

# Deferred Angiography pathway for COVID positive patients presenting with NSTEMI

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## Introduction and objectives

Current UK recommendations for invasive angiography and percutaneous coronary intervention (PCI) in patients with non-ST elevation myocardial infarction (NSTEMI) is within 72 hours (Cardiology GIRFT).

However significantly increased rates of stent thrombosis have been reported in the setting of concurrent COVID-19 infection with worsened outcomes.

Therefore, there remains uncertainty as to the safety and timing of angiography for COVID positive NSTEMI patients.

We initiated a novel pathway of deferred angiography at least 10 days from COVID-19 diagnosis in medically stabilised and low risk NSTEMI.

Objectives:

- To develop a pathway for deferred angiography in patients with medically stabilised NSTEMI and concurrent COVID-19 infection.

- To demonstrate safety and feasibility of this pathway.

## Methods

Between 2021-2022, 153 COVID positive NSTEMI patients were included on the deferred angiography pathway to receive at Barts Heart Centre London.

NSTEMI was diagnosed based on the universal definition of AMI as symptoms and/or ECG changes coupled with elevation in cardiac biomarkers.

COVID-19 diagnosis was based on the identification of SARS-CoV-2 on nasal/throat swab or positive serology.

Medical stabilisation was guideline-based treatment including aspirin, P2Y12 inhibitor, high dose statin, betablocker and ACE-inhibition.

Deferred angiography was carried out at least 10 days post COVID diagnosis.

Patients with ongoing symptoms or high-risk features were kept as inpatients while those without were discharged and readmitted for semi-elective angiography.

The interventional strategy was at the discretion of the operator, including the use of direct stenting, pre/post-dilatation, and treatment of bystander non-infarct related artery stenoses. All patients undergoing angioplasty received a loading dose of aspirin 300 mg and either clopidogrel 600 mg or ticagrelor 180 mg prior to the procedure.

Demographic, procedural and outcome data were collected as part of a national cardiac audit.

The primary outcome was MACE events consisting of a composite of cardiovascular death, non-fatal stroke, non-fatal myocardial infarction or urgent revascularization. These events were captured whilst awaiting angiography and post procedure.

## Results

153 COVID positive NSTEMI patients were referred for angiography.

6 patients died from COVID related respiratory complications prior to angiography.

147 patients received deferred angiography median time from COVID diagnosis was 16 days (IQR 12-19).

10% remained as inpatients based on high-risk features with 90% being discharged prior to angiography. The median GRACE score was 122 (IQR 86-133). Troponin levels were significantly elevated on initial COVID diagnosis compared to time of their procedure.

115 patients had a culprit lesion identified with 88 receiving PCI.

No patients required early revascularisation for NSTEMI while awaiting deferred angiography.

2 patients had peri-procedural complications: CVA and retroperitoneal haemorrhage.

Patients were followed-up for a median of 363 days (IQR 120-485 days) with MACE rates of 4.1% including 1 death from traumatic subdural haematoma, 5 patients with acute coronary syndromes.

This is comparable to the MACE events for NSTEMI patient without COVID at our institution treated during the time period (6.1%).

In terms of secondary outcome, there were no cases of stent thrombosis. 2 patients were admitted for decompensated heart failure.

Baseline Characteristics	
Age (Mean ± SD) –	63 yr ± 12.0
Male sex – no. (%)	75% (110/147)
Black, Asian, Minority Ethnic – no. (%)	53% (78/147)
Median BMI (IQR)	27.4 (24.7: 31.1)
Past Medical History – no. (%):	
Hypertension	60% (88/147)
Hypercholesterolemia	65% (96/147)
Diabetes mellitus	41% (60/147)
Smoking history	44% (65/147)
Previous MI	44% (65/147)
Previous PCI	37% (54/147)
Median COVID-diagnosis to angiography(IQR)- days	16(12: 19)
Median GRACE score	122(86-153)
Troponin T – ng/L (initial COVID diagnosis)	
Troponin T – ng/L (at time of procedure)	111.5 (54: 455) 27 (16: 151)
Time for follow-up, median (IQR) – days	
Final Clinical Diagnosis – no. (%):	243 (81,285)
Acute coronary syndrome	78.2% (115/147)
MINOCA	21.8% (32/147)
Myocarditis	13.6% (9/147)
Takotsubo	4.8% (7/147)
Unknown	12.2% (18/147)
Percutaneous coronary intervention – no. (%)	
Coronary Artery Bypass Grafting – no. (%)	60% (88/147) 11% (16/147)
Medical management of CAD – no. (%)	29% (43/147)
Stent thrombosis(in PCI patients) – no. (%)	
MACE	0% 4.1% (6/147)

## Conclusions

This project demonstrates the safety and effectiveness of deferred coronary angiography after a period of medical management for those patients presenting with NSTEMI and concurrent COVID-19 infection.

There was no morbidity or mortality signal associated with the wait for angiography and the group showed similar MACE rates to those in the non-deferred NSTEMI cohort without COVID-19 at our institute.

This data has implications for standard care for NSTEMI patients without COVID-19 with the potential to reduce inpatient stay.