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PECULIARITIES OF THE TOPOGRAPHY OF VERMIFORM APPENDIX

Abstract. *Topography of the appendix influences its mobility, degree of mobilization of the caecum, and need for additional muscle splitting during appendectomy. Acute appendicitis is one of the most common diseases and is easy to diagnose. However, when the appendix is situated in an abnormal position, the diagnosis of acute appendicitis becomes difficult. The aim of this study was to determine the frequency of the various positions of the appendix. The topography and length of the appendix were determined relative frequency of variants was calculated. The most common appendicular type was pelvic 122 (62.24 %) while retrocaecal position made up 23.46%. The average length of the appendix was 83.06 mm+29.5 mm. Thus the topography of appendix shows variations and its awareness enables to find efficient strategies to prevent misdiagnosis.*

Key words. *Vermiform appendix, morphology, topography, human.*

Introduction. Appendix vermiformis has always been of a particular interest for scientists and medical practitioners. There were many arguments variably made through the 18th and 19th centuries that the vermiform appendix was the source of catastrophic illness in human. In 1711 Lorenz Heister described the blackened stump of an acute gangrenous appendix in his dissection of an executed criminal [1]. Hunter, Bright, Addison, and Parkinson described diseases of appendix in monographs published between 1767 and 1839. In 1880, the appendix was first removed in a planned operation by Dr. Lawson. Jacopo Berengario da Carpi gave the first description of vermiform appendix in 1522. Till now an acute appendicitis is probably the most common intraabdominal condition requiring an immediate surgery. The diagnosis is based on well-established clinical symptoms, basic radiologic findings and surgeon experience [2]. Approximately one third of patients with acute appendicitis have pain localized outside of the right lower quadrant because of the various positions of the appendix vermiformis. However, when the appendix is situated in an abnormal position, the diagnosis of acute appendicitis becomes difficult [3]. Delayed diagnosis or misdiagnosis of appendicitis might lead to perforations of the appendix, which is a clinical emergency.

Objective: a deeper study of peculiarities of the topography of appendix would expand doctors' knowledge and enable to find efficient strategies to prevent misdiagnosis.

Materials and methods. The appendix is said to be the only organ in the body which has no normal position, emphasizing the fact that the appendix is frequently one of the mobile viscera. We have reviewed 102 case histories of patients who were enrolled in Chernivtsi regional clinical hospital with the diagnosis of acute appendicitis, and 94 autopsy reports obtained after routine post-mortem examinations, with an average age of 57 years in all cases (range 21–94 years) were studied. On the basis of surgical protocols and post mortem measurements we have summarized the length and position of appendices. Cases with any gross abnormalities of abdominal organs, fibrosis, kinking or adhesions, and history of abdominal surgery were excluded.

Results and discussion. The appendix is usually located in the lower right quadrant of the abdomen and separates large intestine from small intestine. It is connected to mesentery in lower part of ileum by mesoappendix. It generally represents the part of immune system. The appendix is well endowed with lymphatic vessels [4]. Lymphatic drainage is into the ileocolic chain through the mesoappendix, which usually contains one or many lymph nodes. The position in the abdomen is on the surface known as McBurney's point. With its base attached to the caecum, it may occupy almost any position, like the hands of a clock, both in the sagittal and the coronal planes relative to the caecum, and the most common are retrocecal, pelvic, subcecal, preileal and postileal, while subhepatic, meso-cealic, mid-inguinal and left-sided are seen more

rarely[5]. This variability of its position is easily explained on the basis of an unequal development of the different parts of the original infantile caecum. The appendix is first recognized when the proximal part of the caecum grows out of all proportion to the distal end, which consequently retains its undeveloped form and lumen. At this stage the appendix must necessarily be attached to the lower end of the caecum, in about its middle [6]. The left half of the caecum ceases to grow, or grows very little, while the right half grows enormously; this is the asymmetrical shape of the caecum in the adult. The appendix which was, previous to this change, attached below at the junction of the right and the left halves of the caecum, now appears to be attached to the left of the caecum, because this junction has shifted to the left. Next, due to the rapid growth of the anterior wall of the caecum as compared with the posterior, the appendix may be pushed gradually backwards behind the terminal ileum and caecum [7]. Thus, on the accelerated or retarded growth of the walls of the original caecum depends the ultimate position of the appendix in adult. The appendix in surgical practice is detected by tracing the three longitudinal muscle layers, whose terminal fusion composes the proximal part of the gut extension. The topography of the vermiform appendix depends on the neighbour organs and the attaching apparatus of the peritoneum (mesoappendix). The growth of longitudinal muscle layers (the taenia colli) may confuse the surgeon about the real position of the appendix [8].

After conducting the review of our material we have summarized obtained results in the table 1.

Thus, 62.24 % of the appendixes were located in pelvic position, and 23.46% were retrocaecal, post-ileal position was noted in 8.67% of cases. The average length of all the appendixes was 83.06 mm±29.5 mm, approximately 62% were between 70 and 90mm long. The appendixes of males averaged 7.1 mm longer than those of the females. An unusually long appendix, 239 mm, was noted; the shortest appendix was 32 mm long.

Table

Position and length of the appendix vermiformis

Position	Cases (N)	Total %	Mean length (mm)	Std. deviation (mm)
Pelvic	122	62.24	81.2	20.4
Post-ileal	17	8.67	85.4	27.2
Pre-ileal	6	3.06	77.3	33.2
Retrocaecal	46	23.46	72.5	21.1
Subcaecal	3	1.53	74	35.4
Paracaecal	2	1.02	108	39.7
Total	196	100		

The caecum was at McBurney’s point in 68 (34.69%) cases, pelvic in 122 (62.24%) and high lying in 6 (3.06%) cases. The classic information given in many surgical training centres claims that the appendix lies deep at the junction between the lateral and middle thirds of the right spinoumbilical line, so-called McBurney’s point [9]. However, in the current study, the majority of appendicular bases were not along the spinoumbilical line.

Conclusions. Our study suggests that the appendix may be most commonly situated in a pelvic position, despite the numerous reports in surgical and postmortem studies, and this finding is clinically significant.

Prospects of further studies. Further comparative studies of the position of appendix in children and adults can give additional information concerning the suggested variants of its topography and gender peculiarities.

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