

Physician - Valvular Diseases and Surgery

[MSB-03]

Comparison of Preoperative Multislice Computed Tomography Measurements with Intraoperative Valve Sizes in Sutureless Rapidly Implantable Biological Aortic Heart Valve and Mechanical Aortic Valve Cases

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Objective: This study aimed to evaluate the alignment between preoperative multislice computed tomography measurements and intraoperative valve sizes in sutureless rapidly implantable biological aortic valve and mechanical aortic valve replacements.

Methods: The study included 40 patients (22 males, 18 females; mean age: 61.5 ± 9.1 years) who underwent elective open heart surgery for aortic valve stenosis between February 20, 2023, and May 20, 2023. The patients underwent valve replacement with either sutureless biological valves ($n=20$) or mechanical valves ($n=20$). Data were collected from patient files and the hospital's database, including demographic, preoperative, intraoperative, and postoperative information.

Results: Patients had a mean height of 165.7 ± 10.7 cm, weight of 83.0 ± 15.9 kg, and body mass index of 30.3 ± 5.5 . Common comorbidities were diabetes mellitus (42.5%), hypertension (25%), atrial fibrillation (7.5%), and chronic obstructive pulmonary disease (7.5%). Mechanical valve patients had significantly longer cross-clamp and cardiopulmonary bypass times ($p < 0.001$ and $p = 0.011$, respectively). The mean sinotubular junction diameter was lower in the mechanical group ($p = 0.025$). Although there was no significant difference in the mean value of the aortic annulus between the groups ($p = 0.171$), the optimum and mean effective orifice area index values were found to be higher in patients in the sutureless group compared to those in the mechanical group ($p < 0.001$ for both).

Conclusion: Preoperative multislice computed tomography is valuable for aortic valve replacement. Biological valves show advantages over mechanical valves in terms of shorter cross-clamp and cardiopulmonary bypass times. More importantly, surgeons tend to avoid procedures such as root enlargement with mechanical valves to reduce operative time, opting for smaller valve sizes. Sutureless valves allow for a larger effective orifice area and less anxiety during surgery, with reduced cross-clamp and bypass times.

Keywords: Aortic valve replacement, mechanical valve, multislice computed tomography, open heart surgery, sutureless valve.

Table 1. Examination of the effect of valve type on effective orifice area index

	Total	Mechanic	Sutureless	p value
Age	64 (54.25-68)	55.5 (47.5-65.75)	67 (61.75-69.75)	0.003**
Aortic annulus	23.4 (22.62-23.92)	23.4 (22.8-24.25)	23.25 (22.3-23.6)	0.171
Optimum EOAI (effective orifice area index)	1.22 (0.95-1.56)	0.96 (0.90-1.05)	1.55 (1.43-1.65)	<0.001**
EOAI (effective orifice area index)	1.09 (0.76-1.58)	0.77 (0.66-0.85)	1.58 (1.43-1.67)	<0.001**
BSA (body surface area)	1.94 (1.80-2.11)	1.97 (1.82-2.18)	1.88 (1.77-2.05)	0.221
BMI (body mass index)	29.1 (25.7-34.7)	29.1 (25.9-35.9)	28.9 (25.2-33.2)	0.583

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