

The Celiac Trunk: Anatomical Variants and Malformations – A Narrative Review

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Abstract

The celiac trunk (CT), as the first major ventral branch of the abdominal aorta, plays a critical role in the vascularization of foregut-derived organs, including the stomach, liver, spleen, pancreas, and proximal duodenum. While the classic trifurcation pattern, known as Tripus Halleri, is observed in the majority of individuals, numerous studies have highlighted a remarkable degree of anatomical variability in its branching pattern, origin, and structural characteristics. This narrative review explores the embryological foundations, physiological anatomy, and clinical implications of CT variations, drawing upon historical and contemporary classifications - from Haller's descriptive observations to the structured systems proposed by Lipshutz, Michels, and Panagouli. Notably, deviations such as bifurcation, tetrafurcation, and even heptafurcation of the CT have been documented, with implications ranging from surgical risk in hepatobiliary procedures to complications in liver transplantation. The variability in CT morphology, influenced by developmental, genetic, and potentially ethnic factors, underscores the need for thorough anatomical knowledge in radiological diagnostics and surgical planning. By synthesizing findings from over four decades of cadaveric, radiological, and clinical studies, this review aims to provide a comprehensive understanding of CT anomalies and their relevance in modern clinical practice.

Keywords: celiac trunk, anatomic variants, malformations, anatomical landmark