



Variations in arterial supply of vermiform appendix

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ABSTRACT

Till date appendix holds the same surgical significance, which it had previously. The appendicular artery is considered to be a branch from posterior caecal artery or ileocolic artery entering the mesoappendix from behind the ileum and supplying it. During routine cadaveric dissections some variations were seen in number and course of the appendicular artery. Such three cases of surgical importance along with their review of literature are discussed herewith. © IJAV. 2011; 4: 52–54.

Key words [appendix] [appendicular artery] [variation] [accessory appendicular artery] [blood supply of appendix]

Introduction

Kelly and Hurdon first drew attention towards accessory appendicular arteries in 1905 [1]. Bruce et al. and Koster et al. stated that appendix is supplied by only one artery [2,3]. In addition to this ambiguity in number of vessels supplying the appendix, the present cases also stress the importance of detailed study in variation of course of main and accessory appendicular arteries. Documentation of such variations in literature is necessary as it holds great surgical importance.

Case Report

These cases were found during routine dissection of abdominal region for undergraduate medical students in which the terminal part of ileocolic artery along with its all branches were neatly dissected and traced.

Case 1: In this case it was seen that main appendicular artery was branch of posterior caecal artery, which entered the mesoappendix behind the ileum, and supplied the appendix. There was an accessory appendicular artery, branch of anterior caecal artery and supplied the tip of appendix. This artery passed anterior to the caecum circumferentially from left to right side, went behind and supplied the tip of appendix. It was adhered to the anterior caecal wall but was not within any peritoneal fold. It was also accompanied by

a vein, which can be called as accessory appendicular vein (Figure 1).

Case 2: This case showed variation in course of main appendicular artery. Usually the mesoappendix is extension of left layer of mesentery, but in this case the mesoappendix was an extension of right layer of the mesentery instead of left layer. Thus mesoappendix was in front of ileum. The appendicular artery, which was branch of ileocolic artery, entered this fold and traversed up till appendix. This main appendicular artery was positioned within mesoappendix in front of the terminal ileum than its usual course posterior to it (Figures 2,3).

Case 3: This case showed appendicular artery separating high above from ileocolic artery, and entered the ileocolic fold of peritoneum. It gave small branch to caecum and continued as appendicular artery in the mesoappendix. Again in this case the mesoappendix was an extension of right layer of mesentery and the artery was positioned anterior to ileum (Figure 4).

Discussion

Kelly and Hurdon in 1905 showed that in 66% of appendices studied, the main appendicular artery supplied the distal three quarters of the appendix, while an accessory appendicular artery supplied the proximal fourth [1]. Shah

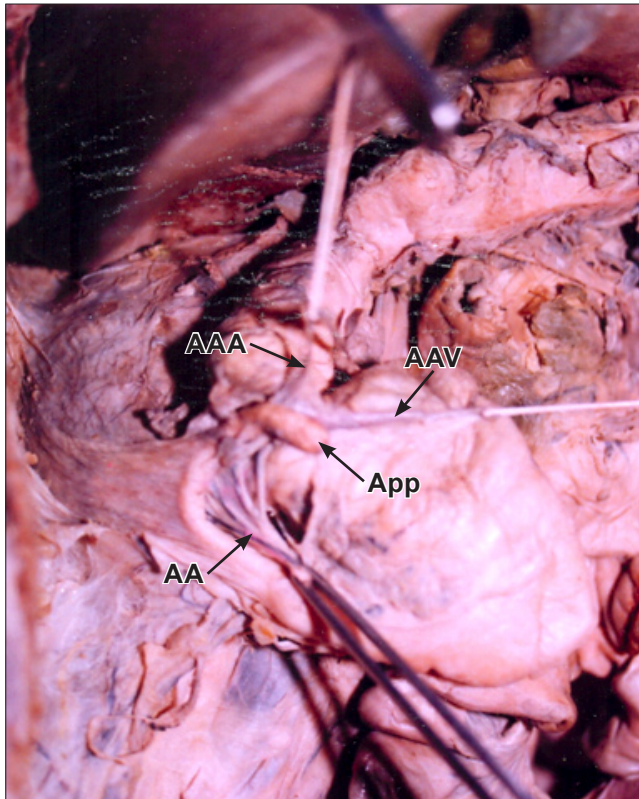


Figure 1. Photograph shows accessory appendicular artery (AAA) and vein (AAV). (*App: appendix; AA: appendicular artery*)

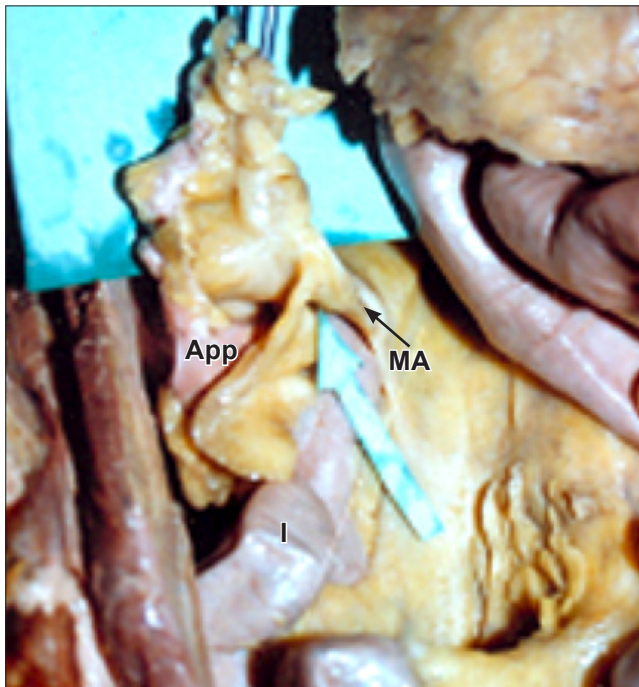


Figure 2. Photograph shows mesoappendix (MA) in front of ileum (I). (*App: appendix*)

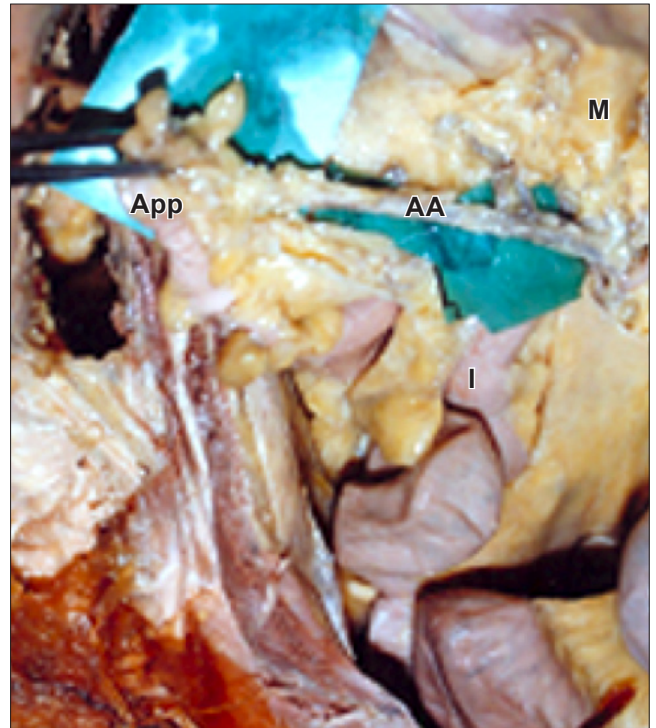


Figure 3. Photograph shows appendicular artery (AA) in front of ileum (I). (*M: mesentery; App: appendix*)



Figure 4. Photograph shows appendicular artery (AA) in front of ileum (I) and its continuity of ileocolic artery (ICA). (*App: appendix; C: caecum*)

and Shah proved that in 30% of cases the appendix received two branches from either the anterior or posterior caecal artery or one branch from each of these [4]. Solanke studied appendicular blood supply to its minute detail by injecting barium sulphate into the arteries and taking radiographs. His study in Nigerians showed 80% cases with accessory appendicular arteries, a reason behind immunity of Nigerians to appendicitis [5]. Contrary to this, the studies by Bruce et al., and Koster et al. showed that appendix is supplied by single artery only [2,3]. Recent study of Skawina et al. on vascularization of vermiform appendix in human fetuses showed that in most of the cases vermiform appendix is supplied by single ramus arising from ileocolic artery [6].

In present case number 1, the additional artery was no doubt branch of anterior caecal artery, but what was peculiar was its long circumferential course along the anterior wall of caecum, which can be due to the differential growth of caecum and rotation of appendicular orifice along with it.

The other two cases in this report highlight the position of mesoappendix and appendicular artery anterior to the ileum which reminds us the very old definition of mesoappendix by Treves in 1885, "Mesoappendix is not primary mesentery

of appendix but peritoneal fold raised secondarily by the appendicular artery along its course to the appendix" [7]. There is practically very less information available in literature regarding the variation in the course of the appendicular artery except for its mention by Bergman et al. in *Anatomyatlases.org* [8]. The above-mentioned other researchers have not taken it into consideration the variations in course of artery.

Accessory arteries are important because they can provide some immunity towards appendicitis. Accessory arteries supplying the tip of appendix reduce the possibility of gangrene formation in appendicitis. Lymphatics travelling along with the accessory arteries assume great importance in oncological treatment of appendix tumors. Variations in course of artery can completely misguide the surgeon in ligating the artery especially in laparoscopic surgeries and can lead to alarming hemorrhage.

We would like to conclude that, surgeons should keep in mind the possibility of accessory appendicular arteries as well as variations in the course of main and accessory appendicular artery during laparoscopic surgeries in this region.

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