Je intervenční léčba vad trikuspidální chlopně realitou nejbližší budoucnosti?

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Kardiocentrum, Kardiochirurgická klinika, *I. Kardio-angiologická klinika, Fakultní nemocnice, Hradec Králové

Tricuspid Valve Repair and Replacement: Outcomes

	Number of cases/Time Frame	Repair versus Replacement	Follow up Period	Long Term Outcomes	Operative Mortality	Freedom from Reoperation	Comments
Marquis-Gravel et al	926 1977-2008 Single Center	792 Repair 134 Replace	4.3 Years (Median)	49.2±2% Repair 38.0±5% Replace (10 Year Mortality)	13% Repair 21% Replace	6% Repair 15% Replace Rates of Re-Operation	
Anselmi et al	188 1971-2012 Single Center	188 Replace	10.2±9.1 Years (Mean)	36±5.2% (Bio) 15 Year Survival	27.6%	94.3% (Bio)	85.5% Freedom from Structural Deterioration (Bio) at 15 years
Guenther et al	416 1974-2003 Single Center	310 Repair 106 Replace	5.9±6.3 Years (Mean)	47±3.5% Repair 37±4.8% Replace (10 Year Survival)	13.9% Repair 33% Replace (30 Day)	83±3.6% Repair 79±6.1% Replace (!0 Years)	Replacement had higher co-morbidities for operative risk

Marquis-Gravel G et al, Am Heart J 2012
Guenther T et al, European Journal of Cardiothoracic Surgery 2008
Anselmi T et al, Ann Thorac Surg 2016

Realita dnešního dne …

- Valve-in-valve
- Valve-in-ring

Tricuspid Valve in Valve Outcomes

Valve-in-Valve International Database (VIVID) Registry

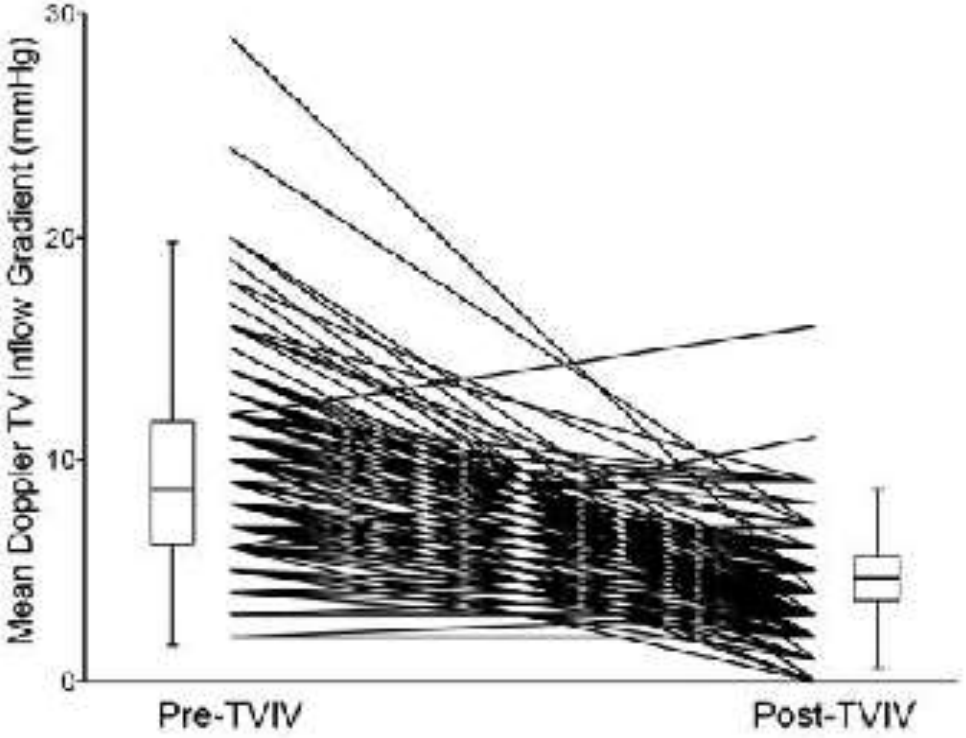
- **156 patients with bio-prosthetic tricuspid valve dysfunction**
- **Median Age: 40 years, 71% NYHA Class III/IV**

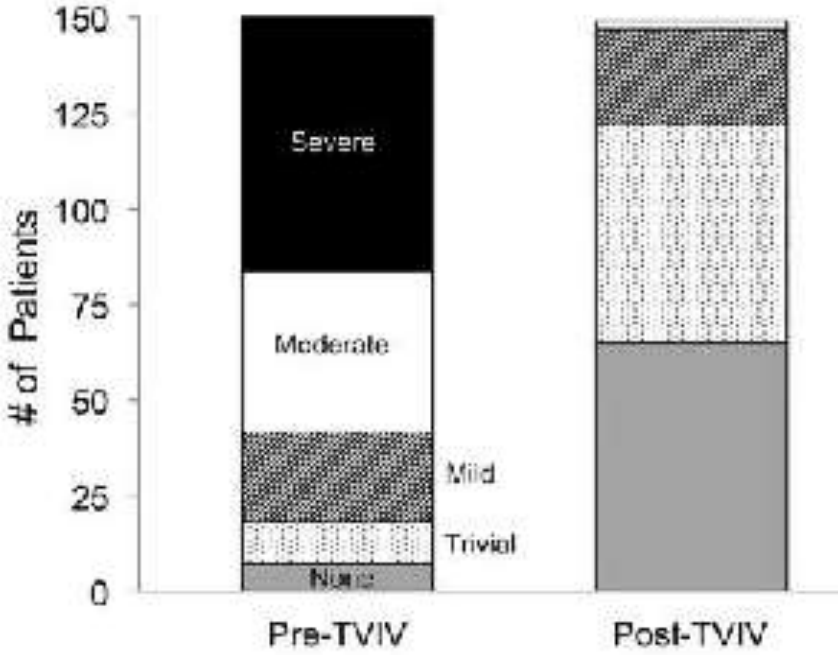
Variable	All Patients (n=156)	Melody (n=94)	Sapien (n=58)	P value
Patient Age	40 (5-84)	27 (5-84)	53 (8-81)	<0.001
Previous Cardiac Surgery	2 (1-10)	2(1-10)	2(1-5)	0.74
Other Prosthetic Valves (n=151)	46 (30)	26(28)	20(26)	0.29
NYHA Class IV	32(21)	15(16)	15(26)	0.15
Acutely ill, hospitalized before procedure	19(12)	12(13)	5(9)	0.43
Acute/chronic renal insufficiency	20(13)	9(10)	10(17)	0.17

McElhinney DB et al, Circulation, 2016

Tricuspid Valve-in-Valve Outcomes

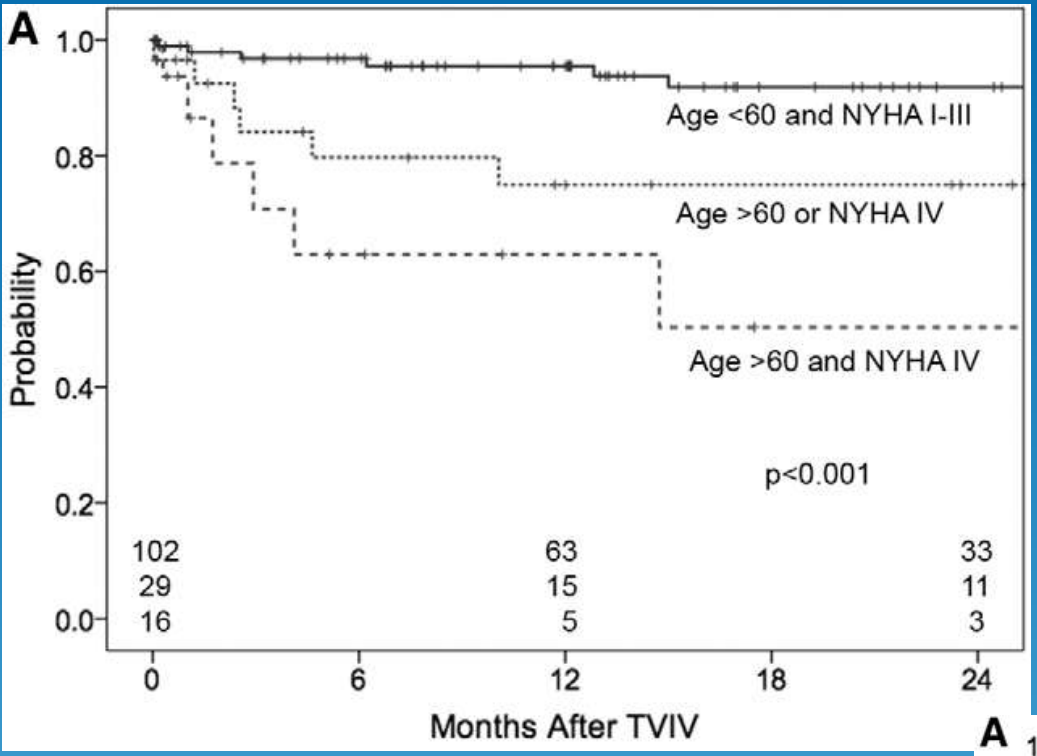
Valve-in-Valve International Database (VIVID) Registry



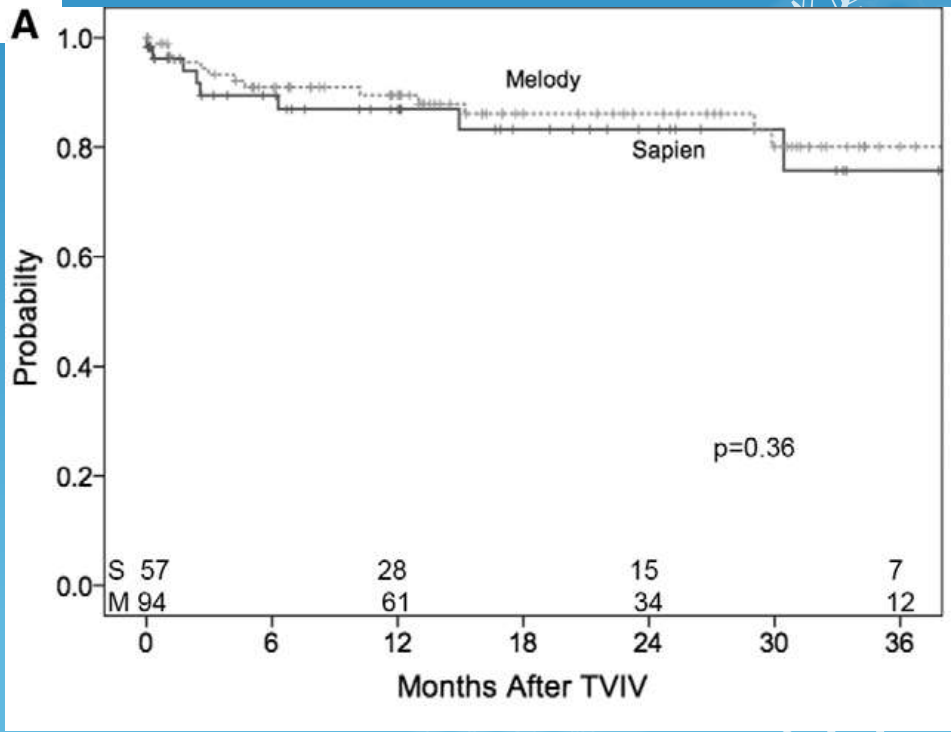


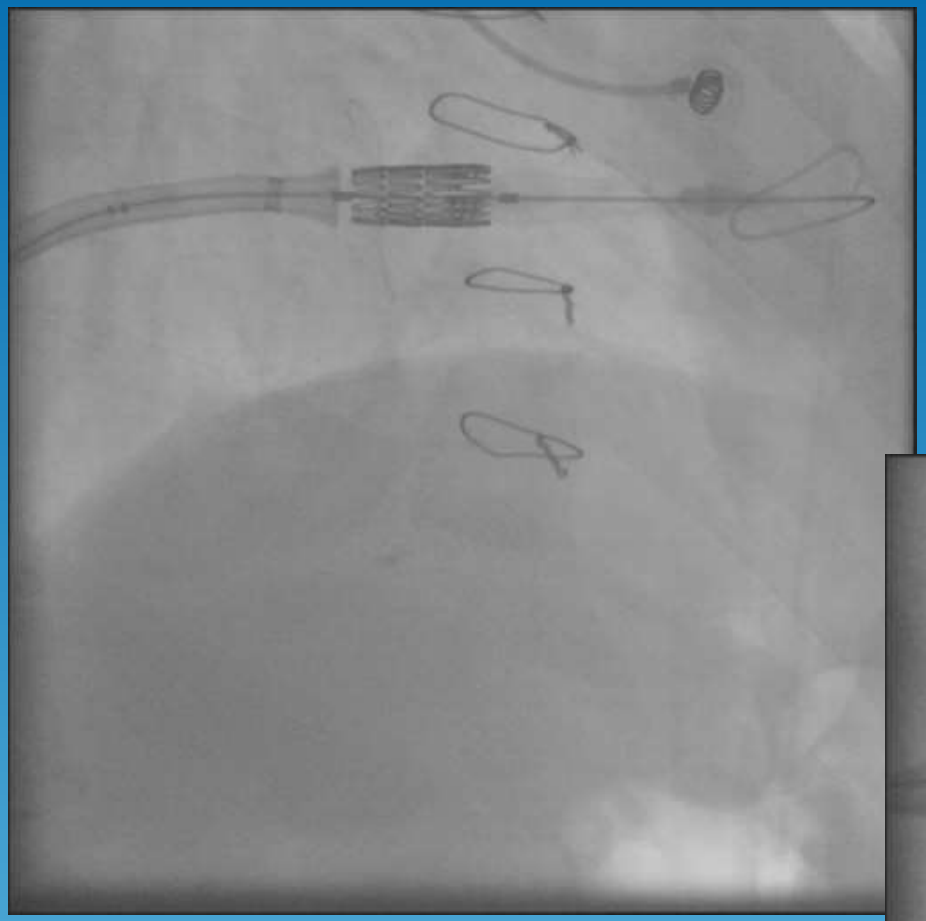
McElhinney DB et al, Circulation, 2016

Přežívání dle věku a NYHA klasifikace

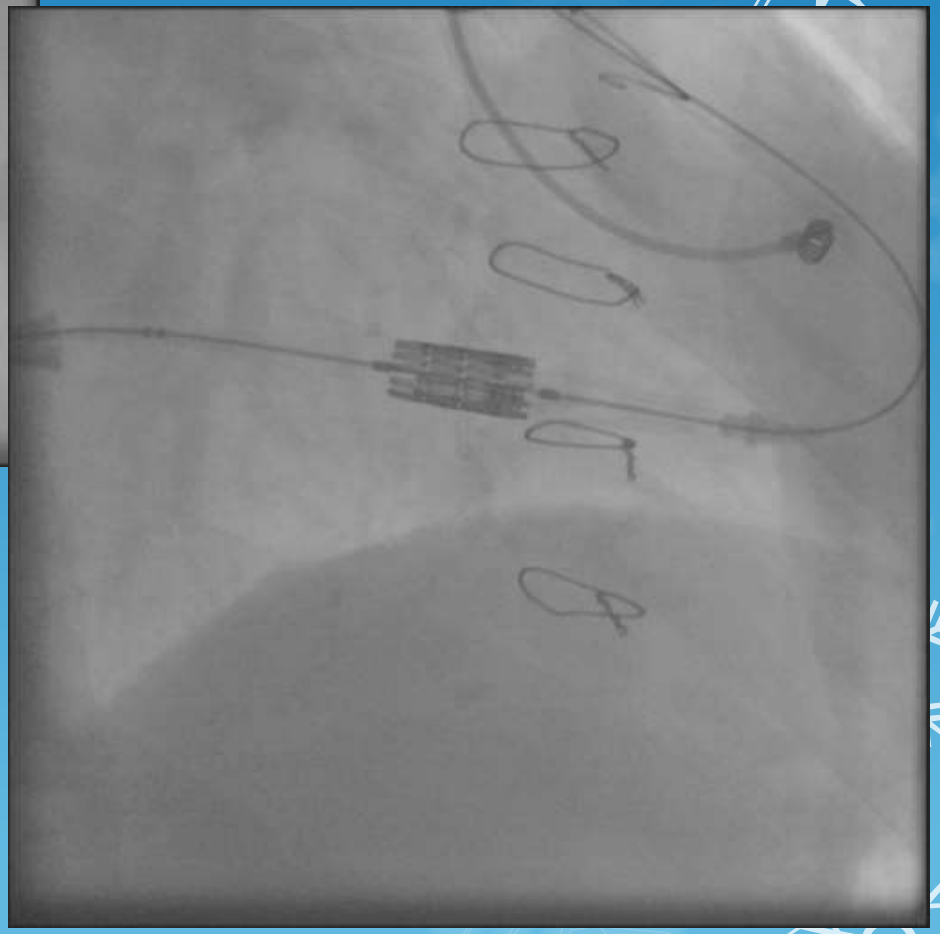


Přežívání dle typu chlopně





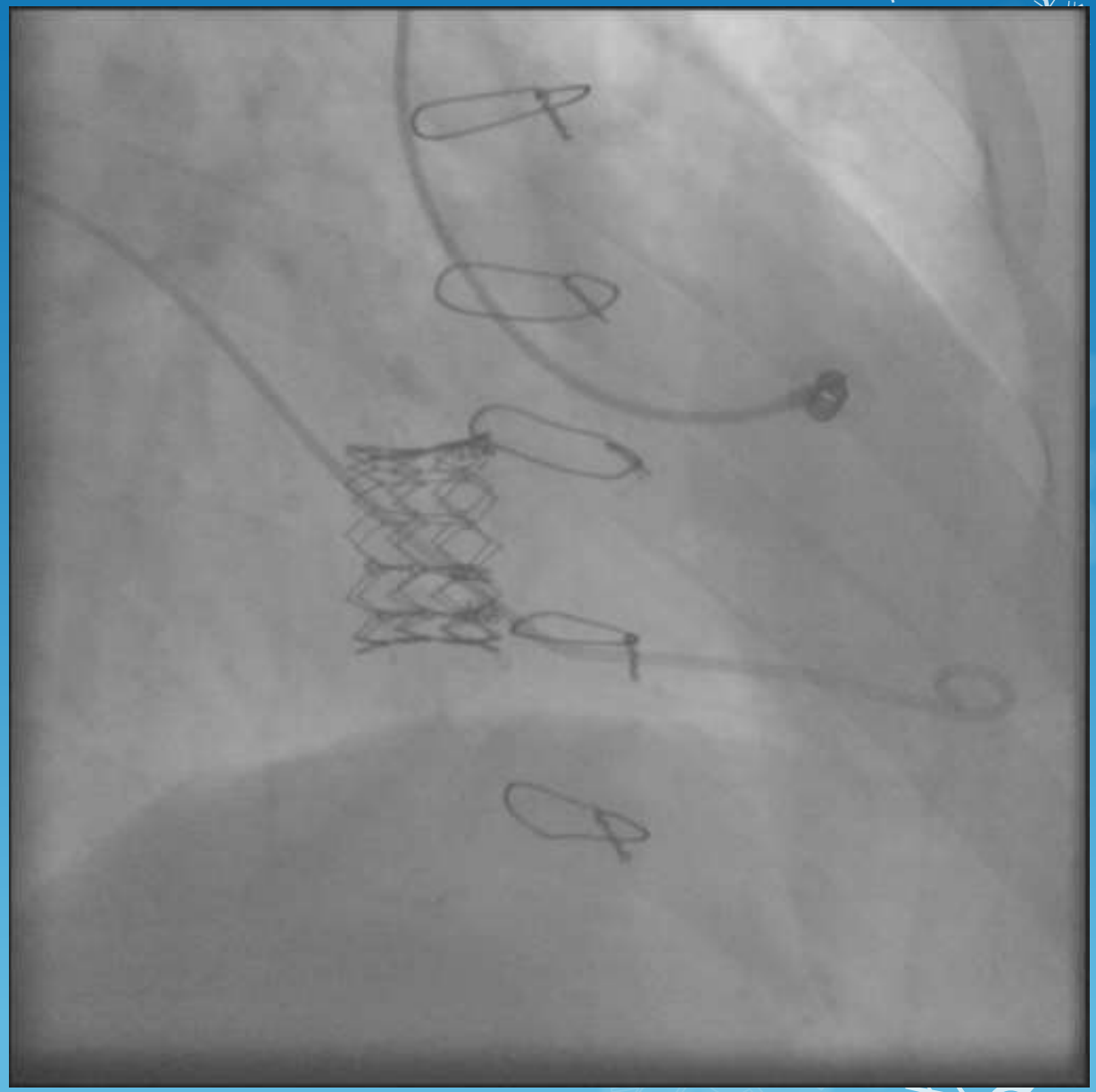
46letý muž, 15 let po náhradě Tr chlopně bioprotézou (Biocor 33) pro Ebsteinovu anomálii



- snížená tolerance námahy, „pulzování“ břicha, NYHA II
- degenerace bioprotézy – gr. 18/11…21/15 mmHg, TrI 4/4, dilatace PK, PS, dysfunkce PK (FAC 24%)

Chlopeň E-S XT č. 29 v bioprotéze Biocor č. 33 (valve-in-valve)

- při F/U 22 měsíců - gr. 5/3 … 10/6 mmHg, stopa paravalvární insuf., asymptomatický



Valve-in-ring

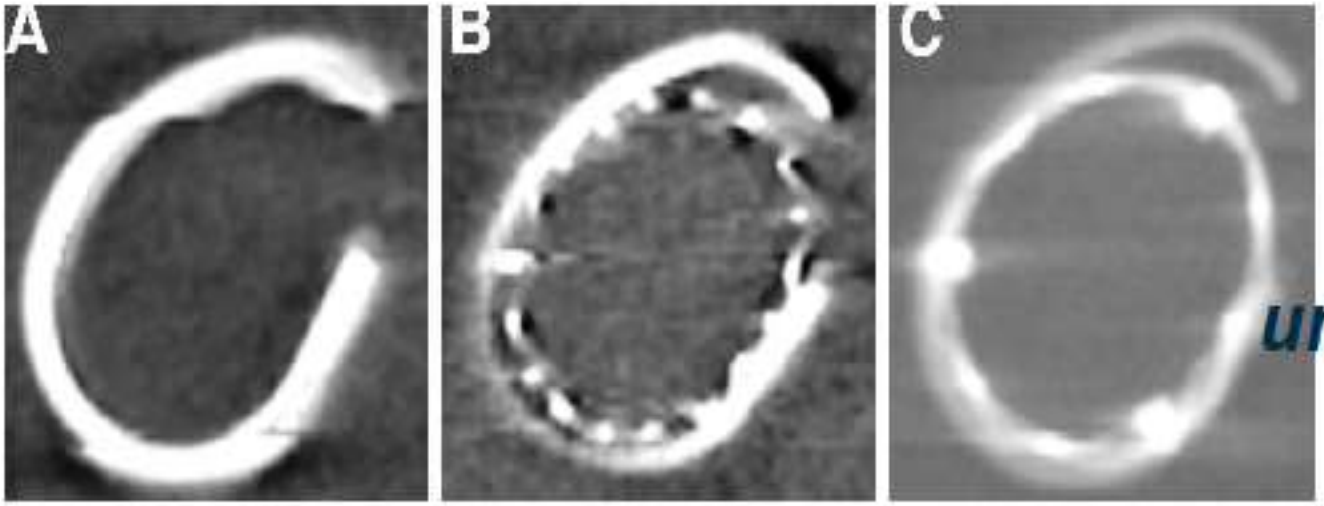
20 nemocných – 17x E-S, 3x Melody
průměrný věk – 49 let (5-69), 86% nemocných NYHA III-IV
rychlá stimulace komor – 50%
paravalv. leak – 75%, 2/3 nemocných málo význ.
valve-in-valve – 10%
katetrizační uzávěr leaku – 20%
přežívání při F/U 1 rok – 95%

Carpentier-Edwards Classic | CE MC3 | Medtronic Contour | Medtronic Sculptor

Aboulhosn J - J Am Coll Cardiol Intv 2017;10:53–63

Tricuspid Valve-in-Ring implantation

Differ from valve-in-valve



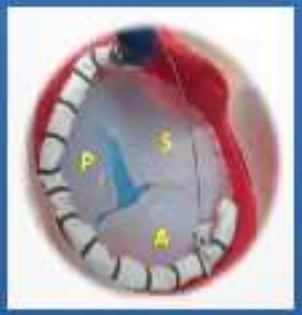
Valve underexpansion PV leak

Realita „blízké“ budoucnosti?

Annular modification

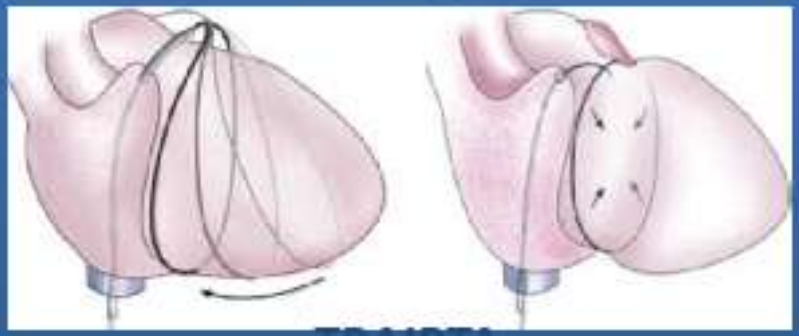
Tricinch

Trialign



Cardioband

Millipede



TRAIPTA

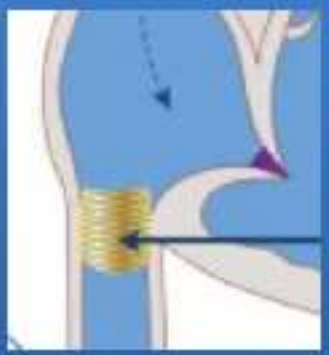
Leaflet apposition

Forma Device

MitraClip

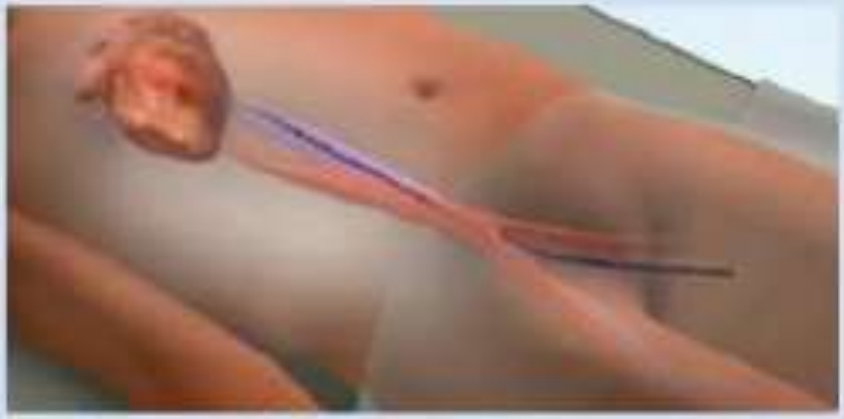
Caval Valve Implantation

TricValve



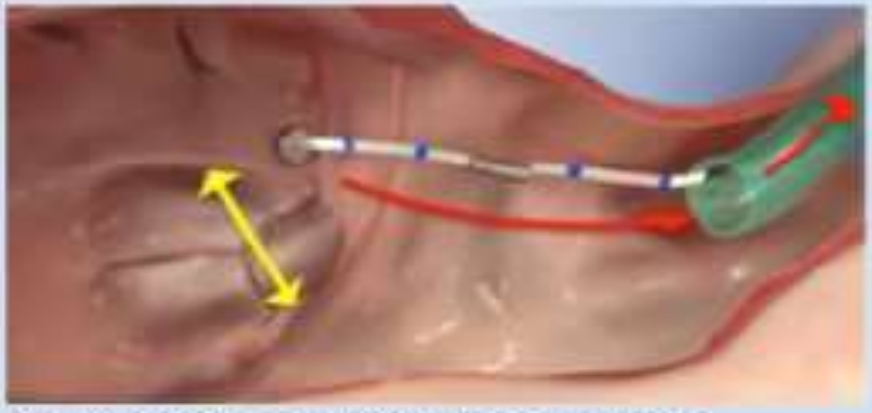
Sapien Valve implanted in the inferior cava vein

4Tech TriCinch System



Step 1: Access via Inferior Vena Cava

Step 2: Aim at the anterior annulus



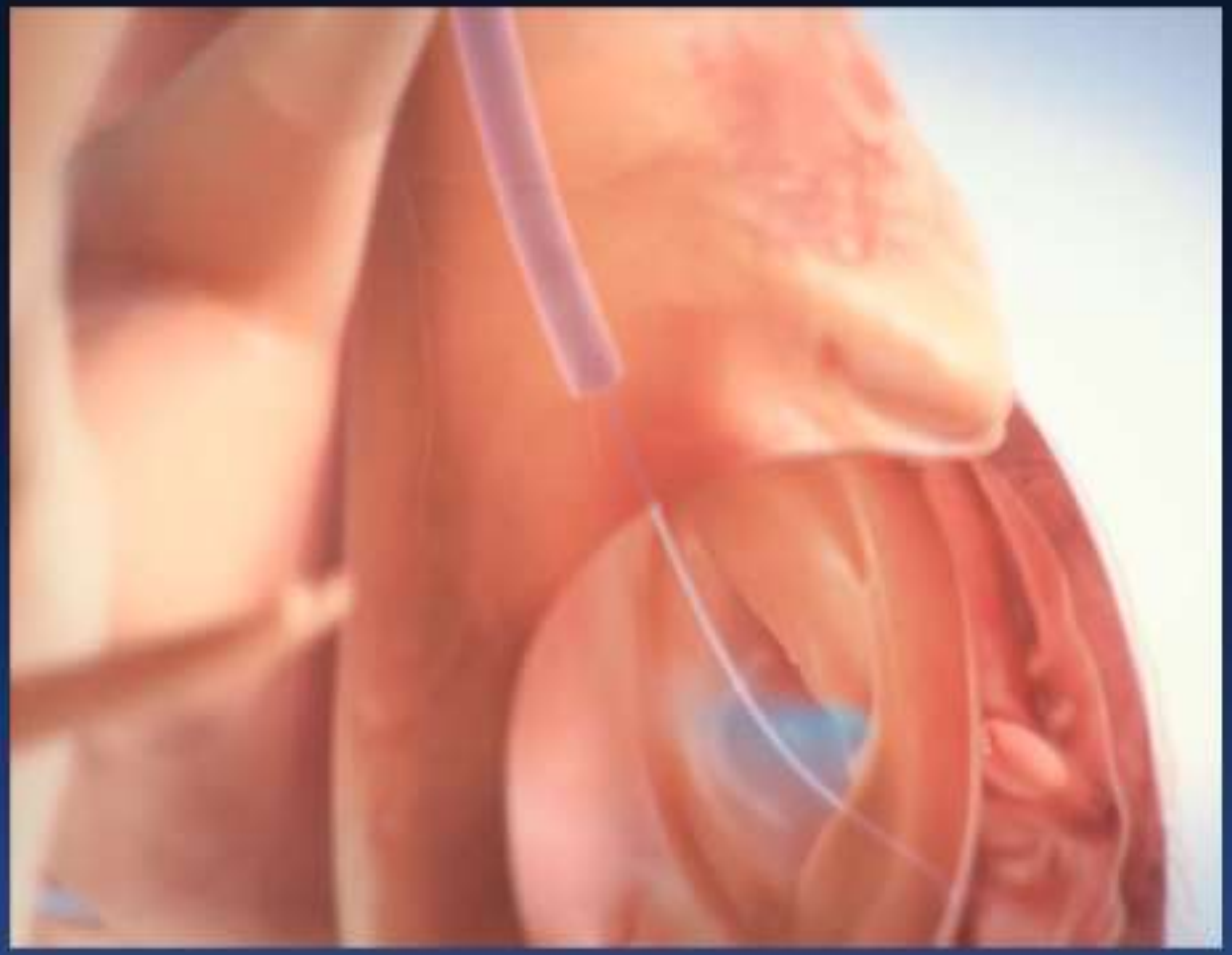
Step 3: Implant the anchor on the annulus

Step 4: Pull tension, check, secure.

Trialign can duplicate the Kay procedure without Surgery

Procedural Steps

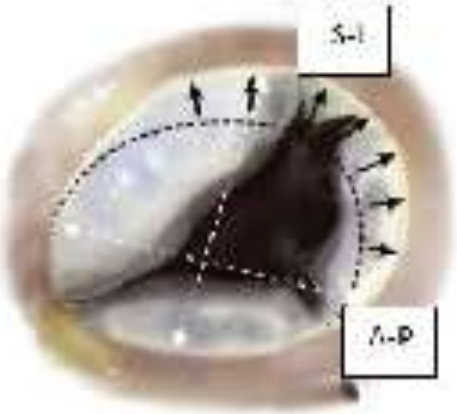
- Wire delivery and deliver 1st pledget (anchor)
- Repeat wire delivery steps and deliver 2nd pledget (anchor)
- Cinch pledgets together to obliterate the posterior leaflet and deliver lock on atrial side



Trialign can duplicate the Kay procedure without Surgery

Cardioband TR
Another gold standard through a catheter

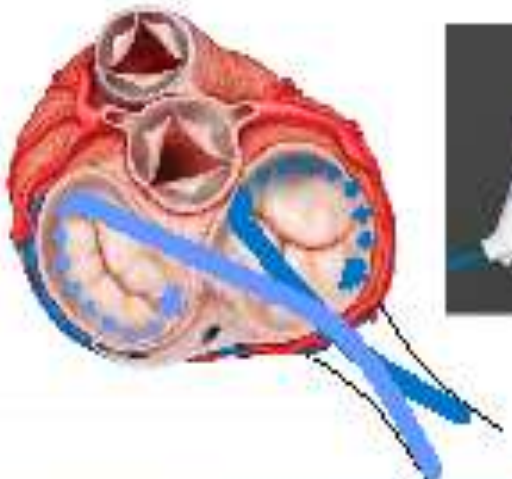
- Functional Tricuspid Regurgitation is a combination of leaflet tethering and annular dilatation
- The role of annular dilatation is usually predominant, and very extensive, requiring a large remodeling
- Distributing the annular reduction across the annulus allows reduction of stresses on the anchoring sites, and reduced risk of coronary compromise



Introducing - Cardioband Tricuspid

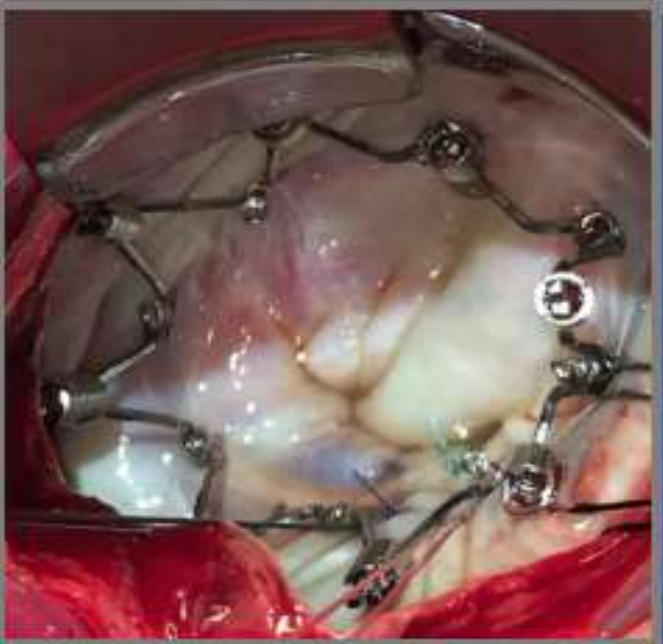
- Cardioband Tricuspid is a transfemoral adjustable annuloplasty band based on the CE approved device for MR treatment application
- Same Implant and delivery system
- Proven safety and performance with over 130 mitral patients
- Quick and easy adoption to mitral users
- Applying the surgical gold standard with a trans femoral approach

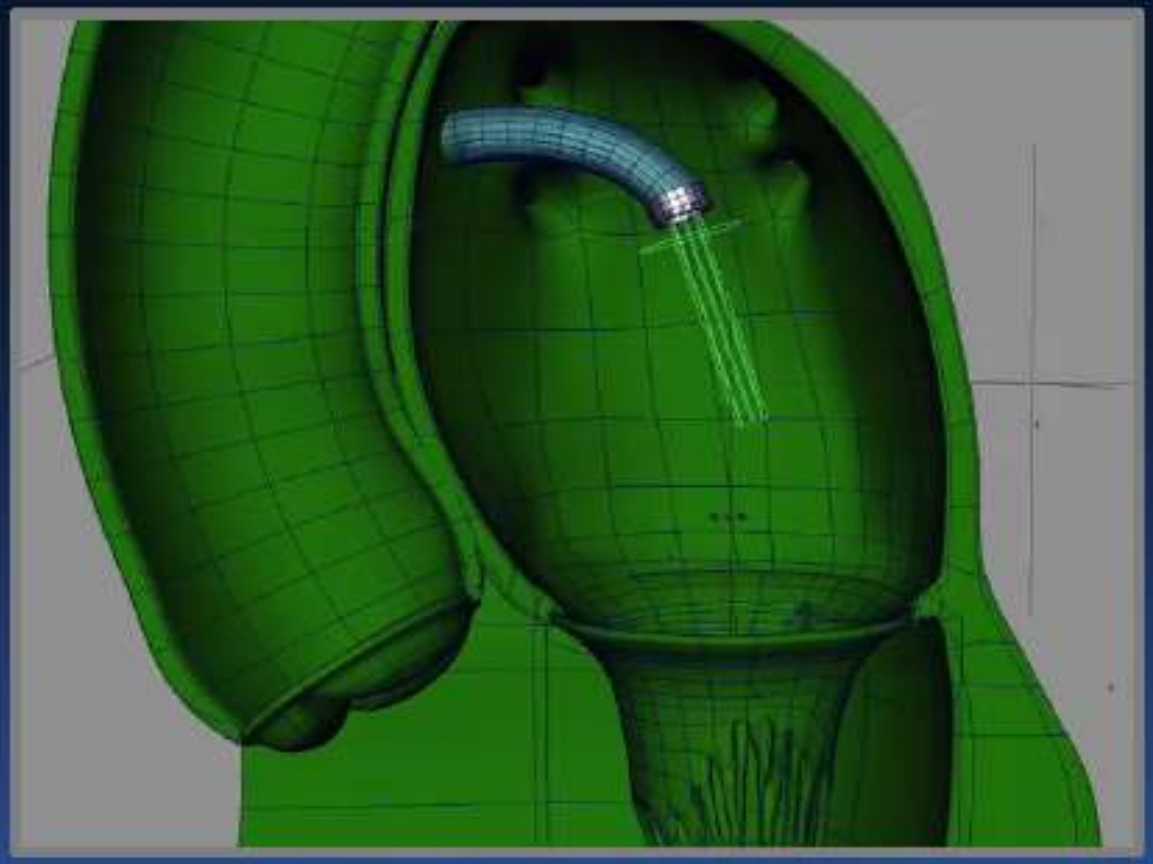
Mitral



Tricuspid

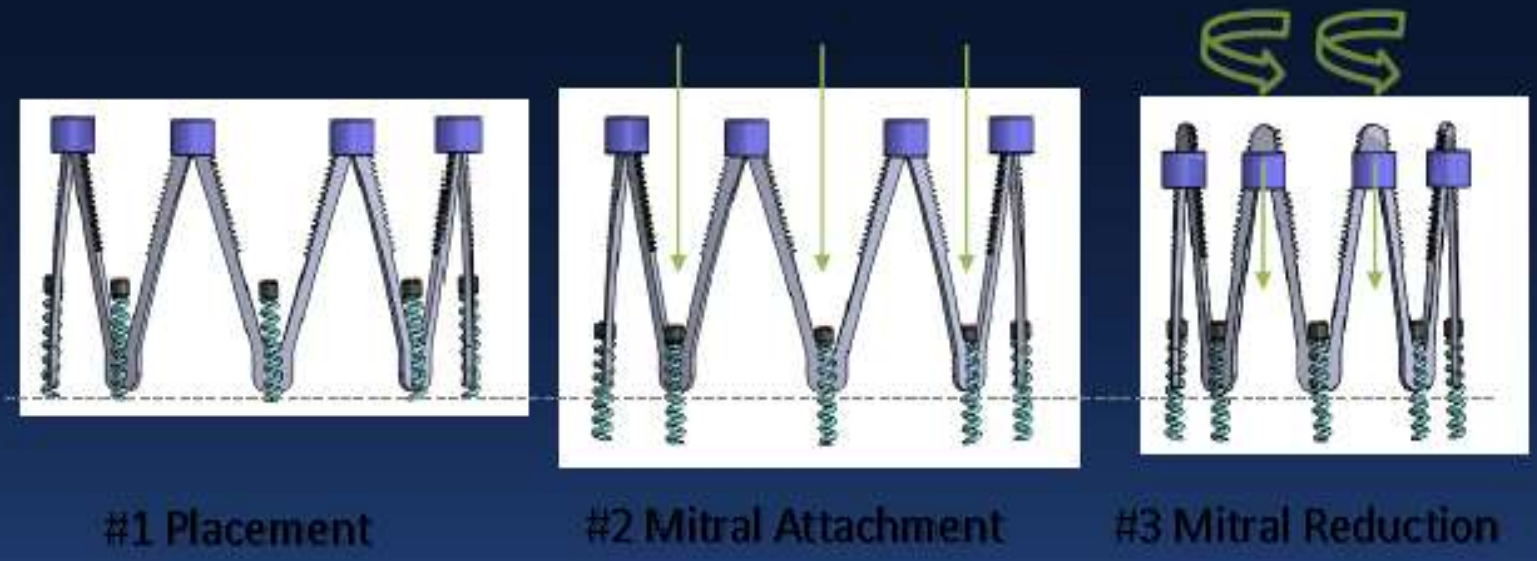
Millipede IRIS Implant





Three Implant Steps

Millipede IRIS Implant



#1 Placement

#2 Mitral Attachment

#3 Mitral Reduction

Dedicated Tricuspid Clip Delivery System

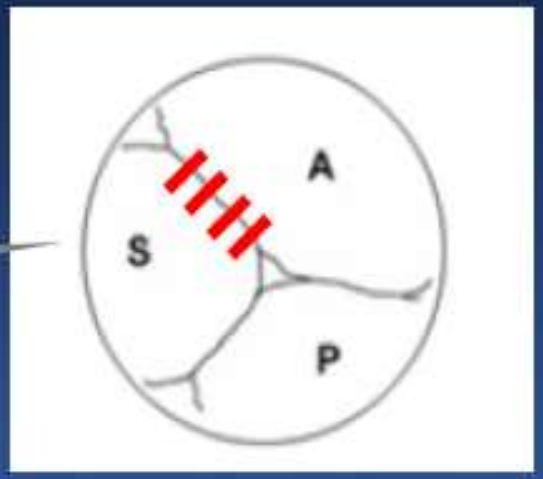
MitraClip® XT*

Design Goal: Improved grasping, greater reduction in MR and potential use in TR

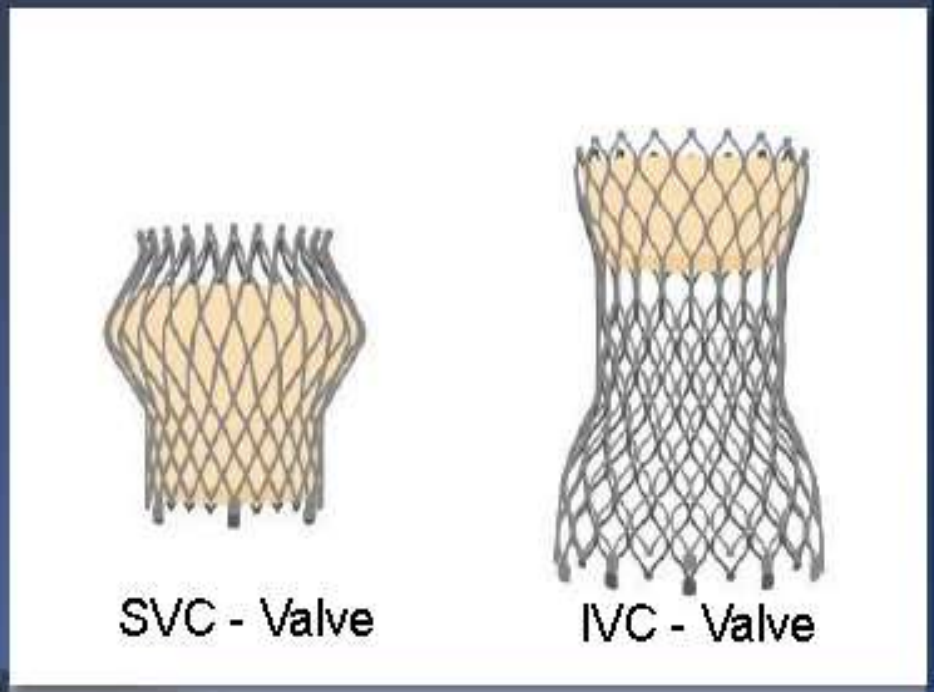
PROCEDURAL DATA

General anesthesia	Yes
Vascular Access	Femoral
IV Inotropes	No
Clip Implantation Location(s) and Number(s)	Four Clips - Antero-Septal
Circulatory Support	No
Other Concomitant Procedure	No

Clip position



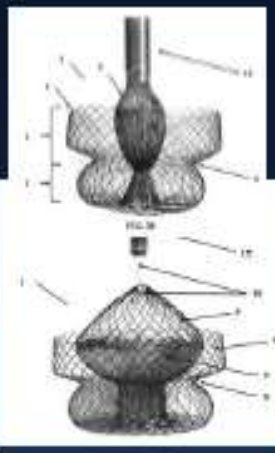
TricValve: self-expanding valve specifically designed for SVC & IVC

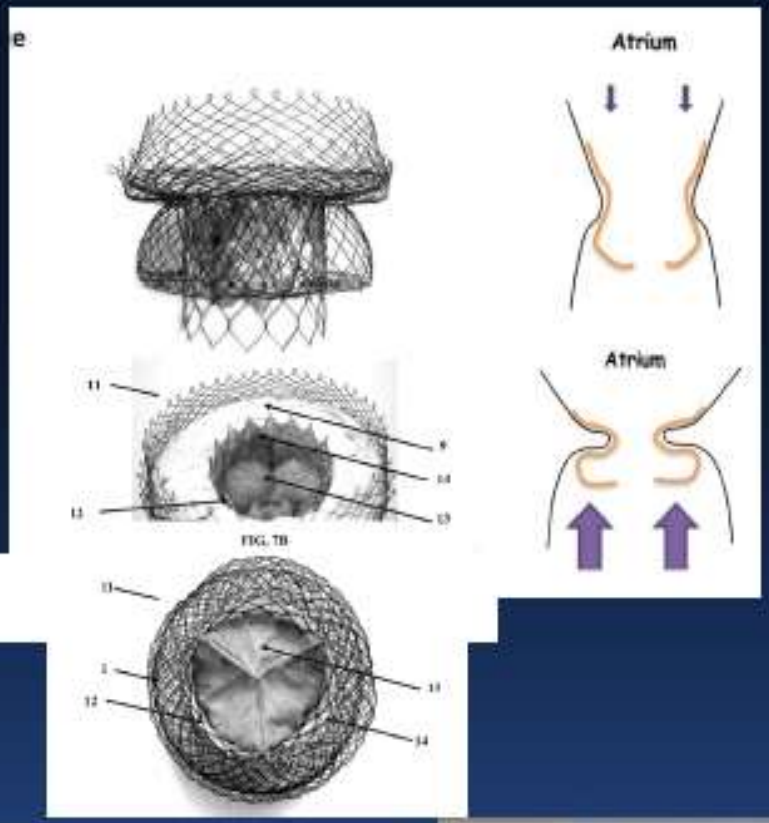


- Self-expandable pericardial tissue valve on nitinol stent frame
  - IVC: up to 43mm
  - SVC: up to 38mm
- 27F flexible catheter for trans-venous implantation

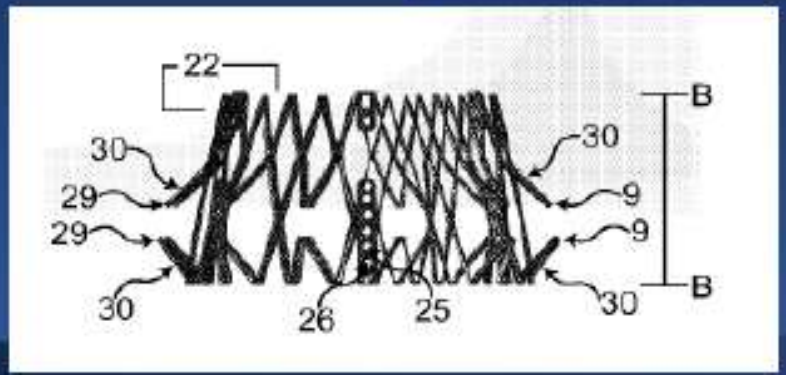
Transcatheter TV Replacement

TriCares





Navigate



Závěry:

Valve-in-valve:
- vysoká úspěšnost výkonu
- výrazné zlepšení symptomatologie
- uspokojivé střednědobé přežívání u mladších a méně symptomatických nemocných

Valve-in-ring:
- vysoký výskyt paravalvárních regurgitací vyžadující další výkon (uzávěr leaku, implantace druhé chlopně – valve-in-valve)
- uspokojivé krátkodobé přežívání nemocných i zlepšení symptomatologie

Ostatní metody:
- ve fázi klinického experimentu
- t.č. nejsou použitelné v běžné klinické praxi