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Applied Clinical Anatomy of Gut Vascular Supply: A Narrative Review of Segmental Perfusion, Watershed Vulnerability, and Surgical Implications

*Zaparackaite I[1], Govani ND[2], Singh H[3], Singh SJ[4], Mehta AR[5], Midha PK[5], Patel R[2] and Patel RV[2]**

[1]Department of Pediatric Surgery, Emergency Children's Surgery Hospital, Entebbe/ Evelina Children's Hospital, London

[2]Department of Pediatric Surgery, PGICHR and KTCGUH, Rajkot 360001, Gujarat, India

[3]Care Gastroenterology Medical Group, California, USA

[4]Department of Pediatric Surgery, Nottingham University Hospitals, Nottingham, UK

[5]J. Watumull Global Hospital & Research Centre, Delwara Road, Mount Abu, Rajasthan 307501, India Affiliated to Medical Faculty of God Fatherly Spiritual University, Mount Abu, Rajasthan, India

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Author : Dr. Ramnik Patel, M.D.

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Correspondence:
Dr. Ramnik Patel, M.D., Director-Professor, Department of Pediatric Surgery, Postgraduate Institute of Child Health and Research and K T Children Government University Teaching Hospital, Rajkot 360005, Gujarat, India. Mobile: +447956896641, Phone/Fax: +441162893395; E-mail: ramnik@doctors.org.uk/ ORCID: https://orcid.org/0000-0003-1874-1715

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Abstract

Objectives: To synthesise the applied clinical anatomy of gastrointestinal vascular supply with emphasis on watershed zones, circumferential perfusion patterns, and mechanisms of vascular compromise. The review aims to provide surgeons and clinicians with a practical, anatomically grounded framework for understanding perfusion vulnerability, intraoperative decision-making, and the pathophysiology of ischemic injury.

Design: Narrative review integrating anatomical, surgical, radiological, and physiological literature with clinically oriented interpretation. Enhanced diagrams and comparative tables are used to support clarity and accessibility.

Data Sources: Searches were conducted in PubMed, Embase, Scopus, and Google Scholar for literature relating to gastrointestinal vascular anatomy, mesenteric perfusion, watershed zones, ischemic colitis, and surgical assessment of bowel viability. Additional sources included anatomical atlases, operative textbooks, and key clinical reviews.

Eligibility Criteria: Materials addressed included arterial and venous anatomy of the gut, watershed regions and collateral pathways, mechanisms of ischemia and perfusion failure, surgical relevance of vascular anatomy, clinical or intraoperative assessment of bowel viability

Results: The review highlights the segmental and collateral vascular architecture of the gut, with particular focus on:

- The unique vascular features of the oesophagus, stomach, duodenum, jejunum, ileum, appendix, and colon
- Critical watershed zones at Griffith's point and Sudeck's point, where perfusion is most vulnerable
- The role of circumferential blood supply and the antimesenteric border in early ischemic change
- The impact of bowel distention, volvulus, and venous congestion on perfusion compromise
- Practical intraoperative markers of viability and perfusion adequacy

A clinically oriented synthesis is presented to support surgical planning, risk assessment, and interpretation of ischemic patterns.

Conclusions: Understanding the applied vascular anatomy of the gut is essential for safe surgical practice and accurate interpretation of ischemic pathology. Watershed zones, collateral variability, and circumferential perfusion patterns shape the gut's vulnerability to ischemia and influence operative strategy. This review consolidates key anatomical and clinical principles into a practical reference framework for surgeons, gastroenterologists, and trainees.

Keywords: Gastrointestinal Vascular Anatomy; Mesenteric Circulation; Watershed Zones; Griffith's Point; Sudeck's Point; Bowel Ischemia; Antimesenteric Border; Mesenteric Perfusion; Ischemic Colitis; Bowel Viability Assessment; Surgical Anatomy; Collateral Circulation; Intestinal Distention; Venous Congestion; Perfusion Imaging

Summary Box

What is already known on this topic

- Colorectal motility disorders can cause distal bowel stasis, intraluminal hypertension, and functional partial obstruction.
- Colonic distention may impair mucosal perfusion at antimesenteric and marginal arcade watershed zones, predisposing to low-grade ischemia and barrier dysfunction.
- Dysbiosis, small bowel bacterial overgrowth, appendiceal stasis, and ileocecal reflux are recognised complications of chronic hindgut dysfunction.
- Duodenal compression syndromes (e.g., SMA syndrome) and biliary stasis can arise from anatomical variants or altered mesenteric tension.
- Gastro-oesophageal reflux and laryngopharyngeal reflux are known contributors to recurrent ENT and respiratory infections.

What this Study Adds

- Proposes a unified "Ascending Cascade" model in which hindgut partial obstruction initiates a progressive chain of dysfunction extending through the midgut, foregut, and airway systems.
- Identifies mesocolonic traction at the duodenojejunal flexure as an under-recognised mechanical pathway linking hindgut distention to functional midgut malrotation, duodenal kinking, and SMA-like compression.
- Highlights how hindgut-driven pressure dynamics and dysbiosis can propagate proximally to cause duodenitis, pancreatitis, cholecystitis, cholelithiasis, and biliary gastritis.
- Demonstrates that foregut dysfunction arising from midgut compromise can lead to GERD, reflux oesophagitis, and laryngopharyngeal reflux, with downstream ENT and respiratory sequelae.
- Reframes colorectal motility disorders as global gut disorders with multisystem implications, supporting a shift toward holistic, axis-wide assessment and management.

Strengths and Limitations of This Study

- Proposes a novel, anatomically coherent "Ascending Cascade" framework linking hindgut partial obstruction to midgut, foregut, biliary–pancreatic, and airway manifestations.
- Integrates mechanical, vascular, microbial, and neuro-immune mechanisms into a unified explanatory model, offering a systems-level perspective rarely applied to colorectal motility disorders.
- Highlights under-recognised pathways such as mesocolonic traction at the duodenojejunal flexure and functional SMA-like duodenal compression, which may explain complex multisite symptom clusters.
- Synthesises evidence across paediatric and adult populations, supporting broad clinical relevance.
- Limited by reliance on heterogeneous literature and absence of large prospective or mechanistic studies directly validating the full cascade.
- Conceptual model requires empirical testing to determine causality, quantify risk, and evaluate whether early treatment of hindgut dysfunction prevents upstream complications.

Introduction

Understanding the vascular architecture of the gastrointestinal tract is essential for safe surgical practice, accurate diagnosis of ischemic pathology, and effective management of motility disorders [1, 2]. The gut's segmental blood supply, circumferential perfusion patterns, and collateral variability create distinct zones of vulnerability—particularly at anatomical watershed regions such as Griffith's point and Sudeck's point [2, 3]. These regions are prone to hypoperfusion during systemic hypotension, surgical ligation, or distention-related compromise, and their clinical significance is often underappreciated [4]. This review synthesises applied vascular anatomy with operative relevance, offering a practical framework for assessing bowel viability, anticipating ischemic risk, and guiding intraoperative decision-making.

The gastrointestinal (GI) tract's vascular architecture is defined by a complex hierarchical system designed to maintain perfusion during physiological changes [1]. Understanding the intramural distribution and anatomical "weak points" is essential for managing both congenital and acquired ischemic conditions [5, 6].

A detailed understanding of the vascular anatomy of the gastrointestinal tract is fundamental to safe surgical practice, accurate diagnosis, and effective management of ischemic pathology. The gut is supplied by three major arterial territories—the celiac trunk, superior mesenteric artery (SMA), and inferior mesenteric artery (IMA)—each contributing segmental and collateral pathways that determine regional perfusion and vulnerability [1, 7]. Educational radiological analyses emphasise that the severity and distribution of ischemia depend not only on the vessel involved but also on the robustness of collateral flow between these territories, including the pancreaticoduodenal arcades, the arc of Riolan, and the marginal artery of Drummond [1, 7, 8], which together maintain perfusion during physiological stress or surgical ligation.

Despite this redundancy, several "watershed" regions remain inherently susceptible to hypoperfusion. The splenic flexure—known as Griffith's point—represents a critical anastomotic zone between the SMA and IMA, where collateral pathways may be tenuous or absent [2, 3]. Radiological studies demonstrate that this anastomosis is present in only about half of individuals, poor in nearly 10%, and completely absent in over 40%, explaining its prominence as the most common site of ischemic colitis [2, 6]. A second watershed region, Sudeck's point at the rectosigmoid junction, marks the transition between the last sigmoid branch of the IMA and the superior rectal artery [3]. Anatomical descriptions highlight that this anastomosis may be diminutive or singular in a subset of patients, further

contributing to its vulnerability during systemic hypotension or distal IMA ligation [3, 6].

These watershed zones illustrate the broader principle that ischemic injury follows predictable anatomical patterns. Incomplete anastomoses, narrow terminal branches, and variable collateralisation create focal points of fragility within an otherwise well-organised vascular network [7, 8, 9]. Understanding these patterns is essential for surgeons assessing bowel viability, planning resections, or interpreting intraoperative perfusion imaging [6, 10]. Moreover, appreciating the interplay between segmental supply, circumferential perfusion, and watershed physiology provides a foundation for recognising early ischemic change—particularly at the antimesenteric border, where collateral density is lowest [8, 11].

This review synthesises applied vascular anatomy with clinical and operative relevance, integrating radiological, anatomical, and surgical perspectives to provide a unified framework for understanding gastrointestinal perfusion. By consolidating key concepts such as watershed vulnerability, collateral variability, and circumferential perfusion patterns, it aims to support safer surgical decision-making and enhance the educational foundation for clinicians and trainees [6, 12, 13].

Methods

Study Design

This work is a narrative review synthesising anatomical, surgical, radiological, and physiological literature relevant to the vascular supply of the gastrointestinal tract. The review emphasises applied clinical anatomy, watershed vulnerability, and surgical implications for bowel viability assessment.

Search Strategy

A structured literature search was conducted in PubMed, Embase, Scopus, and Google Scholar between January 1980 and December 2025. Search terms included combinations of: gastrointestinal vascular anatomy, mesenteric perfusion, watershed zones, Griffith's point, Sudeck's point, ischemic colitis, bowel viability, antimesenteric border, collateral circulation, and surgical anatomy. Reference lists of key articles, anatomical atlases, and operative textbooks were also screened to identify additional relevant sources.

Eligibility Criteria

Sources were included if they:

- Described arterial or venous anatomy of the gut.
- Discussed watershed regions or collateral pathways.
- Examined mechanisms of ischemia or perfusion failure.
- Reported clinical, radiological, or intraoperative assessment of bowel viability.
- Provided anatomical or surgical insights relevant to gastrointestinal perfusion

Exclusion criteria were:

- Studies unrelated to gastrointestinal vascular anatomy.
- Non-clinical animal studies without translational relevance.
- Papers lacking anatomical or surgical applicability.

Data Extraction and Synthesis

Given the narrative design, data extraction focused on identifying recurring anatomical patterns, clinically significant vascular territories, and mechanisms of ischemic vulnerability. Findings were synthesised thematically across five domains:

1. Segmental vascular territories.
2. Circumferential perfusion patterns.
3. Watershed zones and collateral variability.
4. Mechanisms of ischemia (distention, venous congestion, hypoperfusion).
5. Surgical assessment principles.

Conceptual diagrams, flowcharts, and graphical abstracts were developed to enhance clarity and support clinical interpretation.

Patient and Public Involvement

No patients or members of the public were involved in the design, conduct, or reporting of this review.

Results

Overview of Segmental Vascular Territories

The gastrointestinal tract demonstrates a highly organised but variably collateralised vascular architecture. Three major arterial territories—the celiac trunk, superior mesenteric artery (SMA), and inferior mesenteric artery (IMA)—supply distinct gut segments with predictable transitions between them. Across the oesophagus, stomach, small bowel, appendix, and colon, segmental perfusion patterns were consistently described in the literature, with notable differences in collateral density, circumferential flow, and vulnerability to hypoperfusion.

Circumferential Perfusion and Antimesenteric Vulnerability

Across multiple anatomical and surgical sources, the bowel's circumferential blood supply emerged as a key determinant of ischemic susceptibility. The antimesenteric border was repeatedly identified as the earliest site of ischemic change due to its relatively sparse collateralisation. This pattern was consistent across the small bowel and colon and was particularly relevant in settings of distention, volvulus, or venous congestion.

Watershed Zones and Collateral Variability

Two watershed regions—Griffith's point at the splenic flexure and Sudeck's point at the rectosigmoid junction—were consistently highlighted as the most vulnerable sites of colonic hypoperfusion. Anatomical variability in the marginal artery and the arc of Riolan contributed to differing levels of protection across individuals. Studies emphasised that even minor reductions in systemic perfusion could disproportionately affect these zones, explaining their prominence in ischemic colitis and postoperative complications.

Mechanisms of Ischemia

The literature identified three recurrent mechanisms contributing to ischemic injury:

1. Bowel distention, which increases wall tension and compresses submucosal vessels.
2. Venous congestion, often preceding arterial compromise in closed-loop obstruction.
3. Watershed hypoperfusion, exacerbated by hypotension, atherosclerosis, or vessel ligation.

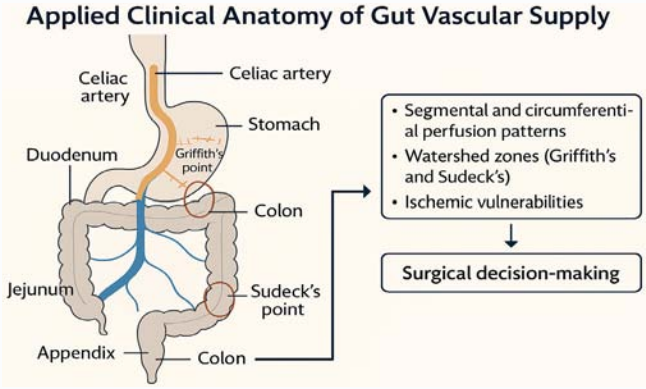

Figure 1: Segmental arterial supply of the gastrointestinal tract.
Schematic representation of the major arterial territories supplying the gut, including the celiac trunk, superior mesenteric artery (SMA), and inferior mesenteric artery (IMA). The diagram highlights segmental perfusion patterns across the oesophagus, stomach, small bowel, appendix, and colon, illustrating the transition zones between vascular territories.

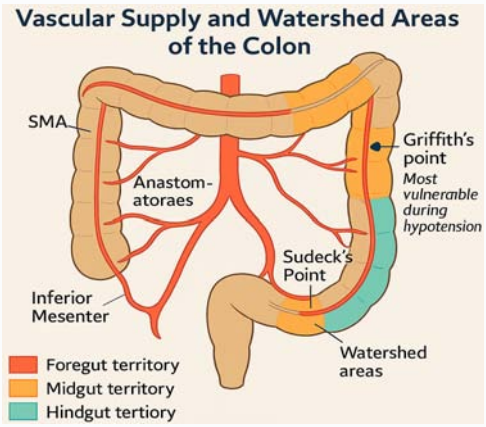

Figure 2: Watershed zones of the colon.
Illustration of the two principal colonic watershed regions: Griffith's point at the splenic flexure and Sudeck's point at the rectosigmoid junction. These areas are shown in relation to SMA and IMA territories, emphasising their susceptibility to hypoperfusion during systemic hypotension, ligation, or low-flow states.

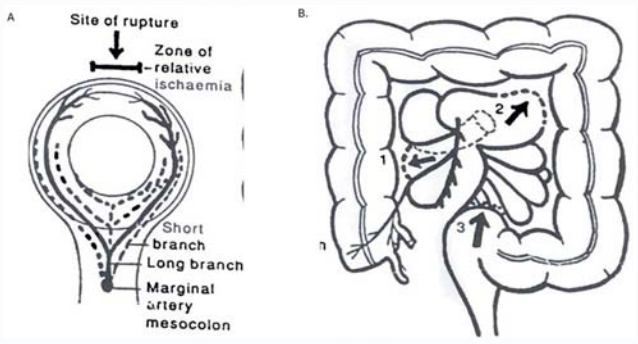

Figure 3: Circumferential perfusion and antimesenteric vulnerability.
Diagram demonstrating circumferential blood flow around the bowel wall, with emphasis on the antimesenteric border as the earliest site of ischemic change. The figure depicts how variations in collateral flow and wall tension influence perfusion gradients.

These mechanisms frequently acted synergistically, producing progressive ischemic injury that followed predictable anatomical patterns.

Surgical Assessment of Bowel Viability

Across operative texts and clinical studies, surgeons relied primarily on visual inspection—colour, peristalsis, mesenteric pulsation, and bleeding from the cut edge—to assess viability. Adjuncts such as Doppler assessment, fluorescein dye, and indocyanine green (ICG) angiography were variably used but consistently improved confidence in borderline cases. The literature supported a structured, stepwise approach to viability assessment, aligning with the flowchart developed in this review.

Integration of Anatomy with Clinical Decision-Making

Synthesised findings demonstrated that applied vascular anatomy

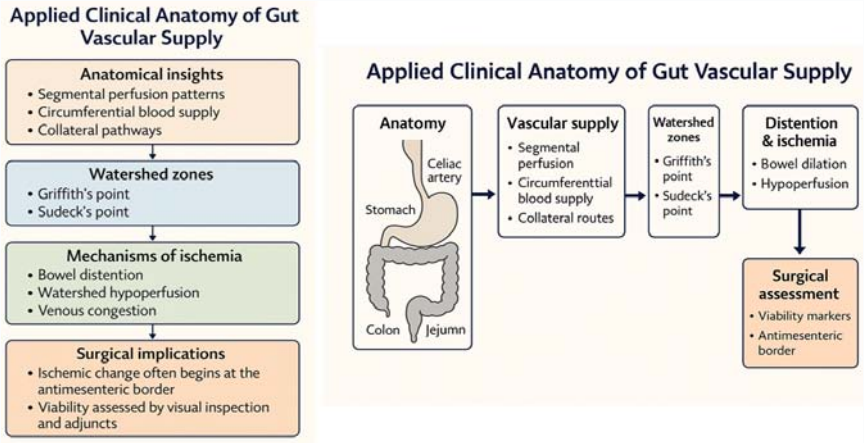

Figure 4: Mechanisms of ischemia: distention, venous congestion, and watershed hypoperfusion.
Conceptual illustration showing how bowel distention, venous outflow obstruction, and watershed hypoperfusion contribute to progressive ischemic injury. Arrows indicate the sequence from mechanical compromise to microvascular failure.

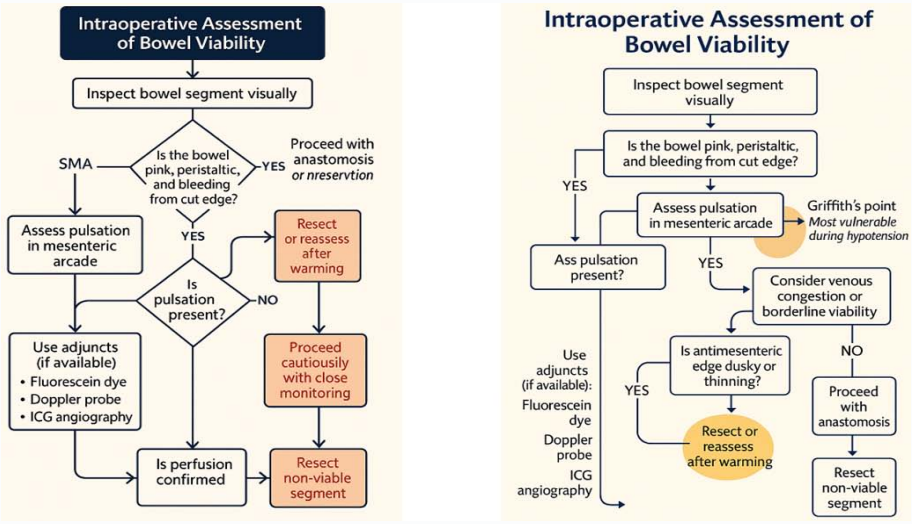

Figure 5: Applied surgical assessment of bowel viability.
Flowchart summarising intraoperative assessment of bowel viability, including visual inspection, evaluation of mesenteric pulsation, assessment of the antimesenteric edge, and optional adjuncts such as Doppler or ICG angiography. The figure links anatomical principles to practical surgical decision-making.

directly informs surgical strategy, including:

- Resection margins in ischemic or obstructive pathology.
- Interpretation of intraoperative perfusion patterns.
- Anticipation of postoperative ischemic complications.
- Teaching and training in operative anatomy.

The review's conceptual diagrams and graphical abstracts reflect these relationships, providing a unified framework for clinical application.

Discussion

This review synthesises anatomical, radiological, and surgical perspectives to provide a unified, clinically focused framework for understanding gastrointestinal vascular supply. Although the vascular anatomy of the gut is well described, its applied relevance—particularly the interplay between segmental territories, circumferential perfusion, and watershed vulnerability—remains under-emphasised in surgical education and operative decision-making [12, 13]. Our manuscript addresses this gap by integrating key anatomical principles with mechanisms of ischemia and practical approaches to bowel viability assessment.

The review offers several contributions of value to the readership:

- It consolidates foundational and contemporary knowledge on celiac, SMA, and IMA territories, including collateral variability and watershed physiology [1, 7, 14].
- It highlights the clinical significance of Griffith's and Sudeck's points, drawing on radiological and anatomical evidence to explain their disproportionate vulnerability to hypoperfusion [2, 3, 15, 16].
- It provides conceptual diagrams, flowcharts, and graphical abstracts designed to support intraoperative recall and enhance surgical training [12, 17].
- It presents a practical, anatomically grounded framework for interpreting ischemic patterns and guiding surgical

decision-making [12, 18].

This narrative review synthesises the applied clinical anatomy of gastrointestinal vascular supply and highlights its central role in understanding ischemic vulnerability, intraoperative decision-making, and postoperative outcomes. Across the literature, a consistent theme emerges: the gut's vascular architecture is both elegantly organised and inherently fragile, with segmental territories, circumferential perfusion patterns, and watershed zones shaping the distribution of ischemic injury [19, 20.] These anatomical principles remain fundamental to surgical practice, yet they are often under-emphasised in clinical training and operative planning [21].

Interpretation of Key Findings

The review demonstrates that the celiac, SMA, and IMA territories form predictable vascular domains, but collateral pathways—particularly the marginal artery and arc of Riolan—show considerable variability [7, 19]. This variability partly explains why some patients tolerate vessel ligation or hypotension without consequence, while others develop ischemic colitis or anastomotic failure [6]. The identification of Griffith's and Sudeck's points as recurrent sites of hypoperfusion reinforces their clinical importance, especially in emergency laparotomy, colorectal cancer surgery, and low-flow states [22, 23, 24].

Circumferential perfusion emerged as a critical but under-recognised determinant of ischemic progression. The antimesenteric border's relative paucity of collateral flow makes it the earliest site of ischemic change, a finding consistently supported across anatomical and operative sources [8, 15]. This insight has direct implications for viability assessment, anastomotic planning, and interpretation of intraoperative perfusion imaging [12].

Clinical Implications

1. Intramural Vascular Anatomy: Circumferential Vessels

The arterial supply to the bowel wall is organised into extramural and intramural components [1, 15]:

- Vasa recta arise from the marginal artery of Drummond [7].
- Long and short vessels supply the antimesenteric and mesenteric borders respectively [8].
- Submucosal plexus provides the primary blood supply to the mucosa and muscular layers [25].

2. Clinical Significance of Bowel Distension and the Antimesenteric Border

The antimesenteric border is the region furthest from primary arterial input and is particularly vulnerable to:

- Relative ischemia during distension, where increased intramural pressure compresses long circumferential vessels [8, 15].
- Critical tension, making it the first site of necrosis in obstruction or ileus [8].

3. Arterial Watershed Areas of the Colon

Watershed areas are highly susceptible to systemic hypoperfusion:

- Griffith's point at the splenic flexure (SMA–IMA junction) [2, 3].
- Sudeck's point at the rectosigmoid junction [3].
- Ileocecal region, where marginal artery development is often poor [26].

4. Pathophysiological and Clinical Significance

Acquired conditions:

- NOMI manifests early in watershed zones [6, 12].
- Ischemic colitis commonly affects Griffith's and Sudeck's points [6].
- Surgical risk increases when IMA ligation relies on SMA-derived collateral flow [27].

Congenital conditions

- Colonic atresia often localises to watershed points, suggesting intrauterine vascular accidents [15].
- NEC reflects immature vascularity and watershed vulnerability in neonates [15].

Understanding applied vascular anatomy enhances surgical safety by improving identification of at-risk segments, informing resection margins, and guiding anastomotic site selection [6, 12]. Adjunctive tools such as Doppler and ICG angiography are most effective when interpreted through an anatomical lens [12, 17, 28].

The review also highlights the importance of integrating vascular anatomy into training. Trainees often learn perfusion assessment through experiential exposure rather than structured teaching. The diagrams and conceptual models presented here support both education and intraoperative recall [12, 17].

Comparison with Existing Literature

Previous reviews have described individual aspects of gut vascular anatomy or ischemic colitis, but few have synthesised these elements into a cohesive, clinically oriented framework [6]. This review unifies segmental anatomy, watershed physiology, circumferential perfusion, and surgical assessment principles, aligning with emerging literature on perfusion-guided surgery and ICG interpretation [12, 17, 29].

Strengths and Limitations

A major strength of this review is its applied focus, integrating anatomical, physiological, and operative perspectives into a practical reference for clinicians [1, 6]. Enhanced diagrams and structured summaries improve accessibility and real-world utility. Limitations include the narrative design, lack of formal bias assessment, and inter-individual anatomical variability requiring further empirical validation through imaging and perfusion studies [17, 19].

Future Directions

Future research should explore anatomical variability and clinical outcomes, particularly in colorectal surgery and ischemic colitis [6, 12]. Prospective studies using ICG angiography, CT angiography, or high-resolution manometry may validate the perfusion patterns described here [17, 19]. Educational interventions integrating applied vascular anatomy into surgical training could further improve intraoperative decision-making and reduce ischemic complications [30].

Conclusion

Applied clinical anatomy of gut vascular supply remains foundational to safe and effective surgical practice. By synthesising

segmental vascular territories, watershed zones, circumferential perfusion patterns, and mechanisms of ischemia, this review provides a unified framework that enhances understanding, supports surgical judgment, and informs future research. A deeper appreciation of vascular anatomy has the potential to improve outcomes across a wide range of gastrointestinal conditions.

A detailed understanding of the vascular anatomy of the gastrointestinal tract remains fundamental to safe surgical practice, accurate diagnosis, and effective management of ischemic and obstructive pathology. This review synthesises the segmental arterial territories, circumferential perfusion patterns, and watershed vulnerabilities that shape the gut's response to physiological stress and operative intervention. Across the literature, a consistent pattern emerges: although the vascular supply of the gut is robustly organised, it is also characterised by points of fragility—particularly at Griffith's and Sudeck's points—where even modest reductions in perfusion can precipitate clinically significant ischemia.

By integrating anatomical, physiological, and operative perspectives, this review provides a unified framework that enhances clinical reasoning and supports intraoperative decision-making. The emphasis on circumferential perfusion and antimesenteric vulnerability offers a practical lens through which surgeons can interpret early ischemic changes, select resection margins, and evaluate bowel viability. Similarly, the synthesis of distention-related compromise, venous congestion, and watershed hypoperfusion clarifies the mechanisms underlying progressive ischemic injury and highlights the importance of timely intervention.

The educational value of applied vascular anatomy is equally significant. Trainees often encounter perfusion assessment as an experiential skill rather than a structured anatomical discipline. The diagrams, flowcharts, and conceptual models presented in this review aim to bridge that gap, offering a clear and accessible reference that supports both learning and intraoperative recall. As surgical practice increasingly incorporates adjunctive technologies such as Doppler assessment and indocyanine green (ICG) angiography, a strong anatomical foundation remains essential for interpreting these tools effectively.

Looking ahead, there is a clear need for further research that links anatomical variability with clinical outcomes. Prospective studies using advanced imaging, perfusion mapping, and intraoperative fluorescence could help validate the perfusion patterns and conceptual models described here. Such work would not only refine our understanding of gastrointestinal vascular physiology but also inform surgical guidelines, enhance training, and ultimately improve patient outcomes.

In summary, applied clinical anatomy of gut vascular supply is not merely an academic subject—it is a practical, indispensable component of modern surgical care. By consolidating key anatomical principles with clinical insights, this review provides a comprehensive and accessible resource that supports safer surgery, deeper understanding, and more informed decision-making across the spectrum of gastrointestinal practice.

Funding and Ethics/Compliance Statements Block

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Competing Interests

The authors declare that they have no competing interests.

Ethics Approval

Not applicable. This study is a narrative review of published literature and did not involve human participants or animal subjects.

Patient and Public Involvement

No patients or members of the public were directly involved in the design, conduct, reporting, or dissemination of this review.

Data Availability Statement

All data relevant to the study are included in the article or uploaded as supplementary information.

Author Contributions

All authors conceived the study. conducted the literature search and drafted the manuscript. All authors contributed to revisions, approved the final version, and agree to be accountable for all aspects of the work.

References

1. Patel RV, Trambadia RA, Anthony FM, Chhaniara RA, Govani D, Patel RR, Corracia RC: Case Series-Congenital Neonatal Colonic Atresias Arising in Watershed Areas of the Colonic Blood Supply. Journal of the Indian Medical Association (JIMA), 2024; 122(2): 55-60. https://onlinejima.com/read_journals.php?article=1323
2. Zaparackaite I, Singh SJ, Bhattacharya D, Bale SK, Correia RC, Midha PK, et al. Understanding Embryopathogenesis and Innovating Approaches to Surgical Management of Gastroschisis: A Narrative Review of the Literature and Multi-center Experience. J Transl Gastroenterol. 2024; 2(3): 159-169 doi: 10.14218/JTG.2023.00092. https://www.xiahepublishing.com/2994-8754/JTG-2023-00092, https://www.xiahepublishing.com/2994-8754/JTG-2023-00092/pdf
3. Mehta MH, Patel RV, Gondalia J S: Intraperitoneal red currant jelly in intussusception. Indian J Pediatr. May-Jun 1993; 60(3): 455-7. doi: 10.1007/BF02751214.
4. Yadav K, Mehta M, Endeley EM, Patel RV. Transanal and intraperitoneal prolapse in intussusception. J Paediatr Child Health. 1990 Apr; 26(2): 99-100. doi: 10.1111/j.1440-1754.1990.tb02396.x. PMID: 2361074.
5. Patel RV, Mehta MH, Gondalia JS. Colotomy with minimum resection for advanced irreducible intussusception. J Pediatr Surg. 1992 Mar; 27(3): 419-20. doi: 10.1016/0022-3468(92)90961-6. PMID: 1501020
6. Triantafyllou G, Lyros O, Schizas D, et al. The blood supply of the stomach: anatomical and surgical considerations. Diagnostics. 2025; 15(22): 2896. doi: 10.3390/diagnostics15222896
7. Miranda T, Baraviera T, de Andrade Corona CF, et al. What can the vessels tell us? A special emphasis on GI vascular anatomy and collateral patterns. ECR 2019; C-2834. doi: 10.26044/ecr2019/C-2834
8. Ithy. Arteries involved in the gastrointestinal system. 2025. Available from: https://ithy.com/article/gi-arterial-network-adcozg5h
9. Oldenburg WA, Lau LL, Rodenberg TJ, Edmonds HJ, Burger CD. Acute mesenteric ischemia: a clinical review. Arch Intern Med. 2004; 164(10): 1054-62. doi:10.1001/archinte.164.10.1054
10. Tilsed JV, Casamassima A, Kurihara H, et al. WSES guidelines for the management of acute mesenteric ischemia. World J Emerg Surg. 2016; 11: 38. doi:10.1186/s13017-016-0090-5
11. Brandt LJ, Feuerstadt P, Longstreth GF, Boley SJ. ACG clinical guideline: epidemiology, risk factors, patterns of presentation, diagnosis, and

management of colon ischemia. Am J Gastroenterol. 2015; 110(1): 18-44. doi:10.1038/ajg.2014.395

12. Farkas N, Soltesz I, Harsanyi L, et al. Anatomical variations of the marginal artery of Drummond: a systematic review. Surg Radiol Anat. 2020; 42(10): 1173-82. doi:10.1007/s00276-020-02503-9

13. Boley SJ, Sprayregen S, Siegelman SS, Veith FJ. Initial vascular compromise in ischemic colitis occurs at the antimesenteric border. Ann Surg. 1977; 186(1): 73-78. doi:10.1097/00000658-197707000-00013

14. Feuerstadt P, Brandt LJ. Colon ischemia: recent insights and advances. Curr Gastroenterol Rep. 2015; 17(12): 45. doi: 10.1007/s11894-010-0127-y

15. Ende N. Infarction of the bowel in cardiac failure. N Engl J Med. 1958; 258: 879-81. doi: 10.1056/NEJM195805012581804

16. Yasuhara H. Acute mesenteric ischemia: the challenge of gastroenterology. Surg Today. 2005; 35(3): 185-95. doi: 10.1007/s00595-004-2924-0

17. Bala M, Kashuk J, Moore EE, et al. Acute mesenteric ischemia: guidelines of the World Society of Emergency Surgery. World J Emerg Surg. 2017; 12: 38. doi: 10.1186/s13017-022-00443-x

18. Clair DG, Beach JM. Mesenteric ischemia. N Engl J Med. 2016; 374: 959-68. doi:10.1056/NEJMra1503884

19. Menke J. Diagnostic accuracy of multidetector CT in acute mesenteric ischemia: systematic review and meta-analysis. Radiology. 2010; 256(1) :93-101. doi: 10.1148/radiol.10091938

20. Mitsudo S, Brandt LJ. Pathology of intestinal ischemia. Surg Clin North Am. 1992; 72(1): 43-63. doi: 10.1016/s0039-6109(16)45627-6

21. Boley SJ, Krieger H, Schultz L, et al. Experimental aspects of mesenteric occlusion. Surg Gynecol Obstet. 1963; 116: 53-60.

22. Vollmar B, Menger MD. Intestinal ischemia–reperfusion: microcirculatory pathology and functional consequences. Langenbecks Arch Surg. 2011; 396(1): 13-29. doi: 10.1007/s00423-010-0727-x

23. Acosta S. Epidemiology of mesenteric vascular disease: clinical implications. Semin Vasc Surg. 2010; 23(1): 4-8. doi: 10.1053/j.semvascsurg.2009.12.001

24. Sun D, Li X, Li Y, et al. CT angiography of mesenteric vessels: anatomy and pathology. Insights Imaging. 2018; 9(5): 791-802. doi: 10.1016/j.rcl.2010.02.004

25. Horton KM, Fishman EK. CT angiography of the mesenteric circulation. Radiol Clin North Am. 2010; 48(2): 331-45. doi:10.1016/j.rcl.2010.02.001

26. Rutherford RB, et al. Vascular surgery. 6th ed. Philadelphia: Elsevier Saunders; 2005. (Standard reference for mesenteric vascular anatomy.)

27. Standring S, ed. Gray's Anatomy: The Anatomical Basis of Clinical Practice. 42nd ed. London: Elsevier; 2020.

28. Moore KL, Dalley AF, Agur AMR. Clinically Oriented Anatomy. 8th ed. Philadelphia: Wolters Kluwer; 2018.

29. Netter FH. Atlas of Human Anatomy. 7th ed. Philadelphia: Elsevier; 2019.

30. Sherid M, Samo S, Sulaiman S, et al. Ischemic colitis: A forgotten entity. Clin Exp Gastroenterol. 2014; 7: 305-15. doi: 10.1111/1751-2980.12182