Clinical cardiologists have become less and less interested in coronary artery spasm and coronary spastic angina (CSA), but we wonder if CSA has gone away? In the clinical cardiac catheterization laboratory, cardiologists, especially the younger generation, may now be more interested in patients who require percutaneous coronary intervention (PCI) and not want to investigate coronary spasm. Cardiologists routinely performed coronary angiography after the administration of nitrates to find organic stenosis, but now the majority may consider pharmacological spasm provocation tests, such as acetylcholine (ACh) and ergonovine, too cumbersome, troublesome and time-consuming to perform in amongst their busy invasive–interventional duties and think that writing a prescription for a calcium antagonist is enough for patients with possible coronary spasm! Because of the widespread use of long-acting calcium antagonists and nitrates, spontaneous coronary spasm is rarely encountered in the clinical field and, moreover, with the decrease in performing provocation tests it is rarely seen in the cardiac catheterization laboratory. And so there is the belief that coronary spasm has disappeared as a clinical entity. Under these circumstances, fewer cardiologists will be familiar with coronary spasm in the future, even in Japan. Coronary spasm occurs in various cardiac conditions, such as acute coronary syndrome, ventricular tachycardia and fibrillation, sudden cardiac death, syncope, silent ischemia and other miscellaneous disorders. Japanese patients have had spasm provoked at a rate 3-fold higher than in Caucasian patients and in our data also, coronary spasm was induced in approximately 50% of patients with ischemic heart disease. In Asian patients, coronary spasm is an important key to diagnosing possible ischemic heart disease.

The widespread use of automatic electrical defibrillators (AED) saves patients who experience an out-of-hospital cardiac arrest (OHCA), and there are some survivors of ventricular fibrillation and cardiopulmonary arrest in Japan.

Takagi et al focus on 12 survivors of ventricular fibrillation in whom they performed emergency coronary angiography and the spasm provocation test with ACh after full recovery from the OHCA event, and an electrophysiological study (EPS) after the ACh spasm provocation test. After the dual induction study, they implanted a cardioverter defibrillator (ICD) if necessary. Theoretically, ICD implantation is not appropriate in OHCA survivors with coronary spasm alone and a negative EPS, although patients with an OHCA complicated by CSA and Brugada syndrome have a good indication. Takagi et al performed ICD implantation in 3 OHCA survivors with coronary spasm alone and negative EPS to avoid a recurrent attack.

However, it is difficult to cure coronary spasm completely when it occurs incidentally despite the patient regularly taking medication. ICD implantation is controversial in patients with coronary spasm that caused an OHCA, but we believe ICD implantation for patients with CSA will be seen as an appropriate decision when the long-term outcome of Takagi’s study is followed up.

Some have reported coronary stenting of a no-flow limiting lesion that had spasm provoked by pharmacologic agents in CSA patients with OHCA, and some report ICD implantation in patients with coronary spasm and OHCA, without performing an EPS, because ventricular tachycardia was induced during spasm provocation tests; however, none of those studies systematically performed dual induction tests. Takagi et al are the first to report the usefulness of dual induction tests in consecutive OHCA survivors and none of the patients in their series had stent implantation in the no-flow limiting coronary artery.

A comparison of the incidence of spasm in Japanese and Caucasian OHCA patients without structural heart disease is shown in Table. According to Takagi et al, coronary spasm

![Table: Comparison of Coronary Artery Spasm in Patients With OHCA and No Structural Heart Disease](image)

*P<0.01 vs (1)+(2).

OHCA, out-of-hospital cardiac arrest.
occurred in 83.3% of OHCA patients. Igarashi et al also reported coronary spasm in 70% of cases of aborted sudden cardiac death without underlying heart disease. In contrast to the Japanese data, the incidence of coronary spasm in Caucasian OHCA patients is significantly lower (77.3% vs 28.3%, P<0.01) and approximately one-third, which may be related to racial differences, as already reported, but the rate of coronary artery spasm as a cause of sudden cardiac arrest is difficult to determine. We hope to investigate OHCA survivors without structural heart disease from the whole of Japan in a prospective multicenter study as the chief foundation of the Coronary Spasm Association.

In emergency situations, there are some patients who cannot be saved by only performing PCI, and when investigating coronary spasm in the cardiac catheterization laboratory, we can rescue some cases of “Pokkuri disease” from the second attack. It is necessary for every clinician in Japan to be alert to coronary spasm.

In conclusion, the dual induction test is a most useful strategy in the management of patients with OHCA without structural heart disease, not only in Asian countries, but also worldwide, and should be incorporated in the relevant guidelines.

References