# Coronary artery spasm; clinical manifestations and angiographic correlates

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Cardiologists commonly encounter patients with angina-like chest pain and normal or nearly normal coronary arteriograms. Coronary artery spasm has been implicated as the cause of chest pain in less than 10% of such patients. The problem for the cardiologists, therefore, is to determine which patient with angina-like chest pain and normal coronary arteriograms is experiencing coronary artery spasm. The diagnosis of coronary artery spasm can be strongly suspected because of the distinctive features that are usually found in such patients. Specific angiographic maneuvers, including the use of provocative tests for coronary artery spasm, are usually diagnostic in such patients.

The clinical presentation of patients who experience symptomatic coronary artery spasm is usually different from patients who suffer typical exertional angina. We analyzed the clinical presentation of 30 patients with symptomatic coronary artery spasm who had no fixed severe (more than 50%) coronary obstructions. All had positive provocative tests for coronary artery spasm. Our results are summarized in *Table 1*.

In the absence of angiographic demonstration of coronary artery spasm, the diagnosis is only presumptive. For this reason, we developed a provocative test for coronary artery spasm using ergonov-

**Table 1.** Symptomatic coronary spasm

| | Percent |
|---|---|
| Clinical findings suggestive of symptomatic coronary spasm and present in most patients | |
| Predominant chest pain at rest | 100 |
| Transient ischemic electrocardiographic changes during all attacks of chest pain | 93 |
| Chest pain typical in quality and location for angina | 93 |
| Prinzmetal's angina | 77 |
| Recurrent nocturnal chest pain | 80 |
| Clinical findings suggestive of symptomatic coronary spasm, although present in less than 50% of patients | |
| Major arrhythmias with chest pain at rest | 47 |
| Other vasospastic disease | 37 |
| Marked drop in blood pressure during chest pain | 25 |
| Syncope with chest pain | 33 |
| Positive stress test with S-T segment elevation | 8 |
| Chest pain precipitated by ergot derivatives | 10 |
| Clinical findings usually not associated with symptomatic coronary spasm | |
| Exertional chest pain only, and no rest pain | |
| Normal electrocardiogram during chest pain | |
| Isolated myocardial infarction without Prinzmetal's angina | |
| Tachycardia and rise in blood pressure during chest pain | |

**Table 2.** Results of tests with ergovine maleate for coronary artery spasm

| Ergonovine response | Group A (Prinzmetal's angina) | Group B (control patients) | Group C (angina-like chest pain) | Group D (myocardial infarction) |
|---|---|---|---|---|
| Positive | 10 | 0 | 3 | 0 |
| Negative | 1 | 15 | 63 | 6 |
| Total | 11 | 15 | 66 | 6 |
| p value* | <0.02 | <0.001 | <0.001 | <0.05 |

* p (probability) value calculated with chi square test.

ine maleate. We found that this drug has a high degree of sensitivity and specificity in reproducing coronary artery spasm. The results of our initial study are listed in *Table 2.*

The incidence of symptomatic coronary artery spasm in the absence of fixed severe coronary obstructions is low, occurring in approximately one of 500 to 1000 patients studied for chest pain at the Cleveland Clinic. The incidence of coronary artery spasm in patients with typical angina and fixed severe obstructions is still under investigation. There is some evidence that it may play a role in patients with myocardial infarction.