

# HISTOPATHOLOGIC CORONARY PATTERNS IN PEOPLE WITH ACUTE MYOCARDIAL INFARCTION AND PTCA

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## ABSTRACT

We studied coronary artery specimens histologically in 96 patients who died from acute myocardial infarction (AMI), to assess those who could benefit from in-hospital percutaneous transluminal coronary angioplasty (PTCA).

For the left anterior descending artery, old stenoses within 1 cm from its origin in 80 cases (83.3%), coronary narrowing over 90% and occlusive thrombi in 40 observations (41.6%) were seen. Left main artery showed proximal stenoses with an occlusive thrombus in 4 cases (41.6%). Left circumflex artery had stenoses within 1 cm from its origin in 32 cases (33.3%), with an occlusive thrombus 6 times (6.25%) and coronary narrowing 75%. Right coronary artery showed stenoses in the proximal and midportion respectively in 20 (20.8%) and 36 cases (37.5%), with 26 occlusive thrombi (27%) and coronary narrowing 85%. Four cases (4.16%) had minimal coronary changes. The patients who had one, two and three vessel disease were 32 (33.3%), 32 (33.3%) and 28 times (29.16%) respectively.

Only one-third of patients could benefit from PTCA.

**Keywords:** Coronary lesions, myocardial infarction, PTCA

## INTRODUCTION

Over the past two decades, PTCA has emerged as an effective alternative to coronary artery bypass surgery (CABS) for many patients with coronary artery disease<sup>(1,2)</sup>. This method, as compared with CABS, reduced morbidity, mortality and expense even if the improvement in circulation may not last as long as that obtained by CABS<sup>(3)</sup>. In addition, some reports emphasize the lower invasiveness of PTCA and extend its use to patients with acute myocardial infarction<sup>(4)</sup>. However, there are as yet no large multi-centre double-blinded randomised trials that are completed currently.

Ideal indication of PTCA includes proximal recent coronary stenoses occluding subtotally (about 75 to 80%) of the coronary lumen<sup>(1,2,5)</sup>. This procedure should not be performed in patients without critical coronary lesions or with severe and too extensive coronary narrowings.

The aim of the present study was to assess retrospectively those lesions, which could benefit from PTCA, in admitted patients, who died from acute myocardial infarction.

## MATERIAL AND METHOD

Our data were derived from previous pathologic observations

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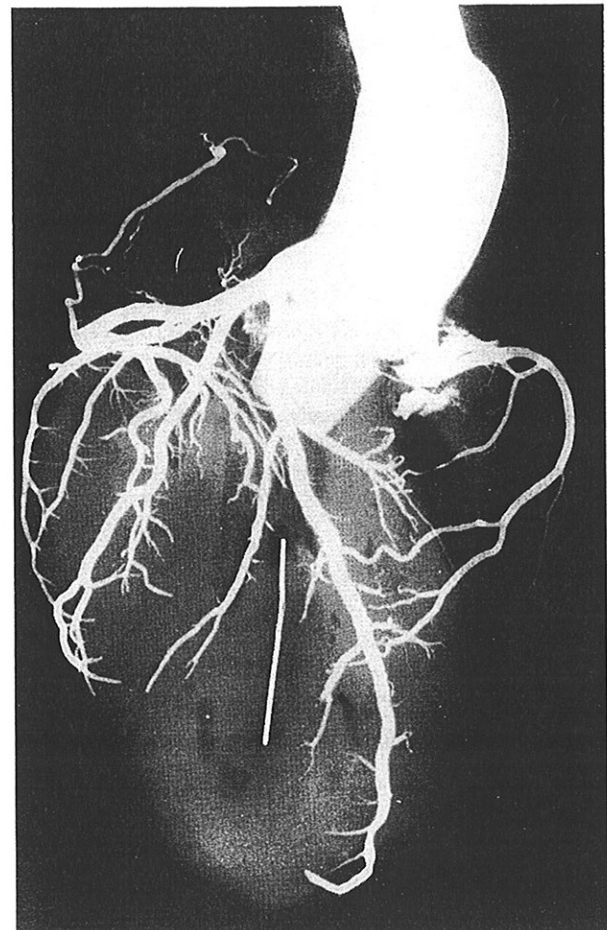
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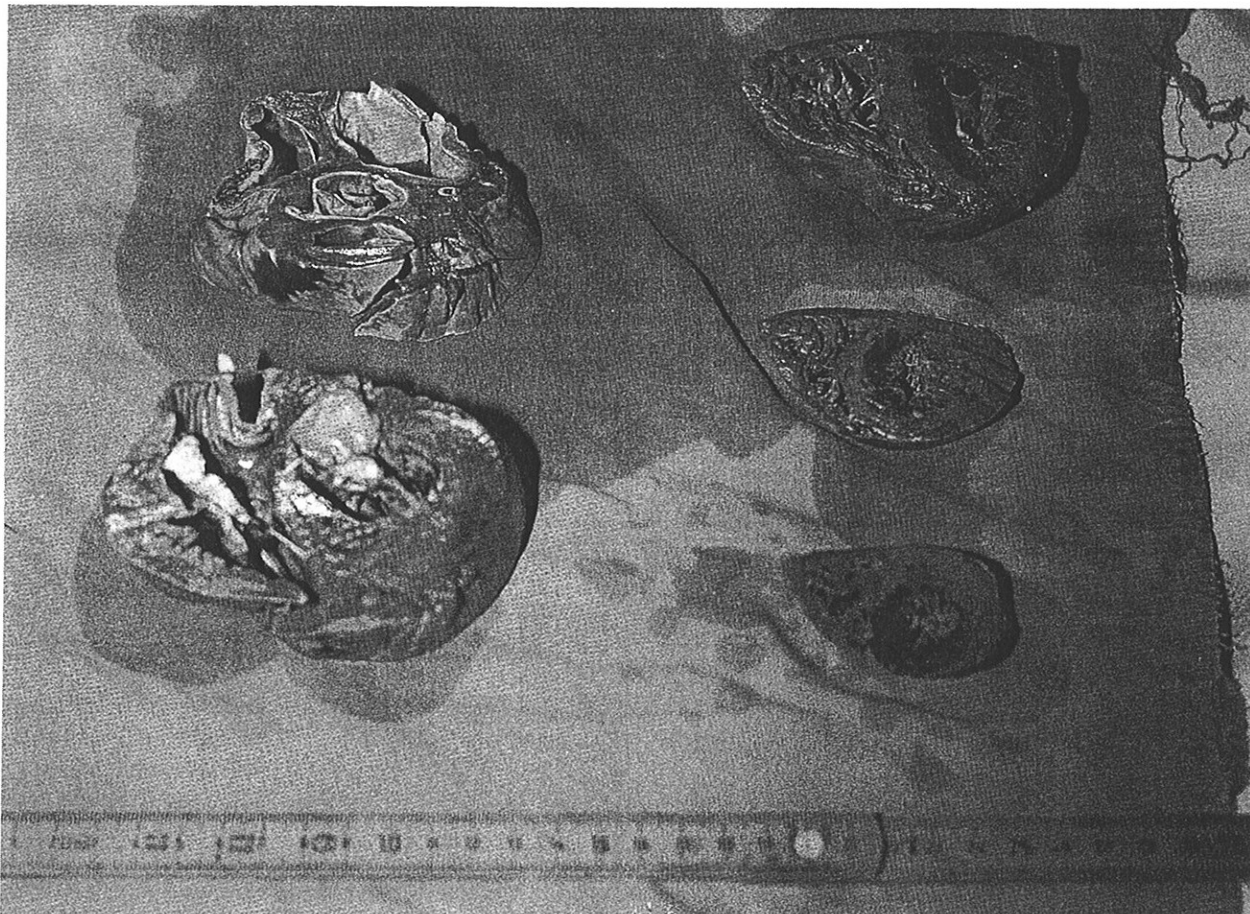
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on 96 autopsy patients, aged from 40 years to 91 years (mean: 65.8±9), who died from acute myocardial infarction in Coronary Care Unit. Postmortem study of the heart and coronary

**Fig 1 - Illustration of the technique for the postmortem coronary angiography. A cork is placed through the aorta into the aortic orifice and the coronary tree is injected by a radiopaque mass through a cannula tied into the aorta. A needle marks the LAD.**



**Fig 2- the heart is cut in transverse sections of thickness approximately 1 cm. These slices are parallel to each other. Myocardial alterations may be seen and compared by analysis of the photograph.**



**Table I - Location and length of the coronary narrowings**

Coronary Artery	Site of coronary narrowing			Length cm
	Proximal Portion	Mid Portion	Distal Portion	
LM	4			0.9 - 1.2
LAD	80			0.9 - 1.2
CX	32			0.6 - 0.8
RC	20	36		0.6 - 0.8

vessels was conducted by a method described previously<sup>(6)</sup>. Briefly, removed hearts were studied as in Fig 1 and 2. A total of 1,152 specimens of coronary arteries were examined to assess those segments which could benefit from in-hospital PTCA. The internal diameter of the vessels was measured with an ocular micrometer to assess the degree and length of narrowing. The location and number of coronary lesions were recorded. We identified narrowings having the above-mentioned characteristics as alternatives to treat with PTCA.

**Table II - Area of the coronary narrowings in specimens without thrombi**

LAD	75 - 90%
CX	75 - 85%
RC	85 - 90%

## RESULTS

**Location and length of coronary narrowing** (Table I). The left anterior descending artery (LAD) showed old stenoses within 1 cm from its origin in 80 cases (83.3%). The length of narrowings was between 0.9 and 1.2 cm. The left main artery (LM) showed proximal stenoses in 4 cases (4.16%). The length of these narrowing was 0.9 to 1.2 cm. The left circumflex artery (CX) had stenoses within 1 cm from its origin 32 times (33.3%) with a length 0.6 to 0.8 cm. The right coronary artery (RC) showed stenoses in the proximal and midportion respectively in 20 (20.8%) and 36 (37.5%) cases with a length between 0.6 and 0.8 cm.

**Area of narrowing** (Table II). Narrowed area between 75% and 100% affected the lumen of the vessels.

**Table III - Number of stenoses and occlusive thrombi in the coronary arteries**

Coronary Artery	No. of Stenoses	Occlusive Thrombi
LM	4	4 (100%)
LAD	80	40 ( 50%)
CX	32	6 ( 19%)
RC	56	26 ( 46%)
Total	172	76

**Occlusive thrombi** (Table III). They were seen 76 times totally. LAD was affected in 40 observations (41.6%), CX 6 times (6.25%), LM 4 times (4.16%) and RC 26 times (27%).

**Table IV - Type of coronary artery disease in the patients studied**

Disease	No. of patients
One vessel	32 (33.3%)
Two vessel	32 (33.3%)
Three vessel	28 (29.16%)
Minimal Coronary Changes	4 ( 4.16%)

**One, two and three vessel disease** (Table IV). The patients who had one, two and three vessel diseases were 32 (33.3%), 32 (33.3%) and 28 times (29.16%) respectively. Minimal coronary changes were seen in 4 cases (4.16%).

**Lesions to treat with PTCA** were 68/168 (40.4%). They affected 30 of the 96 patients (31.2%).

**CONCLUSION**

From our observations, about one-third of patients who died acutely from myocardial infarction could benefit from in-hospital PTCA according to the abovementioned indications. However, this amount is rather vague for two main reasons: on the one hand, the ever increasing indications to PTCA in myocardial infarction, and on the other, our autopsy material. The indications to PTCA will increase progressively because

of technological progresses. To date, the indications of primary acute angioplasty in myocardial infarction extend to complex and multiple coronary lesions. In addition, a series of factors depending on the level of the interventional equipe and characteristics of the patients may influence the approach to such a procedure.

On the contrary, autopsy material gives stable observations for the time being. They might vary numerically only in case of changes of the first factor (enlarged indication to PTCA). Such a consideration may explain the vagueness of our statement.

Finally, studies on the subject do not indicate whether the people who died from acute myocardial infarction, could have been saved by PTCA.

In our opinion, this is the big problem we must try to clarify for increasing the knowledge on the role of PTCA. Careful reviews of clinico-pathologic observations might direct our energies towards explanation.

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