

ABSENCE OF THE ILEOCOLIC ARTERY: MICROSURGICAL IMPLICATIONS IN RECONSTRUCTION OF THE ESOPHAGUS WITH THE FREE ILEOCOLON FLAP

Dear Editor,

The free ileocolon flap, described by Kawahara et al. in 1992,¹ is now a popular option in esophageal reconstruction. One of the main advantages of this flap is its consistent anatomy, which enables a large segment of ileo-colon to be harvested, based on the ileocolic artery (ICA) and vein.²

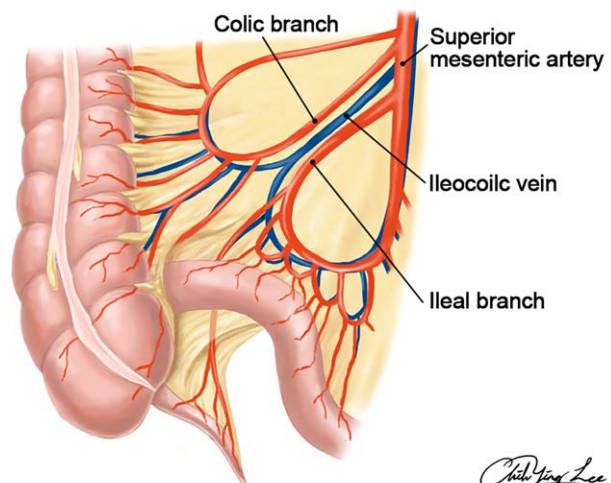
We recently used the free ileocolon flap for a case of reconstruction of the cervical esophagus. During flap harvest, it appeared that the ileocolon segment was nourished by two distinct arterial branches (ileal and colic), both running in close proximity and originating directly from the superior mesenteric artery (SMA). The venous drainage of the ileocolic segment consisted of a single ileocolic vein, which was identified between the two arteries. Initially, the ileal branch was anastomosed to the left transverse cervical artery. However soon after revascularization, a segment of the colon became dusky in color and hence inadequately perfused. At this stage the second flap artery (colic branch) was anastomosed to the left thoraco-acromial artery with the interposition of an 8-cm vein graft. Subsequently, perfusion of the colon segment improved markedly and the flap survived without complications.

Several anatomical studies have demonstrated that the ICA is the most consistent of the three SMA branches, as opposed to the right colic artery (RCA), which is the most variable.³ The ICA arises independently from the SMA in 63–66% of individuals. In the remainder, it originates as a common trunk, usually with the RCA.^{3,4} After its origin, the ICA goes off to

divide at the level of the right iliac fossa into two branches: an ileal branch, that supplies the terminal ileum, and a colic branch that supplies the proximal ascending colon.⁵

In the case described, both the colic and ileal branches supplying the ileocolon flap had an independent origin directly from the SMA and not from the ICA, which in this case was absent (Fig. 1). To our knowledge this anatomical variation is unique, as it does not fit into the existing classifications of anatomical variants of the SMA or ICA.⁶

In the event of double arterial supply to a flap, the need for a second inflow is determined by the grade of vessel overlapping between the vascular territories. Unlike skin flaps,⁷ intestinal flaps display a segmental arrangement of blood supply. Therefore, any devascularized segment relies solely on the collateral circulation within the bowel



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Figure 1. Illustration demonstrating the abnormal origin of the colic and terminal ileal arterial branches directly from the SMA. The ICA was absent. The anatomy of ileocolic vein was normal.

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wall and when this is inadequate, resultant partial bowel ischemia will ensue. Tissue ischemia is poorly tolerated by intestinal flaps and subsequent partial flap necrosis can lead to a cascade of complications including strictures, fistulas, infections, and anastomotic leaks, which can be potentially fatal for the patient. For this reason, previous authors recommended microsurgical supercharge of the pedicle ileocolon flap in cases of esophageal reconstruction.^{8,9}

A similar pattern of dual arterial supply has previously been reported by the senior author in two cases of free jejunum flap.¹⁰ In one patient, revascularization based solely on one artery resulted in partial necrosis and infection. The flap was eventually discarded. Based on our experience, we believe that awareness of anatomical variations in the intestinal vascular supply is of paramount importance in esophageal reconstruction to avoid partial flap loss and its catastrophic complications.

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