RISK OF ATRIAL FIBRILLATION, BUNDLE BRANCH BLOCK AND COMPLETE AV BLOCK IN ISCHEMIC PATIENTS WITH MINIMALLY INVASIVE VALVE SURGERY

SERGIU BATÂR[1], IOAN MANIȚIU[2], GABRIELA EMINOVICI [3], FLORINA BATÂR[4], VICTOR COSTACHE[5]

[1,2,3,4,5] *"Lucian Blaga" University of Sibiu*

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Abstract: *The influence of atrial fibrillation, complete AV block and new-onset bundle branch block, on the evolution of patients (with or without previous PCI) who undergo minimally invasive valve surgery is studied more and more in current literature. Our series of cases is added to the global data available, suggesting that the ischemic patients with minimally invasive valve surgery are electrically stabile, but there is the need of continuing gathering multicentric, prospective data. Preoperative and postoperative AF frequency does not differ statistically significant in patients with PCI / without PCI. Postoperative complete AV block incidence is not significantly different in patients with aortic or mitral pathology, or in patients with PCI/non-PCI, and does not increase the duration of hospital stay significantly.*

INTRODUCTION

Although minimally invasive video-assisted techniques are proving to be safe and secure, however, still few centres global level are introducing these techniques, because of the costs, the learning curve, and the lack of long-term studies.

Moreover, in today's guidelines, minimally invasive valve surgery still does not have a well-defined place.(1) Especially if ischemic coronary artery disease with indication of revascularization is associated, indications of current guidelines do not strongly promote minimally invasive strategies, due to several factors. First, again, the lack of long-term, multicentre studies, as only in the years 2017, 2018, started the enrolment of patients in some European registries (Secondly, there is the fear of haemorrhagic risk in patients with anti-aggregation treatment, who will be subjected to valvular interventions, thus continuing the preference for revascularization with aortocoronarian bypass, due to the supposed haemorrhagic risk, or early intrastent restenosis, when there is limited use of dual antiplatelet therapy. Currently, information is available in the literature only on unicentric series of cases.

The electrical stability of these patients has also limited studies, and there is a lack in multicentric prospective data.

Our series of cases is added to the global data available, suggesting that the ischemic patients with minimally invasive valve surgery are electrically stabile, but there is the need of continuing gathering multicentric, prospective data.

MATERIALS AND METHODS

In the European Hospital Polisano Sibiu, after obtaining the approval of the Ethical Council, for gathering the data of patients, in compliance with the rules in force, for an observational study, in which data are collected from the electronic files, retrospective data were collected, in 2018 and 2019, in an observational, noninterventional study, for patients with minimally invasive cardiac valve surgery in 2018 and the parameters under discussion, but these were filled out in computer systems prospectively.

The types of procedures are: biological or mechanical mitral valve replacement; mitral valve repair; biological or mechanical aortic valve replacement.

An Excel format database was built, which included the following: type of procedure, clamping duration and cardiopulmonary bypass duration, need for prolonged ventilation (> 24h), type of associated procedures (including implantation of pacemakers), ischemic status was filled out as well as PCI/ non-PCI; the number of days of hospitalization was filled out. Those with pre and postoperative atrial fibrillation were identified, those with complete atrioventricular block installation, of the major left or right branch block, and all other postoperative electrical disorders were noted. There were 93 cases, of which 16 preoperatively underwent PCI. For statistical calculations, the subgroups were formed: minimally invasive aortic surgery (MIAS), minimally invasive mitral surgery (MIMS), and percutaneous coronary intervention (PCI) stenting procedure before valvular surgery, and NON-PCI.

Statistical analysis was performed using SPSS v.20 and Microsoft Excel programs from the Microsoft Office 2016 package. Fisher's Exact Test 2-sided was used to compare dichotomous variables, with the definition of statistically significant correlation if $p < 0.05$, and for the study and correlation of mean times (in days for the average length of hospitalization), the ANOVA test was used, with $p < 0.05$ defined as statistically significant.

RESULTS

There were 19 cases of preoperative atrial fibrillation, their number increasing to 49 postoperatively, without statistically correlating significantly the ischemic preoperative PCI status with the presence of preoperative (p=0.734) or postoperative AF (p=0.423).

But if we try to correlate the type of procedure, FiA is statistically significantly more frequent in those with mitral pathology (p=0.05), without statistically significantly increasing the chance of developing postoperative FiA depending on the valvular pathology (p=0.680).

There were 10 cases of complete AV block, without correlating, the status of the PCI patients with valvular intervention, with the incidence of complete AV block (p = 0.684 Test Fischer 2 sided).

[1]Corresponding author: Sergiu Batâr, Str Someşului, Nr 19, Sibiu, Sibiu, România, E-mail: sergiu.batar@ulbsibiu.ro, Phone: +40740 069575
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At MIMS vs. MIAS, there are no statistically significant differences in the installation of complete AV block (p=0.739). Incidence of major branch block in patients with PCI/without PCI did not differ significantly (p=0.368).

The incidence of the major branch block, depending on the valve operated, did not differ significantly (p=0.091).

The hospitalization duration did not differ significantly with the installation of complete AV block (p=0.351).

DISCUSSIONS

Mihos CG (2013) publishes a retrospective study, on 571 cases, with valvular pathology with operative indication, of which 413 with minimally invasive approach and 158 with median sternotomy, trying to determine if the minimally invasive approach reduces the incidence of postoperative atrial fibrillation (AF). The use of resources was compared by the length of hospitalization in the Intensive Care Unit (ICU) and the total length of hospitalization. In that study there were no significant differences in the demographic characteristics of the two groups. The incidence of postoperative AF was 25% (in the group with minimally invasive approach). 37%, in the classical approach group (3).

Murtuza et. al (2008) publishes a meta-analysis with the key question whether the minimally invasive aortic valve approach reduces the incidence of postoperative FiA, which is one of the most important postoperative complications, with a significant impact on morbidity.(4)

Regarding the hospitalization times, in our study no statistically significant differences were found in the average lengths of hospitalization, according to the prevalence of AF. In the group of patients in our study, there are no significant differences in the installation of AF, depending on the presence of PCI with prior stenting, the data being in accordance with the literature.(3,4,6)

In our case series, we find a statistically significantly higher frequency of preoperative AF in patients with mitral valve disease, probably due to the natural evolution of mitral disease, without determining a statistically significant difference in the incidence of postoperative AF in patients with MIMS compared with MIAS, these data being in accordance with the data from the literature.(3,4,6,7)

The prevalence of complete AV block, or the prevalence of the newly onset bundle branch block, did not differ significantly in ischemic patients compared to the non-ischemic ones; the prevalence of complete AV block, or the prevalence of newly onset bundle branch block did not differ significantly depending on the type of valve operated, these data being in accordance with some data from the literature (4,5), although the procedural complexity of the minimally invasive mitral valve surgery is higher.(7,8,9)

The frequency and implications of bundle branch block in our study is consistent with data gathered in literature.(10) The hospitalization duration did not differ significantly with the installation of complete AV block, which is interesting, compared to data published in the literature.(8,9)

The main limitations of this study are derived from the fact that it is a monocentric study, on a number of 93 cases, and it is necessary to continue collecting data, to extend the number of patients, and the duration of the follow-up.

CONCLUSIONS

Preoperative and postoperative AF frequency does not differ statistically significant in patients with PCI/without PCI. It is statistically significantly more common for preoperative AF in patients with mitral surgical pathology, without significantly altering the incidence of postoperative AF depending on the type of valve operated.

Postoperative complete AV block incidence is not significantly different in patients with aortic or mitral pathology, or in patients with PCI/nonPCI, and does not increase the duration of hospital stay significantly. The newly installed bundle branch block is not correlated significantly with the ischemic status or with the type of valve operated.

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