The isolated TR inoperable patient: ideal candidate for TCT?!
Conflicts of interest: none
RIGHT SIDED HEART FAILURE
(Cor Pulmonale)

- Fatigue
- ↑ Peripheral Venous Pressure
- Ascites
- Enlarged Liver & Spleen

- May be secondary to chronic pulmonary problems
- Distended Jugular Veins
- Anorexia & Complaints of GI Distress
- Weight Gain
- Dependent Edema

©2007 Nursing Education Consultants, Inc.
Challenges of Transcatheter Therapies for Tricuspid Regurgitation

- Large tricuspid annulus dimensions
- Nonplanar and elliptical annulus shape
- Absence of calcium
- Right ventricular morphology
- Proximity of other structures (coronary sinus, AV node and HIs bundle, vena cava, right coronary artery)

### TABLE 4 Transcatheter Therapies for TR: Preliminary Clinical, Procedural, and Follow-Up Features

<table>
<thead>
<tr>
<th>Device</th>
<th>Tric Valve n = 5</th>
<th>Sapien Valve n = 10</th>
<th>FORMA n = 7</th>
<th>Mitralign n = 3*</th>
<th>TriCinch n = 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, yrs</td>
<td>79 ± 4</td>
<td>69 ± 7</td>
<td>76 ± 13</td>
<td>83 ± 7</td>
<td>66 ± 10</td>
</tr>
<tr>
<td>NYHA functional class ≥III</td>
<td>5 (100)</td>
<td>10 (100)</td>
<td>6 (100)</td>
<td>3 (100)</td>
<td>8 (100)</td>
</tr>
<tr>
<td>Signs of right heart failure</td>
<td>5 (100)</td>
<td>10 (100)</td>
<td>7 (100)</td>
<td>8 (100)</td>
<td></td>
</tr>
<tr>
<td>Logistic EuroSCORE</td>
<td><strong>37.9 ± 17.9</strong></td>
<td><strong>31.5 ± 19.7</strong></td>
<td><strong>25.7 ± 17.4</strong></td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>(every patient considered prohibitive high risk by heart team)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Moderate</td>
<td>0 (0)</td>
<td>1 (33)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Severe</td>
<td>5 (100)</td>
<td>2 (67)</td>
<td>2 (67)</td>
<td>8 (100)</td>
<td></td>
</tr>
<tr>
<td><strong>Procedural and 30-day data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Successful device implantation</td>
<td>1 (20)†</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>2 (67)</td>
<td>1 (25)</td>
</tr>
<tr>
<td>TR degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>5 (100)</td>
<td>10 (100)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>7 (100)</td>
</tr>
<tr>
<td>Moderate</td>
<td>0 (0)</td>
<td>4 (40)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>3 (75)</td>
</tr>
<tr>
<td>Severe</td>
<td>2 (40)</td>
<td>9 (90)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (25)</td>
</tr>
<tr>
<td><strong>Procedural complications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>30-day mortality</strong></td>
<td>1 (20)</td>
<td>2 (20)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Follow-up data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up time, months</td>
<td>4 ± 13</td>
<td>10 ± 11</td>
<td>7 ± 1</td>
<td>3 ± 3</td>
<td>3 ± 3</td>
</tr>
<tr>
<td>NYHA functional class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-II</td>
<td>2 (40)</td>
<td>6 (60)</td>
<td>7 (100)</td>
<td>NA</td>
<td>3 (100)</td>
</tr>
<tr>
<td>III-IV</td>
<td>0 (0)</td>
<td>4 (40)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Improvement in right heart failure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>1 (10)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>NA</td>
</tr>
<tr>
<td>Moderate</td>
<td>0 (0)</td>
<td>7 (100)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Severe</td>
<td>2 (40)</td>
<td>9 (90)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Mortality</td>
<td>4 (80)</td>
<td>9 (90)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>NA</td>
</tr>
</tbody>
</table>

Values are mean ± SD, n (%), or n.* Data from the Albertinen Heart Center and Medicine Center Hamburg.
†Conversion to open-heart surgery.
NA – not available; NYHA – New York Heart Association; TR – tricuspid regurgitation.
“….such therapies should be limited to those patients with severe comorbidities leading to an extreme or prohibitive surgical risk”

TCT for treating TReg


JACC 2016;67(15):1829-45
Inoperable = extremely high risk
terminally ill

severe distal left main artery stenosis

intractable angina is refractory to medical therapy and not amenable to percutaneous intervention

metastatic lung cancer and poor lung function with a median projected survival of 6 months.

DILEMMA

1. CABG procedure that would alleviate pain
2. high risk operation that might taint the surgeon's results.
3. recommending no treatment, denying the patient otherwise reasonable beneficial treatment.
<table>
<thead>
<tr>
<th>Role</th>
<th>Important milestones in the perception of high risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>Ability to return to work</td>
</tr>
<tr>
<td></td>
<td>Possibility of disability</td>
</tr>
<tr>
<td></td>
<td>Success of operation</td>
</tr>
<tr>
<td>Family</td>
<td>Will patient be able to resume role as carer?</td>
</tr>
<tr>
<td></td>
<td>Will patient survive?</td>
</tr>
<tr>
<td>Nurse</td>
<td>Infection transmission</td>
</tr>
<tr>
<td></td>
<td>Violence towards self</td>
</tr>
<tr>
<td>Surgeon</td>
<td>Likelihood of operative success</td>
</tr>
<tr>
<td></td>
<td>Possibility of operative misadventure</td>
</tr>
<tr>
<td>Anaesthetist</td>
<td>Likelihood of surviving 30 days</td>
</tr>
<tr>
<td></td>
<td>Likelihood of surviving the anaesthetic</td>
</tr>
<tr>
<td>Intensivist</td>
<td>Likelihood of leaving the intensive care unit</td>
</tr>
<tr>
<td></td>
<td>Prolonged stay on the intensive care unit</td>
</tr>
<tr>
<td>Administrator</td>
<td>Outcome poorer than comparative unit</td>
</tr>
<tr>
<td></td>
<td>Care costing more than allocated</td>
</tr>
</tbody>
</table>
THIS IS TRUE

THIS IS TRUE

THIS IS TRUTH
Limitations of scores

- Lose accuracy at extremes of population
  - too few pts
- Really valid for data set only
  - we only assume it can be applied to other populations and for individual patients
- Surgical AVR are probably not applicable to TAVR
- Can’t account for variables that are not collected
What
STS, log
Euroscore, and
Euroscore II do
not include

• Frailty
• Chest deformities
• Malnutrition
• Porcelain aorta
• Liver Disease
• Radiotherapy
What we need

TAVR

SAVR

TAVR mortality risk score
SAVR CVA risk score
SAVR AE risk score

the same applies for tricuspid TCT
Main factors in the cardiac patients decision making – in order of importance to patient

1) Future life expectancy and quality of life
2) Fear, Trauma (small leg wound vs sternotomy)
3) Incapacity time, responsibilities, dependants, work and social affairs
4) Internet /relatives/ social and national media / friends
5) Cardiologist (s)
6) Cardiac surgeon
The current professional society guidelines for TR treatment are based on **expert opinions** with a level of evidence C for all indications.

Current guidelines on the management of heart disease lack any recommendation or the treatment of **isolated** (functional) TR.
20 year data OCC

- 7 out of 3250 patients with isolated TVR
- 3 Redos
- 2 Redo Redo
- 1 Redo Redo Redo
Figure 2  (A) Kaplan–Meier curves for survival in patients with mildly or moderately depressed left ventricular function. Significant tricuspid regurgitation indicates moderate and severe tricuspid regurgitation. (B) Kaplan–Meier curves for survival in patients with severely depressed left ventricular function. Numbers at the bottom indicate the number of patients at risk and the number of events at each follow-up year.

Impact of tricuspid regurgitation on survival in patients with chronic heart failure: unexpected findings of a long-term observational study
Stephanie Neuhold et al European Heart Journal (2013) 34, 844–852
Short- and Long-term Outcomes of Surgery for Severe Tricuspid Regurgitation

Jorge Rodríguez-Capitan et al

New Therapies?

- From where do new therapies arise?
- Who approves them?
- Who drives them?
- Who assesses them?
- What has the past taught us?
- Who benefits?
- Ethics
- Costs
TCT for tricuspid similar to TAVI?

ALTHOUGH easier to compare survival and safety of established sAVR with TAVI

CHALLENGING the comparison with the tricuspid valve alternatives as:

1. the severity of TR and right ventricle dysfunction are often difficult to determine

2. the impact of TR on mortality or heart failure outcomes is not as clearly defined

3. surgical treatments are multiple without robust data for indications and outcomes
Medical Devices - the conundrum

• **Patient** – ignorant of the device, it’s workings, it’s cost and it’s method of implantation. Just wants it to work.

• **Surgeon** - intimate with device features, handles and uses said device. Requires detailed information from manufacturer. Does not pay for the device but knows price

• **Hospital** – ignorant of device features, acquainted with device usage numbers and inventory, pays for the device.

• **Manufacturer** – designs and manufacturers device often in cooperation with a surgeon, cannot use the device they manufacture, under price pressure from Hospital/HMO/government agency (Japan. France, Belgium price is dictated from government)
Not all concepts are good, not all are bad. Assessment has to be fair, just, measured, assessed and applied in the correct circumstances.
Influences on the cardiac patients course of treatment – in order of access

1) Referring physician – Family Doctor, Clinic, A & E
2) Internet /relatives/ social and national media / friends
3) Cardiologist (s)
4) Cardiac surgeon
Thank you!!