

Publication Brief

Predictors and prevention of flow insufficiency due to limited flow demand.

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STUDY

The aim of this study was to investigate the impacts of flow demand and native coronary stenosis on graft flow and patency.

METHOD

The angiograms of 549 bypass grafts in 301 patients who underwent off-pump coronary artery bypass grafting since 2007 were reviewed. They consisted of:

- 237 internal thoracic artery to left anterior descending artery (LAD);
- 97 internal thoracic artery and 52 saphenous vein grafts to left circumflex artery (LCX),
- 109 gastroepiploic artery and 54 saphenous vein grafts to right coronary artery (RCA).
- Only individual bypass grafts created as the sole bypass graft to the coronary vascular region.
- Flow insufficiency was defined as ≤ 20 ml/min measured intraoperatively.
- When a significant difference in the incidence of flow insufficiency or “not functional” occurred between higher and lower values rather than the particular minimal luminal diameter value, the highest value was defined as the cut-off minimal luminal diameter.

RESULTS

- Flow insufficiency was found in 112/549 (20.4%) bypass grafts.
 - For internal thoracic artery to left circumflex artery grafts, the cut-off minimal luminal diameter was 1.25 mm for proximal and 0.75 mm for distal lesions.
 - For gastroepiploic artery to right coronary artery grafts, the cut-off minimal luminal diameter was 0.82 mm for proximal lesions.
 - Ten (71%) of 14 gastroepiploic artery grafts for distal lesions presented with flow insufficiency.

Analysis identified a distal lesion; minimal luminal diameter greater than the cut-off value; right coronary artery and left circumflex artery grafting; and a history of myocardial infarction in the grafted region as significant predictors of flow insufficiency.

CONCLUSIONS

- Both competitive flow and insufficient flow demand cause graft failure. Compared with proximal lesions, more severe stenosis is necessary for distal lesions, to avoid graft failure.
- A revascularization strategy for distal lesions should be separated from that for proximal lesions.

TRANSONIC OBSERVATION

- This paper defines flow insufficiency was defined as ≤ 20 ml/min measured intraoperatively.

REFERENCES

1. Nakajima H, Iguchi A, Tabata M, Koike H, Morita K, Takahashi K, Asakura T, Nishimura S, Niinami H. Predictors and prevention of flow insufficiency due to limited flow demand. J Cardiothorac Surg. 2014;9:188. (Transonic Reference # 10612AHM)