

Imaging Modalities in the Diagnosis of Congenital Abdominal Aortic Stenosis

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Abstract

Case Report

Ischemic episodes affecting the aorta are uncommon in pediatric populations but demand urgent attention due to their potential for grave outcomes if left untreated. This case underscores the critical role of imaging modalities, particularly CT scanning, in diagnosing aortic ischemia swiftly and accurately, thereby facilitating timely therapeutic interventions.

Keywords: Aortic Stenosis, CT Scanning, Diagnosis, Management.

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INTRODUCTION

Ischemic events in the aorta among children are infrequent but can lead to severe complications if not promptly identified and managed. The utilization of imaging techniques, notably ultrasound and CT scanning, holds pivotal significance in the early detection of this condition, offering detailed insights into vascular abnormalities and tissue perfusion.

CASE REPORT

A two-year-old child, with no significant medical history, was admitted due to severe hypotonia, accompanied by a deteriorated general condition, shock, tachycardia, and polypnea. On examination, reduced pulses were noted in the lower extremities, indicative of early arterial ischemia, while the upper limbs appeared unremarkable. Emergency ultrasound revealed a diminished caliber of the abdominal aorta with absent flow on color Doppler. Subsequent CT imaging confirmed a complete opacification defect of the abdominal aorta from the renal arteries, coupled with renal hypoperfusion. The patient was promptly hospitalized in the intensive care unit for further therapeutic and diagnostic management but unfortunately succumbed the following day. Extensive etiological investigations were conducted posthumously.



Figures: Thoraco-abdominal CT scan in sagittal and axial slices, in the abdominal window after arterial phase contrast injection, reveals a complete lack of aortic opacification with bilateral renal hypoperfusion

DISCUSSION

Aortic ischemia in children is a rare condition, but it can have serious consequences if not promptly diagnosed and treated [1]. Imaging modalities such as ultrasound and CT scanning play a crucial role in diagnosing this condition by providing detailed information about vascular anatomy and tissue perfusion [1].

Aortic ischemia in children is extremely rare, with limited epidemiological data available. Specific prevalence studies in this population are scarce, but it is estimated that this condition represents a small proportion of vascular diseases in children [2]. Available data suggest that aortic ischemia can occur at any age in children, although cases in infants and young children are less common than in adolescents [3].

Clinical manifestations of aortic ischemia in children can be varied and nonspecific. In the case presented, the child exhibited severe hypotonia, altered general status, shock, tachycardia, and polypnea. Additionally, reduced pulses in the lower limbs with early arterial ischemia were observed [4]. Clinical manifestations can vary depending on the extent and severity of ischemia, ranging from mild symptoms to severe circulatory distress [1].

Imaging techniques such as ultrasound and CT scanning are essential for diagnosing aortic ischemia in children. Ultrasound can provide initial evaluation, revealing reduced aortic caliber and absent flow on color Doppler [5]. However, CT scanning offers more detailed visualization of the aorta and renal arteries, confirming the diagnosis and assessing the extent of ischemia. In this case, the CT scan showed total opacification defect of the abdominal aorta from the renal arteries with renal hypoperfusion, aiding in prompt diagnosis and management [5].

Underlying causes of aortic ischemia in children can be diverse. These include congenital anomalies such as aortic abnormalities, inflammatory or thrombotic vascular disorders, trauma, infections, and systemic diseases [2, 3]. Specific conditions associated with aortic ischemia in children include Takayasu's disease, Kawasaki disease, thromboembolism, vascular developmental anomalies, and bacterial or fungal infections. Accurate etiological diagnosis is essential for guiding treatment and preventing recurrences [2].

The prognosis of aortic ischemia in children depends on several factors, including the speed of diagnosis, the extent of ischemia, associated complications, and response to treatment. In severe cases, untreated aortic ischemia can lead to renal failure, mesenteric infarction, or even death. However, with early diagnosis and appropriate management, the prognosis can be favorable [1].

CONCLUSION

CT scanning plays a crucial role in the diagnosis and management of aortic stenosis. Its ability to provide detailed anatomical information helps guide treatment decisions and improve patient outcomes. Further research is needed to optimize CT imaging techniques and enhance our understanding of this complex cardiac condition.

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