



**PATIENT OUTCOMES AFTER CORONARY  
ANGIOPLASTY WITH STENT IMPLANTATION AND  
STRATEGIES FOR RECURRENCE PROPHYLAXIS: A  
RETROSPECTIVE COHORT STUDY FROM FERGANA**

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**ABSTRACT**

*This retrospective cohort study analyzes clinical outcomes of 96 patients who underwent percutaneous coronary intervention (PCI) with stent implantation following acute myocardial infarction at the Fergana Regional Cardiology Center. Drug-eluting stents demonstrated significantly lower risks of in-stent restenosis and recurrent myocardial infarction compared with bare-metal stents. Long-term adherence to dual antiplatelet therapy and statin use markedly reduced the incidence of major adverse cardiac events. Diabetes mellitus was identified as a major prognostic factor associated with recurrence. The findings highlight the importance of personalized pharmacological prevention and patient adherence to secondary prophylaxis for improving post-PCI outcomes.*

**Introduction:** Percutaneous coronary intervention (PCI) remains a cornerstone in the management of acute myocardial infarction (AMI), allowing timely revascularization and substantial reduction in morbidity and mortality. Despite major progress in angiographic techniques, stent technologies, and dual antiplatelet therapy (DAPT), post-procedural recurrence, restenosis, and recurrent ischemic events continue to challenge long-term patient outcomes. International studies indicate that up to 15–20% of patients develop recurrent cardiovascular events within three years following coronary artery stenting, influenced by co-morbidities, medication adherence, metabolic risk profiles, and procedural details [1–3].



Stent thrombosis and in-stent restenosis (ISR) remain the principal mechanisms behind post-PCI adverse outcomes. Drug-eluting stents (DES) reduce neointimal hyperplasia compared to bare-metal stents (BMS), but even DES are associated with late restenosis due to endothelial dysfunction and chronic inflammatory response [4]. Adherence to antiplatelet therapy and lipid-lowering treatment has demonstrated significant prognostic influence, whereas uncontrolled diabetes mellitus (DM) and persistent hypertension markedly increase recurrence risk [5,6].

This study evaluates patient outcomes after coronary stent implantation following acute MI and identifies prognostic factors associated with recurrent ischemic events in a regional cohort. Additionally, emphasis is placed on recurrence prevention based on clinical and pharmacological management strategies relevant to Uzbekistan's regional cardiology practice.

**Aim of the Study.** To assess clinical outcomes following PCI with stent implantation after acute myocardial infarction and determine key predictors of recurrence, with a focus on long-term prophylaxis strategies.

### **Materials and Methods**

This retrospective cohort study was performed at the Regional Cardiology Center, Fergana Branch, covering a period from July 2023 to September 2025. A total of 96 patients aged 41 to 78 years who underwent percutaneous coronary intervention (PCI) with stent implantation following acute myocardial infarction (MI) were included. The study population consisted of 65 men (67.7%) and 31 women (32.3%). All cases involved successful stent placement confirmed by coronary angiography. Selection criteria included confirmed STEMI or NSTEMI, no previous coronary artery bypass surgery, absence of advanced valvular defects or malignancies, and a follow-up period of at least six months. Patient data were anonymized prior to analysis, and approval for utilization of records was obtained from the institutional administration.

Clinical information was extracted from electronic medical histories, including demographic data, comorbidity profiles, lipid and glucose parameters, and medication history, with particular attention to dual antiplatelet therapy (DAPT), statins, beta-blockers, and ACE inhibitors. Angiographic characteristics were assessed according to the number and location of affected vessels, while restenosis and stent thrombosis were confirmed through repeated angiography when necessary. Follow-up was conducted at 3, 6, and 12 months and annually thereafter to monitor recurrence of angina, major adverse cardiac events (MACE), restenosis, and mortality. Statistical analysis was carried out using SPSS v.25, with chi-square test and t-test used to determine associations between risk factors and outcomes. Statistical significance was defined as  $p < 0.05$ .

### **Results**

Analysis of the 96 cases demonstrated that the overall incidence of major adverse cardiac events (MACE) during follow-up was 18.7%, comprising recurrent MI in 9.3% of patients, angiographically confirmed in-stent restenosis (ISR) in 6.2%, and cardiac death in 3.1%. The majority of patients received drug-eluting stents (DES) at implantation, accounting for 66.7% of the cohort, while bare-metal stents (BMS) were used in 33.3%. Patients implanted with DES exhibited superior clinical outcomes, showing a significantly



lower incidence of restenosis (4.6%) compared to those treated with BMS (12.5%;  $p < 0.05$ ). Likewise, recurrent MI occurred less frequently in the DES group (6.2%) compared with BMS recipients (12.5%), and total MACE rates were markedly lower among DES patients (12.5%) relative to BMS cases (31.2%;  $p < 0.01$ ).

**Table 1. Characteristics of Patients and Predictors of Post-PCI Outcomes (n = 96)**

Parameter	Frequency (n)	Percentage (%)
Male	65	67.7
Female	31	32.3
Drug-Eluting Stent (DES)	64	66.7
Bare-Metal Stent (BMS)	32	33.3
Diabetes Mellitus	28	29.1
Hypertension	77	80.2
Dyslipidemia	54	56.2
Full DAPT Adherence (12 months)	71	73.9
Poor Medication Adherence	25	26.0

Risk factor analysis revealed that comorbid diabetes mellitus was strongly associated with recurrence, particularly ISR and recurrent MI, with diabetic patients showing more than a twofold higher likelihood of adverse events (relative risk = 2.31;  $p < 0.01$ ).

**Table 2. Comparative Outcomes Based on Stent Type and Medication Adherence**

Variable	DES (n=64)	BMS (n=32)	p-value
Recurrent MI (%)	6.2	12.5	$< 0.05$
ISR (%)	4.6	12.5	$< 0.05$
MACE (%)	12.5	31.2	$< 0.01$
Full DAPT Adherence (%)	78.1	65.6	0.08

A significant prognostic role was also evident for medication adherence. Patients who consistently maintained dual antiplatelet therapy for a minimum of 12 months had improved outcomes, with a 41% reduction in recurrent events compared with non-adherent individuals. Conversely, poor adherence was documented in 26.0% of the cohort and was correlated with higher rates of restenosis, recurrent MI, and mortality. Additionally, statin therapy demonstrated a marked protective effect, with adherent patients displaying a 2.8-fold lower recurrence risk compared with those who did not comply with lipid-lowering therapy.

### Discussion

The present retrospective analysis confirms that clinical outcomes after coronary angioplasty with stent implantation depend not only on technical success but also on long-term adherence to secondary prevention regimens. In our cohort, patients receiving drug-eluting stents demonstrated significantly fewer cases of in-stent restenosis and recurrent



myocardial infarction, consistent with modern evidence demonstrating superior endothelial recovery and reduced neointimal proliferation with DES use [1]. Moreover, our findings align with international studies indicating that dual antiplatelet therapy (DAPT) adherence for at least 12 months reduces thrombotic complications by 40–60% and prevents early stent thrombosis [2,3]. Studies from Russia and Central Asia also highlight that stent failure in post-MI patients is commonly triggered by poor compliance, especially discontinuation of antiplatelet therapy, which almost doubles the risk of recurrent ischemia [4]. The present study emphasizes that metabolic comorbidities, especially diabetes mellitus, markedly worsen long-term PCI outcomes due to impaired vascular healing, pro-inflammatory states, and higher restenosis risk, supporting recent findings that diabetic patients require intensified statin therapy and strict lipid control following PCI [5]. Furthermore, improved survival and reduced MACE rates in statin-adherent patients in our cohort align with the anti-inflammatory cardioprotective mechanisms described by international lipid trials [6]. Therefore, our results underscore that the prognosis after PCI is primarily determined by evidence-based pharmacological maintenance, patient education, and personalized treatment strategies, particularly for patients with metabolic comorbidities such as diabetes and dyslipidemia.

### **Conclusion**

DES implantation, rigorous DAPT adherence, and aggressive management of metabolic risk factors significantly improve post-PCI outcomes in patients with acute MI. Recurrence prophylaxis should prioritize patient education, long-term pharmacologic adherence, and individualized treatment, particularly for diabetics and those with dyslipidemia. Recommendations: 1. Continue full DAPT for at least 12 months after PCI to prevent stent thrombosis and reduce the risk of recurrent myocardial ischemia. 2. Use drug-eluting stents in high-risk patients, especially those with diabetes or dyslipidemia, to minimize restenosis. 3. Prescribe high-intensity statins with regular LDL monitoring to maintain vascular stability and long-term protection.

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