A Rare Case of Unusual Origin of Left Colic Artery

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Abstract: We report here an anomalous origin and course of left colic artery in relation to pancreas during routine dissection of the abdominal region in a 60-year-old female in the department of surgery in Meenakshi medical college. The anomalous left colic artery took its origin from the superior mesenteric artery instead of inferior mesenteric artery and immediately divided into right and left branches. The right branch passed through the transverse mesocolon to supply the left one third of the transverse colon. The left branch traversed to the left along the inferior border of the body of the pancreas and supplying the left colic flexure of colon and descending colon. This aberrant course of the left colic artery can be considered as a “vulnerable” course as it is liable to injury during pancreatic and right hemicolectomy since the artery is not expected to run along the inferior border of the pancreas. Surgery of the pancreas and hemicolectomy, therefore, not only needs a knowledge of the normal course of branches of these vessels but also demands a good knowledge of possible anomalous vessels arising in this region.

Keywords: Aberrant left colic artery, vulnerable course, right hemicolectomy

1. Introduction

The left colic artery (LCA) is the first branch of the inferior mesenteric artery. It divides into ascending and descending branches. The ascending branch anastomoses with the left branch of the middle colic artery whereas the descending branch anastomoses with the ascending branch of the first sigmoidal artery. LCA supplies the left one third of the transverse colon and upper part of the descending colon [1]. LCA may show variation in its origin and course. The normal course of the left colic artery is not closely related to the pancreas. It is closely related to the abdominal aorta, inferior vena cava, coeliac trunk and its branches, superior mesenteric vessels, splenic and portal veins [2]. In 1960s, its postoperative morbidity rate was 60% and mortality rate was about 25% [3]. Postoperative bleeding occurs in 3% - 13% of patients after pancreatic surgery [4, 5, 6]. Here we present a case of the anomalous origin and course of left colic artery and discuss its clinical importance.

2. Case Report

A 60 year female malliga, during right extended hemicolectomy in the department of general surgery, Meenakshi medical college, Kancheepuram, there was an anomalous left colic artery originated from the superior mesenteric artery and divided into left and right branches immediately. The level of origin of the artery was situated just below the body of the pancreas, arising from the right side of superior mesenteric artery (FIGURE 1). The right branch passed through the transverse mesocolon and supplied the left one third of the transverse colon. The left branch coursed to the left and supply left colic flexure of colon and the descending colon, respectively. The middle colic and right colic arteries arose through a common trunk from the superior mesenteric artery. The other branches of the superior mesenteric artery, namely the inferior pancreatico-duodenal, jejunal, ileal and ileo- colic arteries had normal course and distribution. The inferior mesenteric artery gave only sigmoidal branches and continued down as the superior rectal. Post op arteriography shows left colic artery arising from superior mesenteric artery (FIGURE 2).
3. Discussion

The abdominal aorta gives rise to three ventral splanchnic branches, namely the celiac trunk, the superior mesenteric artery and the inferior mesenteric artery which supply the derivatives of the foregut, midgut and hindgut respectively [1]. The variation in the number and branching pattern of the arteries of the gut may be correlated with their embryologic development. During the early fetal life, the two dorsal aortae, before the stage of their fusion, give ventral splanchnic branches which supply the gut and its derivatives. In the beginning, the ventral branches are paired. But when the dorsal aortae fuse, these ventral branches fuse and form a series of unpaired segmental arteries. These arteries run in the dorsal mesentry of the gut and are divided into ascending and descending branches. These arteries ultimately form dorsal and ventral longitudinal anastomotic channels. After the formation of longitudinal anastomotic channels, numerous ventral splanchnic branches disappear and only three trunks persist as the celiac trunk, the superior mesenteric artery and the inferior mesenteric artery [8]. Any deviation from the normal pattern of fusion of these channels can lead to the existence of anomalous branching pattern of these major vessels. Superior and inferior mesenteric arteries are known to show variations in its branching pattern. A study reports the origin of an accessory right hepatic artery from the superior mesenteric artery, middle colic artery from splenic artery and left colic artery from superior mesenteric artery [9]. In a study by kadile and Ughade, common hepatic artery arising from hepatomesenteric trunk instead of celiac trunk [10]. In a study conducted by Ashwiniet al., (2013), the right colic artery was absent in 10% of cases and in 34% of cases it arose as a common trunk with the ileocolic artery, with middle colic artery 10%, ileocolic artery arises 66% directly and 34% with right colic artery, middle colic artery arises 90% directly and 10% with right colic artery [11]. The origin of splenic artery from superior mesenteric artery and the appendicular artery from the right colic artery have been reported very recently [12]. In a study by Simeon et al., (2013) on fifty seven formalin embedded cadavers, the inferior mesenteric artery branched into left colic artery and a common sigmoid trunk in twenty three cases, while the classical branching pattern was observed in only seven cases [13]. Variations of the left colic artery are however, extremely rare. Though there are a few reports on its variations, there is no report on its close relation with the inferior border of the body of the pancreas, as seen in the present case study. Rusu et al., (2008) have reported the presence of an aberrant accessory left colic artery [14]. It originated from the superior mesenteric artery about 3 cm proximal to the middle colic artery, near the inferior border of pancreas. It reached the colon by passing over the Treitz’s muscle. Jiji P. J. et al., (2008) observed a case of anastomosis between the left colic artery and dorsal pancreatic artery [15]. In the present case study, we observed that the superior mesenteric artery was an independent branch of the abdominal aorta and it gave rise to the left colic artery. The current case is somewhat similar to this case. In the current case, it is difficult to explain why a branch of the artery of the midgut is supplying the derivatives of the hindgut. The left colic artery being reported in the current case draws special attention to not only its origin and distribution, but also to its close relation to the pancreas. Its relationship with the lower border of the pancreas may make it vulnerable during pancreatic surgeries since the surgeons normally do not expect an artery of that caliber in the vicinity. The gastroenterologists and radiologists while formulating the treatment plan and performing radiological procedures involving the mesenteric vessels should keep in mind, the variations in the branching pattern of the mesenteric vessels. Knowledge of this rare anatomical variant of left colic artery is of significant clinical importance in pancreatic surgeries such as Whipple procedure for treatment of pancreatic carcinomas, in vascular studies & radiological interventional procedures such as Transcatheter Arterial
Emboli zation in treatment of ruptured left colic artery aneurysm. If the aberrant left colic artery is injured during extended right hemicolectomy, the left \(\frac{1}{3}\) th and proximal descending colon blood supply with get cut off which will lead to ischemia and gangrenous, so in future colonic conduit cannot be done. In a study by Prabhat B. Nichkaode and Tarun Naik, a colon conduit has been suggested to be more durable and safe, and supposed to long term functional make it preferred oesophageal substitute in those with benign disease and whose cancer stage predict long term survival[16].

4. Conclusion

Variation in abdominal vessels is a frequently encountered feature. Superior mesenteric artery and its branches is most commonly used vessel in many surgical and radiological procedures. Left colic artery may arise from superior mesenteric artery, as in this case. Variations in the branching pattern or position and course of blood vessels can affect routine clinical procedures like laparoscopic interventions.

References