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Miniaccess Heart Surgery. A Spanish Multicenter Registry

Cirugía cardiaca mediante mínimo acceso. Registro multicéntrico español

To the Editor,

Minimally invasive surgery is performed in many Spanish centers, but few articles give the impression that these techniques are widely used in Spain.[1,2] We present an analysis of the data compiled in a Spanish registry including 15 centers where minimally invasive surgery is performed, mainly for aortic valve replacement and mitral valve repair or replacement (Table 1).

In total, 1245 patients undergoing on-pump surgery were analyzed. Aortic valve replacement was performed using a ministernotomy as the preferred approach in 963 patients (Ao group) and mitral valve replacement, mitral repair, or another procedure was performed using a right anterior minithoracotomy in 282 patients (MT group).

The preoperative variables in both groups are shown in Table 2. The preferred technique in the Ao group was a ministernotomy, used in 945 patients (98%), which consisted of a vertical incision measuring 6 to 12 cm (in 75%, 7–8 cm) in the most cephalad portion of the sternum. Only 2% underwent surgery using a right anterior minithoracotomy approach, described as being as effective as ministernotomy for aortic valve replacement, but technically more demanding.[3]

Table 1
Centers Participating in the Registry, With the Number of Patients Included per Center

Hospital	Ao group	MT group	Total
Complejo Hospitalario de A Coruña	212	0	212
Clínico Universitario Virgen de la Arrixaca, Murcia	167	37	204
Princesa, Madrid	90	25	115
12 de Octubre, Madrid	0	112	112
Virgen de la Victoria, Malaga	64	41	105
Germans Trias i Pujol, Badalona	102	0	102
Puerta de Hierro, Madrid	92	0	92
Sant Pau, Barcelona	70	15	85
Virgen Macarena, Seville	80	0	80
Virgen del Rocío, Seville	20	38	58
Hospital Infanta Cristina, Badajoz	46	5	51
Bellvitge, L'Hospitalet de Llobregat	7	7	14
Hospital de Navarra, Pamplona	8	0	8
Vithas Xanit Internacional, Malaga	4	0	4
Hospital Son Espases, Palma de Mallorca	0	2	2
TOTAL	962	282	1.244

Ao group, valve replacement alone, using a miniaccess; MT group, right anterior minithoracotomy for mitral replacement/repair, tricuspid repair, atrial septal defect closure, or atrial myxoma resection

Patients in the MT group underwent surgical treatment through a right anterior minithoracotomy for the following purposes: mitral valve replacement in 48%, mitral valve repair in 27%, closure of an atrial septal defect in 15%, and myxoma resection in 5%. The tricuspid valve was treated in 10% of patients.

The procedure-related information and data on morbidity and mortality in both groups are shown in Table 2. The revision rates for bleeding were low (Ao, 2.80% and MT, 3.90%). The rate of surgical wound infections was also reduced, with a value of only 1.80% in both groups.

Current technological advances, such as transesophageal echocardiography (regularly used in many types of cardiac procedures in almost all centers performing cardiac surgery), new instrumentation specifically designed for small approaches, and thoracoscopy techniques that provide excellent vision, have allowed the development of miniaccess surgery without increasing operative risk. Aortic and mitral valve surgery using small incisions has several advantages: lower bleeding rates, transfusion requirements, and wound infection rates; fewer respiratory complications; and shorter intensive care unit stay and overall length of hospital stay.[4] The pioneers of the technique in Cleveland analyzed 832 patient pairs[5] and found no significant differences in mortality, which was very low (0.96% in both groups). However, they reported differences in the number of bleeding episodes, transfusions, respiratory complications, and the percentage of patients extubated in the operating room in the ministernotomy group, as well as postoperative pain reductions, shorter hospital stay, and shorter duration of on-pump circulation and aortic clamping. Furthermore, all these advantages imply a significantly lower in-hospital cost expenditure per patient.

Similar advantages have been described for the MT approach, which is associated with reductions in morbidity and mortality, length of hospital stay, and repeat interventions for bleeding, as well as less pain, faster recovery, and, of course, evident aesthetic advantages that are particularly appreciated by younger patients.[6]

In the database analyzed, mortality in the Ao group was lower than would be expected attending to the logistic EuroSCORE and EuroSCORE IIrisk scores: the median [interquartile range] was 1.5% vs 5 [3-7] and 2 [1-3], respectively. Similar results were found in the MT group, which had an observed mortality of 2.20%, whereas the expected mortality was 2.7% [1.5-6.8] for the logistic EuroSCORE and 1.7% [0.8-2.3] for EuroSCORE II.

An analysis of the patients undergoing surgery starting from 2014 showed an even greater reduction in mortality. In the Ao group, the observed mortality was 1.2% whereas the expected mortality was 5.86% [3.40-8.44] according to the logistic EuroSCORE and 1.76% [1.16-2.87] according to EuroSCORE II. There were similar findings in the MT group, where the observed mortality starting from 2014 was 1.6%%, whereas the median risk was 2.08% [0.98-4.38] determined by the logistic EuroSCORE and 1.76% [0.98-2.48] by EuroSCORE II.

Table 2
Preoperative Characteristics and Results Obtained in Patients Treated Using Miniaccess Techniques

	Ao group	MT group
Patients, n	963	282
Age, y	75 [67-80]	60 [49-69]
HT	75	29
Diabetes mellitus	27	9
Dyslipidemia	62	19
COPD	15	7
Peripheral arterial disease	8	0.4
Renal failure	8	3
Previous stroke	5	4
Normal ejection fraction	87	89
Moderately reduced ejection fraction	12	8.2
Severely reduced ejection fraction	1.5	1.1
Logistic EuroSCORE	5 [3-7]	2.7 [1.5-6.8]
EuroSCORE II	2 [1-3]	1.7 [0.8-2.3]
Size of incision, cm	8 [7-9]	7 [6-8.5]
Duration extracorporeal circulation, min	81 ± 31	123 ± 45
Duration aortic clamping, min	61 ± 23	81 ± 42
ICU stay, days	3 ± 5	3 ± 6
Total hospital stay, d	10 ± 10	10 ± 8
Reoperation for bleeding	2.80	3.90
Number packed red blood cell units transfused	1 ± 1.8	0.7 ± 1.4
Postoperative low cardiac output	4	3.9
Perioperative AMI	0.2	1.4
Pulmonary complications	6	5
Postoperative atrial fibrillation	24	9.6
Pacemaker requirement	4.7	2.5
Neurological complications	3.2	2.5
Postoperative renal failure	8.2	3.9
Surgical wound infection	1.8	1.8
Absence of periprosthetic aortic regurgitation	96	
Mild periprosthetic aortic regurgitation	3.7	
Moderate periprosthetic aortic regurgitation	0.6	
Severe periprosthetic aortic regurgitation	0	
Moderate postrepair mitral regurgitation		0.4
Severe postrepair mitral regurgitation		0
Moderate periprosthetic mitral regurgitation		0
Severe periprosthetic mitral regurgitation		0
Total mortality	1.5	2.2

AMI, acute myocardial infarction; Ao group, aortic valve replacement alone, using a miniaccess; COPD, chronic obstructive pulmonary disease; HT, hypertension; ICU, intensive care unit; MT group, right anterior minithoracotomy for mitral replacement/repair, tricuspid repair, atrial septal defect closure, or atrial myxoma resection Values are expressed as the percentage, mean ± standard deviation, or median [interquartile range].

To conclude, these results indicate that miniaccess surgery is safe in Spain. In the coming years, we may see a significant expansion of this practice, which would benefit many patients, allowing faster return to normal activities of daily life, and with a lower cost expenditure for the publically-funded health care system.

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Out-of-working-hours Primary Percutaneous Coronary Intervention in STEACS: Does It Worsen Clinical Outcomes?

Intervención coronaria percutánea primaria en el SCACEST fuera del horario laboral. ¿Tiene peores resultados clínicos?

To the Editor,

There are no studies in Spain investigating the outcome of primary percutaneous interventions (PPCIs) for ST-elevation acute coronary syndrome (STEACS) performed out-of-working-hours (OWH) compared with those carried out during working hours (WH).

A retrospective analysis was performed in a cohort of STEACS patients treated by PPCI in our center between 2006 and 2014 (N = 2941). The characteristics of the sample were