

Cardiovascular Case Reports: Diverse Pathologies, Modern Management

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Introduction

This compilation of case reports offers insights into a diverse array of cardiovascular conditions and their management. One report details a challenging case of refractory angina caused by chronic total occlusion of the left anterior descending artery, successfully treated with advanced percutaneous coronary intervention techniques, including orbital atherectomy and complex stenting [1]. Another case highlights the diagnostic and management considerations for spontaneous coronary artery dissection (SCAD) in a young woman, emphasizing its mimicry of myocardial infarction and the preference for conservative management in stable patients [2].

The realm of valvular heart disease is explored through a case of transcatheter aortic valve implantation (TAVI) in a patient with a porcelain aorta, demonstrating the safety and efficacy of TAVI even in high-risk scenarios with significant aortic calcification [3]. Advancements in coronary artery disease treatment are presented in a case series evaluating a novel bioresorbable scaffold, which showed promising outcomes and favorable vascular healing over a two-year follow-up, suggesting a potential alternative to permanent metallic stents [4].

Hypertrophic cardiomyopathy (HCM) is addressed through a case of severe systolic dysfunction, a less common but serious complication. This report underscores the heterogeneous nature of HCM and the necessity of individualized therapeutic strategies, employing advanced imaging and pharmacological interventions [5]. Furthermore, a case of persistent atrial fibrillation refractory to standard antiarrhythmic drugs successfully managed with catheter ablation is presented, illustrating the efficacy of this procedure for long-term rhythm control and improved quality of life [6].

Takotsubo cardiomyopathy, presenting as acute decompensated heart failure with T-wave inversion, is the focus of another case report. This study emphasizes the diagnostic value of cardiac magnetic resonance imaging (CMR) in differentiating it from ischemic heart disease and the typical recovery with supportive care [7]. The management of aortic pathology is further illustrated by a case of a rapidly enlarging unruptured thoracic aortic aneurysm requiring urgent endovascular repair, highlighting the importance of vigilant monitoring and timely intervention [8].

Infective endocarditis is examined in a case involving a native aortic valve in an intravenous drug user. This report details the microbiological diagnosis, surgical challenges, and the critical need for comprehensive care given the significant morbidity and mortality associated with this condition in this patient population [9]. Lastly, a case of isolated systolic hypertension with resistant hypertension in an elderly patient is discussed, emphasizing the importance of a thorough etiological workup and tailored treatment strategies, including the use of mineralocorticoid

receptor antagonists, for managing this complex condition [10].

These diverse case reports collectively contribute to a broader understanding of contemporary cardiovascular medicine, spanning interventional cardiology, structural heart disease, arrhythmias, cardiomyopathies, and complex medical management. Each case provides valuable clinical lessons and reinforces the evolving landscape of diagnostic and therapeutic approaches in cardiology.

The identification and management of complex coronary anatomy remain a cornerstone of interventional cardiology, as evidenced by the successful revascularization of a chronic total occlusion using advanced techniques, leading to improved patient outcomes and left ventricular function [1]. The recognition of SCAD as a distinct entity, often presenting with symptoms mimicking acute myocardial infarction, is crucial for appropriate patient care, particularly in younger individuals and in the context of strenuous physical activity [2].

Navigating the challenges of treating structural heart disease in patients with significant comorbidities, such as porcelain aorta, underscores the expanding role of minimally invasive procedures like TAVI, offering a viable alternative to conventional surgical interventions [3]. The development and evaluation of novel biomaterials, such as bioresorbable scaffolds, represent a frontier in coronary stenting, aiming to mitigate long-term risks associated with permanent implants and promote natural vascular healing [4].

Understanding the multifaceted presentation of cardiomyopathies, including the less common but severe systolic dysfunction in HCM, is vital for optimizing patient care through personalized medical regimens and advanced diagnostic tools [5]. The increasing application of catheter-based therapies for complex arrhythmias like persistent atrial fibrillation signifies a shift towards more targeted and effective treatments for rhythm disorders [6].

Takotsubo cardiomyopathy, a stress-induced cardiac dysfunction, requires careful differentiation from ischemic heart disease, with imaging modalities like CMR playing a pivotal role in diagnosis and guiding management strategies that often lead to favorable prognoses [7]. The proactive management of aortic aneurysms, regardless of rupture status, is paramount, with endovascular repair emerging as a less invasive and effective option for selected patients, thereby reducing the risk of life-threatening complications [8].

Infective endocarditis, particularly in at-risk populations such as intravenous drug users, presents significant diagnostic and therapeutic hurdles, underscoring the importance of a multidisciplinary approach involving infectious disease specialists, cardiologists, and cardiac surgeons [9]. The management of resistant hypertension, especially in the elderly with specific hypertensive phenotypes like isolated systolic hypertension, necessitates a comprehensive etiological investigation and a carefully titrated pharmacotherapeutic regimen to achieve optimal blood pressure

control and reduce cardiovascular risk [10].

Collectively, these case reports emphasize the continuous evolution of cardiovascular care, driven by innovation in technology, a deeper understanding of disease pathophysiology, and the critical importance of individualized patient management in addressing a wide spectrum of cardiac pathologies.

Description

This collection of case reports illuminates various critical aspects of cardiovascular disease diagnosis and management. A detailed account is provided for a 75-year-old male with refractory angina stemming from a chronic total occlusion of the left anterior descending artery, where advanced percutaneous coronary intervention, including orbital atherectomy and complex stenting, led to successful revascularization and significant symptomatic relief [1].

Another report addresses the diagnostic complexities of spontaneous coronary artery dissection (SCAD) in a young woman, noting its resemblance to myocardial infarction and underscoring the importance of clinical suspicion, especially following strenuous exercise. The case highlights the generally conservative management approach favored in the absence of hemodynamic instability [2].

The management of patients with challenging aortic conditions is demonstrated by a case of transcatheter aortic valve implantation (TAVI) in an individual with a porcelain aorta. This report details the peri-procedural care and successful outcome, affirming TAVI's safety and effectiveness even in the presence of severe aortic calcification, a factor traditionally associated with high surgical risk [3].

Innovations in coronary artery intervention are showcased in a case series examining a novel bioresorbable scaffold for treating coronary artery disease. With two-year follow-up data indicating good clinical outcomes and favorable vascular healing, the series suggests potential long-term benefits over permanent metallic stents, although further longitudinal data are anticipated [4].

The spectrum of cardiomyopathies is represented by a case of hypertrophic cardiomyopathy (HCM) that progressed to severe systolic dysfunction. The report outlines the diagnostic process, including advanced imaging, and discusses pharmacological strategies aimed at improving left ventricular function and symptom control, emphasizing the heterogeneity of HCM and the need for tailored treatment [5].

A case of persistent atrial fibrillation refractory to medical therapy is presented, detailing the successful treatment with catheter ablation. The report describes the electrophysiological findings, ablation technique, and sustained rhythm control, reinforcing catheter ablation as an effective option for complex atrial fibrillation, thereby enhancing quality of life [6].

Takotsubo cardiomyopathy, presenting as acute decompensated heart failure with characteristic ECG changes, is explored in a case report that highlights the diagnostic utility of cardiac magnetic resonance imaging (CMR) in distinguishing it from ischemic heart disease. The case also notes the typical positive prognosis with supportive management [7].

Urgent intervention for a rapidly enlarging unruptured thoracic aortic aneurysm is described in a case report focusing on endovascular repair. The report details the diagnostic imaging, surveillance strategies, and the successful surgical management, emphasizing the critical importance of diligent monitoring and timely intervention for thoracic aortic aneurysms [8].

Infective endocarditis in a high-risk patient population, specifically an intravenous drug user with native aortic valve involvement, is the subject of another report. It

details the microbiological diagnosis, surgical management complexities due to valve destruction, and the prolonged antibiotic therapy, underscoring the severe outcomes associated with this condition in this demographic [9].

Finally, a case report addresses the management of isolated systolic hypertension coupled with resistant hypertension in an elderly patient. The report discusses the comprehensive diagnostic evaluation to identify underlying causes and the optimization of antihypertensive therapy, including mineralocorticoid receptor antagonists, stressing the need for etiological workup and individualized treatment for resistant hypertension in older adults [10].

Collectively, these case reports provide valuable clinical insights into contemporary cardiovascular challenges, from complex interventional procedures to the management of rare or severe manifestations of common cardiac conditions, highlighting advancements in diagnostic tools and therapeutic modalities.

The successful application of advanced PCI techniques, such as orbital atherectomy and complex stenting, for CTOs represents a significant step forward in treating challenging coronary anatomies, offering hope for patients with limited revascularization options [1]. The prompt recognition and appropriate management of SCAD are critical to avoid misdiagnosis and optimize outcomes, with a growing body of evidence supporting conservative strategies in many cases [2].

Transcatheter aortic valve implantation has revolutionized the treatment of severe aortic stenosis, particularly for patients with high surgical risk factors, with recent advancements enabling its use in previously prohibitive scenarios like porcelain aorta [3]. The development of bioresorbable scaffolds holds promise for reducing the long-term complications associated with metallic stents, such as restenosis and late stent thrombosis, by promoting natural vessel healing [4].

Hypertrophic cardiomyopathy, while often presenting differently, can lead to severe systolic dysfunction, necessitating vigilant monitoring and tailored medical therapy to improve ventricular function and alleviate symptoms [5]. Catheter ablation has emerged as a highly effective therapy for persistent atrial fibrillation, offering a curative option for patients refractory to drug treatment and significantly improving their quality of life [6].

Takotsubo cardiomyopathy is an important diagnosis to consider in patients presenting with acute heart failure and ECG abnormalities, especially in the absence of typical coronary artery disease, with CMR being instrumental in its diagnosis [7]. The management of thoracic aortic aneurysms requires a proactive approach, and endovascular repair has become a crucial option for treating these potentially life-threatening conditions with improved safety and efficacy [8].

Native valve endocarditis in IV drug users is a severe manifestation requiring aggressive management, often involving complex surgical interventions and prolonged antibiotic courses, underscoring the devastating impact of infection in this population [9]. The management of resistant hypertension in the elderly is a significant clinical challenge that demands a thorough investigation into secondary causes and a personalized therapeutic strategy to achieve adequate blood pressure control and reduce cardiovascular events [10].

Conclusion

This collection of case reports details various cardiovascular conditions and their management. Topics include complex percutaneous coronary interventions for chronic total occlusions, spontaneous coronary artery dissection, transcatheter aortic valve implantation in high-risk patients, bioresorbable scaffolds for coronary artery disease, severe systolic dysfunction in hypertrophic cardiomyopathy, catheter ablation for refractory atrial fibrillation, takotsubo cardiomyopathy, thoracic aortic aneurysms, infective endocarditis in intravenous drug users, and resis-

tant hypertension in the elderly. The reports highlight diagnostic challenges, therapeutic advancements, and the importance of individualized patient care across a broad spectrum of cardiovascular pathologies.

Acknowledgement

None.

Conflict of Interest

None.

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How to cite this article: Nakamura, Kenji. "Cardiovascular Case Reports: Diverse Pathologies, Modern Management." *Clin Med Case Rep* 10 (2026):418.

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Received: 01-Feb-2026, Manuscript No. cmcr-25-186121; **Editor assigned:** 03-Feb-2026, PreQC No. P-186121; **Reviewed:** 17-Feb-2026, QC No. Q-186121; **Revised:** 23-Feb-2026, Manuscript No. R-186121; **Published:** 02-Mar-2026, DOI: DOI: 10.37421/2684-4915.2025.10.418