

CONTENTS

5.4.5.2. Rami omentales of arteries radicularis et arcuatae	181
5.4.5.3. Arcus omentalis Markovi = Omental arcade	181
5.4.5.4. Rami omentales lateralis = Posterior omental artery	181
5.4.6. Connections of the angiographic and anatomical vascular systems	182
5.4.7. Embryological mistakes in the arterial supply of the large intestine	184
5.4.8. Plexus retroperitonealis Toldt = Retroperitoneal plexus	185
5.4.9. Meandering meandering collaterals (collanea fuscata) = Collanae fuscatae	186
5.4.10. Arteria iliaca communis = Iliacic artery	186
6. CONCLUSIONS	189
6.1. Summary of the results	189
6.1.1. Anatomical surprises = Superior mesenteric vein	191
6.1.2. New anatomical findings (all anatomical systems are still awaiting further research)	194
6.1.2.1. Venae hæmorrhoidales = Hemorrhoidal veins	196
6.1.2.2. Vena colica supraductalis = Colic vein above the duct of the liver	197
6.1.2.3. Vena colica media = Middle colic vein	198
6.1.2.4. Vena colica inferior = Inferior colic vein	199
1. PREFACE	11
1.1. Surgical notes to the blood supply of the large intestine (written by JIŘÍ HOCH)	11
1.2. Blood flow disturbances in the gastrointestinal tract	13
2. REFERENCE LITERATURE	14
2.1. History of circulatory system research with emphasis on large intestine vessels	14
2.1.1. The beginnings	14
2.1.2. First steps to reveal the secrets of circulation	17
2.1.3. Discovering the secret of the circulatory system	19
2.1.4. Improving methods of circulatory system injection	22
2.1.5. Descriptions and depictions of the intestine vessels	27
2.1.6. Further progress in variant anatomy and histology in 19 th and 20 th centuries	34
2.1.7. Specialized studies focusing on exploration of the regional blood supply of the large intestine	36
3. ANATOMICAL AND EMBRYOLOGICAL PREVIEW	39
3.1. Anatomical terminology	39
3.2. Elementary anatomical text	45
3.3. Basic facts about the embryology of intestinal vessels	52
3.3.1. Development of the intestinal arteries	52
3.3.1.1. Truncus coeliacomesentericus	57
3.3.1.2. Arcus Bühléri	57
3.3.2. Development of the portal system	58
3.4. Clinical anatomy of the vascular supply of the large intestine	59
4. METHODOLOGY	63
4.1. Macropreparation	63
4.1.1. Macroscopic techniques on anatomical cadaveric material	63
4.1.2. Macroscopical techniques on the dissection material	64
4.2. Angiography	64
4.3. Injection techniques	65
4.3.1. India ink injection	67
4.3.2. Resin corrosion injections	68
4.3.2.1. Dentacryl	68
4.3.2.2. Methylmetacrylate	68
4.3.2.3. Mercox	69
4.3.3. Final processing	70
4.3.4. Conclusion	71
4.4. Histological processing and lightening techniques	72

4.5. The pros and cons of the gathered specimens	72
4.5.1. The pros and cons of the dissection material	72
4.5.2. The pros and cons of the resection material	73
5. CONCLUSIONS – ARTERIAL BLOOD SUPPLY	74
5.1. Arteria mesenterica superior = Superior mesenteric artery	74
5.1.1. Arteria pancreaticoduodenalis inferior = Inferior pancreaticoduodenal artery	80
5.1.2. Arteriae jejunales et ileales = Jejunal and ileal arteries	83
5.1.3. Arteria ileocolica = Ileocolic artery	83
5.1.3.1. Ramus colicus arteriae ileocolicae = Colic branch of ileocolic artery	87
5.1.3.2. Ramus ilealis arteriae ileocolicae = Ileal branch of ileocolic artery	88
5.1.3.3. Arcus ileocolicus = Ileocolic arcade	90
5.1.3.4. Arteria appendicularis = Appendicular artery	90
5.1.3.5. Arteriae caecales = Caecal arteries	96
5.1.3.6. Arcus caecocolicus = Caecocolic arcade	100
5.1.3.7. Blood supply of the terminal ileum	100
5.1.4. Arteria colica dextra = Right colic artery	103
5.1.5. Arteria colica media = Middle colic artery	105
5.1.6. Arteria flexurae dextrae = Right flexure artery	109
5.1.7. Arteriae colicae accessoriae = Accessory colic arteries	110
5.1.7.1. Arteria appendicularis accessoria = Accessory appendicular artery	110
5.1.7.2. Arteria colica dextra accessoria = Accessory right colic artery	111
5.1.7.3. Arteria colica media accessoria = Accessory middle colic artery	113
5.1.7.4. Ramus colicus accessorius = Accessory colic branch	117
5.1.7.5. Ramus ilealis accessorius = Accessory ileal branch	117
5.1.7.6. Arteriae caecales accessoriae = Accessory caecal arteries	118
5.1.8. Aberrant branches of the arteria mesenterica superior	118
5.1.8.1. Hepatic aberrant branches of the arteria mesenterica superior	118
5.1.8.2. Other aberrant branches of the arteria mesenterica superior	120
5.2. Arteria mesenterica inferior	121
5.2.1. Arteria colica sinistra = Left colic artery	131
5.2.2. Arteria colica sinistra accessoria = Accessory left colic artery	132
5.2.3. Anastomosis intermesenterica = Intermesenteric anastomosis: Anastomosis magna Halleri = Arcus Riolani	136
5.2.4. Anastomosis accessoria intermesenterica Villemaini = Accessory intermesenteric anastomosis	139
5.2.5. Arteria colica sinistra media = Middle left colic artery	144
5.2.6. Arteria colica sinistra inferior = Inferior left colic artery	144
5.2.7. Aberrant arteries in the area of the colon transversum and flexura coli sinistra	145
5.2.8. Arteriae sigmoideae = Sigmoid arteries	146
5.2.9. Griffiths' point	150
5.2.10. Toupet's point	151
5.2.11. Arteria rectalis superior = Superior rectal artery	152
5.2.12. Sudeck's point	156
5.2.13. Arteria rectosigmoidea = Rectosigmoid artery	158
5.2.14. Sphincter rectosigmoideus O'Beirnei = Rectosigmoid sphincter	161
5.2.15. Arteria marginalis coli Drummondi = Marginal artery of colon	162
5.3. Arteria iliaca interna and its branches supplying the intestine	166
5.3.1. Arteria iliaca interna = Internal iliac artery	166
5.3.2. Arteria rectalis media = Middle rectal artery	166
5.3.3. Ligamentum laterale recti = Lateral ligament of rectum	171
5.3.4. Arteria rectalis inferior = Inferior rectal artery	171
5.3.5. Other sources of the rectum blood supply	173
5.4. Other vascular patterns connected with the intestinal blood supply	174
5.4.1. Truncus coeliacus = Coeliac trunk	174
5.4.2. Truncus coeliacomesentericus = Coeliacomesenteric trunk	177
5.4.3. Truncus coeliacobimesentericus = Coeliacobimesenteric trunk	178
5.4.4. Arcus Bühléri = Bühlér's arcade	178

5.4.5. Blood supply of the omentum majus	180
5.4.5.1. Arcus gastroomentalis = Gastroomental arcade	180
5.4.5.2. Rami omentales anteriores = Anterior omental branches	181
5.4.5.3. Arcus omentalis Barkowi = Omental arcade	181
5.4.5.4. Rami omentales posteriores = Posterior omental branches	182
5.4.6. Connections of the omentum majus and colon transversum circulation	183
5.4.7. Arteria mesenterica media = Middle mesenteric artery	184
5.4.8. Plexus retroperitonealis Turneri = Retroperitoneal plexus	185
5.4.9. Meandering mesenteric artery of Moskowitz	186
6. CONCLUSIONS – VENOUS BLOOD DRAINAGE	189
6.1. Vena mesenterica superior = Superior mesenteric vein	191
6.1.1. Vena ileocolica = Ileocolic vein	194
6.1.1.1. Venae ileales terminales = Terminal ileal veins	196
6.1.1.2. Vena colica dextra media = Middle right colic vein	197
6.1.2. Vena colica dextra superior = Superior right colic vein	198
6.1.3. Vena colica media = Middle colic vein	199
6.1.4. "Henle's trunk"	201
6.1.5. Vena gastroomentalis dextra = Right gastroomental vein	208
6.1.6. Vena pancreaticoduodenalis inferior anterior = Anterior inferior pancreaticoduodenal vein	209
6.1.7. Vena pancreaticoduodenalis inferior posterior = Posterior inferior pancreaticoduodenal vein	210
6.1.8. Vena pancreaticoduodenalis superior anterior = Anterior superior pancreaticoduodenal vein	210
6.1.9. Vena pancreaticoduodenalis superior posterior = Posterior superior pancreaticoduodenal vein	211
6.1.10. Arcus venosi pancreatici = Pancreatic venous arcades	212
6.1.11. Venae jejunales et ileales = Jejunal and ileal veins	212
6.1.11.1. Venae ileales parvae = Small ileal veins	213
6.1.11.2. Venae ileales = Ileal veins	213
6.1.11.3. Vena jejuniolealis intermedia = Intermediate jejunoleal vein	215
6.1.11.4. Venae jejunales = Jejunal veins	215
6.1.11.4.1. Vena jejunalis prima = First jejunal vein	218
6.1.11.4.2. Vena jejunalis secunda = Second jejunal vein	219
6.1.11.4.3. Vena jejunalis tertia = Third jejunal vein	219
6.1.12. Surgical trunk of the vena mesenterica superior	219
6.2. Vena mesenterica inferior = Inferior mesenteric vein	219
6.2.1. Vena colica sinistra superior = Superior left colic vein	221
6.2.2. Vena colica sinistra inferior = Inferior left colic vein	222
6.2.3. Venae sigmoideae = Sigmoid veins	222
6.2.4. Vena rectosigmoidea = Rectosigmoid vein	223
6.2.5. Venae rectales = Rectal veins	223
6.2.5.1. Plexus venosus rectalis = Rectal venous plexus	223
6.2.5.2. Vena rectalis superior = Superior rectal vein	224
6.2.5.3. Vena rectalis media = Middle rectal vein	224
6.2.5.4. Vena rectalis inferior = Inferior rectal vein	225
6.2.6. Vena marginalis coli = Marginal vein of colon	225
6.3. Vena portae = Portal vein	225
6.3.1. Vena gastrica sinistra = Left gastric vein	229
6.3.2. Vena gastrica dextra = Right gastric vein	229
6.3.3. Vena cystica = Cystic vein	230
6.3.4. Venae paraumbilicales Sappeyi = Paraumbilical veins	230
6.3.5. Vena pancreatica dorsalis = Dorsal pancreatic vein	230
6.3.6. Vena splenica = Splenic vein	231
6.3.6.1. Venae gastricae breves = Short gastric veins	231
6.3.6.2. Vena gastroomentalis sinistra = Left gastroomental vein	231
6.3.6.3. Venae pancreaticae = Pancreatic veins	232
6.3.6.3.1. Vena pancreatic inferior = Inferior pancreatic vein	232
6.3.6.4. Vena gastrica posterior = Posterior gastric vein	232
6.3.7. Portal and paraportal jejunal veins	233

7. CONCLUSIONS – COLLATERAL CIRCULATION	234
7.1. Collateral circulation between the arteries of the small and the large intestines	234
7.2. Venous collateral circulation	241
7.2.1. Anastomoses portocavales = Portocaval anastomoses	242
8. CONCLUSIONS – VASA RECTA	246
8.1. Vasa recta intestini tenuis = Straight vessels of the small intestine	246
8.2. Vasa recta intestini crassi = Straight vessels of the large intestine	249
8.2.1. Vasa recta longa = Long straight vessels	249
8.2.2. Vasa recta brevia = Short straight vessels	250
8.2.3. Communications between vasa recta	251
8.2.4. Clinical consequences	251
8.2.5. Summary	258
8.2.6. Venae rectae = Straight veins	259
9. PLEXUS INTRAMURALES = INTRAMURAL PLEXUSES	260
9.1. Plexus subserosus = Subserous plexus	263
9.2. Plexus submucosus = Submucous plexus	268
9.3. Plexus intermuscularis = Intermuscular plexus	271
9.4. Plexus mucosus = Mucous plexus	272
9.5. Summary and discussion	279
10. APPENDICES OMENTALES = OMENTAL APPENDICES	282
10.1. A, B – Pedicle (slim) type	284
10.2. I – Short-based type	284
10.3. II – Long-based type	285
10.4. Y – Wide-based type	285
10.5. X – Narrow-based type	286
10.6. Blood supply	286
10.7. Clinical remarks	290
11. OVERVIEW OF NEW PROPOSED ANATOMICAL TERMS	292
12. REFERENCES	295