

"PAINLESS" MYOCARDIAL INFARCTION

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TO WILLIAM HEBERDEN⁴ should go the credit for recognition of the symptoms of disease of the coronary arteries. In 1818 he wrote:

"They who are afflicted with it are seized while they are walking (more especially if it be up hill and soon after eating) with a painful and most disagreeable sensation of the breast, which seems as though it would extinguish life if it were to increase or continue; but the moment they stand still, all this uneasiness vanishes. The pain is sometimes situated in the upper part, sometimes in the middle, and sometimes at the bottom of the os sterni, and often more inclined to the left than to the right side. It likewise very frequently extends from the breast to the left arm."

Although 132 years have passed since this was written, this characteristic pain is still the most important and often the only clue one has to the presence of coronary artery disease and the threat of sudden death that it carries.

It wasn't, however, until twenty years ago that our present concept of the mechanism of pain in coronary disease was placed on a sound basis by the work of Keefer and Resnik.⁵ This was called the anoxemia theory. Painless myocardial infarction had been described prior to this time, and these authors proposed the following as an explanation: Pain can be absent in myocardial infarction either because the subject is relatively insensitive to pain or because the infarction occurs so slowly, only a few fibers being injured at a time, that the resulting sensation is insufficient to reach the level of consciousness.

The frequency with which painless myocardial infarction occurs varies considerably if one is to believe all that is written on the subject in recent years in medical literature. Boyd and Werblow,² in 1937, reported one-third of 125 consecutive cases of "coronary thrombosis" occurred without pain. (This paper was typical of many in which a careful distinction between coronary thrombosis and myocardial infarction was not made, the terms being frequently used interchangeably.) In marked contrast to this, was Kennedy's series

of 200 autopsied cases of myocardial infarction from the records of the Peter Bent Brigham Hospital.⁶ One hundred forty-two were classified as recent, and forty-eight of this group were discarded because an adequate history was not obtained at the time of the infarct. Of the ninety-four remaining, 92 per cent had definite pain, 4 per cent had discomfort only (usually a pressure sensation), and 4 per cent had no pain or discomfort.

A recent report by Behrmann, Hipp, and Heyer³ supports the conclusion of Kennedy that painless myocardial infarction is relatively rare except under circumstances in which the reason for failure to elicit a history of pain is quite obvious.

A review of 200 consecutive cases of recent myocardial infarction seen from July 1, 1947 to July 1, 1950, at the Minneapolis Veterans Administration Hospital has been carried out with special effort to study the type of pain and the circumstances under which no history of pain at the time of infarction could be elicited.

Many of the patients were not admitted until several weeks after symptoms began. Despite this, an accurate description of the pain could still be elicited as the experience was indelibly impressed on the patient's consciousness in most instances. Included in the study were all cases in which a diagnosis of recent myocardial infarction was established either at autopsy or beyond reasonable doubt by serial electrocardiograms and other clinical criteria. The age distribution is shown in Table I.

TABLE I

Age	Cases	Per Cent
Under 35	5	2.5
36 to 45	16	8.0
46 to 55	80	40.0
56 to 65	80	40.0
66 to 75	17	8.5
Over 76	2	1.0

Of the 200 cases, 184 (92 per cent) had typical angina, usually described as "crushing," "pressing," "burning," or "severe aching" substernal or precordial pain. The adjective "sharp" was seldom used. In 120 cases, the pain radiated to one

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or both arms or into the neck, and in the rest of this group no radiation was described. Radiation into the lower extremities was not encountered.

In nine cases the pain was not typical, but in all of these but one, the symptoms were suggestive enough of myocardial infarction that the diagnosis was suspected immediately by the admitting physician. The exception was a man with substernal pain which was described as being made worse by his lying on his back, and a mistaken diagnosis of hiatus hernia was made in the admitting room. Others of this "atypical" pain group are listed below:

- "numbness of the left hand accompanied by weakness and dizziness"
- "severe indigestion and shortness of breath"
- "severe sense of fullness in the epigastrium with shortness of breath"
- "aching in the throat with radiation down the left arm"
- "severe pain in the left arm radiating down the forearm"
- "left chest pain described as pleuritic associated with epigastric pressure and vomiting"
- "soreness in the left chest on the day after pneumothorax was initiated"

In the remaining seven cases, there was no mention of pain at the time of the infarct in the admission history. The reason for "no pain" in each of these instances becomes obvious with inspection of Table II in which they are summarized.

TABLE II

Comatose	1
Moribund	1
Under anesthesia	1
Aphasic	3
In shock	1
Total	7

Comment

Of course, it cannot be concluded from this series that acute myocardial infarction is never painless in an otherwise healthy individual. One, however, can safely say that it must be quite an unusual occurrence; so unusual in fact, that one need not think too seriously of myocardial infarction in a patient who develops congestive heart failure or an arrhythmia, for instance, unless a history of pain or a suggestive pain equivalent can be elicited. This is obviously not true, however, under circumstances in which pain either could not be appreciated (comatose, under anesthesia, et cetera), or could not be expressed (aphasic) by the patient.

That old myocardial infarcts are found at autopsy in patients in whose record no pain has ever been described, is a well-known fact and not at all uncommon. This is best explained by the two factors mentioned by Keefer and Resnik in the report already referred to; namely, the rate with which the infarction takes place, and the patient's threshold for pain. To have an infarct of sufficient size to be recognized clinically occur without exceeding the threshold of pain must be quite rare, unless that threshold has been markedly elevated through the effect of some co-existing pathological state. In this series it did not occur.

Summary

1. Two hundred cases of recent myocardial infarction seen at the Minneapolis Veterans Administration Hospital were reviewed with special reference to the type of pain described when present and the circumstances under which no mention of pain was found in the record.
2. Of these, 92 per cent had classical angina.
3. 4.5 per cent had unusual pain, but still suggestive enough of angina to make myocardial infarction the admitting diagnosis in all but one case.
4. 3.5 per cent of the records contained no mention of pain at the time of infarct, but in all of these instances the failure to elicit a history of pain could be easily accounted for by an associated pathological condition which either elevated the patient's pain threshold or rendered him incapable of manifesting the pain had it existed, or both.

References

1. Behrmann, James H., Hipp, Harold R., and Heyer, Howard E.: Pain Patterns in Acute Myocardial Infarction. *Am. J. Med.*, 9:156, 1950.
2. Boyd, L. J., and Werblow, S.: Coronary Thrombosis without Pain. *Am. J. M. Sc.*, 194:814, 1937.
3. Gorham, L. W., and Martin, S. J.: Coronary Occlusion with and without Pain. *Arch. Int. Med.*, 112:821, 1938.
4. Heberden, Wm.: Quoted in *Classic Descriptions of Disease* by R. H. Major, Springfield, Ill.: Charles C Thomas, 1932.
5. Keefer, Chester, and Resnik, William: Angina Pectoris. *Arch. Int. Med.*, 41:769, 1928.
6. Kennedy, J. Allen: Incidence of Myocardial Infarction without Pain in 200 Autopsied Cases. *Am. Heart J.*, 14:703, 1937.
7. Stroud, Wm. D., and Wagner, Jos. A.: Silent Coronary Occlusion. *Ann. Int. Med.*, 15:25, (July) 1941.