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INTRODUCTION

Institut Jantung Negara (IJN) is a tertiary cardiac center located in Kuala Lumpur with a 24-hours around the clock Percutaneous Coronary Intervention (PCI) services. Primary PCI (PPCI) is the preferred treatment for ST-elevation myocardial infarction (STEMI) if performed in a timely manner. When timely PPCI is not available or contraindicated, thrombolytic therapy should be administered. Tenecteplase (Metalyse) is the agent of choice for thrombolysis in IJN. We reviewed the utilisation of Tenecteplase and outcomes in STEMI cases, in IJN from 2017 – 2020.

MATERIAL AND METHODS

This Retrospective observational study was carried out between 1st January 2017 until 31st December 2020. All patients who were administered Tenecteplase in Emergency Department during this period were included in the analysis. Data collected from patient's medical records were analyzed using Excel software. We investigated the indication for Tenecteplase and examined the outcomes of STEMI patients treated with Tenecteplase.

RESULTS

A total of 88 patients were treated with Tenecteplase (Figure 1). Utilisation doubled from 15 to 18 patients per year from 2017 to 2019 to 37 patients in 2020 (Figure 2). Indications for use included STEMI 90% (n=79), Peripheral Artery Disease 6% (n=5), Pulmonary Embolism 2% (n=2) and Pediatric Congenital Heart Disease 2% (n=2).

In 2020, out of 334 cases of STEMI, 37 patients (11.08%) were given fibrinolysis as compared to PPCI (Figure 3). This is doubled the previous rate of fibrinolytic therapy administered in 2017–2019. As shown in Figure 4, out of 79 STEMI cases, indication for utilization of Tenecteplase instead of PPCI were patient instability 32% (n=25), previous Coronary Artery Bypass Graft (CABG) or planned for CABG 31% (n=24), Cardiologist preference 24% (n=19) and no consent for PPCI 10% (n=8). Other reasons were financial constraints and unavailability of the catheterization laboratory.

In terms of STEMI outcomes, 81% (n=64) had successful thrombolysis where 36 patients proceeded with angiogram and 21 had PCI. 19% (n=15) had failed thrombolysis where 10 proceeded with angiogram and 8 went for rescue PCI. 94% (n=60) with successful thrombolysis survived to discharge compared to 40% (n=6) with failed thrombolysis (Figure 5). Overall mortality rate for STEMI patients treated with Tenecteplase was 16%.

Figure 5: Outcome of Tenecteplase utilisation in STEMI cases in IJN from 2017 to 2020

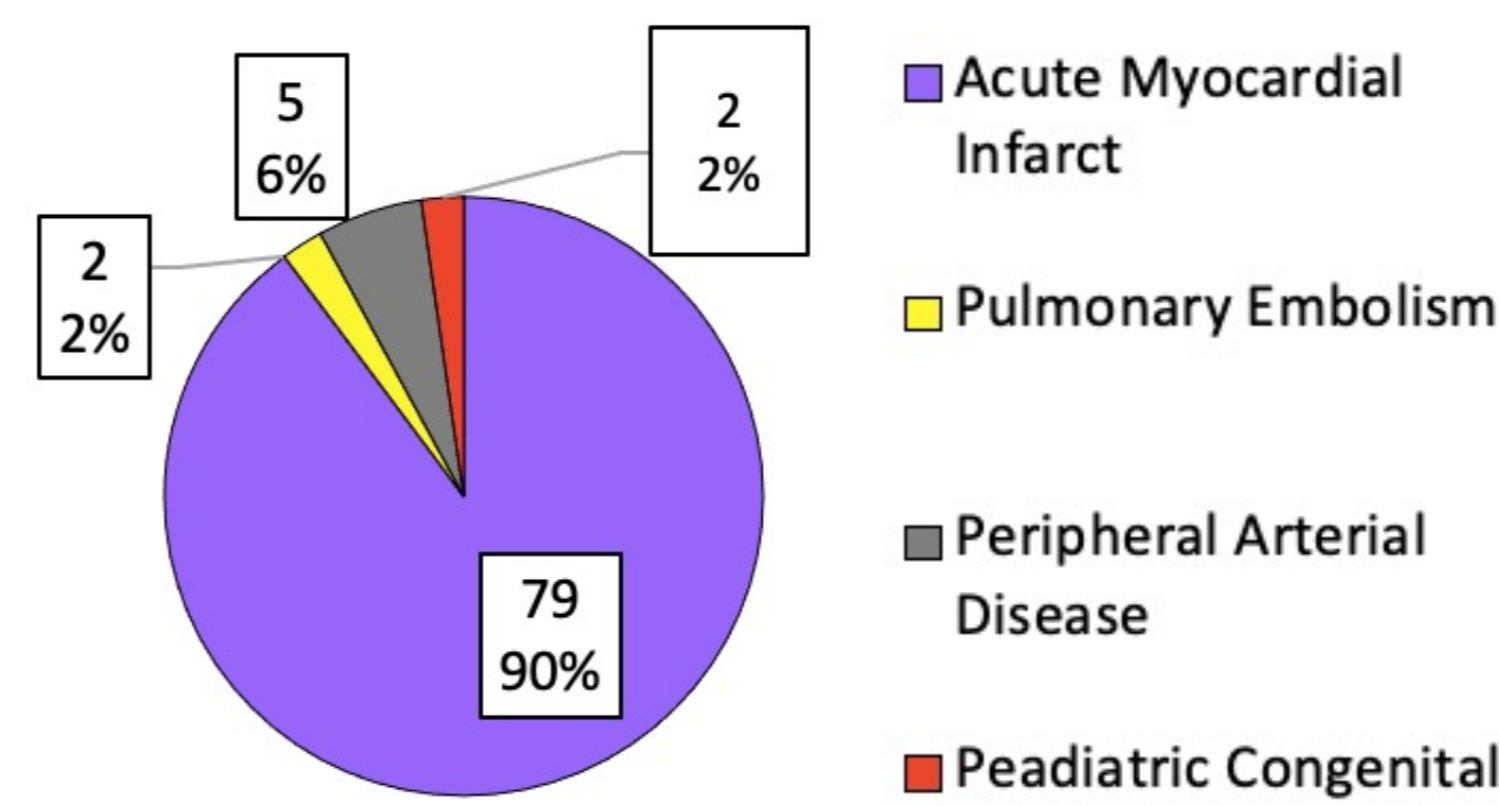
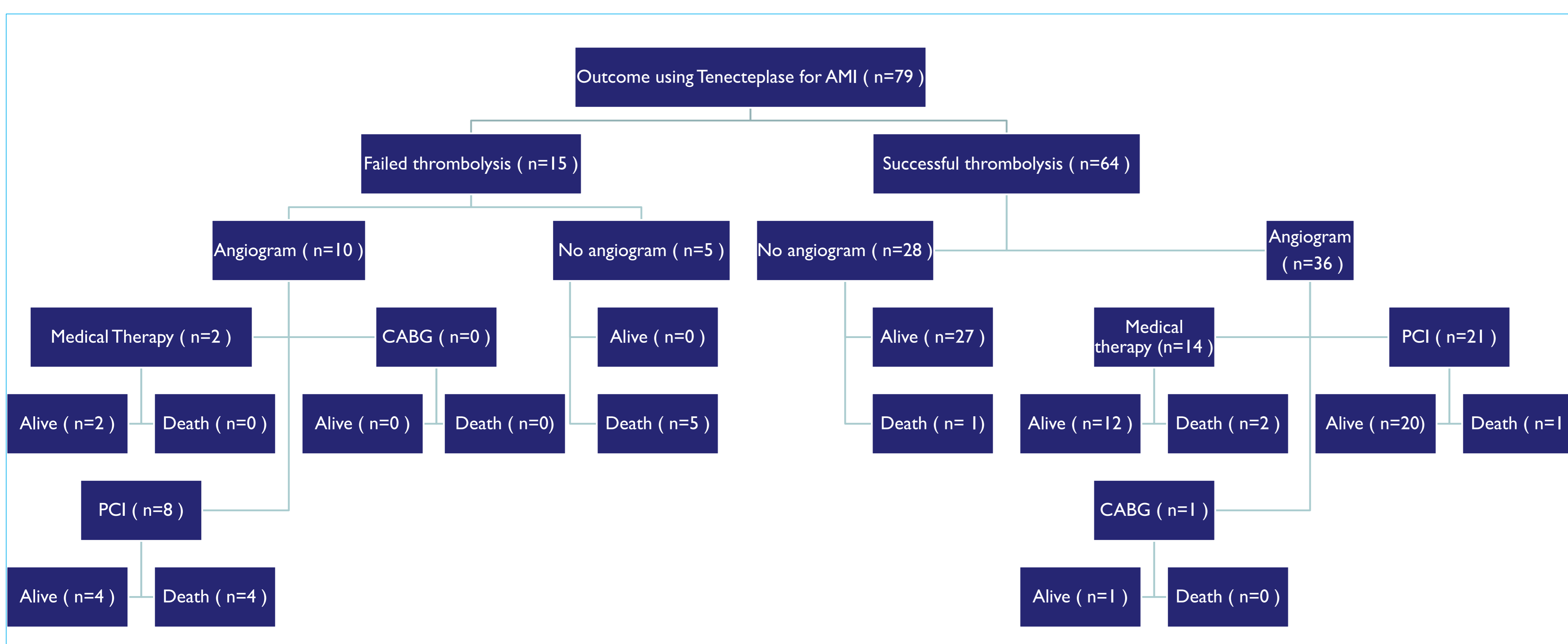


Figure 1: Tenecteplase administration in IJN from 2017 to 2020 (88 cases)

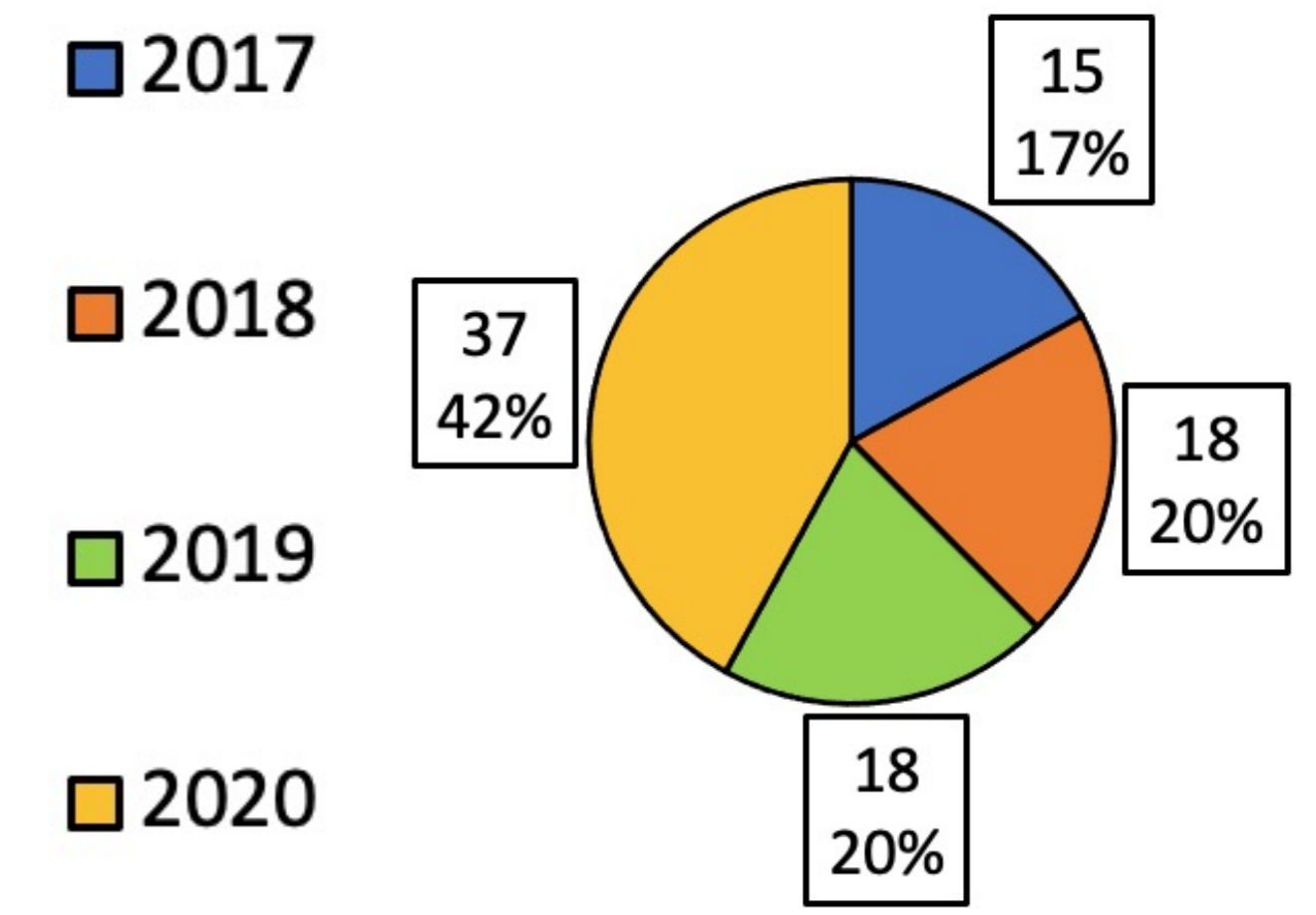


Figure 2: Utilisation of Tenecteplase shown according to year

Admission Year	Lytic Therapy		PPCI		Total No of STEMI Cases (n)	Total Percent (%)
	No of STEMI Cases (n)	Percent (%)	No of STEMI Cases (n)	Percent (%)		
2017	11	4.93%	212	95.07%	223	100.00%
2018	15	5.95%	237	94.05%	252	100.00%
2019	16	4.29%	357	95.71%	373	100.00%
2020	37	11.08%	297	88.92%	334	100.00%
Grand Total	79	6.68%	1103	93.32%	1182	100.00%

Figure 3: Year to year comparison of Thrombolysis (Lytic Therapy) and PPCI in STEMI.

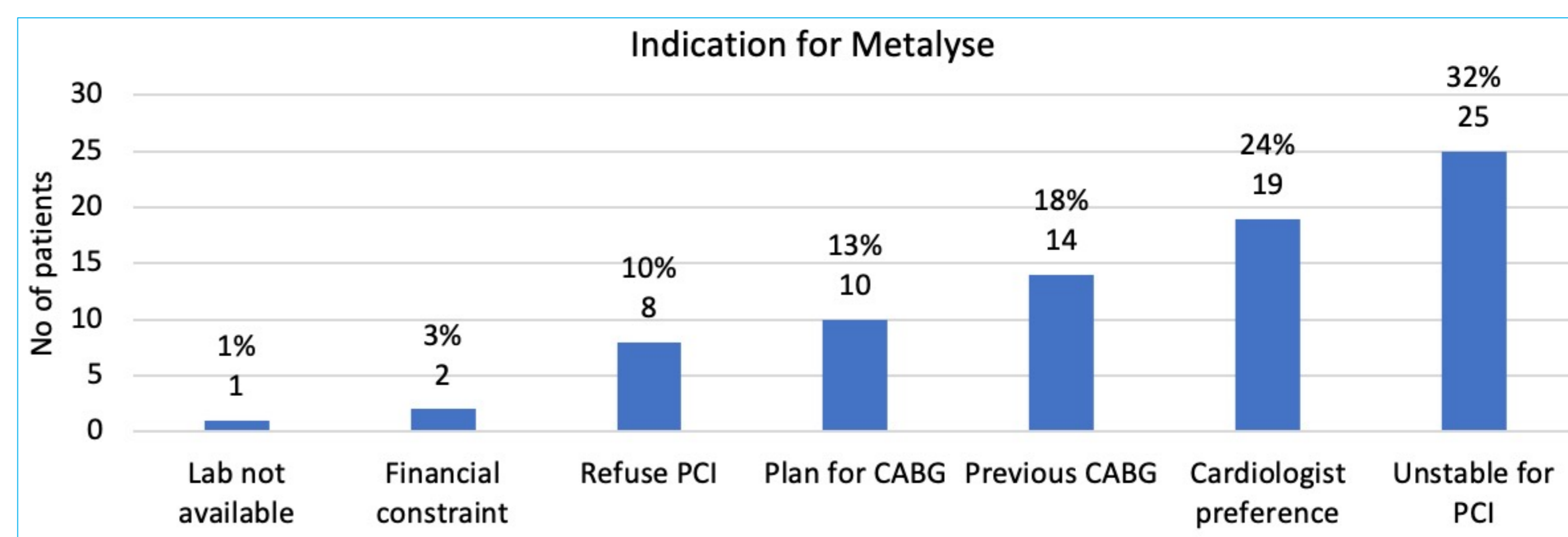


Figure 4: Indication for utilisation of Tenecteplase in the 79 cases of STEMI.

DISCUSSION

The increased use of Tenecteplase for STEMI in 2020 was probably due to the shift in the preferred initial treatment modality during the SARS-CoV2 pandemic, as reflected by Cardiologist preference in choosing thrombolysis over PPCI. During the initial phase of the pandemic, thrombolysis was the preferred management of STEMI. Early in-patient PCI was performed once the patient has been tested negative for covid-19. Thrombolytic therapy was also preferred in patients that were deemed clinically unstable to undergo angioplasty. In patients that had undergone coronary bypass surgery previously, or diagnosed with severe coronary artery disease requiring surgery, thrombolytic therapy was also the preferred option as primary angioplasty can be technically challenging and has no data proving clinical benefit in such situations. There was high survival rate in patients with successful thrombolysis compared to failed thrombolysis (94% vs 40%). Overall mortality rate of STEMI patients treated with Tenecteplase (16%) reflects the high number of unstable patients who required coronary reperfusion therapy.

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