

Background

- Intravascular ultrasound (IVUS) has become increasingly used in percutaneous coronary intervention (PCI) over the past decade [1] – [3].
- IVUS-guided PCI are reported to improve lesion assessment and reduce restenosis, target vessel revascularization, and MACE in many studies [1] – [3].
- Benefits of IVUS vary in complex lesion, such as unprotected left main disease and bifurcations [3].
- Limited information exists on how IVUS affects the quantity of subsequent treatments patients must undergo.

Aim: Retrospective study at DHMC (2015–2022) using propensity matching examined procedure time, resource use, in-hospital outcomes and 1-year follow up for IVUS vs. non-IVUS PCI.

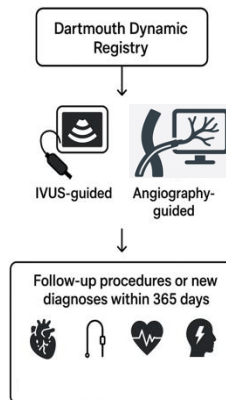
Method

In Hospital Outcome

- Queried the Dartmouth Dynamic Registry for 7,641 PCI procedures (2015–2022), categorized as IVUS-guided (n=1,811) or angiography-guided (n=4,994).
- Assessment of outcomes included fluoroscopy time and in hospital complications

1 year Follow-up Procedure

- Patients were further stratified into IVUS-guided (IG) complex lesion (n=1545) or angiography-guided (AG) complex lesion (n=3758).
- Main outcomes assessed included need for repeat PCI or CABG within one year
- Follow-up procedures or new diagnoses were identified using CPT and ICD-10 codes linked to patient MRNs



Results

Year	Total PCI (n=7641)	Angiography-Guided PCI (n=5651)	IVUS-Guided PCI (n=1990)	Percent IVUS-Guided PCI
2015	910	811	99	10.9%
2016	1019	920	99	9.7%
2017	973	845	128	13.2%
2018	966	815	151	15.6%
2019	973	796	177	18.2%
2020	850	673	213	25.1%
2021	1017	482	535	52.6%
2022	933	345	588	63.0%

Table 1: IVUS usage at DHMC

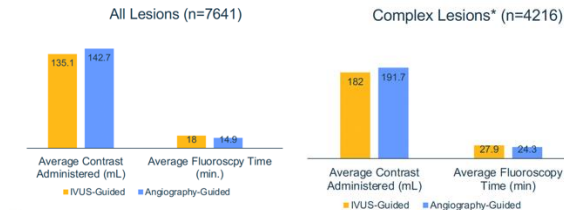


Figure 1. Contrast use and fluoroscopy time in IVUS- vs. angiography-guided PCI. Left: all lesions; Right: *complex lesions (left main, ostial, bifurcation, multiple stents).

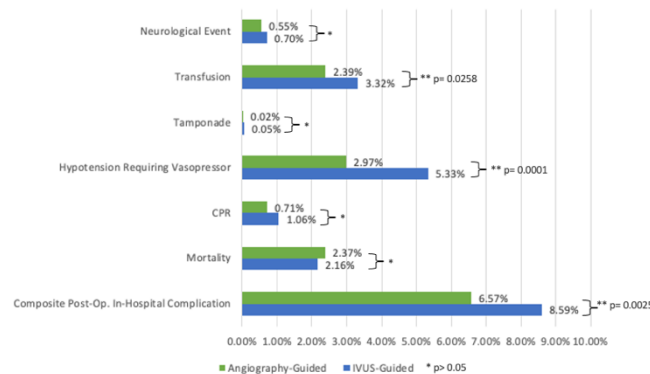


Figure 2. Incidence of In-Hospital Post Operative Complications

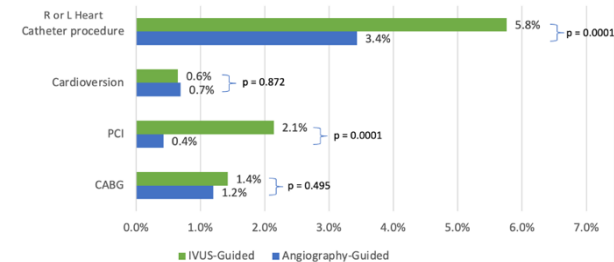


Figure 3. Incidence of Follow Up Procedures 1 year Post PCI for Complex Lesions

Discussion

Key Results

- IG and AG patient populations were well matched for demographics and cardiovascular risk factors.
- IG utilization increased from 10.9% in 2015 to 63.0% in 2022.
- IG was associated with lower contrast use but longer fluoroscopy times compared to AG.
- IG had a higher incidence of in-hospital complications compared to AG.
- Within 1 year, IG had a greater incidence of follow-up procedures (CPT) compared to AG, with no difference in new diagnoses (ICD-10).
- Stratification by complex lesions showed IG continued to have a higher 1-year follow-up procedure incidence compared to AG.

Conclusion

- While IVUS reduces contrast use, its association with higher complication and follow-up procedure rates highlights the need for careful patient selection.
- Increased follow-up interventions may have important financial and health system implications.
- Longer-term studies are needed to clarify intermediate and long-term outcomes of IVUS-guided PCI.

References

- [1] Gao X, et al. *J Am Coll Cardiol Interv.* 2021;14:247–257. DOI: 10.1016/j.jcin.2020.10.001
- [2] Tian NL, et al. *EuroIntervention.* 2015;10:1409–17. PMID: 25912391
- [3] Kim JS, et al. *JACC Cardiovasc Interv.* 2013;6:369–76. PMID: 23523455