Section: Cardiology

Original Research Article

# STUDY ON IMPACT OF THROMBUS CONTAINING LESION AS A CAUSE AND RESULT OF COMPLICATED PERCUTANEOUS CORONARY INTERVENTIONS.

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## Abstract

**Background:** Intracoronary thrombus is commonly seen in patients with acute myocardial infarction (MI) or unstable angina and in patients with complex lesion morphology. Thrombus identified at the time of angiography has been associated with an increased risk of acute complications after percutaneous coronary interventions, as well as with restenosis and vessel occlusion. The strength of this association has varied, however, as some studies have shown thrombus to be a strong independent predictor of adverse outcome and others have found a weak association. **Aim:** This study aimed to assess the common Risk factors associated with thrombus containing lesion and their various effect and complications on and after the PCI. **Material and Methods:** A Observational study was conducted at the Department of Cardiology, Coimbatore Medical College and Hospital, from October 2023 to September 2024. A total of 50 patients who underwent cardiac catheterization for CAD and had a thrombotic Ontario coronary lesion were included in the study. Data on demographic characteristics, clinical history, medication use, and complications during the procedure and after 1month were collected and analysed. **Results:** The study found that 20% of participants developed Complications during or within one month after revascularisation. Older age, male gender, smoking, were identified as significant risk factors for developing complications during or within one month after the PCI. Notably, the Recurrent MI is observed in 10% of patients having thrombus during PCI. **Conclusion:** The study highlights the effect of thrombus in a patient undergoing cardiac catheterization and it's higher mortality and morbidity during and after one month of the procedure.

## INTRODUCTION

Intracoronary thrombus is commonly seen in patients with acute myocardial infarction (MI) or unstable angina and in patients with complex lesion morphology. Thrombus identi®ed at the time of angiography has been associated with an increased risk of acute complications after percutaneous coronary interventions, as well as with restenosis and vessel occlusion (1±5). The strength of this association has varied, however, as some studies have shown thrombus to be a strong independent predictor of adverse outcome and others have found a weak association (1±3,6). The primary objective of this study was to determine whether pre-existing intracoronary thrombus is an independent predictor of angioplasty failure.

**Objectives**: To assess the Role of Thrombus containing coronary lesion leading to complicated PCI in patients undergoing cardiac catheterization studies.

## MATERIALS AND METHODS

**Study Design:** The study employed a retrospective analytical design to investigate the incidence and risk factors of complicated pci due to thrombus containing lesion in patients who underwent cardiac catheterization for Coronary Artery Disease (CAD) at the Department of Cardiology, Coimbatore Medical College and Hospital.


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**Study Setting:** The study was conducted at the Department of Cardiology, Coimbatore Medical College and Hospital, spanning from October 2023 to September 2024.

**Sample Size:** A total of 250 patients were included in the study cohort, meeting the criteria of undergoing cardiac catheterization for CAD during the specified study period.

**Sampling Technique:** Purposive sampling was employed to select patients meeting the inclusion criteria and excluding those with predefined exclusion criteria.

**Study Population:**

**Inclusion Criteria:** Patients undergoing cardiac catheterization for Coronary Artery Disease were included in the study.

**Exclusion Criteria:** Patients who had Valvular Heart Disease, cardiomyopathy, congenital heart disease undergone an angiographic study were excluded from the study.

**Data Collection:**

1. Demographic and clinical characteristics of patients were collected, including age, gender, comorbidities, and procedural details.
2. Left Ventricular Ejection Fraction (LVEF) was assessed as part of the clinical evaluation.
3. Patient Angiogram details will be collected
4. Patient will be followed up for period of one month for development of any complications

**Statistical Analysis:** Statistical analysis was performed to analyze the incidence of CIN and identify associated risk factors. Descriptive statistics, such as mean, standard deviation, and frequency distributions, were used to summarize patient characteristics. Inferential statistics, including chi-square tests and Mann Whitney U test were utilized to assess the relationship between risk factors and the development of CIN.

**Ethical Consideration:** The study protocol was approved by the Institutional Ethics Committee, ensuring adherence to ethical guidelines, patient confidentiality, and informed consent procedures.

## RESULTS

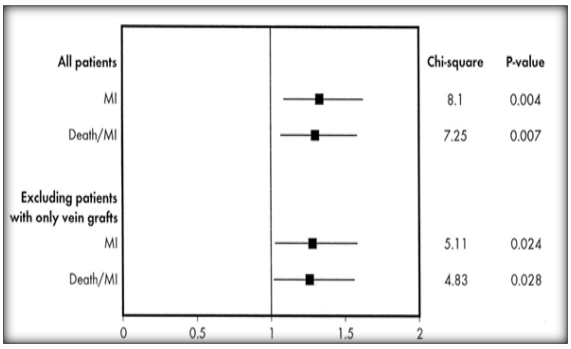


**Figure 1: Showing the odds ratio for Death**

**Table 1: Profile of the study participants**

| S No | Variable | Frequency | Percentage |
|---|---|---|---|
| 1 | **Age (Years)** | | |
| | < 40 | 34 | 13.6 |
| | 41 – 50 | 74 | 29.6 |
| | 51 – 60 | 75 | 30 |
| | > 61 | 67 | 26.8 |
| 2 | **Gender** | | |
| | Male | 197 | 78.8 |
| | Female | 53 | 21.1 |
| 3 | **Smoker** | | |
| | Yes | 86 | 34.4 |
| | No | 164 | 65.6 |
| 4 | **Associating factors** | | |
| | Hypertension | 86 | 34.4 |
| | Diabetes Mellitus | 93 | 37.2 |
| | Anaemia | 228 | 91.2 |
| | Dehydration | 30 | 12 |

**Table 2: Table depicting the complications due to thrombus**

| Complications | No of patients |
|---|---|
| Death | 2 |
| Recurrent MI | 14 |
| Emergency CABG | 3 |
| Abrupt Closure In Lab | 19 |
| Recurrent Angina | 40 |

## DISCUSSION

We found that pre-existing intracoronary thrombus did not confer an additional risk of in-hospital mortality after coronary angioplasty. However, pre-existing thrombus was predictive of in-laboratory abrupt closure and postprocedural death/MI. At one-month follow-up, the rates of mortality and repeat revascularization was a higher incidence of death/MI in patients with thrombus. Glycoprotein IIb/IIIa inhibitors did not appear to influence positively the in-hospital outcomes of coronary interventions in patients with demonstrable angiographic thrombus. Previous studies have described pre-existing thrombus as a factor related to angioplasty failure and increased risk of


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angioplasty-related complications including major dissection, vasoconstriction, abrupt closure and total occlusion (1±3,11±13). Pre-existing thrombus also has been shown to increase angiographic restenosis, mainly through early vessel occlusion.[12] Multiple clinical, angiographic and procedural factors have been associated with the failure of angioplasty, and important inter-relationships have been found with thrombus (1±3,8). Pre-existing thrombus continued to be an independent predictor of angioplasty failure in the late 1980s and early 1990s.[1,2] In this study, in-hospital and one-month mortality in the thrombus containing groups was low and comparable to recently published studies of patients without thrombus. In the Evaluation of Platelet IIb/IIIa Inhibitor for Stenting (EPISTENT) trial,[14] mortality in the coronary angioplasty plus abciximab group was 0.8%, a rate similar to that for patients with thrombus in this study. The incidences of MI and the composite end point of death, MI and/or repeat revascularization were higher after coronary angioplasty in patients with thrombus in the present study than in the coronary angioplasty plus abciximab group in the EPISTENT trial. The present study included higher risk patients with thrombus, and the difference in the composite outcome in the present study was mainly driven by a higher rate of MI. After successful coronary intervention, the posthospital discharge incidence of death/MI continued to be higher in patients who had thrombus than in those who did not. The incidence of death and repeat revascularization, however, was similar between the two groups. The exclusion of patients whose lesions were all in vein grafts did not affect the results of the study, signifying the importance of thrombus in native coronary arteries as well.

Our study concludes that coronary angioplasty can be safely performed with a low in-hospital and one-month mortality in patients with angiographic thrombus. The main negative consequence of visible thrombus was a higher incidence of in-hospital abrupt closure and death/MI. Approximately 90% of the abrupt closures in patients with thrombus occurred inside the catheterization laboratory and were most likely due to intimal/medial disruption and coronary artery spasm.[16] Non±Q-wave MI in these high risk patients may represent distal embolization, abrupt closure of a distal vessel or cardiac enzyme elevation despite successful coronary angioplasty. New approaches may further improve outcome. The efficacy of stents in thrombus-containing lesions has been proven in various trials of primary angioplasty for acute ST-segment elevation MI.[17] Thrombus-removal devices have recently been found safe and effective in removing thrombus from native coronary arteries and degenerated vein grafts.[18,19] These two recent advances would have a salutary effect on the outcome of patients with pre-existing angiographic thrombus. The patients included in this study were enrolled in angioplasty clinical trials in the prestent era, however, with the latest of the six trials having concluded in 1995.

## CONCLUSION

This study demonstrated the safety and efficacy of balloon angioplasty in a high risk subset of patients with pre-existing angiographic thrombus with similar mortality rates and a similar need for repeat revascularization, although such patients had a higher incidence of death/MI. This study also suggests that glycoprotein IIb/IIIa inhibitors may be ineffective in the presence of angiographic thrombus. Additional studies in patients who have undergone more recent angioplasty procedures may be instructive.

**Conflict of Interest:** Nil
**Acknowledgement:** Nil.

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