

EFFICACY OF INTRACARDIAC ECHOCARDIOGRAPHY DURING TRANSCATHETER AORTIC VALVE IMPLANTATION: PREPARATION TO THE LOCAL ANESTHESIA ERA IN JAPAN

Akihisa Kataoka, Miho Mitsui, Yusuke Watanabe, Tadanori Harada, Yugo Nara, Fukuko Nagura, Hideyuki Kawashima, Hirofumi Hioki, Makoto Nakashima, Kumiko Konno, Naoyuki Yokoyama, Tomoki Shimokawa, Ken Kozuma

Division of Cardiology, Department of Medicine, Teikyo University, Tokyo, Japan

BACKGROUND

Although the use of local anesthesia during a transcatheter aortic valve implantation (TAVI) procedure has become widespread, general anesthesia with continuous transesophageal echocardiography (TEE) monitoring is still mainstream in Japan. Some Japanese physicians are concerned about the safety of the local anesthesia TAVI procedure without TEE monitoring. Intracardiac echocardiography (ICE) is a potential alternative to TEE during local anesthesia.

OBJECTIVE

The aim of this study was to compare the equivalence of monitoring ability between ICE and TEE during the TAVI procedure.

METHODS

We prospectively conducted a co-instantaneous ICE and TEE monitoring in 16 patients who underwent general anesthesia TAVI with a SAPIEN XT valve (n = 11) and Core Valve (n = 5). Complications during the procedure, basal aortic root morphologies (annulus, sinus of Valsalva, sinus tubular junction (STJ), ascending aorta, and aortic valve area, paravalvular leakage (PVL) area after transcatheter heart valve deployment, and baseline pericardial effusion (PE) were evaluated and assessed by using a one-sample proportion test with a 70% null hypothesis, interrater agreement, Pearson correlation, and Bland-Altman analysis, respectively. All p values of <0.05 were considered significant.

RESULTS

One cardiac tamponade as a major complication was detected only in TEE, not in ICE. By using both modalities, no complications were found in the other 15 cases. Thus, the interrater agreement was >81% (p = 0.038). The agreement for identifying baseline PE was not significant (p = 0.663, κ = 0.256). The correlation coefficients and bias (mean \pm 1.96 SD, vs TEE) between ICE and TEE in the aortic valve annulus, sinus of Valsalva, STJ, and aortic valve and PVL area were 0.84 (p < 0.001, -0.1 ± 2.7 mm), 0.82 (p < 0.001, -0.6 ± 4.4 mm), 0.75 (p < 0.01, -0.6 ± 3.3 mm), 0.75 (p < 0.01, 0.02 ± 0.20 cm²), and 0.53 (p = 0.067, -0.07 ± 0.20 cm²), respectively.

CONCLUSION

ICE during TAVI can provide accurate measurements for basal aortic root morphologies. However, evaluation of PVL and PE may be a concern. Further investigation with a larger cohort is needed for comparison of complications.