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Aortic stenosis above 70, conventional aortic valve replacement vs trans catheter aortic valve implantation (TAVI)

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***Abstract*---**Background: The prognosis is not good for those who have severe aortic stenosis with symptoms. In adults who have significant symptoms caused by aortic stenosis, surgical replacement of the aortic valve has been the treatment of choice up until quite recently. Objective: to accurately compare the surgical process and initial results of the more invasive standard sternotomy with the less invasive TAVI approach in elderly patients with isolated aortic valve disease who needed surgery in accordance with the inclusion criteria.Patients and method: Our research was a retrospective comparative analytical investigation that was carried out on forty patients who were above the age of seventy and suffered from severe aortic stenosis. The study was conducted at the National Heart Institute as well as other hospitals. Fifty percent of the participants were candidates for aortic valve replacement surgery via traditional median sternotomy, and the other fifty percent were candidates for trans-catheter aortic valve implantation (TAVI). Results: There was statistically insignificant difference between the two groups in terms of death after surgery, stroke, acute kidney injury, complete heart block requiring ppm, re-intervention, or bleeding. In the TAVI group, two patients (10%) had strokes, three (15%) had AKI, two (10%) needed a permanent pacemaker, and one (5%) had bleeding. In the AVR group, one patient (5%) had a stroke, two (10%) had AKI, one (5%) needed a

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permanent pacemaker, and two (10%) had bleeding. There were no statistically significant differences between the two groups. Conclusion: For patients over the age of 70 with severe aortic stenosis in Egypt, the findings of this research from 3 centres reveal that there is no difference between the risk of all-cause death and post-operative complications in the TAVI and SAVR groups. However, further studies are needed, ideally with larger sample sizes and longer durations of follow-up.

***Keywords*---**aortic valve, aortic stenosis, sternotomy, permanent pacemaker, post-operative complications.

Introduction

People who have significant aortic stenosis and symptoms should not have high hopes for their prognosis. Adults who had severe aortic stenosis that produced symptoms were often treated with surgery to replace the aortic valve until very recently. This was the standard of treatment. But the risks of surgery to replace the aortic valve are higher for older patients, those with severe systolic heart failure or coronary artery disease, and those with other conditions like cerebrovascular and peripheral arterial disease, chronic kidney disease, and chronic respiratory dysfunction.

People who are at a high risk of problems from surgery may be candidates for transcatheter aortic valve implantation (TAVI), which is an alternative to surgery. In 2002, Allen Cribier was the first person to successfully implant a TAVI device into a human. He used a horse valve that consisted of a frame that was capable of being enlarged using a balloon. Two of the devices that are now available on the market are the self-expanding Core Valve prosthesis made by Medtronic in Minneapolis, Minnesota, and the balloon-expanding Edwards SAPIEN prosthesis. Both of these prostheses are currently available (Edwards Life sciences, Irvine, California).

Increasingly than 300,000 patients with severe, symptomatic aortic stenosis who were unable to undergo surgery or were deemed to be at too high of a risk have received the procedure known as transcatheter aortic valve implantation (TAVI). TAVI is becoming more widespread. Although this strategy is still in its infancy, there is mounting evidence from observational studies, national and device-specific registries, and randomised clinical trials showing it is effective. (3) It has been shown that TAVI may significantly reduce mortality rates while simultaneously improving both quality of life and functional status. TAVI was initially reserved for patients with the highest surgical risk and those who were unable to undergo surgery due to their age or other health problems; however, in recent years, TAVI has also been used to treat people with low and moderate risks. Transcatheter aortic valve replacement is what TAVI stands for (4).

Patients and Methods

Our study was a look back, a comparison, and an analysis of the cases of forty people over the age of 70 who were diagnosed with severe aortic stenosis. The other half of the patients could have had their aortic valve replaced using either the traditional median sternotomy surgery or the transcatheter aortic valve implantation (TAVI). The investigation was done with the help of the National Heart Institute and a number of other hospitals. In older patients with isolated aortic valve disease who required surgery and satisfied the inclusion criteria, we sought a fair manner to evaluate the procedure and early outcomes (6 months after surgery) of standard sternotomy vs the less invasive TAVI technique. The following happened to everyone in the study group:

Inclusion criteria: Candidates for this procedure include elderly patients (over the age of 70), those with severe symptomatic aortic stenosis (an aortic-valve area of ≤ 0.8cm2 plus a peak velocity of ≥ 4 m/s or a mean valve gradient of ≥ 40mmHg), and those with a high-risk status for surgical aortic-valve replacement, as determined by skilled surgeons. Patients were considered to be at high risk for postoperative complications if they had a history of diseases that raised their probability of dying during the first 30 days after surgery by at least 15%.

Exclusion criteria: Patients with more than one type of heart disease (valvular, congenital, or ischemic), patients who have already had heart surgery, and patients younger than 70 years old. The research was given the go light by the hospital ethics committees at each institution that took part. Left cardiac catheterization, computed tomography, transthoracic or transesophageal echocardiography, and the EuroSCORE II for clinical risk assessment were all used to evaluate the feasibility of TAVI from a technical and anatomical standpoint.

An interdisciplinary team of cardiac surgeons and interventional cardiologists examined each patient's situation and reached a decision on the best course of therapy after reaching a consensus (TAVI vs SAVR). We divided our patients into 2 main groups: If a patient satisfied the requirements for participation in our research, they were sequentially allocated to each group. A) Surgical Aortic Valve Replacement group: This group included 20 patients the aortic valve was replaced in a standard surgical fashion via a median sternotomy, 2 types of valves used, mechanical valve and tissue valve. Transcatheter aortic valve implantation group: This group included 20 patients and 2 types of valves used

CoreValve (self-expandable valve): The CoreValve Evolut R device, manufactured by Medtronic, is now offered in four device sizes: 23, 26, 29, and 34mm. These dimensions make it possible to treat native valves with a circumference of between 56.5 and 94.2 millimetres. Composed of a tricuspid valve harvested from swine pericardial tissue, which is then installed and sutured inside of a self-expanding nitinol frame.

Edwards SAPIEN (balloon expandable valve): The balloon-expandable Sapien family of devices has entered its fourth generation with the advent of Edwards

Lifesciences' Sapien 3 transcatheter heart valve (THV). It is available in four different valve sizes (20, 23, 26, and 29 mm). To reduce paravalvular leakage, the Sapien 3 valve is built with a cobalt and chromium frame, three leaflets composed of bovine pericardial tissue, a polyethylene terephthalate (PET) skirt in the inflow area, and an exterior PET sealing skirt.

To be eligible for TAVI, individuals had to meet the following requirements: Severe and symptomatic aortic stenosis with an echocardiographic mean gradient of more than 40 mmHg or an estimated aortic valve area of less than 1 cm2, as well as one or more of the following conditions: According to EuroSCORE II, there is a high surgical risk, as well as concurrent comorbidities such as porcelain aorta and liver cirrhosis (in Child-Pugh Class B and C).

Inclusion criteria for TAVI Group: Aortic valve area <1cm2 measured by conventional echocar-diography. Mean gradient >40mmHg measured by conventional echocar-diography. Peak gradient >65mmHg measured by conventional echocar-diography. Peak velocity >4m/s measured by conventional echocardiography. Aortic valve annulus diameters from 20mm and to 26 mm measured by multi-slice CT in TAVI Population. Diameter of ascending aorta 3cm above the annulus maximum 45 mm measured by multi-slice CT in TAVI Population. Diameter of iliac and femoral arteries above 7mm measured bymulti-slice CT in TAVI population.

Exclusion criteria for TAVI Group: Femoral, iliac, or aortic disease that makes it hard to catheterize, aortic aneurysm, carotid or vertebral arteries that are blocked more than 70% of the time, coagulopathy,, myocardial infarction or cerebrovascular accidents within one month, tricuspid or mitral valvular insufficiency of sever degree, left ventricular or atrial thrombus, atrial fibrillation, previous aortic valve replacement, sepsis or active endocarditis, hypersensitivity or contraindication to any medication used in the study, previously conduction defects, congenital Aortic valve (Bicuspid, unicuspid, … etc), supra aortic and subaortic stenosis, concomitant procedure on another valve (eg mitral or tricuspid valve repair or replacement, patients who had did transapical TAVI, aortic Annular diameter < 19 mm or > 27mm, prior surgical aortic replacement, prior pacemaker, Prior ICD, prior CRT, concomitant aortic root replacement procedures, aortic regurgitation more than mild degree and all patients were subjected to ethical considerations including written informed consent about the type of the study from all patients or their closest relatives.

All patients were prepared to our study by History and examination: Age, gender, past history and auscultation. Blood tests: Coagulation profile, blood grouping, electrophoretic sedimentation rate, sodium and potassium, C-reactive protein test, liver function test, renal function test (urea and creatinine), and complete blood count. Electrocardiogram (ECG): The monitoring of the ECG was carried out in four stages: First, before the operation, to rule out the existence of any conduction problems and to determine the baseline parameters; second, during the hospitalisation, with continuous monitoring; third, one month after being discharged; and fourth, six months after being released. Chest radiography, Transthoracic echocardiogram: The most important diagnostic tool was an echocardiogram: It is possible to divide aortic stenosis into the following four

categories: Aortic stenosis with a steep gradient. Aortic stenosis characterised by low flow and a low gradient, together with a decreased ejection percentage. Aortic stenosis that has low-flow and low-gradient, yet the ejection fraction is intact. Aortic stenosis characterised by normal blood flow and a modest gradient, with intact ejection fraction Exercise testing was recommended in physically active patients for unmasking symptoms and for risk stratification of asymptomatic patients with severe aortic stenosis, dobutamine stress echocardiography. TOE was used to additional evaluation of concomitant mitral valve abnormalities. MSCT and CMR were used to provide additional information on the dimensions and geometry of the aortic root and ascending aorta and the extent of calcification. Diagnostic workup before trans catheter aortic valve implantation: Candidates for transcatheter aortic valve replacement (TAVR) have undergone cardiac imaging using transthoracic or transesophageal echocardiography, cardiac multidetector computed tomography, and coronary angiogram. Those results were aided by the experiments we ran.

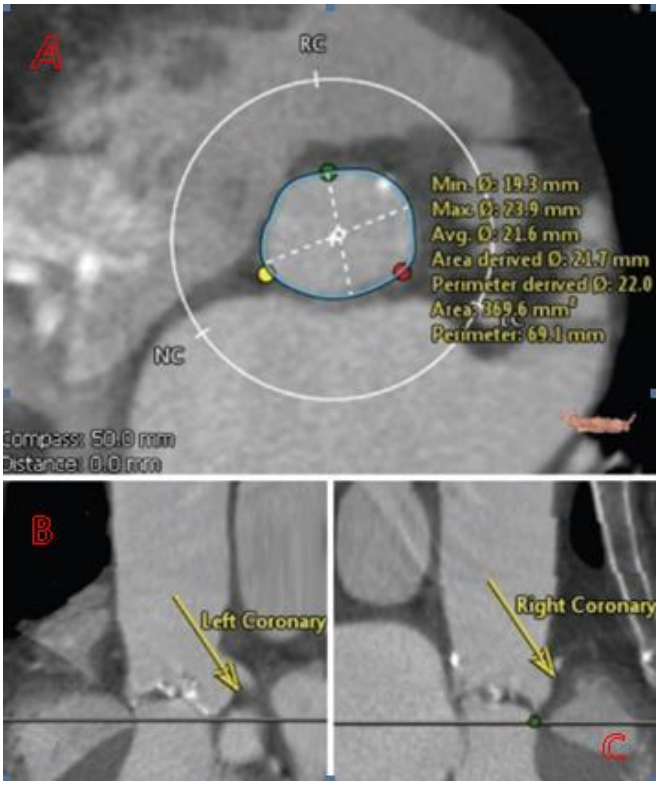

Fig (1): Aortic annulus measurement with multidetector cardiac computed tomography (MDCT). The optimal size for a transcatheter heart valve can be determined using MDCT images to assess the aortic annulus (landing zone) (a). The distance between the aortic annulus and the starting points of the left (B) and right (C) coronary arteries is also measured. To reduce the danger of coronary occlusion during valve deployment, preparations are made using this knowledge.

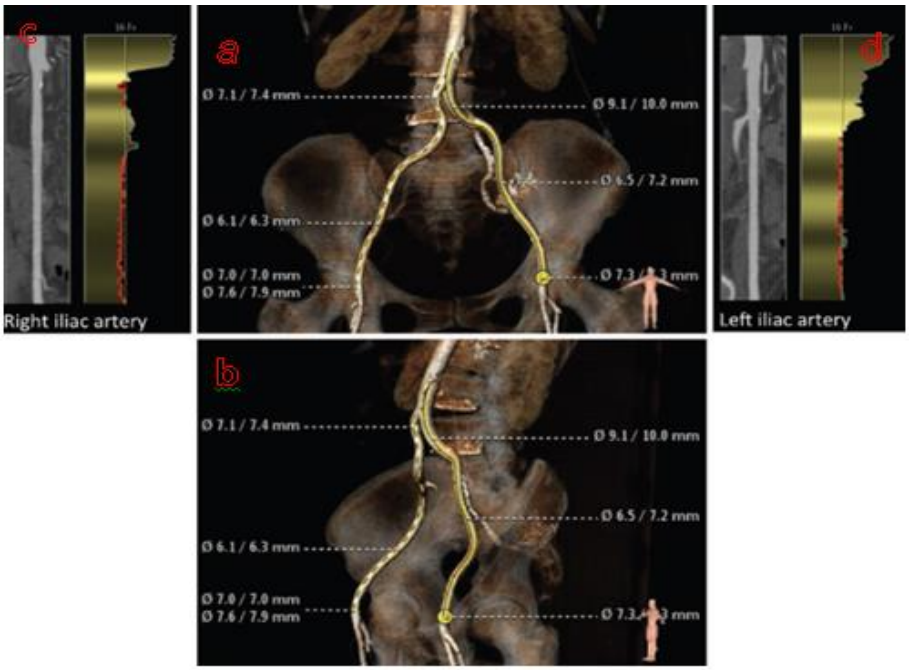

Fig. (2): Transcatheter aortic valve implantation: iliac and femoral artery evaluation (TAVR). Images from a contrast abdominal and pelvic CT scan may be used to measure the diameters of the common iliac and femoral arteries at various levels (a-d), which will indicate whether or not a transfemoral approach is possible for inserting the delivery system sheath. It is possible to assess the degree of calcification and tortuosity of a conduit by the use of 3-D reconstruction (a and b).

Currently, only the Edwards Life Sciences Corporation SAPIEN valve (Irvine, California) and the Medtronic Core Valve are transcatheter aortic valves approved by the FDA in the United States (Minneapolis, Minnesota).

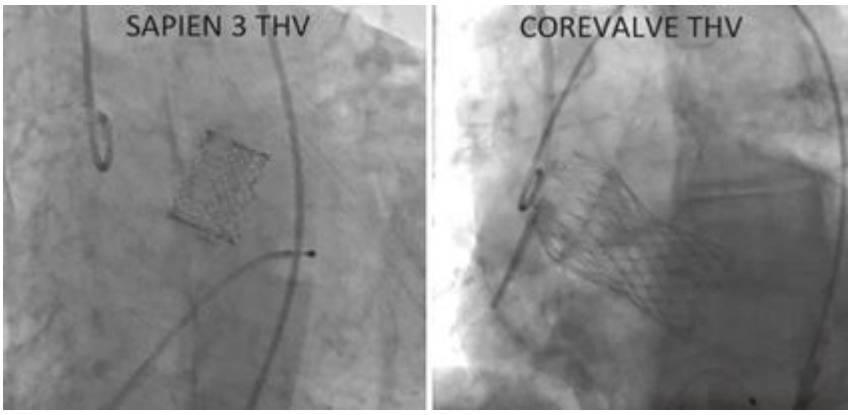

Fig. (3): fluoroscopy of transcatheter cardiac valves that have been implanted (THV). (1a) The SAPIEN THV, and (b) The COREVALVE THV

The access site used and TAVR Technique: Transfemoral access: Every single TAVR patient had treatment using the transfemoral entry technique. The SAPIEN 3 uses an extensible sheath with a 14Fr thread count for valve sizes 20, 23, and 26, while the sheath for the 29 mm valve has a 16Fr thread count. Any size valve can be used with the CoreValve delivery system, which is available in 18Fr. The system's adaptability makes this possible. Coronary angiography: Seimens hybrid machine was used for coronary angiography and TAVI procedure. Coronary angiography was done preoperative for all patients without contraindications. All TAVI procedures were done through femoral approach.

Post-porocedural monitoring: Primary outcomes: (Most important outcomes to be assessed): Aortic regurgitation, renal insufficiency, coronary artery obstruction, vascular complications, annular rupture and bleeding, and the need for blood transfusions are complications. All-cause mortality at 1 year. Stroke and transient ischemic attacks. Conduction system abnormalities, including block requiring a permanent pacemaker implant. Secondary outcome parameters (other outcomes to be assessed): Total hospitals stay time, Morbidities (deep sternal wound infection), cosmetics, satisfaction and cost effectiveness

Statistical analysis: Traditional median sternotomy was used to replace the aortic valves in 20 patients, whereas transcatheter aortic valve implantation was used to replace the aortic valves in the other 20 patients (TAVI). The research instruments that were employed were a checklist and a data compilation form. In this research, both fixed and variable data on the patients' perioperative conditions were compared. Perioperative data were statistically analysed using the statistical package for social science (SPSS), as well as the EPIcalc software programmes. For quantitative data analysis, the arithmetic mean and standard deviation were used in conjunction with hypothesis student's "t" tests. For qualitative data analysis (ordinal, categorical), the chi-square test (x2) (Fisher's Exact Test) was utilised.

Results

This comparative analytical study was performed in a retrospective manner on a total of 40 patients older than 70 years old who were diagnosed with severe aortic stenosis. The patients were randomly assigned to either undergo surgical aortic-valve replacement or transcatheter aortic valve implantation (TAVI). Twenty of the patients underwent aortic valve replacement surgery using a standard median sternotomy approach (AVR). Twenty patients were present for the transcatheter implantation of their aortic valves (TAVI).

There was statistical significant differences between both groups in body surface area, Euro-score, diabetes mellitus and hypertension as $p<0.05$. AVR group had significantly higher mean of BSA (2.02±0.11) than TAVI group (1.87±0.12) ($p<0.001$). Euroscore II was significantly higher among TAVI group (14.12±3.8) than AVR group (2.03±0.83) ($p<0.001$). TAVI group also had significantly higher percentage of patients with diabetes mellitus (65%) and hypertension (95%) than AVR group (25% and 65%) ($p=0.011$ and 0.018, respectively). Table (1)

Table (1): Demographic data of the study groups

	AVR group (n=20)	TAVI group (n=20)	Test value	P-value
Age (Years) Mean±SD	73.9±3.2	73.9±7.7	0.071	0.726[1]
Gender (n,%)				
Female	9(45%)	6(30%)	0.960	0.327[2]
Male	11(55%)	14(70%)		
BMI (kg/m²) Mean±SD	28.9±3.7	29.3±3.2	0.269	0.789[1]
BSA (m²) Mean±SD	2.02±0.11	1.87±0.12	4.355	<0.001*[1]
EUROSCORE II Mean±SD	2.03±0.83	14.12±3.8	13.79	<0.001*[1]
Comorbidities (n,%)				
DM	5(25%)	13(65%)	6.465	0.011*[2]
HTN	13(65%)	19(95%)	5.625	0.018*[3]
Stroke	1(5%)	4(20%)	2.185	0.342[3]
Arrhythmia	2(10%)	3(15%)	0.229	0.633[3]
COPD	3(15%)	5(25%)	0.625	0.429[3]

1. Independent t test; 2. Chi square test; 3. Fisher exact test.
*Statistically significant as p less than0.05.
Abbreviations, BMI; body mass index, BSA; body surface area,
DM; diabetes mellitus, HTN; hypertension,
COPD; Chronic Obstructive Pulmonary Disease, SD; standard deviation

TAVI group had significantly higher mean valve size (27.95±2.91) than AVR group (21.3±1.34) (p<0.001). Table (2)

Table (2): Intraoperative data of the study groups

	AVR group (n=20)	TAVI group (n=20)	Test value	P-value
Valve size Mean±SD	21.3±1.34	27.95±2.91	9.280	<0.001*[1]

Independent t test.
* Statistically significant as p less than0.05.

Among TAVI group, 1(5%) of patients had Edward-SAPIEN valve replacement, while 19(95%) had Evolute R Medtronic valve replacement. Table (3)

Table (3): Type of valve replacement in TAVI group (n-20)

	TAVI group (n=20)
Edward-SAPIEN (n,%)	1(5%)
Evoluter Medtronic (n,%)	19(95%)

In this table, 5patients (25%) in TAVI group had surgical closure and 15(75%) had proglide closure. Table (4)

Table (4): Methods of closure in TAVI group (n=20)

	TAVI group (n=20)
Closure (n,%)	
Proglide	15(75%)
Surgical	5(25%)

This table showed that there was no statistical significant difference between two groups regarding post-operative mortality, stroke, and acute kidney injury, complete heart block requiring ppm, reintervention and bleeding in both groups. TAVI group had 2 patients (10%) with stroke, 3(15%) with AKI, 2(10%) who needed permanent pacemaker and one patient (5%) had bleeding while in AVR group one patients (5%) with stroke, 2(10%) with AKI, 1(5%) who needed permanent pacemaker and 2(10%) had bleeding with statistical insignificant differences. Table (5)

Table (5): Post procedural clinical outcome of the study groups

	AVR group (n=20)	TAVI group (n=20)	Test value	P-value
Mortality (n,%)	0(0%)	0(0%)	0.00	1.00[1]
Stroke (n,%)	1(5%)	2(10%)	1.026	0.311[1]
AKI (n,%)	2(10%)	3(15%)	1.026	0.311[1]
PPM (n,%)	1(5%)	2(10%)	1.026	0.311[1]
Reintervention (n,%)	2(10%)	0(0%)	0.982	0.119[1]
PRBCs Mean±SD	1.55±0.61	0.2±0.52	7.550	<0.001*[3]
Bleeding	2(10%)	1(5%)	1.026	0.311[1]
In-hospital stay (days) Mean±SD	6.83±0.95	3.25±0.55	14.86	<0.001*[3]

1- Chi square test; 2- Fisher exact test; 3- Independent t test
* Statistically significant as p less than0.05.
Abbreviations, AKI; Acute Kidney Injury,
PPM; postoperative permanent pacemaker,
PRBCs; Packed Red Blood Cells

After 30 days, there was no mortality, MI and thrombosis in both groups. TAVI group had 2 patients (10%) with CVA,1(5%) with NYHA≥3, 1(5%) with MR≥II and three patients (15%) needed rehospitalization while in AVR group one patient (5%) with CVA, 2(10%) with NYHA≥3, no patients with MR≥II and two patients (10%) needed rehospitalization with statistical insignificant differences. TAVI group had significantly higher patients with prosthesis regurge 15(75%) than AVR group (0%) (p<0.001). Table (6)

Table (6): Clinical outcome after 30 days of the study groups

	AVR group (n=20)	TAVI group (n=20)	Test value	P-value
Mortality (n,%)	0(0%)	0(0%)	0.00	1.00[1]
CVA (n,%)	1(5%)	2(10%)	1.026	0.311[1]
MI (n,%)	0(0%)	0(0%)	0.00	1.00[1]
Prothesis regurge (n,%)	0(0%)	15(75%)	24.00	<0.001*[2]
NYHA ≥III (n,%)	2(10%)	1(5%)	1.026	0.311[1]
Thrombosis (n,%)	0(0%)	0(0%)	0.00	1.00[1]
MR ≥II (n,%)	0(0%)	1(5%)	1.026	0.311[1]
Re-hospitalization (n,%)	2(10%)	3(15%)	1.026	0.311[1]
PPM (n,%)	1(5%)	2(10%)	1.026	0.311[1]

Fisher exact test; 2. Chi square test
* Statistically significant as p less than0.05.
Abbreviations, CVA; Cerebrovascular accident,
MI; Myocardial Infarction, MR; Mitral Regurgitation,
PPM; postoperative permanent pacemaker

After six months, there was no mortality, MI and thrombosis in both groups. TAVI group had one patient (5%) with CVA, 1(5%) with NYHA≥3, one patient with MR≥II and one patient (5%) needed rehospitalization while in AVR group two patients (10%) with CVA, 1(5%) with NYHA≥3, one patient (5%) with MR≥II and two patients (10%) needed rehospitalization with statistical insignificant differences. TAVI group had significantly higher patients with prosthesis regurge 15(75%) than AVR group (0%) (p<0.001). Table (7)

Table (7): Clinical outcome after six months of the study groups

	AVR group (n=20)	TAVI group (n=20)	Test value	P-value
Mortality (n,%)	0(0%)	0(0%)	0.00	1.00[1]
CVA (n,%)	1(5%)	2(10%)	1.026	0.311[1]
MI (n,%)	0(0%)	0(0%)	0.00	1.00[1]
Prothesis regurge (n,%) No Grade I Grade II	 20(100%) 0(0%) 0(0%)	 5(25%) 13(65%) 2(10%)	 24.00	 <0.001*[1]
NYHA ≥III (n,%)	1(5%)	1(5%)	0.00	1.00[1]
Thrombosis (n,%)	0(0%)	0(0%)	0.00	1.00[1]
MR ≥II (n,%)	0(0%)	1(5%)	1.026	0.311[1]
Re-hospitalization (n,%)	1(5%)	2(10%)	1.026	0.311[1]
PPM (n,%)	1(5%)	2(10%)	1.026	0.311[1]

1- Fisher exact test.
* Statistically significant as p less than0.05.
Abbreviations, CVA; Cerebrovascular accident,
MI; Myocardial Infarction, MR; Mitral Regurgitation,
PPM; postoperative permanent pacemaker

Discussion

In the current research, 15 females and 15 males participated. 45% of the women and 30% of the men underwent SAVR and TAVI procedures, respectively. Nicolo Piazza and colleagues compared the clinical results of SAVR and TAVI in a study of 3,666 patients with symptomatic severe aortic stenosis. The purpose of this research was to see whether there is a correlation between the use of procedure and improved clinical results. Four hundred and five patients undergoing TAVI and four hundred and five patients undergoing SAVR were matched. Similar to the PARTNER US Cohort A study, they observed that TAVI seemed to be more beneficial to female patients than it was to male patients (6). Additionally, females had a reduced rate of success with the SAVR. This may be because women often have a smaller body surface area, smaller chest cavity, smaller (and more calcified) aortic annulus and root, and more severe concentric remodelling than men. However, whereas these traits may be associated with poor outcomes after SAVR, they may not play a role in the case of TAVI (or might only be to a lower degree). Short-term and long-term survival rates following TAVI were greater for women, according to observational studies involving a single arm (7)

In our research, the TAVI group had a considerably smaller mean body surface area than the SAVR group (2.02±0.11 vs. 1.87±0.12), which was statistically significant ($p<0.0001$). The body's surface area was shown to be a predictor of vascular complications in a previous research (8), and it was found that the risk of vascular problems decreased with each unit increase in the body's surface area. It is well known that a patient's death rate following surgery may be predicted using their body mass index (BMI). (9) A meta-analysis conducted in Italy with 10,196 patients participants indicated that a higher BMI is related with considerably lower in-hospital and 30-day early mortality ($P = 0.001$), reduced mid-term and long-term mortality ($P = 0.04$) after TAVR. The authors came to the conclusion that there is undeniably a contradiction between obesity and TAVR treatments. (10)

TAVI group showed substantially higher mean of creatinine than AVR group in the current research (1.03±0.36vs 1.47±0.29) ($p<0.001$). Likewise, (5) showed that serum creatinine was greater among the TAVI than SAVR group (1.21±0.7vs 1.06±0.6). In the present research, mitral regurge was observed in two instances in AVR group (10 percent) and one case in TAVI group (5 percent), but with statistical negligible difference ($p=0.584$). There were statistical negligible variations between two groups in ECHO parameters as $p>0.05$. The mean ejection fraction for the examined group was 56.35 ± 9.35. This was compared with the results of (11) which revealed that the mean of left ventricular ejection fraction of the study group was 62±12.5. This may explain the greater death, MI and HF rates in that research compared with us.

Aortic valve area in the current research was substantially greater in TAVI group (27.95±2.91) than AVR group (21.3±1.34). Similarly, the mean aortic valve areas were 1.6cm2 with TAVR vs 1.5cm2 with SAVR in the PARTNER 1 study(6) (6) Likewise, Mathew Williams et al,(12) discovered that TAVR echocardiographic valve regions were greater (1.49cm2 vs. 1.36cm2; $p < 0.01$), and this difference

was connected with the success of the surgery. Only 3 percent experienced moderate-severe paravalvular leak.

In the present research, neither throughout the six-month follow-up period nor in the post-operative period did any of the study participants suffer mortality. Compared to prior published series, this was significantly different. A previous study (13) of 991 patients with isolated severe aortic stenosis found that the clinical outcomes revealed that: *Twenty patients in the TAVR group of that study died in the postoperative period: six as a result of an emergency reoperation after prosthesis implantation, and four as a result of malpositioning or embolization.

Because of this, hospital mortality was substantially greater in patients who were undergoing a transcatheter therapy, which led researchers to the conclusion that the use of TAVR enhanced the probability of dying by a ratio of two. They are therefore opposed to the purposeful use of TAVR in patients with intermediate-risk aortic stenosis, as the method may lead some patients to have safety issues in such people. Another experiment with 3,666 patients who had severe aortic stenosis and received either TAVI (n = 782) or SAVR (n = 2,884) reported no difference in mortality between the 2 groups at 30 days and 1 year (11) (11) Therefore, further independent randomised controlled trials are eagerly expected to discover the optimum therapeutic technique for this group of patients.

Two TAVI patients (ten percent) and one SAVR patient (five percent) in our investigation both needed a permanent pacemaker. Similar to this, the meta-analysis (14) indicated that SAVR and TAVI both increased the risk of permanent pacemaker implantation. According to the current study, only one TAVI patient (5 percent) and two SAVR patients (10 percent) suffered post-procedural bleeding. This contrasts the results of Siontis et al., who arrived to the conclusion that TAVI was linked with a reduced risk of severe bleeding than SAVR (14). (14). Additionally, we observed that the TAVI group's mean hospital stay was substantially shorter than the AVR group's (6.83±0.95) (3.25±0.55) ($p< 0.001$).

In an earlier investigation by Takejy et al. (11) encompassing 3,815 patients with severe aortic stenosis, it was observed that the TAVI group's hospital stay was shorter than that of the SAVR group. Another study comparing the cost-effectiveness of surgical aortic valve replacement with transcatheter aortic valve implantation in patients with severe aortic stenosis at high surgical risk discovered that the surgical intervention resulted in a longer hospital stay and more time spent in intensive care (15) (15) TAVI and SAVR have been examined in a variety of matched studies using real-world data in terms of short-term (≤30 days), medium-term (≤1 year), and long-term (5 years) clinical findings (6, 11). (6, 11).

The only suitable treatment for some persons with severe, symptomatic AS is TAVR as pharmacological therapy is useless and potentially hazardous in such instances. The majority of patients for whom TAVR is now allowed are those who are inoperable owing of old age and other conditions. the growth of TAVR indications in persons with intermediate risk

Conclusion

This research from three centres in Egypt suggests that the risks of all-cause mortality and post-operative complications are comparable between the groups getting transcatheter aortic valve replacement (TAVI) and conventional surgery for patients with severe aortic stenosis who are older than 70. (SAVR). However, further studies are required, ideally with larger sample sizes and longer periods of follow-up.

Abbreviations

CRT	C Reactive Protein
ECG	Electrocardiogram
MDCT	multidetector computed tomography
PET	polyethylene terephthalate
SPSS	statistical package of social science
TAVI	Transcatheter aortic valve implantation
TAVR	transcatheter aortic valve replacement
TEE	transes-ophageal echocardiography
THV	transcatheter heart valve
TTE	transthoracic echocardiography

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