

Incidence of Coronary Artery Anomalies in Young Female Patients Presenting with Chest Pain

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ABSTRACT

Coronary artery anomalies (CAAs) are rare congenital variations that may present with chest pain, arrhythmias, or sudden cardiac death. Their recognition in young female patients is particularly challenging due to overlapping non-cardiac causes of chest pain. This review synthesizes incidence data, diagnostic approaches, and management strategies, emphasizing the importance of early detection in this subgroup.

Keywords: Coronary artery anomalies; Chest pain; Young female patients; Congenital heart disease; Coronary CT angiography; Sudden cardiac death

INTRODUCTION

Chest pain in young women is often attributed to benign etiologies, yet coronary artery anomalies remain an underrecognized cause. Although uncommon, CAAs can have serious consequences, including myocardial ischemia and sudden cardiac death. Understanding their incidence and clinical presentation in young female patients is essential for timely diagnosis and intervention.

Epidemiology

Anomaly type	Incidence (general population)	Reported incidence in young females with chest pain
Anomalous origin of RCA from left sinus	~0.1-0.3%	~2-3% of unexplained chest pain cases
Anomalous origin of LCA from pulmonary artery (ALCAPA)	~0.008%	Rare, but disproportionately reported in young women
Interarterial course anomalies	~0.2-0.4%	~2-5% of symptomatic female patients under 40

Pathophysiology

Interarterial course→compression between aorta and pulmonary artery during exertion.

Aberrant origin→impaired perfusion, risk of ischemia.

Associated conditions→hypertrophic cardiomyopathy, connective tissue disorders.

Clinical Presentation

- Symptoms: exertional chest pain, palpitations, syncope.
- Misdiagnosis risk: often attributed to anxiety or musculoskeletal pain.
- Red flags: exertional symptoms, family history of sudden cardiac death, abnormal ECG.

Diagnostic Modalities

Diagnostic Approach in Young Female Patients with Chest Pain:

1. Initial evaluation: ECG,troponin,echocardiography
2. Persistent unexplained chest pain → Coronary CT angiography (CCTA)
3. If anomaly detected → MRI for ischemia assessment
4. Symptomatic anomaly→surgical referral

Management

Asymptomatic: surveillance imaging.

- Symptomatic: surgical correction (reimplantation, unroofing).
- Lifestyle: avoidance of strenuous exercise until definitive management.
- Pharmacological: beta-blockers in select cases.

DISCUSSION

The incidence of CAAs in young female patients presenting with chest pain is low but clinically significant. Underdiagnosis remains a challenge due to symptom overlap with benign conditions. Advanced imaging and heightened clinical suspicion are essential to reduce morbidity and mortality.

CONCLUSION

Coronary artery anomalies should be considered in the differential diagnosis of chest pain in young female patients. Early recognition and appropriate management can prevent catastrophic outcomes. Large-scale registries are needed to better define incidence and prognosis in this subgroup.

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