

Promonteric Position of Vermiform Appendix and its Vasculature: A Case Report.

Shruthi BN^{1*}, Balakrishna¹, and Shubha R²

¹Department of Anatomy, Rajarajeswari Medical College, Kombipura, Bangalore, Karnataka, India.

²Department of Anatomy, Kempegowda institute of medical college, Bangalore Karnataka, India.

Short Communication / Case Report

Received: 12/08/2013

Revised : 26/08/2013

Accepted: 31/08/2013

*For Correspondence

Department of Anatomy,
Rajarajeswari Medical College,
Kombipura, Bangalore,
Karnataka, India.
Mobile: +91 9686530303.

Keywords: Vermiform appendix,
Promontericpostion of appendix,
Variation in appendicular
arteries, Mesoappendix

ABSTRACT

Vermiform Appendix is characterised by great variability of its location and morphology. Appendicitis is one of the most common diseases that needs emergency surgery. Variations in anatomical position cause different clinical presentation. During routine dissection for UG's in a adult male cadaver, the appendix was found to be in promonteric position with dual blood supply. The arteries found to arise from ileocolic artery, one each to the base and tip of the appendix. The arteries Inflammation of atypically located vermiform appendix may imitate inflammation of other organs which leads to diagnostic errors. This report explains the possible clinical implications due to location variability.

INTRODUCTION

The vermiform appendix is a narrow worm like diverticulum which arise from the posteromedial wall of the caecum about 2cm below the ileocecal junction and has no constant position. The length of appendix varies from 2 to 20cms with an average of 9cm ^[1].

The vermiform appendix is considered as a vestigial organ occupying variable positions. Histological differentiation of vermiform appendix shows that it is a specialized organ ^[1].

The appendix usually lies in the right iliac fossa. The base of appendix is fixed. Whereas the remaining part may occupy any of the following positions which indicated with an hour hand of a clock. Retrocaecal (12 o'clock), Pelvic (4 o'clock), Subcaecal (6 o'clock), Preileal & Post ileal (2 o'clock), Promonteric (3 o'clock) positions. But there is no definite rule about the position of the vermiform appendix. It is thought that the position appendix is closely related to development of caecum and is highly variable ^[2].

Documentation of such variations in literature is necessary as it holds great surgical importance; mainly due to its propensity for inflammation and may mimic other diseases like pelvic inflammatory diseases, torsion of ovarian cyst and ruptured tubal gestation, biliary colic etc.

MATERIALS AND METHODS

During routine dissection of abdominal region of adult male embalmed cadaver in the department of anatomy of Rajarajeswari medical college Bangalore, we observed a vermiform appendix which was running horizontally towards sacral promontory; which is one of the rarest positions of the appendix. The mesoappendix was cleaned to trace its blood supply and the length of the appendix was measured from the base to the tip by using Vernier callipers. The photographs of the same were taken insitu from different angles.

OBSERVATIONS AND RESULTS



Diagram 1: Showing the attachment of mesoappendix to tip (a) and base of appendix (b)



Diagram 2: Showing the blood vessels to the tip (artery supplying to tip-ast) and base of vermiform appendix (main appendicular artery-maa)

Vermiform appendix was arising from the posteromedial wall of the caecum about 2cm below the ileocecal junction.

The tip of the appendix was running horizontally and pointing towards the sacral promontory, behind the terminal part of the ileum.

The length of the appendix from base to the tip was about 8.5cm. This is within the normal range.

A separate peritoneal fold lying posterior to the mesentery connecting terminal ileum to the tip of appendix carrying an artery was noticed (artery supplying the tip- Diagram 1).

This is in addition to the mesoappendix carrying the appendicular artery (main appendicular artery) lying nearer to the base.

Both the arteries were seen arising from ileocolic artery (Diagram-2).

DISCUSSION

Vermiform appendix is characterised by variability of its location and morphology, the ultimate position of the appendix is profoundly influenced by the changes in position and shape which the caecum undergoes during development and growth^[3]. During growth, the caecum may be considered to undergo a helicoidal torsion whereby the appendicolocaecal junction is displaced leftwards, upwards and backwards to such an extent that in the extreme form it may lie behind the ileocaecal junction. The method of growth of the caecum must be the main factor in determining the position of the appendix^[4].

Other important circumstances quoted in the articles which modify the ultimate position of appendix is the urogenital ridge which may persist to a greater or lesser extent as the genitomesenteric fold^[5].

Various authors have studied the different position of appendix by different methods. Pelvic position of the appendix was observed in 33.3% of cases in a study by Gopalipur et al in 2003, retrocaecal in 32.45%, post ileal in 2.6%, preileal in 18.8% and subcaecal in 12.8%^[6].

The various positions of vermiform appendix were observed in a study by Wakeley in 1933. According to him Retrocaecal (65.3%), Subcaecal (2.3%), Lumbar (1%), Postileal (0.4%), Subcaecal (2.26%), Postcaecal (65.5%) and Ectopic were observed in 0.05% of cases^[5].

In an autopsy study by Clegg Lampty et al in 2006, retrocaecal position was the commonest in 67.3% cases and other positions were pelvic 21.6%, preileal in 4.9%, postileal in 3.8% and paracaecal in 2.4% of cases^[7].

A total of 303 cases were studied by laparoscopy for the position of appendix; that explains appendix was pelvic in 51.2%, preileal in 3%, paracaecal in 3.6%, post ileal in 22.1% and retrocaecal in 20.1%^[8].

The position of the appendix posterior to the caecum is due to the disposition of its bloodvessels within mesoappendix coming from the dorsal aspect. The main artery is derived from ileocolic artery or from its posterior caecal branch and occupies a posterior position.

All the studies that were reported earlier, mentions about the retrocaecal, post ileal, preileal and subcaecal positions of vermiform appendix. None of these articles mentions about the promonteric position of appendix. Text books mentions that promonteric position of appendix was seen in 1% of cases^[9]. The case presented in this article is a rare one and unusual which is underreported in literature.

Variations in arterial supply of vermiform appendix were noticed by Umesh and Deepali in 2011 during dissection of 3 cadavers. They observed that:

In case I; main appendicular artery was a branch of posterior caecal artery and entered the mesoappendix behind the ileum. There was an accessory appendicular artery, branch of anterior caecal artery that supplied the tip of appendix.

In case II; mesoappendix was in front of ileum and the appendicular artery was a branch of ileocolic artery which traversed till tip of the appendix.

In case III; the appendicular artery separated from the ileocolic artery at a higher level and entered the ileocolic fold. A small branch from it supplied the caecum and then continued as appendicular artery^[10].

In another study by Shah and Shah in 1948; 30% of cases the appendix received two branches from either the anterior or posterior caecal artery or one branch from each of these arteries^[11].

In the present case, two arteries arising from ileocolic artery separately supplied the base and tip of the appendix. The artery supplying the base entered through mesoappendix and the artery supplying the tip shared a

separate fold of peritoneum (Diagram - 1). This double blood supply is of importance that can provide some immunity towards appendicitis by reducing the gangrene formation.

There is practically very less information available in literature regarding the variation in the course of the appendicular artery^[12]. Hence the importance of this study.

CONCLUSION

It is very important to be aware of the possible variations in the positions of vermiform appendix, which may pose challenging, diagnostic and therapeutic problems while doing many abdominal surgeries. The possible significant educational value may perhaps change a clinician's traditional method of handling such a case. Variations in the course of appendicular artery; can completely misguide the surgeon in ligating the artery especially in laparoscopic surgeries and can lead to alarming haemorrhage. Promonteric position of the appendix which is the rarest of rare should be kept in mind along with its blood supply while making optimal diagnosis of various pathological conditions related to these organs and treat accordingly.

REFERENCES

1. Borley NR. Vermiform appendix; standing S, Ellis H, Healy JC, Johnson D, Williams A, Collins P, et al., Gray's anatomy: the anatomical basis of clinical practice. 39th ed. Edinburgh: Elsevier Churchill Livingstone; 2005. P.1189-90.
2. Moore KL, Dalley AF. Clinically oriented anatomy 4th ed. Philadelphia: Williams and Wilkins; 1999. P.350-4.
3. Banarjee A, Kumar IA, Tapadar A, Pranay M. Morphological variations in the anatomy of caecum and appendix- a cadaveric study. NJCA. 2012; 1(1): 30-35.
4. Datta A. K. (2000). The circulatory system, Essentials of human embryology, 4th edn, 194, current books internationals, Calcutta.
5. Wakeley CPG. The position of the vermiform appendix as ascertained by an analysis of 10,000 cases. J Anat. 1933; 67: 277-83.
6. Golalipour MJ, Aray B, Azarhoosh R, Jahanshahi M. Anatomical variations of vermiform appendix in South East Caspian sea (Gorgan Iran). J Anat Soc India. 2003; 52(2) 1413.
7. Clegg lampsey JN, Armah H, Naaeder SB, Adu Aryee NA. Position & Susceptibility to inflammation of Vermiform appendix in accra, Ghana East Afr Med J. 2006; 83 (12): 670-3.
8. Ifran Ahmed, Kristjan S. Asgeirsson, Ian J Beckingham, Dileep N. Lobo. The position of vermiform appendix at laparoscopy. Surgical and Radiological Anatomy, March 2007; 29 (2): 165-168.
9. Vishram Singh. Anatomy of Abdomen & Lower limb. Vermiform Appendix, Elsevier, Gurgaon, 2011; 160.
10. Umesh K Kulkarni, Deepali U Kulkarni. Variations in arterial supply of Vermiform appendix. IJAV. 2011; 4: 52-54.
11. Shah MA, Shah M. The arterial supply of the Vermiform appendix. Anat Rec. 1948; 95: 457-460.
12. Bergman RA, Afifi AK, Miyauchi R. Illustrated encyclopedia of Human Anatomic Variations: Opus 11: Cardiovascular System; arteries: Abdomen.