# The Rapid Deployment (Sutureless) AVR only for selected patients

7th AP VALVES 2018

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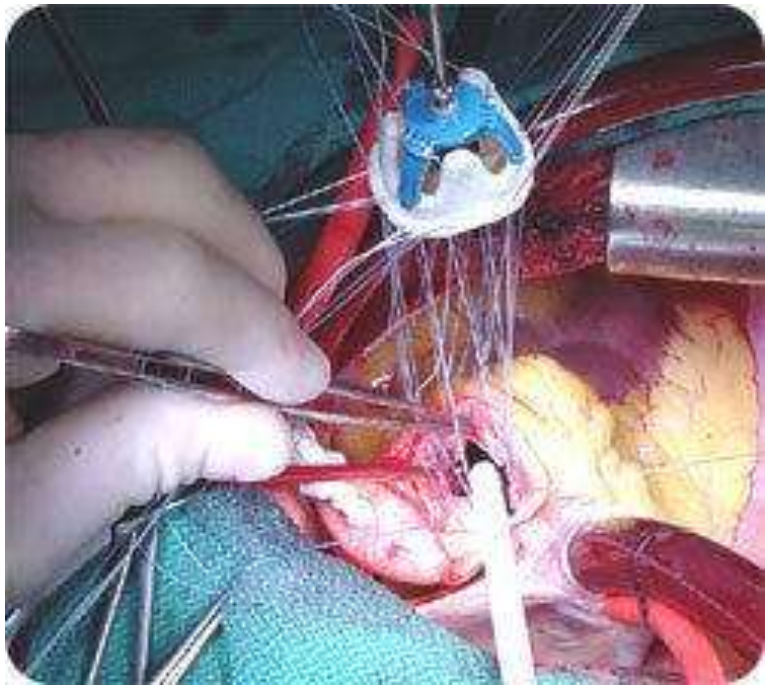
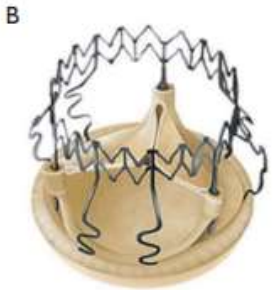
# Conventional AVR

- **Full Sternotomy**
- **CPB/ACC**
- **Aortotomy**
- **Resection of native aortic valve**
- **Aortic valve suture :10~15 ea**
- **Aortotomy closure**
- **ACC off / CPB weaning**
- **Sternotomy closure**



# Sutureless AVR

- **Sternotomy/thoracotomy**
- **CPB/ACC**
- **Aortotomy**
- **Resection of native aortic valve**
- **Aortic valve suture : 0~3ea**
- **Aortotomy closure**
- **ACC off / CPB weaning**
- **Sternotomy closure**


# Sutureless Aortic Valve Replacement International Registry (SU-AVR-IR): design and rationale from the International Valvular Surgery Study Group (IVSSG)



*Ann Cardiothorac Surg* 2015;4(2):131-139

# Conventional surgery, sutureless valves, and transapical aortic valve replacement: What is the best option for patients with aortic valve stenosis? A multicenter, propensity-matched analysis

TABLE 5. Postoperative outcomes after TA-TAVR, SU-AVR, and SAVR; analysis included 286 patients with caliper matching 1:1

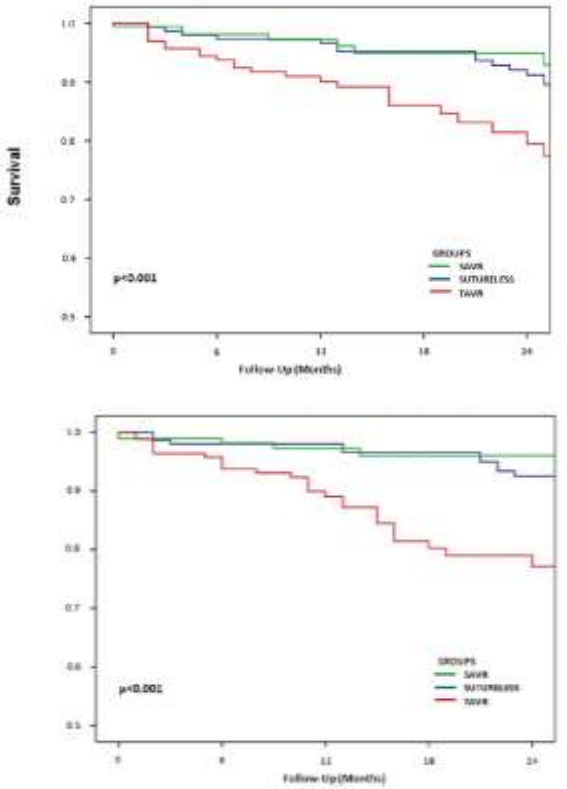
| Outcome | TA-TAVR (n = 143) | SU-AVR (n = 31) | SAVR (n = 112) | *P* value | |
|---|---|---|---|---|---|
| | | | | TA-TAVR vs SU-AVR | TA-TAVR vs SAVR |
| Death (n) | 10 (7) | 0 | 1 (1.8) | 0.21 | .026* |
| Stroke (n) | 4 (2.8) | 0 | 0 | 1 | .13* |
| PPM (n) | 7 (4.9) | 1 (3.2) | 1 (0.9) | 1 | .082* |
| RRT (n) | 7 (4.9) | 1 (3.2) | 0 | 1 | .019* |
| AMI (n) | 5 (3.5) | 0 | 1 (0.9) | 0.59 | .23* |
| Postoperative AR (≥1+/3+) | 41 (28.7) | 6 (19.4) | 2 (1.8) | 0.37 | <.001* |
| Mean gradient (mm Hg) | 10.7 ± 4.4 | 11.1 ± 3.3 | 16.5 ± 5.8 | 0.69* | <.001† |

The Journal of Thoracic and Cardiovascular Surgery • November 2013

# A comparison of conventional surgery, transcatheter aortic valve replacement, and sutureless valves in "real-world" patients with aortic stenosis and intermediate- to high-risk profile

**TABLE 3. Operative data and performance of hemodynamic prostheses**

| Variables | SAVR n = 204 n (%) | Sutureless n = 204 n (%) | TAVR n = 204 n (%) | *p* value |
|---|---|---|---|---|
| Preoperative echocardiography assessment | | | | |
| Peak gradient (mm Hg) | 84 ± 21 | 80 ± 27 | 77 ± 20 | .084 |
| Mean gradient (mm Hg) | 51 ± 15.2 | 49 ± 18 | 48 ± 14 | .122 |
| Valvular area ($cm^2$) | 0.77 ± 0.21 | 0.66 ± 0.2 | 0.7 ± 0.2 | .017 |
| CPB time (min) | 79.4 ± 12.4 | 50 ± 11.5 | | <.001 |
| Aortic crossclamp time (min) | 61.2 ± 11.7 | 32.8 ± 12.6 | | <.001 |
| MV >48 h | 7 (3.4) | 4 (1.9) | 3 (1.5) | .066 |
| ICU stay (d) | 2.2 ± 3.4 | 1.6 ± 2.3 | 3.2 ± 2 | .011 |
| Prostheses diameters (mm) | 22.4 ± 2.0 | 23.3 ± 2.7 | 25.8 ± 1.5 | <.001 |
| Hemodynamic parameters at discharge | | | | |
| Postoperative peak gradient (mm Hg) | 22.75 ± 11.7 | 19.52 ± 12.45 | 14.34 ± 7.5 | .015 |
| Postoperative mean gradient (mm Hg) | 11.4 ± 6 | 10.8 ± 6.8 | 7.6 ± 4.2 | .077 |
| AR greater than grade 2 | 1 (0.5) | 4 (1.9) | 18 (8.8) | .028 |




The Journal of Thoracic and Cardiovascular Surgery c December 2015

# A comparison of conventional surgery, transcatheter aortic valve replacement, and sutureless valves in "real-world" patients with aortic stenosis and intermediate- to high-risk profile

**TABLE 4. Postoperative complications**

| Variables | SAVR (G3) n = 204 n (%) | Sutureless (G2) n = 204 n (%) | TAVR (G3) n = 204 n (%) | *P* value | *P* value G1 vs G2 | *P* value G1 vs G3 | *P* value G2 vs G3 |
|---|---|---|---|---|---|---|---|
| Bleeding requiring revision | 6 (2.9) | 10 (4.9) | 4 (1.9) | .526 | .447 | .271 | .314 |
| Anemia requiring at least 2 units of RBCs | 116 (57) | 73 (35.7) | 67 (32.8) | <.001 | <.001 | <.001 | .683 |
| Acute renal failure | 30 (14.7%) | 11 (5.3) | 24 (11.7) | .007 | .003 | .462 | .039 |
| CVVH | 7 (3.4) | 3 (1.5) | 12 (5.8) | .063 | .547 | .255 | .019 |
| Stroke | 6 (2.9) | 4 (2) | 7 (3.4) | .661 | .617 | .733 | .587 |
| Peripheral vascular complications | 0 (0) | 0 (0) | 20 (9.8) | <.001 | 1 | <.001 | <.001 |
| PM implantation | 8 (3.9) | 20 (9.8) | 30 (14.7) | <.001 | .021 | <.001 | .228 |
| 30-d mortality | 7 (3.4) | 12 (5.8) | 20 (9.8) | .005 | .341 | .015 | .341 |

*SAVR*, Surgical aortic valve replacement; *TAVR*, transcatheter aortic valve replacement; *RBC*, red blood cell; *CVVH*, continuous venovenous hemofiltration; *PM*, pacemaker.

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# Sutureless versus Conventional Aortic Valve Replacement:

## Outcomes in 70 High-Risk Patients Undergoing Concomitant Cardiac Procedures

*Tex Heart Inst J 2018;45(1):11–6*

**TABLE II.** Comparison of Operative and Postoperative Results

| Variable | **Group 1** (Sutureless AVR) (n=38) | **Group 2** (Conventional AVR) (n=32) | ***P* Value** |
|---|---|---|---|
| Operative time (min) | 253 ± 76 | 350 ± 85 | 0.001 |
| Cross-clamp time (min) | 78 ± 28 | 122 ± 38 | 0.001 |
| CPB time (min) | 119 ± 42 | 166 ± 50 | 0.001 |
| Ventilator dependence (hr) | 9.4 ± 3.5 | 11.6 ± 7.8 | 0.134 |
| Intensive care unit stay (d) | 4.2 ± 3.7 | 4.9 ± 4.8 | 0.462 |
| Drainage (mL) | 396 ± 153 | 1,010 ± 1,208 | 0.009 |
| Re-exploration for bleeding | 2 (5.3) | 2 (6.3) | 0.999 |
| Red blood cell transfusion (U) | 2.2 ± 1.8 | 3.4 ± 3 | 0.037 |
| FFP transfusion (U) | 2.2 ± 1.9 | 2.9 ± 3.4 | 0.262 |
| 30-day hospital death | 2 (5.3) | 5 (15.6) | 0.234 |
| Hospital stay (d) | 9.3 ± 5.1 | 13.6 ± 6.6 | 0.004 |

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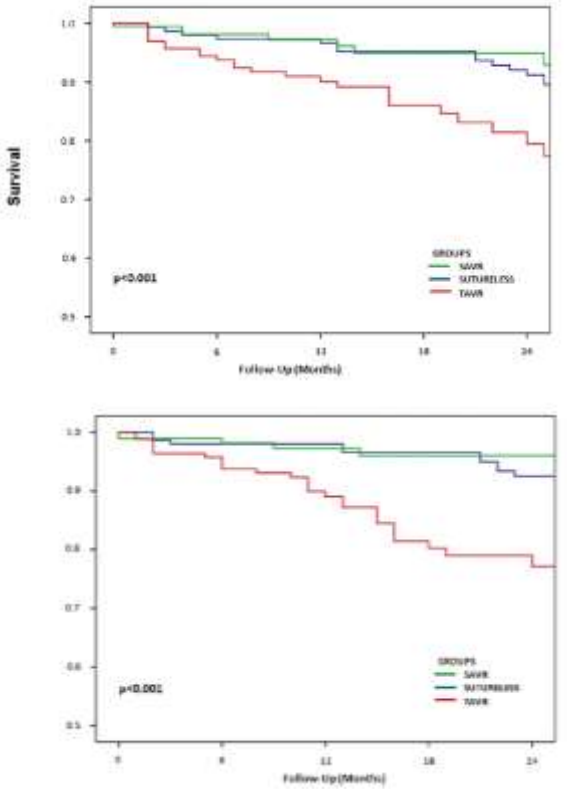


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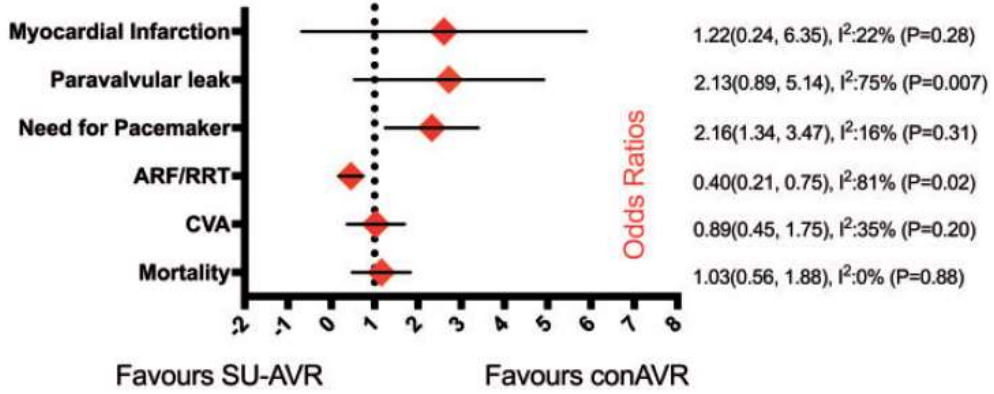
# Meta-analysis of sutureless technology versus standard aortic valve replacement and transcatheter aortic valve replacement

Saqib H. Qureshi[a,*], Anas Boulemden[a], Adam Szafranek[a] and Hunaid Vohra[b]

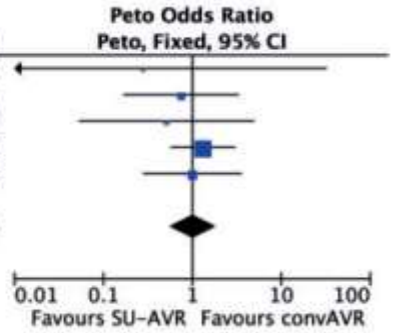



## DISCUSSION

This meta-analysis attempted to evaluate evidence with the aim to appraise clinicians on the quality and direction of available evidence. The key findings are that SU-AVR is associated with 30% reduction in relative risk for PVL and 30-day mortality compared with TAVR. The effect of SU-AVR on 30-day mortality versus conAVR requires further evidence. There is also 'firm evidence' to implicate sutureless technology associated with the increased risk of PPM compared with conAVR.

| Study or Subgroup | SU-AVR Events | SU-AVR Total | convAVR Events | convAVR Total | Weight | Peto Odds Ratio Peto, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| D'Onofrio 2013 | 0 | 31 | 1 | 112 | 1.6% | 0.28 [0.00, 32.45] |
| Dalen M 2015 | 3 | 171 | 4 | 171 | 16.5% | 0.75 [0.17, 3.33] |
| Gilmanov D 2014 | 1 | 133 | 2 | 133 | 7.1% | 0.51 [0.05, 4.95] |
| Muneretto C 2015 | 13 | 204 | 10 | 204 | 52.1% | 1.32 [0.57, 3.05] |
| Pollari 2014 | 5 | 82 | 5 | 82 | 22.6% | 1.00 [0.28, 3.58] |
| **Total (95% CI)** | | **621** | | **702** | **100.0%** | **1.03 [0.56, 1.88]** |
| Total events | 22 | | 22 | | | |

Heterogeneity: $Chi^2 = 1.16$, $df = 4$ ($P = 0.88$); $I^2 = 0\%$
Test for overall effect: $Z = 0.09$ ($P = 0.93$)




**30 day mortality**

European Journal of Cardio-Thoracic Surgery 53 (2018) 463–471

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Saqib H. Qureshi[a,*], Anas Boulemden[a], Adam Szafranek[a] and Hunaid Vohra[b]

## Implications for clinical practice

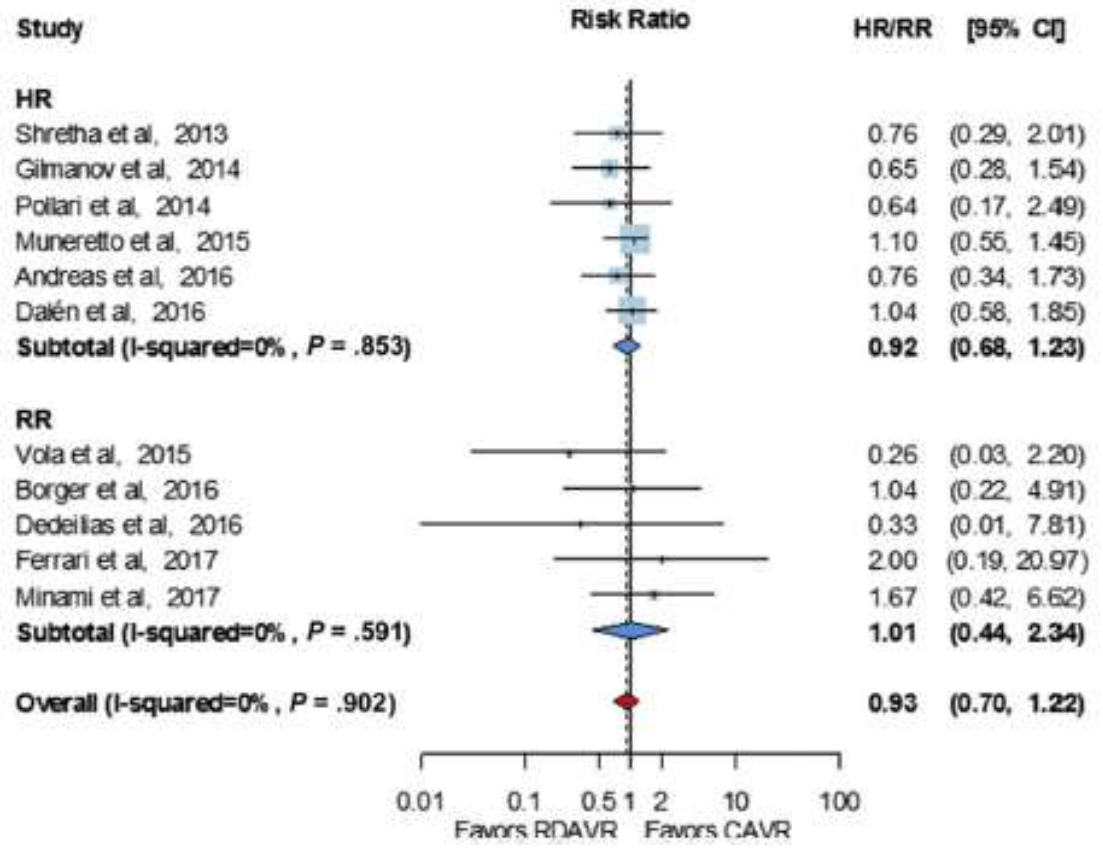
Recent expert consensus supports the use of sutureless technology in patients with isolated or concomitant procedures where controlling CPB comorbidity is imperative and in calcified root, porcelain aorta as well as prior implantation of aortic homograft [29]. Acknowledging the limitations of current evidence, this meta-analysis advocates selected patients with worse annular characteristics and higher inherent risk for PVL to be offered SU-AVR and not TAVR. Neither superiority nor inferiority can be firmly established against conAVR. It is our recommendation that the safety and efficacy of sutureless and rapid-deployment technology should be further tested in large-scale randomized trials controlling annular characteristics beyond other variables against both TAVR and conAVR.

European Journal of Cardio-Thoracic Surgery 53 (2018) 463–471

# Rapid deployment or sutureless versus conventional bioprosthetic aortic valve replacement: A meta-analysis

Suk Ho Sohn, MD,[a] Myoung-jin Jang, PhD,[b] Ho Young Hwang, MD, PhD,[a] and Kyung Hwan Kim, MD, PhD[a]

Early death

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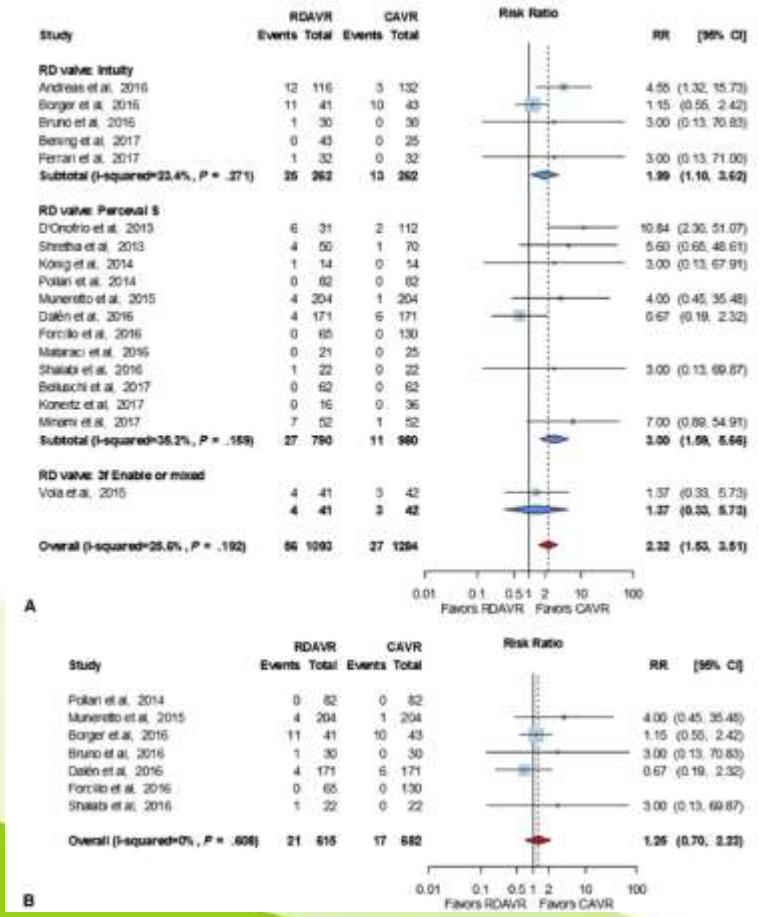
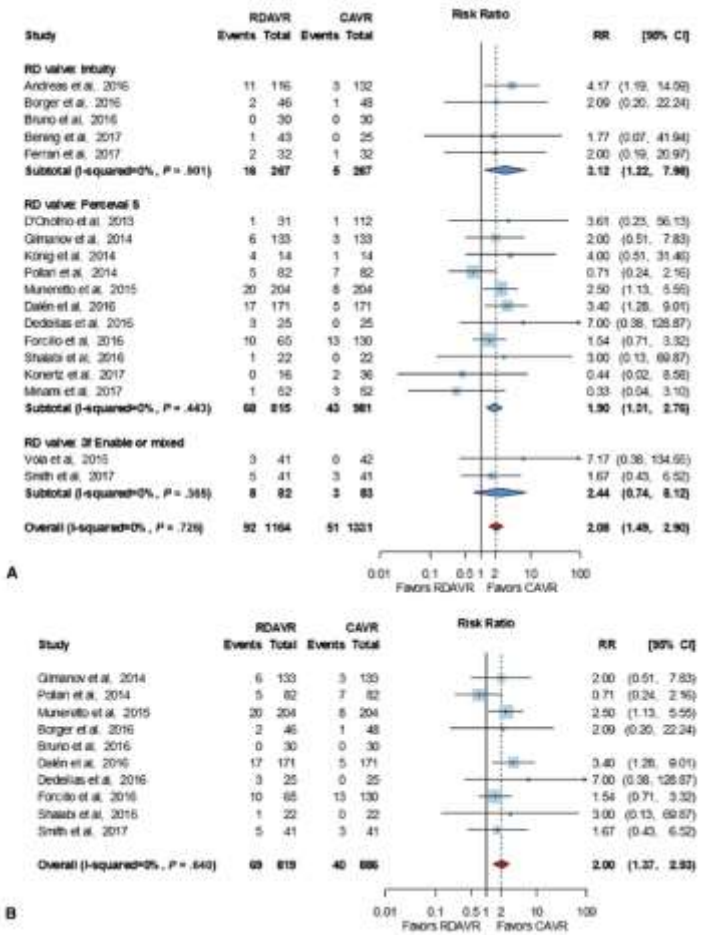
PVL




PPM



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## CONCLUSIONS

Aortic valve replacement with RD valves is associated with significantly shorter ACC and CPB times than conventional AVR, although these differences did not translate into improved postoperative complications and mortality early after surgery and during the follow-up. Care might be needed when implanting RD valves because they are associated with a higher incidence of PPM insertion, regardless of the RD valve type.

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# Cost in Korea

| Valve | Price | Pt's pay(%) | Pt's pay |
|---|---|---|---|
| Sutureless valve | ₩11,000,000 ($9,792) | 50 | ₩5,500,000 ($4,896) |
| Conventional valve | ₩2,802,660 ($2,500) | 5 | ₩140,133 ($125) |

# Conclusion

- We can not justify the use of Sutureless valve instead of classical valve
  - There are no definite advantanges - sutureless valve can only save operation time just less than 30min.
  - There are two definite disadvantages - paravalvular leakage and permanent pacemaker insertion
  - The patient and the government have to spend a lot of money ( patient – 50times, government - 4times)

# 감사합니다 !!

# Thank you !!