The neurological junction between the appendix and ascending colon

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SUMMARY The junction between gut wall having the intramural plexus distribution characteristic of large bowel and that of appendix does not occur at the anatomical junction of the caecum and the appendix but at a level proximal to this and just distal to the ileocaecal valve.

The intramural ganglionic plexus of the appendix differs from that of the rest of the intestine in that instead of the nerve cells being clearly stratified into distinct plexuses, they are arranged in an apparently irregular pattern within the muscle layers.

While studying the intramural plexus of the colon of immature infants who had delayed bowel activity and seeking the site of origin of the appendix in the conical caecum seen in such infants (Fig. 1), we were surprised to find that the whole of the muscle of the immature conical caecum and appendix appears to have the same ganglionic plexus distribution as the adult appendix. It soon became obvious that in elder children the gross anatomical junction of the appendix with the colon does not coincide with the neurological one.

This paper reports an attempt to define the apparent caeco-appendicular neuronal junction.

Method

The appendix and caecum from 74 children varying in age from stillborn at 38 weeks gestation to children of 12 years, were examined. Eighteen were obtained from operation specimens and the rest were at necropsy.

The specimen of colon, caecum and appendix...
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Results

The general distribution of ganglia in the colon and appendix as seen in our strips is illustrated in Figure 2. In this figure the junction between the appendix and colon would be indicated by the junction between the mid and lower range of the tracing where at least as much ganglionic plexus resides outside the intermuscular layers as between them (Figure 3).

In none of the specimens studied did the change in ganglion distribution coincide with the anatomical junction between the appendix and caecum. The junction lay at an irregular line around the caecum just below the ileocaecal junction and running slightly obliquely from this as illustrated in Figure 4. In no case did we see appendix-like innervation extending into the ileum but in several cases, it appeared to approach the appendicular border of the ileocaecal valve.

Discussion

Most studies of the appendix are confined to the vermiform structure. There have been many
studies of the intrinsic nervous tissue (Reiser, 1932; Sato, 1935; Makii, 1937; Lassman, 1952; Shersheneva, 1959; Yamamoto, 1960; Erdohazi and Read, 1967) and a number of studies have been carried out on changes in the nerves of the appendix associated with both acute and chronic appendicitis (Reiser, 1932; Walcker, 1932; Drüner, 1936; Schuringa, 1940; Llombart and Alcober, 1953; Röper, 1952; Simard, 1935).

Our findings suggest that from a nerve functional point of view, the caecum below the level of the ileocecal valve should be considered the same as that of the vermiform appendix. This is borne out by some radiological studies (Pressler, 1962, suggesting that the appendix and caecum do function as one. An observation of Gross (1927) is also relevant. He noticed that electrical stimulation of the appendix does not cause contraction of the large bowel but of the ileocecal valve.

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References


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