

Transcatheter aortic valve implantation during the COVID-19 pandemic: clinical expert opinion and consensus statement for Asia.

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Abstract

Objectives The impact of the COVID 19 pandemic on the treatment of patient with aortic valve stenosis is unknown and there is uncertainty on the optimal strategies in managing these patients. **Methods** This study is supported and endorsed by the Asia Pacific Society of Interventional Cardiology. Due to the inability to have face to face discussions during the pandemic, an online survey was performed by inviting key opinion leaders (cardiac surgeon/interventional cardiologist/echocardiologist) in the field of transcatheter aortic valve implantation (TAVI) in Asia to participate. The answers to a series of questions pertaining to the impact of COVID-19 on TAVI were collected and analyzed. These led subsequently to an expert consensus recommendations on the conduct of TAVI during the pandemic **Results** The COVID 19 pandemic had resulted in a 25% (10-80) reduction of case volume and 53% of operators required triaging to manage their patients with severe aortic stenosis. The two most important parameters used to triage were symptoms and valve area. Periprocedural changes included the introduction of teleconsultation, pre-procedure COVID 19 testing, optimization of pre-tests and catheterization laboratory set up. In addition, length of stay was reduced from a mean of 4.4 to 4 days. **Conclusion** The COVID-19 pandemic has impacted on the delivery of TAVI services to patients in Asia. This expert recommendations on best practices may be a useful to guide to help TAVI teams during this period until a COVID 19 vaccine becomes widely available

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Introduction

The current COVID-19 pandemic has had significant impact on the healthcare delivery. There is a constant balance needed to rationalize limited resources while minimizing the risk of delaying important interventional procedures. The specific impact of COVID-19 on patients with aortic stenosis is not well studied. It is known however, that these patients, who are older and have pre-existing cardiac disease, are especially vulnerable¹. In addition, symptomatic severe aortic stenosis is a time sensitive disease and increase in wait times can potentially increase mortality². In Asia, the pandemic is at varying stages in different geographies (e.g. China, Hong Kong, Taiwan and Vietnam are seeing very few new cases, while several others are in the middle of the pandemic at the time of writing). While there has been prior guidance for the treatment of transcatheter aortic valve implantation (TAVI) from other cardiac interventional societies^{3,4}, It is unclear how the TAVI situation is in Asia. This letter describes the collective experience of how TAVI management has changed in Asia during this time and provides expert consensus recommendations on the role of transcatheter aortic valve implantation (TAVI) during the COVID-19 pandemic.

Methods and Results

This study was supported and endorsed by the Asia Pacific Society of Interventional Cardiology. Due to the pandemic and an inability to meet face to face, an online survey was sent out to 15 Asian TAVI key opinion leaders in Asia via email correspondence. These included cardiac surgeon, interventional cardiologist, echocardiologist. Table 1 shows the survey questions and the results of the survey. *Response rate was 100% except for questions 13 and 14 where response was 92% (See table 1).* The results were tabulated and further discussion followed online to produce the subsequent expert consensus recommendations.

Summary of key findings:

The online survey had shown a significant reduction in TAVI volumes during the pandemic by 25% (10-80). There was also a need for physicians to triage patients based on disease severity (seen in 53% all Asian centres). The 2 most important criteria deemed to influence triage were the presence of symptoms as well as the anatomical severity of the valve. Pre, peri procedure and post procedural changes were also

described. The use of teleconsultation, pre-procedural testing for COVID-19 as well as a tendency to reduce or minimize pre TAVI tests were adopted by some of the centres. Similarly, changes in the site of where TAVI is performed as well as modifications done in the catheterization laboratory were described. There were also reductions in the length of stay (4.4 to 4 days) of patients following the TAVI procedure during the pandemic.

Asian TAVI Key Opinion Leaders recommendations for the management of patients with severe aortic valve stenosis during COVID-19 pandemic.

Pre TAVI work up and evaluation

Minimize unnecessary testing during work up (keep visits minimal where possible without affecting safety of the patient)

Consider teleconsultation where available

Consider COVID-19 test before TAVI (type would vary according to available tests on site)

Timing of TAVI during COVID

Urgent TAVI (done inpatient or within days – 2 weeks)

1. Critical AS (defined as AVA<0.6cm²) with symptoms
2. Severe AS plus
 - NYHA III-IV
 - Labile symptoms (including chest pain, dizziness)
 - Not responding to medical treatment
 - Recurrent heart failure
 - Cardiogenic shock

Semi urgent TAVI (weeks to 1 month)

Severe AS (0.6-0.8 cm²) with

- NYHA II and/or
- LVEF<50%

Elective TAVI (1-3 months) (very close phone call/telehealth review weekly if deferred)

Severe AS (0.8-1cm²)

- NYHA I
- Normal LVEF

Asymptomatic with AVA < 0.75cm², transaortic gradient of >50mmHg or peak velocity >=4.5m/s

TAVI procedure

Consider negative pressure CCL room (catheterization/hybrid operating room) if available

Minimize unnecessary personnel in room (eg fellows/students/visitors)

Local anesthesia and monitored sedation if possible

Adequate personal protective equipment if suspected/confirmed COVID-19 patients

Terminal disinfection after TAVI procedure for suspected/confirmed COVID-19 patients

Consider pre-intubation in patients with high risk of heart failure (in negative pressure room prior to arrival in catheterization laboratory)

Maintain high TAVI standards

Post procedure

Streamline post-TAVI procedures to expedite safe early discharge if possible (e.g. early mobilization)

Teleconsult post discharge where available

Post lockdown measures

There is likely to be a protracted period of close vigilance required before the current COVID pandemic resolves or when the presence of an effective vaccine becomes widely available. The strict lockdown measures are already being gradually lifted in several Asian countries. However, requirements of social distancing as well as the above measures recommended are likely to be relevant. Increased number of pre-testing of patients with aortic stenosis for pre-symptomatic or asymptomatic COVID 19 infections prior to intervention may further mitigate the risks to healthcare workers. When the number of COVID-19 infections are kept under control and when hospital and intensive care resources become less overwhelmed, a cautious approach to increase the capacity for the number of patients treated should be considered in tandem with guidance from local public health experts.

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Table for COVID 19 survey.docx available at <https://authorea.com/users/324311/articles/452568-transcatheter-aortic-valve-implantation-during-the-covid-19-pandemic-clinical-expert-opinion-and-consensus-statement-for-asia>