

# WHEN I DO THE ROSS – OPERATION?

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# Disclosure

Wolfgang Hemmer

I have the following potential conflicts of interest to report:

- ☐ Consultant for JOTEC, Inc.

# WHY I DO THE ROSS – OPERATION?

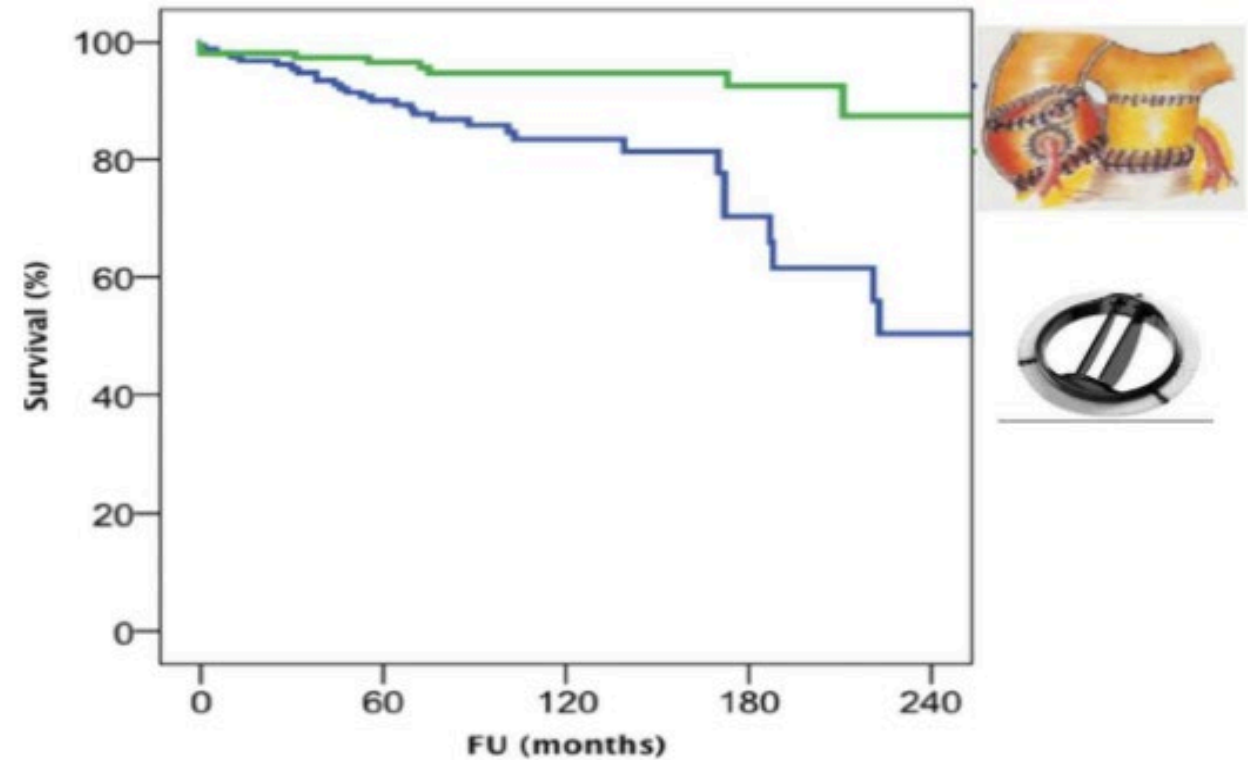
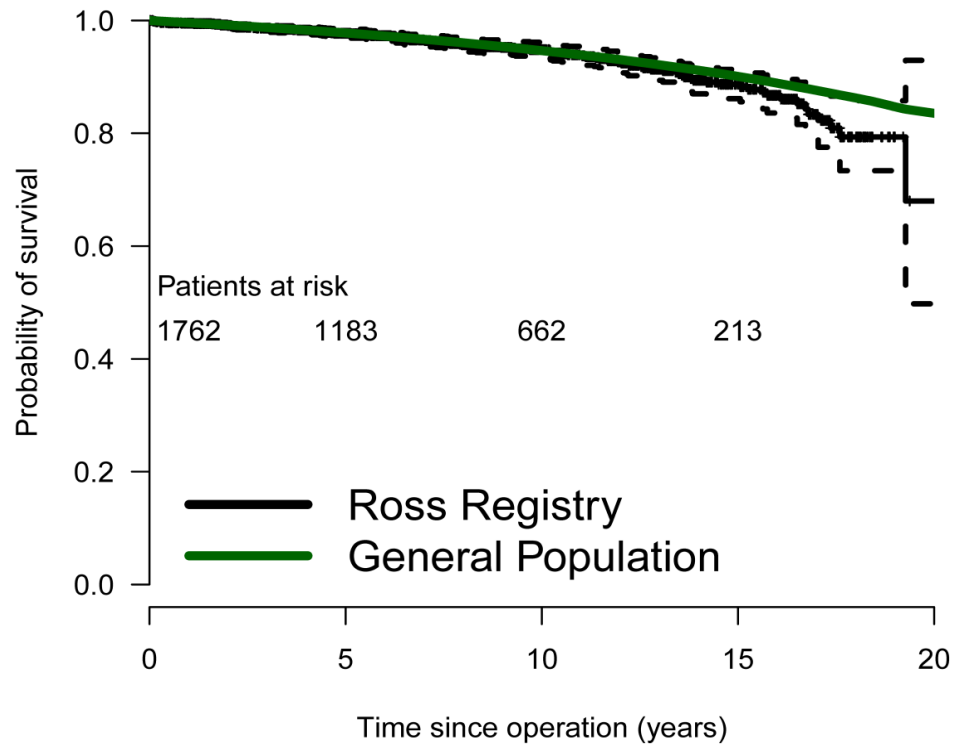


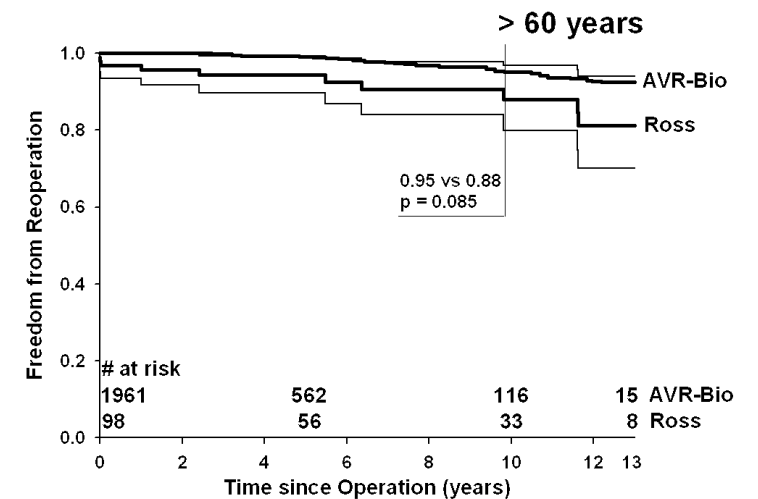
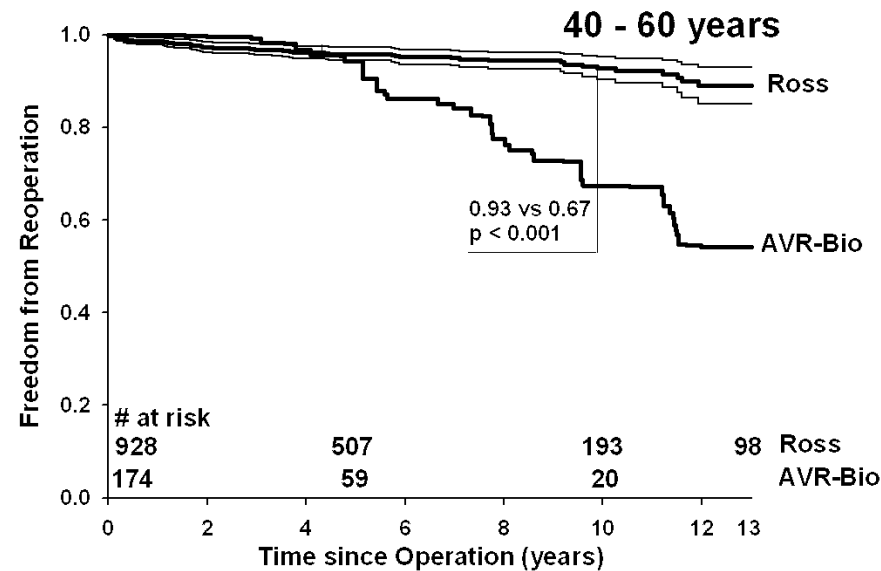
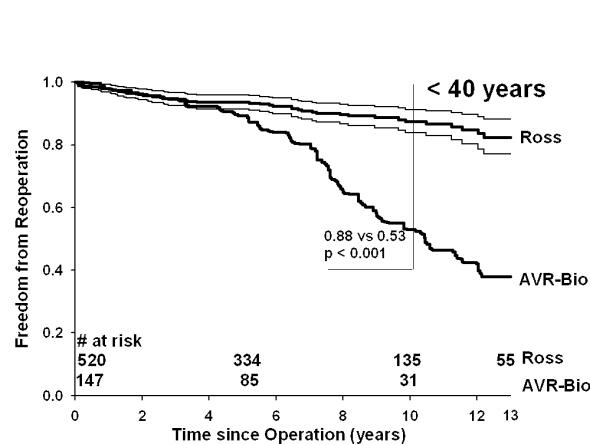
Abbildung 8: Überleben nach Aortenklappenersatz mit einer mechanischen Prothese vs. ROSS Operation

# REOPERATION RATE - ROSS VS. BIOPROSTHESES

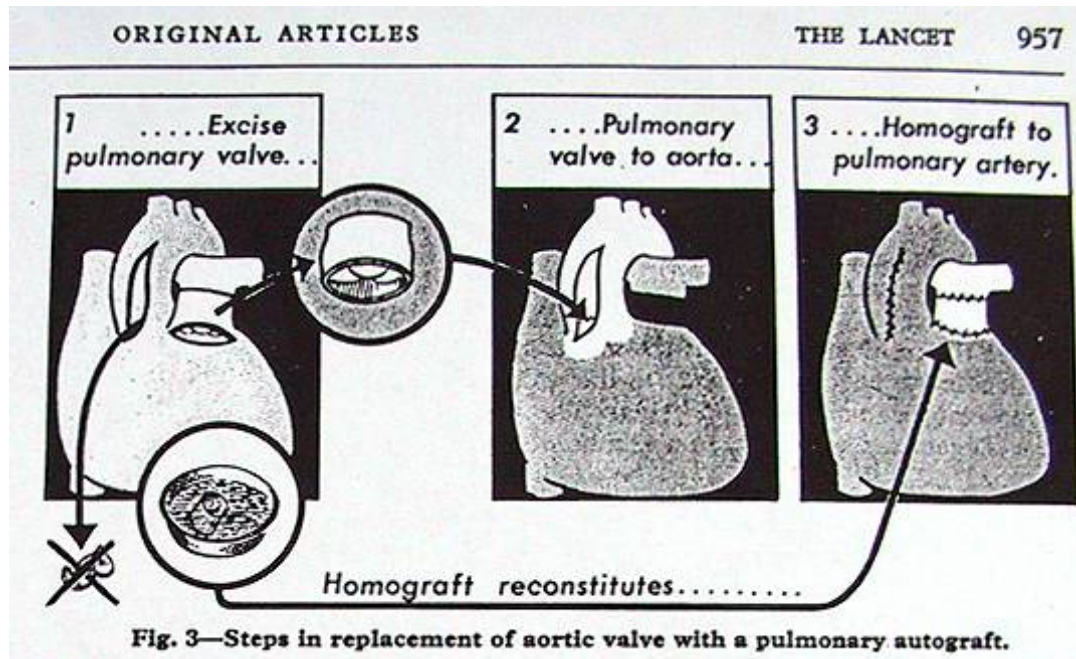
**Age-related reoperation rate after the Ross procedure: a report from the German Ross Registry.**

Richardt D, Hemmer W, Moritz A, Hetzer R, Gorski A, Franke UF, Hörer J, Lange R, Sachweh JS, Riso A, Dodge-Khatami A, Hübler M, Charitos EI, Stierle U, Sievers HH.

J Heart Valve Dis. 2015 Mar;24(2):220-7.



# HISTORY



Donald N. Ross:  
Replacement of Aortic and Mitral Valves with a  
Pulmonary Autograft. The Lancet 1967;2:956-8  
Subcoronary Implantation = original technique

Aortic valve replacement with the best valve  
available – the patients own pulmonary valve.

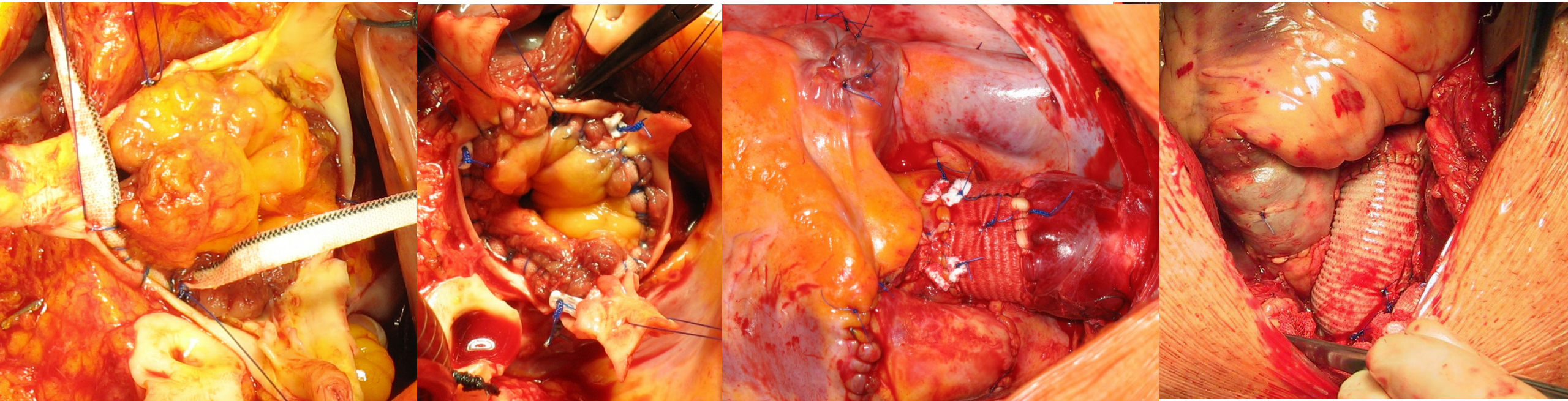
Pulmonary valve replacement with a homograft,  
potential problems of the foreign valve substitute  
are shifted to the low pressure system.

Stelzer P, Jones DJ, Elkins RC: Aortic Freestanding Root  
with Pulmonary Autograft.  
Circulation 1989;80 (suppl):209-13  
Freestanding Root



# STUTTGART TECHNIQUE

## Freestanding Root Replacement with Annular Reinforcement and Stabilization of the Sino-tubular Junction



# PATIENT SELECTION

- Aortic valve replacement in children and adolescents
- Adults < 60 ys with active and sportive lifestyle who want to avoid anticoagulation
- Contraindication against anticoagulation
- Women who desire to have children

## Contraindications

- Connective tissue disease (Marfan) or active rheumatic fever
- Severe comorbidities or reduced life expectancy (< 10-15 years)
- Severely reduced left ventricular function or severe coronary heart disease
- Bicuspid aortic valve with insufficiency and dilated annulus (first choice is valve repair)
- Uncontrolled arterial hypertension or a history of early homograft degeneration?

# PATIENTS AND RESULTS

In view of the very limited speech time, only a short overview of our results can be presented. We report about



**750 patients**

who were operated on between

**1995 and 2017.**



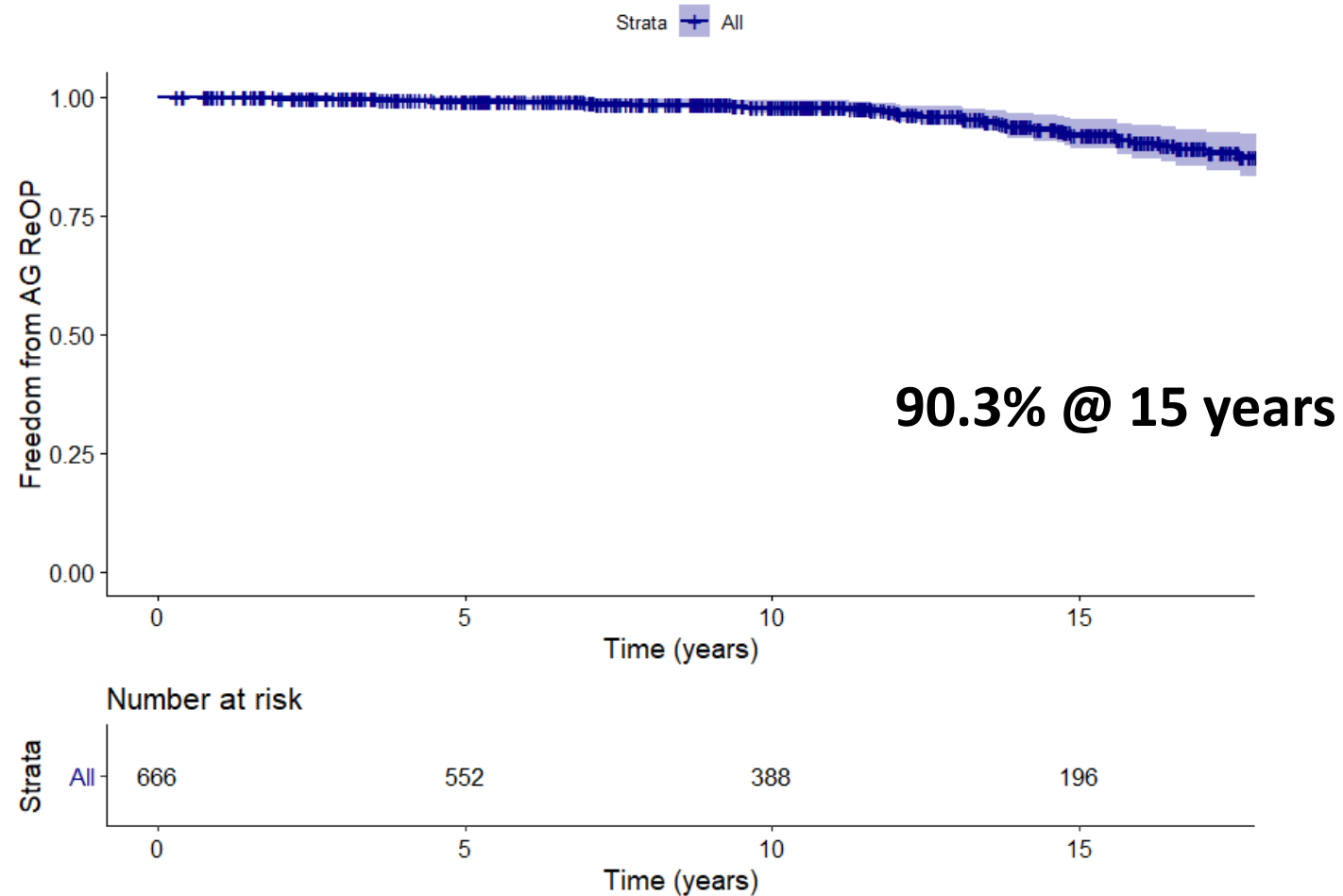
# PATIENT'S CHARACTERISTICS AND PERIOPERATIVE VARIABLES

| Characteristic                  | Number   | Percent |
|---------------------------------|----------|---------|
| Patients                        | 750      |         |
| Male Gender                     | 579      | 77      |
| Mean Age (ys )                  | 44 ± 14  |         |
| Prior Cardiac Surgery           | 102      | 14      |
| EF > 50%                        | 568      | 76      |
| Active Endocarditis             | 39       | 5       |
| Concomitant Procedures          | 377      | 50      |
| Mean CPB–time (min)             | 165 ± 35 |         |
| X-clamp time (min)              | 133 ± 24 |         |
| Circul. arrest for arch surgery | 39       | 5       |

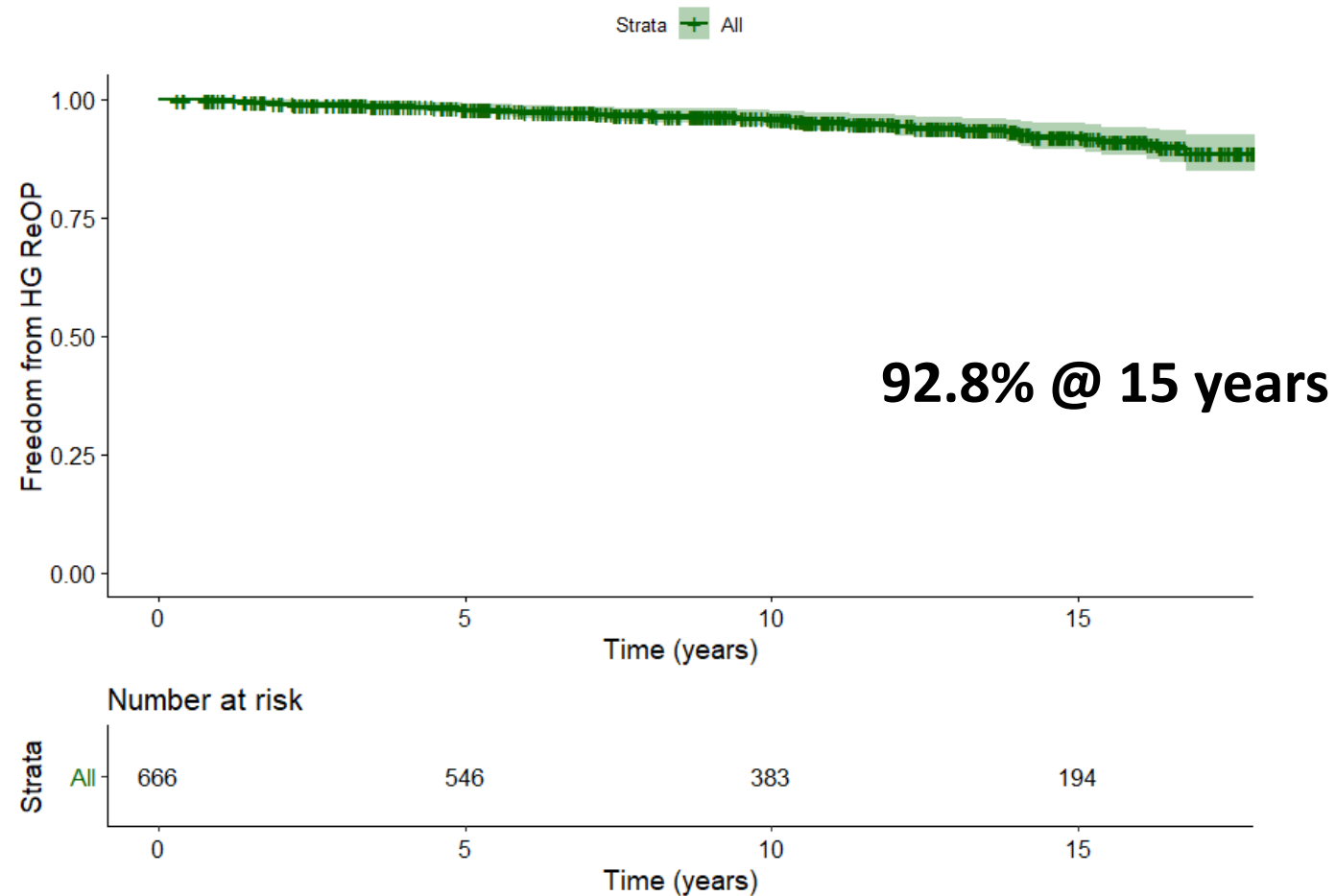
# CLINICAL COURSE

| Characteristic   | Number | Percent |
|--|--------|---------|
| Early Mortality (< 30 days)                                  | 7      | 0.9     |
| Early Reoperation  | 34     | 4       |
| Patients with valve related reoperations,<br>Follow-up 93.6% | 84     | 11.6    |
| Thromboembolic Event incl. TIA                               | 14     | 2       |
| Hemorrhagic Event  | 3      | 0.4     |
| Endocarditis   | 17     | 2       |
| Late Mortality   | 47     | 6.1     |
| Cause for Late Death: Cardiac                                | 24     | 3,1     |
| Unknown  | 9      | 1.2     |
| Non-cardiac  | 14     | 1.8     |

# FREEDOM FROM REOPERATION - AUTOGRAFT



# FREEDOM FROM REOPERATION – HOMOGRAFT/RVOT





# HOMOGRAFT AND AUTOGRAFT REOPERATIONS

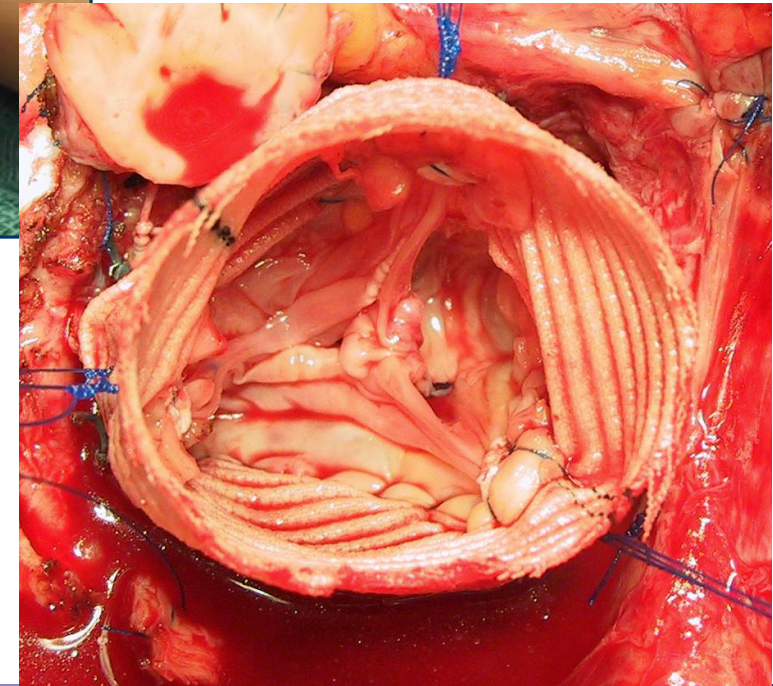
Homografts are still „gold standard“ for RVOT reconstruction.

Homograft reoperations can be done with transcatheter valves or open surgery.

A failing autograft can be preserved in the majority of patients.

Risk factor for neo-aortic root dilatation:  
-> regurgitant bicuspid aortic valve.

In 32 patients we were able to preserve the pulmonary autograft with a David - procedure



# SUMMARY

The Ross procedure provides a very good surgical option for the younger patient with aortic valve disease, especially stenosis.

Operative mortality and morbidity correlate with conventional valve surgery.

Despite expected reoperations, life quality and expectancy are comparable to healthy people.

Implantation technique and indication are key to success. If you do the root replacement technique, root reinforcement should be mandatory.

Therefore the Ross procedure should not be an occasional event, but should be concentrated in specialised centres with adequate experience.