

THE LENGTH AND POSITION OF THE VERMIFORM APPENDIX*

A STUDY OF 4,680 SPECIMENS

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THE length of the appendix as noted in the literature from 1861 to the present time is given in Table I. Byron Robinson,²⁶ in 1895, stated that the appendix of the male is, on an average, 0.6 centimetre longer than that of the female. Fawcett and Blachford,⁷ in 1900, studied 350 anatomic dissections and concluded that the appendix of the male is, on an average, 1 centimetre longer than that of the female; this was substantiated by Nowicki,²¹ in 1909. Dock,⁶ in 1892, stated that in his experience appendixes

TABLE I

Length of the Appendix as Given by Various Authors

Year	Author	Shortest, Centimetres	Longest, Centimetres	Average Length, Centimetres	Average Diameter, Centimetres
1861	Luschka		23.0		
1888	Ranschoff		19.0		
1890	Grauer (Kelly and Hurdon)		33.0		
1891	Ferguson	2.2		10.13	0.8
1892	Clado			8.0	
1893	Ribbert			8.3	
1893	Lafforgue		24.0		
1893	Bryant	0.6		8.25 at age of 60	
1895	Berry	3.1	13.3	8.3	0.6 at base 0.5 at tip
1900	Fawcett and Blachford			8.4	
1900	Lenzmann		22.0		
1903	Huntington	0.5			
1904	Holmes			6-10	-1.0
1905	Kelly and Hurdon			9-10	0.6
1905	Weaver (Kelly and Hurdon)		21.5		
1905	Blake (Kelly and Hurdon) . .		24.0		
1909	Nowicki			8.4	0.7
1913	Deaver	1.0	23.0	8-9	0.3-0.5
1918	Lewis	2.0	20.0	8.3	
1920	Lake		29.4		
1923	Arthur Robinson	1.8	23.0	9.2	0.6
1923	Piersol	1.0	24.0	8.4	
1924	Davis			8.75-10	0.6
1927	Royster	2.5	29.4	7.5	
1929	Henke and Lubarsch		28.0	9.5 at age of 20-30	

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normally are longer in the Negro race than those found among his white patients. The longest appendix on record in the literature was one reported by Grauer,¹⁰ in 1890. This specimen was 33 centimetres long, after being fixed in solution of formaldehyde. The next longest specimen was one reported by Lake,¹⁶ in 1920; it was 29.4 centimetres long and was obtained from a Negro aged twenty-two years, who had had symptoms referable to the lower part of the abdomen during the previous year, and had suffered sudden acute exacerbation of chronic appendicitis with perforation of the tip. The next longest appendix was reported by Henke and Lubarsch,¹¹ in 1929, it was 28 centimetres long and was found at necropsy of a man aged forty years who had died of a disease unrelated to the appendix.

The length of the appendixes in my series which represents 4,680 specimens removed from post-mortem material are given in Table II. It may be noted that approximately 61 per cent. of specimens were between 6 and 9 centimetres long. The extremes of length were 0.3 and 24.5 centimetres; the average length was 8.21+ centimetres. The average length of the appendixes of the male was 0.68+ centimetre longer than that of the female. One full-term, normally developed fetus (stillborn) was reported as not having an appendix.

TABLE II

Length of the Appendix in 4,680 Specimens

Length, Centimetres	Specimens	Per Cent.	Length, Centimetres	Specimens	Per Cent.
1.....	12	0.26	12.....	174	3.72
2.....	44	0.94	13.....	122	2.60
3.....	89	1.90	14.....	100	2.14
4.....	214	4.57	15.....	75	1.60
5.....	322	6.88	16.....	36	0.79
6.....	482	10.30	17.....	20	0.43
7.....	733	15.66	18.....	11	0.23
8.....	864	18.46	19.....	6	0.13
9.....	783	16.72	20.....	1	0.02
10.....	358	7.65	24.5.....	1	0.02
11.....	233	4.98	Totals.....	4,680	100.00

The longest appendix in my series was observed in a man aged seventy-six years, whose weight was 122 pounds (55 kilograms) and whose height was 177 centimetres. He died of a disease entirely unrelated to the appendix and, so far as could be learned from relatives, he had never had abdominal pain which might be construed as being referable to the appendix. The retrocecal position of this appendix and the intimate adhesion to the posterior wall of the cæcum is shown in Fig. 1. Its length after being fixed in formalin was 24.5 centimetres; its tip reached to the hepatic flexure of the colon.

The first comprehensive study made of the position of the appendix was completed by Gladstone and Wakeley,⁹ in 1924, who studied 3,000 anatomic dissections. Previous to this, other authors had stated their belief, from observations at necropsy or operation, that the majority of appendixes are situated anteriorly, that they are free and hang over the brim of the pelvis.

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Gladstone and Wakeley concluded that 0.9 per cent. were anterior or pre-ileac, 0.5 per cent. were splenic or post-ileac, 27.5 per cent. were pelvic, lying on the psoas major muscle near or hanging over the brim of the pelvis, 1.86 per cent. were subcecal and beneath the caput ceci, 69.2 per cent. were post-cecal and retrocolic, and 0.033 per cent. (one case) were ectopic. The position of the appendix in this series is shown in Table III. Three thousand six hundred seventy-six specimens (78.5 per cent.) were situated anteriorly, and 1,004 (21.4 per cent.) were retrocecal. These observations agree substantially with statements made by other observers.^{1, 4, 5, 11, 14, 18, 21, 24, 25, 27}

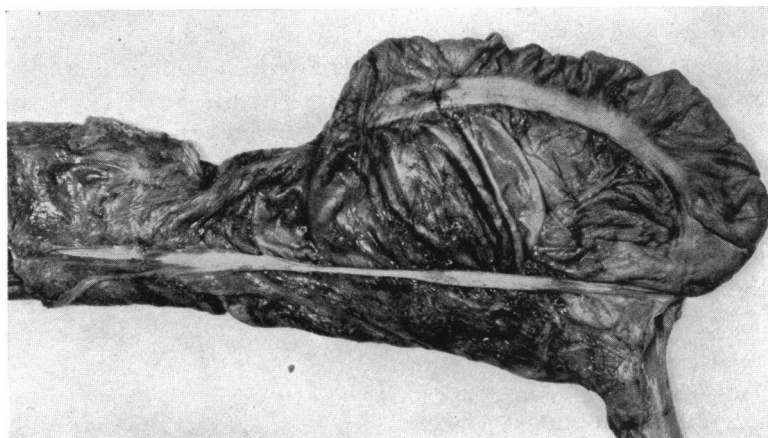


FIG. 1.—Posterior aspect of regions of the ileocecal and ascending colon. The appendix was 24.5 centimetres long when fixed in solution of formaldehyde and extended to the hepatic flexure of the colon. It was intimately adherent to the posterior surface of the cæcum and ascending colon; its lumen was obliterated.

I believe that the only true retrocecal appendix is one that is either partially or entirely retroperitoneal and adherent to the posterior wall of the cæcum.

SUMMARY

A pathologic anatomic study is presented in which are summarized the length and position of 4,680 appendixes derived from post-mortem material. Seventy-eight and five-tenths per cent. of the appendixes were situated anteriorly and 21.4 per cent. were retrocecal. Approximately 61 per cent. were between 6 and 9 centimetres long. The appendixes of males averaged 0.68 centimetre longer than those of the females. The average length of all the appendixes was 8.2 centimetres. An unusually long appendix, 24.5 centimetres, was noted. In 50.8 per cent. of the cases, appendectomy had been performed.

TABLE III

Position	<i>Position of Appendix in 4,680 Specimens</i>	Specimens	Per Cent.
Anterior			
Free		3,262	69.68
Bound down in pelvis		370	7.90
Adherent to mesentery of terminal portion of ileum		44	0.94
Total		3,676	78.52

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TABLE III—(Continued)

Position	Specimens	Per Cent.
Retrocecal		
Bound down and either partially or totally retroperitoneal	913	19.50
Free and subcecal	58	1.24
Bound down to retroperitoneal tissue behind terminal portion of ileum	33	0.71
Total	1,004	21.45

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