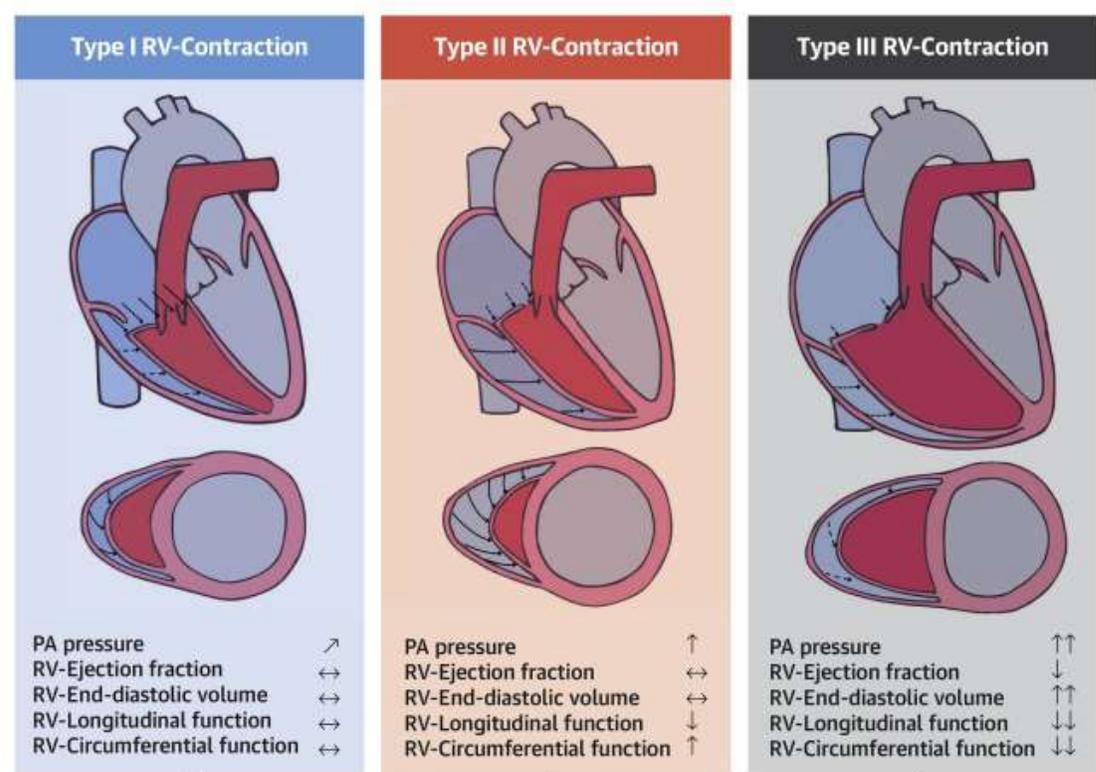
| | | | | |
|-------------|------------------|----|----|----|
| No. at risk | RVEF $> 45\%$ | 61 | 52 | 31 |
| | RVEF $\leq 45\%$ | 18 | 9 | 4 |

3 profils de contraction:

1: RVEF/TAPSE +/-

2: RVEF/TAPSE +/-

3: RVEF/TAPSE -/-



Conclusion

Le clip tricuspide en 2021:

Bénéfice démontré, y compris à 1 an

Bénéfice clinique mais également échographique:

- Amélioration des dimensions et de la fonction VD ++

Plusieurs réponses sur le choix des patients:

- Rôle croissant du cathétérisme droit et de l'imagerie en coupe

Merci pour votre attention!

