

Learning Objective

To recognize anatomical implications of myocardial bridging and physiological cardiovascular changes induced by spinal anesthesia, enhancing intraoperative management strategies for chest pain, especially in patients without known cardiac disease history.

Background

Myocardial bridging is a congenital condition characterized by the intramyocardial course of an epicardial coronary artery, typically affecting the left anterior descending (LAD) artery. While often asymptomatic, myocardial bridging can manifest clinically as angina under stress conditions in the perioperative setting. Spinal-anesthesia induced hypotension is a well -documented phenomenon, resultant from sympathetic blockade and vasodilation, potentially compromising perfusion.³ Contemporary literature emphasizes its potential significance in symptomatic patients and the role of advanced imaging techniques for diagnosis and risk assessment.²

Case Report

A 59-year old male with a history of hypertension, hyperlipidemia, obesity, smoking, and gastric cancer presented for elective total right hip arthroplasty. He received spinal anesthesia and subsequently developed acute epigastric discomfort described as severe heartburn. He became hypotensive with mean arterial pressures in the 60s, and telemetry showed significant ST depression in lead V5. Initial management included a phenylephrine infusion, IV fluid boluses, and sublingual nitroglycerin, resulting in symptomatic and hemodynamic improvement. Despite stabilization, ongoing chest discomfort led to cardiology consultation and further cardiac evaluation. Surgery was canceled intraoperatively due to ongoing concerns.

Patient Outcome

Cardiac catheterization revealed no significant coronary artery stenosis but identified an incidental myocardial bridge in the mid LAD-artery. Echocardiography demonstrated normal cardiac function with an LV ejection fraction between 60-64%, normal ventricular filling pressures, and no pericardial effusion. Coronary CT angiography is increasingly used in such cases to characterize bridging anatomy and determine hemodynamic relevance.² The total hip arthroplasty was rescheduled and successfully completed under general anesthesia and arterial blood pressure monitoring.

Imaging



Figure 1: Myocardial bridge with a deep intramural course: the coronary artery is completely surrounded by a myocardial sleeve. Gross (a) and histological views (b). Azan Mallory Stain.

Figure 2: White arrows point to an intramyocardial course by the LAD artery in a myocardial bridge

Discussion

This case underscores myocardial bridging as an important but often underrecognized cause of intraoperative chest pain and ECG changes in patients undergoing non-cardiac surgery. Although often asymptomatic, myocardial bridges can provoke ischemia under conditions of reduced preload and hypotension, such as those induced by spinal anesthesia. The patient’s ECG findings, hypotension, and resolution of symptoms with nitrates and fluids are consistent with transient ischemia due to mechanical vessel compression. Coronary CTA and catheterization remain key tools in diagnosis, with conservative management typically sufficient in cases without flow-limiting pathologies.¹

Conclusion

This case highlights the need for anesthesiologists and perioperative teams to recognize myocardial bridging as a potential cause of intraoperative ischemia, even in patients with no prior cardiac history. Awareness of this anomaly, and quick intervention with hemodynamic support and diagnostic evaluation can ensure patients safety. In patients with myocardial bridging, thorough anesthetic planning and monitoring are essential to minimize risk during procedures.

References

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2. Rovera C, Moretti C, Bisanti F, De Zan G, Guglielmo M. *Myocardial Bridging: Review on the Role of Coronary CT Angiography*. J Clin Med. 2023;12(18):5949. <https://doi.org/10.3390/jcm12185949>
3. Ferré F, Martin C, Bosch L, Kurrek M, Lairez O, Minville V. Control of Spinal Anesthesia-Induced Hypotension in Adults. Local Reg Anesth. 2020 Jun 3;13:39-46. doi: 10.2147/LRA.S240753. PMID: 32581577; PMCID: PMC7276328.

Image 1. <https://www.ahajournals.org/doi/10.1161/circulationaha.108.820720>
Image 2: https://www.researchgate.net/figure/Myocardial-bridge-with-deep-intramural-course-the-coronary-segment-is-completely_fig10_351994327