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A Novel Presentation of a Gastric-Derived Left Middle Suprarenal Artery: Novel Gastric origin of Suprarenal Artery

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Case Report

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Abstract

The suprarenal glands possess a complex arterial supply that is critical to their physiological function and surgical management. Typically, each gland receives blood from the superior, middle, and inferior suprarenal arteries, although considerable anatomical variation exists in the origins and distribution of these vessels. Recognition of such variations is particularly important during abdominal and retroperitoneal procedures, where unanticipated vascular anatomy may complicate surgical dissection and compromise glandular perfusion. This case report describes an anomalous artery supplying the left suprarenal gland that coursed medially across the posterior abdomen, in the absence of a middle suprarenal artery arising directly from the abdominal aorta. Further anatomical examination revealed that this vessel originated from the left gastroepiploic artery. To our knowledge, this represents the first reported case of a suprarenal artery arising from a gastric vessel. This finding expands the recognized spectrum of suprarenal arterial anatomy and highlights the clinical importance of identifying atypical vascular origins and courses to support appropriate surgical planning and minimize the risk of inadvertent vascular injury.

Keywords: Suprarenal Arteries; Gastroepiploic Artery; Middle Suprarenal Arteries; Suprarenal Gland; Aberrant Suprarenal Artery

Abbreviations

LRV: Left Renal Vein; LSG: Left Suprarenal Gland; LRA: Left Renal Artery; TP: Tail of the Pancreas; SP: The Spleen; GC: Greater Curvature of the Stomach; OM: Omentum; SA: Splenic Artery.

Introduction

The suprarenal glands are a vital pair of retroperitoneal endocrine organs positioned just superior to the kidneys on the posterior aspect of the abdominal wall, near the level of T12. These glands produce and secrete a series of critical hormones that play central roles in blood pressure regulation, the stress response, and the fight-or-flight response.

The suprarenal gland is a complex endocrine organ that develops between the 5th and 7th weeks of embryologic development and is composed of two distinct tissue types derived from different embryological origins. The outer cortical tissue, which produces corticosteroid hormones, including glucocorticoids, mineralocorticoids, and gonadocorticoids, which is of mesodermal origin. In contrast, the medullary tissue, responsible for producing catecholamines essential for the fight-or-flight response, is derived from neuroectoderm [1,2]. Reflecting their

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critical role in human physiology, the suprarenal glands demonstrate a characteristic tripartite pattern of vascular supply. Classically, each gland receives superior suprarenal branches from the inferior phrenic arteries, a middle suprarenal artery arising directly from the abdominal aorta, and inferior suprarenal branches from the renal arteries [3,4]. These vessels form a dense subcapsular arterial plexus that supports the highly metabolic cortex and medulla.

Anatomic variation in arterial networks, origins, and patterns of vascular supply is common in human anatomy, and the suprarenal arteries are no exception. Variations in the number, origin, and dominance of these vessels have been documented in cadaveric studies and case reports [5-12]. A comprehensive review of suprarenal arterial anatomy across multiple anatomical studies and clinical reports demonstrates a wide range of potential arterial origins, including the abdominal aorta, celiac trunk, intercostal arteries, renal polar arteries, gonadal arteries, and superior mesenteric artery, as well as aberrant branches arising from other suprarenal vessels [12]. Recognition of these variations is clinically important, as aberrant vessels may pose significant risks during adrenalectomy, nephrectomy, renal transplantation, and interventional radiologic procedures.

In this case report, we describe a previously undocumented arterial variant in which a suprarenal artery arises from the left gastroepiploic artery and courses medially to supply the left suprarenal gland. Because the superior and inferior suprarenal arteries were clearly identified during dissection, this vessel most likely represents a novel variant of the left middle suprarenal artery.

Case Report

Slippery Rock University's Institutional Review Board does not oversee cadaveric investigations; therefore, authorization for this study was obtained through Wright State University's Anatomical Gift Program, and the investigation was conducted in full compliance with institutional requirements.

During routine abdominal dissection of a 96-year-old male donor, the spleen, stomach, and pancreas were removed en bloc to preserve their arteriovenous relationships and facilitate examination of the posterior abdominal wall. Inspection of the left posterior abdominal wall revealed an unidentified arterial vessel superior to the left renal vein (Figure 1A). Further dissection demonstrated that the vessel passed deep to the left phrenicoadrenal trunk before turning superolateral and terminating along the medial aspect of the left suprarenal gland (Figure 1B). From this medial point, the vessel was traced laterally for 9.40 cm, where a prominent branch arose, coursing superomedial to enter the lateral aspect of the left suprarenal gland. Beyond this branch point, the parent vessel continued an additional 14.30cm across the posterior abdominal wall, terminating at a transected end near the splenic bed. The transected end was circular in cross-section and measured approximately 2.0mm in diameter.

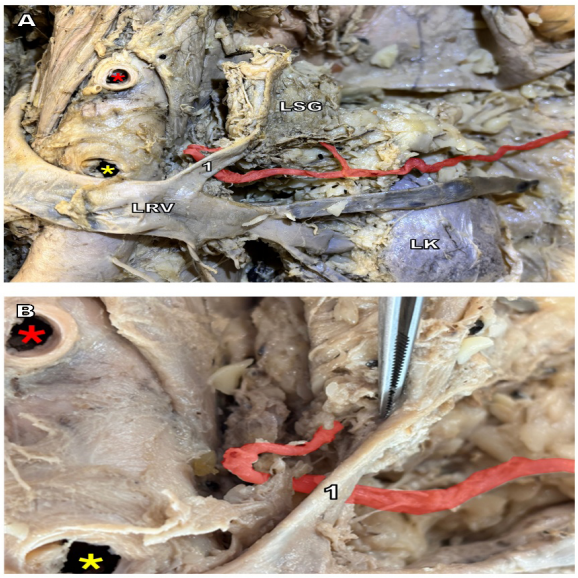


Figure 1: (A) Overview of the posterior abdominal wall, demonstrating the course of travel of this aberrant blood vessel (red highlighting), which was superior to the left renal vein (LRV). The transected end of this vessel was located lying in the area of the splenic bed, while the vessel projected medially, casting off a prominent branch into the lateral aspect of the left suprarenal gland (LSG), then continuing on, passing posterior to the left phrenicoadrenal trunk (1) before ascending in a superolateral direction into the medial aspect of the left suprarenal gland. (B) Close-up view showing the artery passing posterior to the left phrenicoadrenal trunk (1), before turning superolateral into the medial aspect of the left suprarenal gland (LSG). Red asterisk = location of the Celiac Trunk, yellow asterisk = Superior Mesenteric Artery, LRA = Left Renal Artery, LK = Left Kidney.

To identify the origin of the anomalous vessel, the left posterior abdominal wall and abdominal aorta were carefully examined for evidence of a vascular origin. Both superior and inferior suprarenal arteries were identified arising from their expected anatomical origins (Figure 2); however, no identifiable middle suprarenal artery arising from the abdominal aorta was observed. No other identifiable vascular branches or evidence of an aortic origin for the anomalous vessel were found. Additionally, because the fibrous renal capsule had been removed to expose the left kidney and

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posterior abdominal wall, a capsular arterial origin is highly unlikely. With no identifiable source for the aberrant blood vessel identified on along the posterior abdominal wall and given the location of the vessel's transected distal end near the splenic bed, the excised stomach–pancreas–spleen organ block was subsequently examined for a corresponding arterial stump.

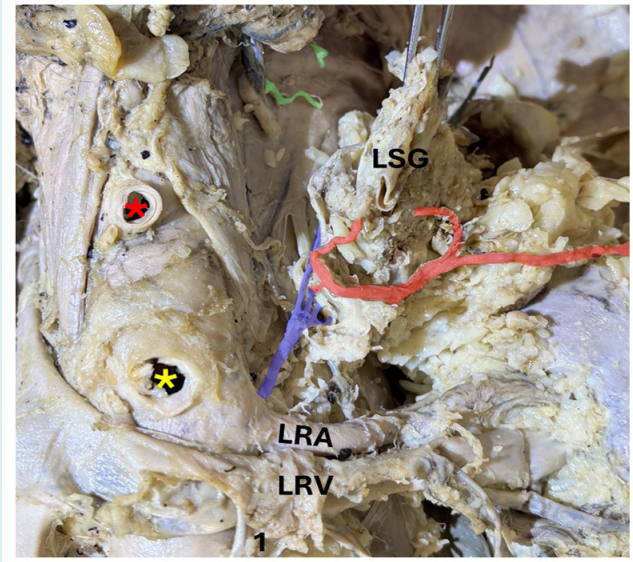


Figure 2: Close-up view of the posterior abdominal wall in the region of the left suprarenal gland (LSG), with the left phrenicoadrenal trunk (1) reflected inferiorly to visualize the suprarenal arterial supply. The superior suprarenal arteries (green highlight) are observed arising from their typical origin, the inferior phrenic artery. The inferior suprarenal arteries (blue highlight) are identified arising near the junction of the abdominal aorta and the left renal artery (LRA), with what appeared to be potential anastomotic connection with the aberrant vessel (red highlighting). Further examination of the abdominal aorta revealed no evidence of any direct arterial branches (intact or remnants) supplying the left suprarenal gland (LSG); instead, only the aberrant vessel (red) was observed supplying the medial aspect of the left suprarenal gland. Red asterisk = location of the Celiac Trunk, yellow asterisk = Superior Mesenteric Artery.

Inspection of the organ block revealed a prominent transected arterial stump projecting from the vasculature along the greater curvature of the stomach (Figure 3A). Its location and orientation corresponded precisely with the transected end of the anomalous vessel identified near the splenic bed. The posterior surface of the organ block was then carefully dissected, with the splanchnic vasculature separated to facilitate tracing of the gastric arterial network. The left gastroepiploic artery was identified arising from the splenic artery, consistent with its expected anatomical origin (Figure 3B). Further tracing demonstrated its expected bifurcation into an omental branch, coursing toward the greater omentum, and a gastric branch, continuing along the greater curvature of the stomach. Direct visualization confirmed that the previously identified arterial stump arose from the left gastroepiploic artery, establishing the left gastroepiploic artery as the source of the anomalous vessel (Figure 3B).

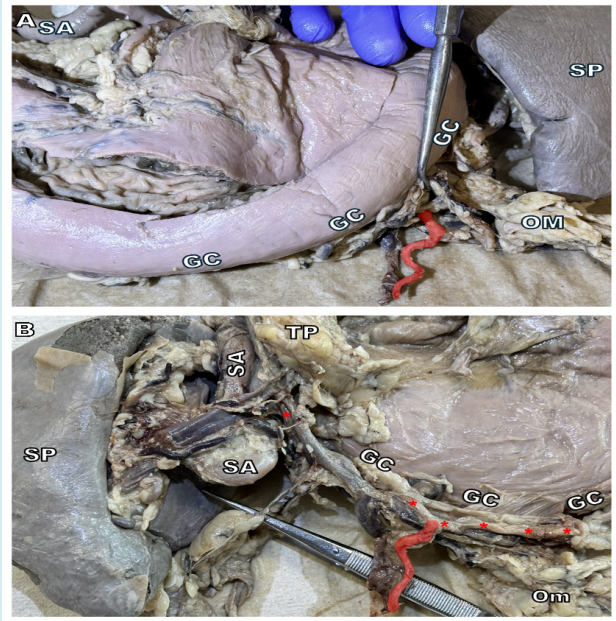


Figure 3: (A) Anterior view of the stomach–pancreas–spleen organ block with intact vasculature, demonstrating the transected stump of the aberrant suprarenal artery (red highlight) projecting from the vasculature along the greater curvature of the stomach (GC). (B) Posterior view of the organ block with the splanchnic vasculature splayed to facilitate detailed vascular tracing. The spleen (SP), tail of the pancreas (TP), greater curvature of the stomach (GC), remnants of the greater omentum (OM), and splenic artery (SA), are clearly identified. The left gastroepiploic artery (red asterisks) is visualized arising directly from the splenic artery (SA) and following its typical expected anatomic course along the greater curvature (GC) of the stomach. As the left gastroepiploic artery courses along with the greater curvature (GC), the transected stump of the aberrant suprarenal artery (red highlight) is observed arising directly from it. This tracing confirms that the aberrant suprarenal artery originates from the left gastroepiploic artery.

The anomalous vessel's anatomical course and distribution, together with the identification of its origin

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from the left gastroepiploic artery, distinguish this finding from the expected configuration of the suprarenal arterial supply. Both the superior and inferior suprarenal arteries were present at their typical origins, whereas a conventional middle suprarenal artery arising from the abdominal aorta could not be identified. Notably, the anomalous vessel coursed medially across the posterior abdominal wall and supplied the left suprarenal gland through branches entering its lateral and medial aspects. Taken together, these findings support the interpretation of this vessel as a previously undescribed variant of the middle suprarenal artery, arising from the left gastroepiploic artery rather than the abdominal aorta. To our knowledge, this configuration represents a novel variation in the arterial supply of the left suprarenal gland.

Discussion

To our knowledge, this case represents the first documented report of a suprarenal artery originating from a gastric vessel, specifically the left gastroepiploic artery. Beyond its unprecedented origin, this variant is distinguished by the unusually prolonged course of the artery across the posterior abdomen before reaching the left suprarenal gland. The combination of a non-local arterial origin and an extended retroperitoneal trajectory represents a previously undescribed configuration of suprarenal vascular anatomy. This finding expands the recognized spectrum of suprarenal arterial variation and highlights the importance of continued anatomical investigation and documentation, particularly for variants with potential implications for clinical practice.

The suprarenal glands possess an extensive arterial network that is essential to their endocrine function. Classically, each gland receives a tripartite arterial supply from the superior, middle, and inferior suprarenal arteries, which typically arise from the inferior phrenic arteries, abdominal aorta, and renal arteries, respectively. Although variations in the origins and distribution of these arteries are well documented [5-11], the middle suprarenal artery demonstrates the greatest variability [12]. Previously described variants have predominantly involved vessels arising from anatomically adjacent structures, including the celiac trunk, mesenteric arteries, gonadal arteries, renal polar arteries, and inferior phrenic artery. In contrast, the artery described in this case originates from the left gastroepiploic artery, a vessel associated with the gastric and greater omental vasculature and follows an extended course across the posterior abdomen to reach the suprarenal gland. This unusual vascular relationship is particularly noteworthy because it differs from the regional patterns generally described in the existing literature. Furthermore, the substantial length and relatively uniform diameter of the vessel suggest that it may represent a meaningful source of arterial inflow to the gland, although its precise contribution to overall suprarenal perfusion cannot be established from the present anatomical observation alone.

The clinical significance of this variation extends beyond its unusual origin. Knowledge of suprarenal arterial anatomy is essential during procedures involving the adrenal glands and adjacent retroperitoneal structures, where unrecognized arterial variants may increase the risk of inadvertent vascular injury, hemorrhage, or disruption of glandular perfusion. Aberrant suprarenal arteries are particularly relevant during adrenalectomy, nephrectomy, and renal transplantation, in which vascular identification and preservation are important considerations. The present variant introduces an additional consideration: because its origin lies outside the immediate suprarenal region and its course traverses the posterior abdomen, the vessel may be encountered during abdominal procedures that would not ordinarily be expected to involve the suprarenal arterial supply. Its relationship to the gastrointestinal vasculature may therefore be relevant during operations involving the stomach, greater omentum, and adjacent abdominal structures. Failure to recognize such a vessel could result in unexpected hemorrhage or inadvertent ligation, with the potential for compromising its contribution to adrenal perfusion.

The extended trajectory of this artery may also have implications for the interpretation of diagnostic imaging and the assessment of abdominal vascular anatomy. Recognition of an atypical suprarenal arterial origin may help prevent misidentification of the vessel during preoperative evaluation and facilitate more informed surgical planning. In addition, its course across the posterior abdomen may be relevant when evaluating vascular structures following abdominal trauma. Although the suprarenal glands possess a rich and redundant arterial network, disruption of their blood supply may contribute to adrenal hemorrhage or vascular compromise [13-15]. Given the critical endocrine functions of the suprarenal glands, substantial vascular injury may have serious clinical consequences, including adrenal insufficiency and, in severe cases, cardiovascular collapse. The extent to which injury to this particular variant would affect overall glandular perfusion, however, would depend on the adequacy of the remaining arterial supply and cannot be determined from the present findings.

Although human gross anatomy is often described using established patterns, arterial variations remain clinically relevant and may challenge assumptions regarding the predictable origins and courses of major vessels. The present case is notable not simply for an unusual suprarenal arterial origin, but for the combination of a gastric source, an extended

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posterior abdominal course, and the absence of a middle suprarenal artery arising directly from the abdominal aorta. Collectively, these features distinguish this configuration from previously described patterns and broaden the anatomical framework through which suprarenal vascular relationships may be understood. Recognition of this variant may be particularly important for surgeons, radiologists, and other clinicians involved in the evaluation or treatment of the upper abdominal and retroperitoneal regions. Continued documentation of atypical vascular anatomy is essential to refining established anatomical descriptions, improving recognition of clinically relevant variations, and supporting safer surgical and diagnostic practice.

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Author Contributions

- J McAteer: Performed the Dissection, acquired donor images, and initially composed the methods and case report sections, reviewed the final manuscript to ensure accuracy
- JR Siebert: acquired donor images, created the figures, drafted the manuscript, reviewed the final manuscript to ensure accuracy

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Conflict of Interest

The authors declare there are no conflicts of interest related to this study.

References

1. Nicolaides NC, Willenberg HS, Bornstein SR, Chrousos GP (2023) Adrenal Cortex: Embryonic Development, Anatomy, Histology and Physiology. In: Feingold KR, et al. (Eds.), Endotext [Internet]. MDText.com, Inc., South Dartmouth, MA.

2. Dutt M, Wehrle CJ, Jialal I (2023) Physiology, Adrenal Gland. In: StatPearls [Internet]. StatPearls Publishing, Treasure Island, FL.

3. Borley BR (2008) Abdomen & Pelvis. In: Standring S (Ed.), Gray's Anatomy: The Anatomical Basis of Clinical Practice. 40th(Edn.), Churchill Livingstone, pp: 1197-1201.

4. Moore KL, Dalley AF, Agur AMR (2014) Moore's Clinically Oriented Anatomy. 7th (Edn.), Lippincott Williams & Wilkins.

5. G V, Parthasarthy M (2020) Anatomical variant origin of suprarenal arteries from coeliac trunk development, and its clinical significance. International Journal of Research in Medical Sciences 8(2): 460–463.

6. He Z, Ma L, Dan W, Cai X, Liu H, et al. (2024) Anomalous origin of the left suprarenal, inferior phrenic arteries and left ovarian artery in a human cadaver. Anatomical Science International 99(1): 146–150.

7. Manso JC, DiDio LJA (2000) Anatomical variations of the human suprarenal arteries. Annals of Anatomy 182(5): 483-488.

8. Dutta S (2010) Suprarenal gland-arterial supply: an embryological basis and applied importance. Romanian Journal of Morphology and Embryology 51(1): 137-140.

9. Olewnik Ł, Waśniewska A, Polguj M, Topol M (2018) Rare combined variations of renal, suprarenal, phrenic and accessory hepatic arteries. Surgical and Radiologic Anatomy 40(7): 743-748.

10. Rahman HA, Dong K, Yamadori T (1993) Unique course of the ovarian artery associated with other variations. Journal of Anatomy 182(2): 287-290.

11. Honma S, Kudo M (2012) The middle suprarenal artery arising from the superior mesenteric artery. Surgical and Radiologic Anatomy 34(1): 93-95.

12. Priya A, Narayan RK, Ghosh SK (2022) Prevalence and clinical relevance of the anatomical variations of suprarenal arteries: a review. Anatomy & Cell Biology 55(1): 28-39.

13. Szwarcbard N, Davis A, Bach LA, Hackman K (2022) Adrenal gland haemorrhages following motor vehicle accident with resultant adrenal insufficiency. Endocrinology, Diabetes & Metabolism Case Reports 2022: 21-0208.

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14. Mehmood KT, Sharman T (2023) Adrenal Hemorrhage. In: StatPearls [Internet]. StatPearls Publishing, Treasure Island, FL.

15. Patel A, Downing R, Vijay S (2013) Spontaneous rupture of the adrenal artery successfully treated using the endovascular approach: a report of 2 cases. Vascular and Endovascular Surgery 47(2): 124-127.

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