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EDITORIAL

# Complex PCI without Surgical on Site Set up! Is it safe?

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Coronary Percutaneous intervention (PCI) has evolved over last 3 to 4 decades and it is now considered safe and effective treatment option for patients with coronary artery disease (CAD) across the globe. Advancement in devices, drugs and technology used for PCI have changed the horizon of interventional cardiology procedures from simple PCI to complex PCI with variable set of lesions such as chronic total occlusions (CTOs), heavily calcified and unprotected left main disease demonstrating high rate of procedural success and safety. Despite this improvement in PCI, the surgery on site (SOS) is mandated on the notion of safety paradigm[1].

Primary PCI for STEMI has already been considered safe and effective method of revascularization without SOS setup and it is accepted across the board[2]. The point which needs consideration is to perform complex PCI having the calculated risks without SOS setup.

The reason for agreeing on complex PCI without SOS setup depends on patient access and equity. A specialized high risk PCI center is the only hope for optimal revascularization in surgical turn down cases with significant co-morbidities or patients with rural area having the only available interventional center. In case of high-risk non-ST-elevation acute coronary syndromes (NSTE-ACS) decentralization ensures rapid treatment and decreases the logistical and clinical burden of prolonged transfers. Moreover, the recent data confirms that elective PCI without SOS settings has increased in both volume and complexity, demonstrating similar complication rates to SOS setups[1].

The issue is to perform complex PCI labelled as the one with multivessel PCI with high syntax score (> 32), needing debulking devices such as rotational atherectomy and managing last remaining patent vessel that carries a non-trivial risk of acute catastrophic complications, such as tamponade - secondary to perforation or untreatable dissection needing emergent coronary artery bypass surgery. The rates of emergent bypass performed for a peri- procedural complication after PCI have remained extremely low. Though it is very rare, yet these events require immediate sternotomy, a procedure that cannot be effectively replicated by even the most meticulous transfer protocols.

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In order to perform complex PCI efficiently without SOS setup, extreme precautions are mandatory to mitigate the calculated risk of procedure. To achieve the clinical and ethical excellence in such high risk cases, meticulous approach is required. Such a setup undertaking complex PCI without SOS should adopt the best strategies of treating high risk patients, which includes and not limited to patient selection, experienced and trained operator and staff, use of imaging modalities, hemodynamic support (mechanical circulatory support) and robust time sensitive transfer protocols.

Patient selection is of corner stone importance, which is achieved through multidisciplinary approach (Heart Team) where benefit of the complex PCI clearly outweighs the risk rendered by the without SOS setup. Patients should generally be ineligible or have extreme risk for surgical intervention. This procedure must be performed by highly specialized operators, who consistently meet high-volume, high-complexity benchmarks, supported by a cath lab team drilled in emergent pericardiocentesis and stabilization protocols. The routine use of intravascular ultrasound (IVUS) or Optical Coherence Tomography (OCT) is mandatory to optimize stent deployment, minimize dissection risk, and confirm the completeness of lesion preparation, thereby reducing procedural complications. Studies show IVUS guidance significantly improves clinical outcomes in complex coronary lesions[3]. Prophylactic use of temporary support devices (e.g., Impella or IABP) should be standardized for high-risk, low ejection fraction patients undergoing complex intervention, providing crucial hemodynamic stability in the event of a complication[4]. A seamless, rapid-response plan, with documented door-to-transfer times of less than 60 minutes to the nearest surgical facility, must be in place and must be regularly tested. This, critically, is a safety net, not a solution.

In order to allow a complex PCI in SOS setup it requires a delicate balance between access and maximum immediate safety and thus standardization of procedures and system is of paramount important. To achieve the goals, a national registry is a must to track the outcomes of complex PCI at SOS setup, so that gain in volume should not compromise the fatal delays in rare catastrophic complications.

In summary, to perform a complex PCI without SOS setup in a truly ethical way, it should elevate the standard of care and not merely lower the barrier to entry. Every successful complex case done this way requires diligence, technology, and a profound respect for the high wire upon which interventionalists tread. We must ensure the system that supports, rather than compromises this calculated risk.

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