BRITISH MEDICAL JOURNAL

British Medical Journal

Volume 3, No.1, January 2023

Internet address: http://ejournals.id/index.php/bmj
E-mail: info@ejournals.id
Published by British Medical Journal
Issued Bimonthly
3 knoll drive. London. N14 5LU United Kingdom
+44 7542 987055

Requirements for the authors.

The manuscript authors must provide reliable results of the work done, as well as anobjective judgment on the significance of the study. The data underlying the work shouldbe presented accurately, without errors. The work should contain enough details andbibliographic references for possible reproduction. False or knowingly erroneous statementsare perceived as unethical behavior and unacceptable.

Authors should make sure that the original work is submitted and, if other authors'works or claims are used, provide appropriate bibliographic references or citations. Plagiarismcan exist in many forms - from representing someone else's work as copyright to copying orparaphrasing significant parts of another's work without attribution, as well as claimingone's rights to the results of another's research. Plagiarism in all forms constitutes unethicalacts and is unacceptable. Responsibility for plagiarism is entirely on the shoulders of theauthors.

Significant errors in published works. If the author detects significant errors or inaccuraciesin the publication, the author must inform the editor of the journal or the publisher aboutthis and interact with them in order to remove the publication as soon as possible or correcterrors. If the editor or publisher has received information from a third party that thepublication contains significant errors, the author must withdraw the work or correct theerrors as soon as possible.

CHIEF EDITOR

Dr. Fiona Egea

EDITORIAL BOARD

IS THE RISK OF SURGICAL STABILIZATION OF THE AORTIC WALL JUSTIFIED IN PATIENTS WITH AORTIC STENOSIS AND EXPANSION OF THE ASCENDING AORTA?

Aliev Sh.M.
Kayumov A.R.
Sultonov N.Kh.

Abstract: According to international consensus and recommendations for the diagnosis and treatment of aortic disease, the management of patients with thoracic aortic aneurysms depends on the size/diameter of the expansion and represents a balance between the risk of aneurysm rupture and postoperative mortality during aneurysm repair. In this aspect, several studies are aimed at assessing the prognostic consequences and surgical risks of combining aortic valve replacement (AVR) with ascending aortic replacement (AA) for post-stenotic dilatation of the aorta. So, according to JY Lim et al. (2013), "there was no increased risk of early postoperative mortality and a trend towards a long-term positive effect on the risk of late mortality".

Keywords: aortic valve disease, aortic stenosis, aortic aneurysm, supracoronary ascending aortic replacement, aortic valve replacement.

In another study conducted by M. Yalcin et al . (2016), the authors tried to determine whether concomitant surgery predicted mortality in patients undergoing surgery for (AA) aneurysm and concluded that "AA prosthetics increased the risk of death in AVR 2.25 times, 4.5 times in CABG, 10 8 times for combined AVR and CABG and 4 times for the Bentall procedure compared with isolated AA prosthetics with an initial diameter of more than 45 mm, but the difference was not statistically significant. However, this technique also has its supporters and opponents, cutting and suturing the Dacron prosthesis leads to the disappearance of its elasticity, which can lead to compression of the aortic wall, which is between the actions of two forces: resistance to stretching and blood pressure from the inside.

Thus, the analysis of the literature shows that aortic malformations, caused by a high risk of aortic dissection and rupture, remain an urgent problem in cardiac surgery today.

Due to the wide variety of surgical techniques available to the surgeon, the choice of the optimal method can sometimes be very difficult. In this direction, relevant for practical healthcare is the development of a unified approach to the surgical correction of aortic stenosis and post-stenotic expansion of the AA, as well as the improvement of technical aspects that provide for a reduction in the volume and trauma of surgical intervention while maintaining the radicalness of the operation. Of particular interest is the long-term behaviour of the remodelled wall of the ascending aorta (post-stenotic expansion) after aortic valve replacement, which will determine the need for intervention on it during the primary operation.

Materials and methods.

The study was based on the results of the treatment of 187 patients after PSM alignment, 90 patients were included in a 2:1 distribution with AA expansion from 40 to 55 mm. Patients of the first group (PFG 60 patients) underwent standard isolated AV prosthetics without interventions on the aorta, and the second group (30 patients) underwent AV prosthetics in combination with supracoronary aortic grafting or external wrapping of the aorta with a synthetic vascular prosthesis (SP + PFG / EP + PFG group).

Clinical and demographic characteristics of patients in the study groups SP+PAK/EP+PFG and PFG are presented in Table 1. The mean age of patients after PSM was 55.52±11.16 years in the SP+PFG/EP+PAV group (range 49 to 64 years), and in the AVR group, it was 50.67±11.77 years (range 39 to 60 years) (p=0.805). The groups were also comparable in terms of the presence of concomitant diseases in patients.

Table 1
Clinical and demographic characteristics of patients

Index	After PSM			
	SP+PAK/EP+PAK N =60	PACK N=30	Comparison	
			95% CI	p
Age, years	56 [49; 64] 55.52±11.16	54.5 [38.75; 59.75] 50.67±11.77	-4 [-9; one]	0.073
Floor: 1 - male, 2 - female	1 - 44 (73.3%) 2 - 16 (26.7%)	1 - 21 (70%) 2 - 9 (30%)		0.805
PPT, m ^{2}	1.97 [1.9; 2.08] 1.99±0.18	2 [1.9; 2.16] 2.02±0.23	0.03 [-0.06; 0.14]	0.523
AG (n, %)	44.73% [61%; 83%]	27.90% [74%; 97%]	3.2 [0.8; 18.9]	0.100
DM (n, %)	12.20% [12%; 32%]	10.33% [19%; 51%]	2 [0.7; 6]	0.197
IHD (n, %)	23.38% [27%; 51%]	12.40% [25%; 58%]	1.1 [0.4; 2.9]	>0.999
GB (n, %)	46.77% [65%; 86%]	27.90% [74%; 97%]	2.7 [0.7; 16]	0.160
Stroke /TIA (n, %)	6.10% [5%; twenty%]	4.13% [5%; thirty%]	1.4 [0.3; 6.4]	0.726
CRF (n, %)	17.28% [19%; 41%]	16.53% [36%; 70%]	2.9 [1.1; 7.9]	0.036 *
COPD (n, %)	7.12% [6%; 22%]	1.3% [1%; 17%]	0.3[0; 2.2]	0.261
FP (n, %)	14.23% [14%; 35%]	6.20% [10%; 37%]	0.8 [0.2; 2.7]	0.794
Etiology of the defect: 1 - degener. vice; 2 - rheumatism; 3 - bivalve. valve	1 - 18 (30%) 2 - 9 (15%)3 - 33 (55%)	1 - 10 (33.3%) 2 - 7 (23.3%)3 - 13 (43.3%)	General comparison: p=0.514	
Stenosis and AK insufficiency	21.35% [24%; 48%]	13.43% [27%; 61%]	1.4 [0.5; 3.8]	0.494
Stenosis of the AC	38.63% [51%; 74%]	17.57% [39%; 73%]	0.8 [0.3; 2]	0.647

In the SP+PAV/EP+PAV group, in 75.0% of cases (45 out of 60) a mechanical AV prosthesis was used, in the remaining 15.0% (15 out of 60) cases a biological valve was used. In the AVR group, the majority (76.7%; 23 out of 30) of cases also used a mechanical valve prosthesis (p>0.999).

Aortic dilatation was established by contrast-enhanced CT angiography and transthoracic echocardiography of AA.

The nonparametric Mann-Whitney U-test was used to compare scores between groups. Descriptive characteristics are presented as median [first quartile; third quartile] for numerical data, per cent [lower bound 95% CI; upper bound 95% CI] for categorical data with the calculation of confidence interval (CI) bounds using the Wilson formula.

Research results.

The dynamics of changes in linear indicators are presented in detail in Table. 2 and fig. 1. Thus, in the early postoperative period, the AA diameter in the SP+PAV/EP+PAV group averaged 31.79±1.29 mm (from 31 to 32), having significantly decreased from the initial values of 46.07±2.59 mm. However, in the PAC group, an increase in this parameter could be observed from 44.3±2.65 mm to 46.63±4.81 mm (range 43.25 to 49.75 mm). The intergroup statistical difference was 95% CI 15 [13; 16]; p< 0.001. At the same time, the AV pressure gradient (Table 5.2) did not differ statistically between the groups, amounting to 19.1±3.44 mm Hg in patients after SP+PAV/EP+PAV. Art., and in the PAC group - 20.4±7.82 mm Hg. Art. (95% CI 0 [-2; -3]; p=0.799).

The diameters of the sinuses of Valsalva in the early postoperative period were as follows: 34.56±5.35 mm (from 32 to 37 mm) in the group of patients after SP+PAV/EP+PAV and 34.53±4.08 mm (from 32 to 36.5) in the group of PAV without a statistical difference (95% CI 0 [-2; -2]; p = 0.713).

Differences were also noted according to the results of the study of patients 12 months after surgical treatment about the AA diameter - 32.49±1.07 mm in the SP+PAK/EP+PAV group versus 43.52±5.21 mm in the PAV group (95% CI 15 [13; 16] ; p< 0.001). But this indicator is incorrect since it is impossible to compare the fixed diameter of the synthetic prosthesis and the diameter of the native aorta.

However, there was no statistical difference in the diameters of the sinuses of Valsalva 12 months after surgical treatment. Thus, in the group of patients after SP + AVR /EP + AVR, the mean diameter of the sinus of Valsalva was 35.12 ± 3.32 mm (from 32 to 38 mm), and in the AVR group - 34.5 ± 3.22 mm (from 32.5 to 37.5 mm) (Table 2, Fig. 1).

Table 2

Dynamics of changes in linear Echo CG parameters in the SP+PAK/EP+PAK and PAK groups

	SP+PAK/EP+PAK (N=60)	PACK (N=30)	95% CI	R
Before surgery				
fibrosis diameter. rings, mm	23 [22; 25] 24±2.88	22 [21; 23] 22.33±1.84	-one [-2; 0]	0.009
AA diameter, mm	46 [44.75; 48] 46.07±2.59	44 [42; 46] 44.3±2.65	-2 [-3; -one]	0.003
Diameter of the sinuses of Valsalva, mm	37.5 [34; 40] 37.47±5.02	35 [32; 37.75] 34.9±4.56	-2 [-4; 0]	0.035
After operation				
ak gradient, mmHg Art.	18.5 [17; 21] 19.1±3.44	eighteen [15.25; 25.75] 20.4±7.82	0 [-2; 3]	0.799
AA diameter, mm	32 [31; 32] 31.79±1.29	46 [43.25; 49.75] 46.63±4.81	fifteen [13; 16]	<0.001
Diameter of the sinuses of Valsalva, mm	34 [32; 37] 34.56±5.35	33.5 [32; 36.5] 34.53±4.08	0 [-2; 2]	0.713
12 months after surgery				
AA diameter, mm	32 [thirty; 34] 32.49±1.07	41 [40.3; 46.5] 43.52±5.21	fifteen [13; 16]	<0.001
Diameter of the sinuses of Valsalva, mm	35 [32; 38] 35.12±3.32	34 [32.5; 37.5] 34.5±3.22	0 [-2; -2]	0.682

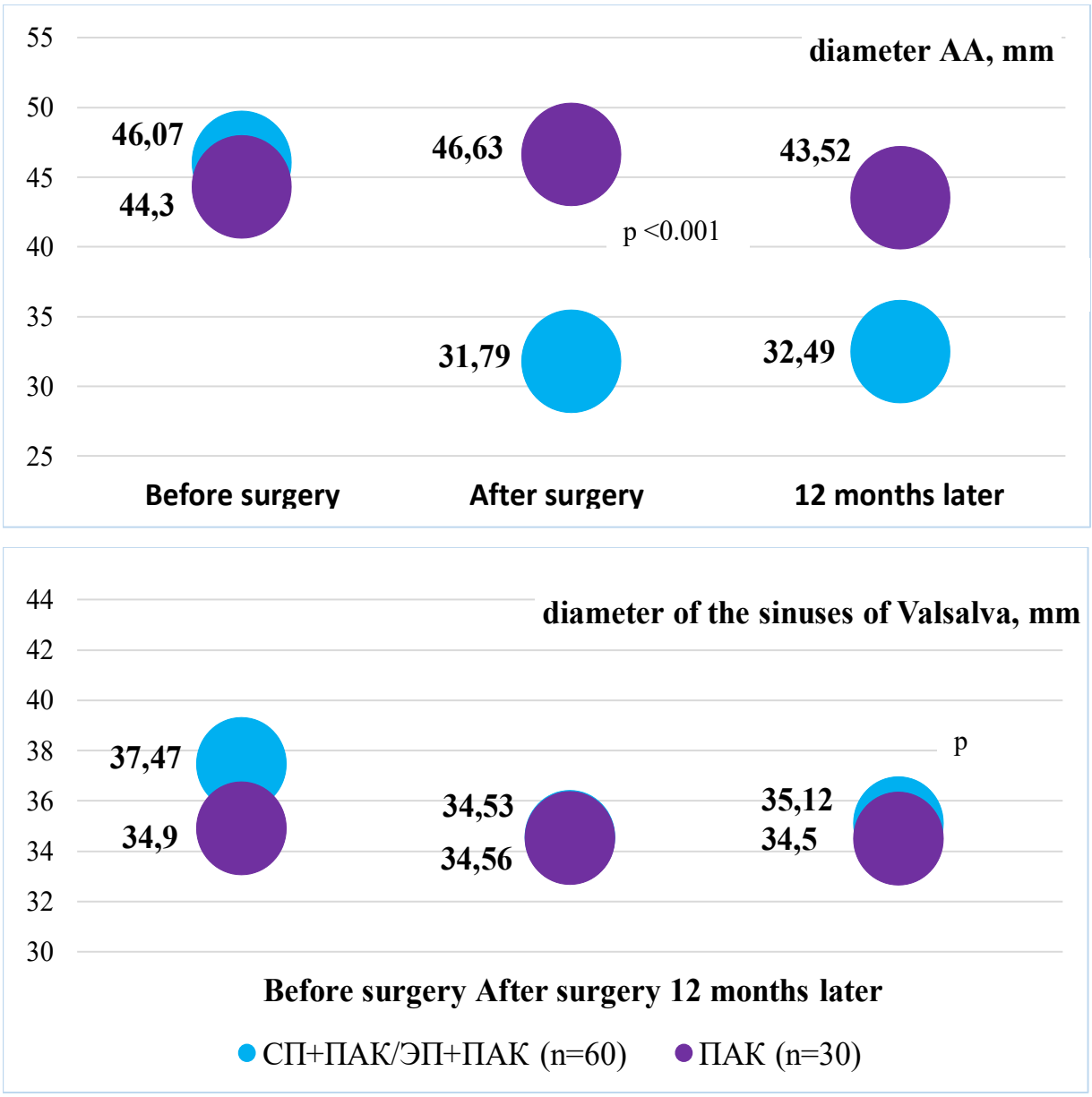

Fig. 1. Dynamics of changes in the diameters of the AA and sinuses of Valsalva in the SP+PAK/EP+PAV and PAV groups

In a comparative analysis of the frequency of cases with an increase in the diameters of the AA and sinuses of Valsalva in the postoperative period, as can be seen from Fig. 1, in both groups there were no cases of an increase in the diameter of the AA in the early period, while remotely in the PAC group in 30% (9 of 30) cases, there was a statistically insignificant increase in the AA, and in the SP + PAH/EP + PAH group - 0%.

Conclusion

This study reliably demonstrates that in patients with the aortic disease and moderate (up to 55 mm) dilatation of the ascending aorta, the diameter of the ascending aorta stabilizes, so it is reasonable to confine ourselves to isolated aortic valve replacement due to the lack of significant advantages of more aggressive procedures (SP+PAV/ EP+VAV) in the near and distant periods.

Used literature.

1.Faiza Z., Sharman T. Thoracic Aorta Aneurysm. Treasure Island (FL): StatPearls Publishing; 2021 Jun 29. In: StatPearls [Internet].

2.Lim J.Y, Jung S.H, Kim J.B, Kim D.K, Chung C.H, Song H, Lee J.W, Choo S.J. Concomitant replacement of the dilated ascending aorta during aortic valve replacement; does it increase the perioperative morbidity and mortality risks? J Card Surg. 2013;28(3):285-90. doi : 10.1111/jocs.12111.

3.Yalcin M, Tayfur K.D., Urkmez M. Should patients undergo ascending aortic replacement with concomitant cardiac surgery? Cardiovasc J Afr. 2016 Nov/Dec 23;27(6):338-344. doi : 10.5830/CVJA-2016-026.

4.Kim M.S, Kim J.H, Lee S.H, Lee S, Youn Y.N, Yoo K.J, Joo H.C. Long-term Fate of Dilated Ascending Aorta after Aortic Valve Replacement for Bicuspid Versus Tricuspid Aortic Valve Disease. Am J Cardiol. 2020 Aug 15;129: 53-59. doi : 10.1016/ j.amjcard.2020.05.026.