Vermiform Appendix

Related terms:

Neoplasm, Surgery, Cells, Tissues, Diagnosis, Protein, Drug, Species, Pain

View all Topics

Appendix

NORMAN J. CARR, LESLIE H. SOBIN, in Modern Surgical Pathology (Second Edition), 2009

PATHOLOGIC EXAMINATION

The appendix is a common specimen in most surgical pathology laboratories. It may be received as an appendectomy specimen or attached to the cecum as part of a more extensive procedure. In either case, assessment is similar. The length and greatest diameter are measured. Any variation in diameter is recorded. The serosal surfaces are described; they are normally smooth and glistening. The cut surfaces are examined for any areas of hemorrhage, thickening, cyst formation, or tumor. Any fecalith or foreign body in the lumen is noted. A tumor of the appendix requires the same description as a tumor of the colon, with measurement in three dimensions.

Dissection of the appendix and selection of tissue for microscopy may proceed by one of several standard techniques. A common method is to bisect the tip longitudinally and make transverse sections at intervals of no more than 10 mm through the remainder; the pathologist then submits half the tip, one or more transverse sections from the middle, and a transverse section from the base.[11] Some pathologists prefer to bisect the base to produce longitudinal sections from the base as well as the tip (by using the surgeon's clamp mark to distinguish them on the slide). This technique facilitates accurate assessment of the resection margin in the case of neoplasm; the rationale for using it routinely is that some tumors are not identified by gross examination.[12] Alternatively, the entire appendix can be bisected longitudinally.[13] A flexible approach is probably better than slavish adherence to one particular protocol. In particular, the dissection technique needs adjusting in cases of tumors and mucoceles to ensure adequate sampling.

Adult Age-at-Death Estimation in Unknown Decedents

Kristen Hartnett-McCann, ... Andrew C. Seidel, in New Perspectives in Forensic Human Skeletal Identification, 2018

Appendix A. Quick Reference Guide for Practical Applications of Adult Age-at-Death Estimation Techniques, 78

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GI Tract Endoscopic and Tissue Processing Techniques and Normal Histology

BRIAN C. JACOBSON, ... FRANCIS A. FARRAYE, in Surgical Pathology of the GI Tract, Liver, Biliary Tract, and Pancreas (Second Edition), 2009

APPENDIX

The vermiform appendix is a narrow, worm-shaped structure that protrudes from the posteromedial aspect of the cecum, 2 cm (or less) below the insertion of the ileum into the cecum. The appendix is located at the proximal root of the outer tinea coli of the cecum. Because the anterior tinea coli of the cecum is generally quite prominent, it serves as a guide to locate the appendix. The length of the normal appendix is quite variable, from 2 to 20 cm in length. Its diameter is quite consistent and uniform along its length, about 0.3 to 0.5 cm. It has a rudimentary mesentery only on a portion of its length. The intraperitoneal location of the appendix also is variable. The appendix may lie behind the cecum, hang over the brim of the pelvis, or lie in front or behind the ileum. However, in any individual, the location is relatively fixed.

The appendix is completely invested by peritoneum, and has both an inner circumferential and a fully circumferential, outer longitudinal muscle layer of the muscularis propria. The mucosa of the appendix is colonic in type. However, the most prominent feature is the abundance of lymphoid tissue that lies within both the lamina propria and submucosa (Fig. 1-15). The lymphoid tissue is particularly prominent in younger individuals, and dissipates gradually over the person's lifetime. The concept that the appendix undergoes normal “fibrous obliteration” late in life has long been postulated. More likely, alterations to the lumen of the appendix reflect a life of clinically silent inflammatory conditions (see Chapter 15).

Abdomen

S. Jacob MBBS MS (Anatomy), in Human Anatomy, 2008

The appendix

The appendix (Figs 4.37, 4.38) is attached to the posteromedial aspect of the caecum. Its size and position are variable. In about 75% of cases it is retrocaecal, whereas in about 20% it hangs into the pelvis. The other possible locations are paracaecal, preileal (in front of ileum) and postileal. The three taenia coli merge at the root of the appendix. However the appendix itself is devoid of taenia and appendices epiploicae. It has a mesentery which contains the appendicular artery, which is a branch of the ileocolic artery or that of one of its caecal branches.

The surface marking of the appendix is the McBurney's point, which is the junction between the lower third and the upper two-thirds of the line connecting the anterior superior iliac spine to the umbilicus. See Clinical box 4.8.

Clinical box 4.8

Appendicitis

Inflammation of the appendix is known as appendicitis. The abdominal pain of appendicitis is somewhat unique. Inflammation follows obstruction of its lumen which causes swelling and stretching of the visceral peritoneum. This causes a vague pain in the region of the umbilicus in the early stage. It is a referred pain transmitted through sympathetic afferents to T10 segment of the spinal cord which falsely refers it to the umbilical region. At a later stage the parietal peritoneum is inflamed when the pain gets localised in the right iliac fossa at the McBurney's point.

The appendicular artery is functionally an end artery, thrombosis of which in appendicitis causes gangrene of the appendix leading to perforation.

The lumen of the appendix is relatively wide in infants but it is almost obliterated in old age. As appendicitis starts with obstruction of the lumen it is rare in infants and the elderly.

Appendicectomy is often done through a Lanz incision (see Clinical box 4.1). The caecum is mobilised and the appendix, if not visible, identified by tracing the taenia coli. The appendicular mesentery containing the vessels and the root of the appendix are then tied and removed. The stump is finally invaginated into the caecum.

The paediatric uterus, ovaries and testes

Gurdeep S. Mann, ... Paul S. Sidhu, in Clinical Ultrasound (Third Edition), 2011

Torsion of the testicular appendix

The appendix testis lies at the upper pole of the testis in the groove between the testis and head of the epididymis and is best seen in the presence of a hydrocele (Fig. 72.37). The appendix measures between 1 and 7 mm in length and is of similar reflectivity to the epididymal head.[83] Torsion of the testicular appendix is more common than testicular torsion, occurring in boys between the ages of 3 and 13 years.[84] Patients present with pain at the upper aspect of the testis, with a small bluish nodule; the 'blue-dot' sign. In torsion of the appendix, ultrasound of the testis is normal with low resistance arterial blood flow on Doppler ultrasound. Often there is an inflammatory reaction in the epididymis, which is enlarged, and hyperaemic.[85] The appendix itself tends to be of higher reflectivity although 30% are of reduced reflectivity with a surrounding reactive hydrocele.[86] No surgical intervention is required and the condition settles.

Analytical Profiles of Drug Substances and Excipients

Manasen A. Radwan, ... Omar A. Al Deeb, in Analytical Profiles of Drug Substances and Excipients, 1998

4.2 Identification [3]

4.2.1 Infrared Absorption Spectrum

Appendix IIA of the British Pharmacopoeia (1993 edition) contains the reference IR spectrum of mebeverine hydrochloride. The five most intense lines of the experimentally determined spectrum should agree with those of the reference.

4.2.2 UV Absorption Spectrum

Appendix IIB of the British Pharmacopoeia (1993 edition) contains the ultraviolet absorption spectrum of 0.003% w/v

mebeverine hydrochloride in 0.1 M hydrochloric acid, over the range of 230 to 356 nm. As mentioned in a previous section, the compound exhibits a maximum at 263 nm, and a shoulder at 292 nm. The absorbances at these wavelengths are approximately 0.79 and 0.41, respectively.

4.2.3 Chloride Content

The chloride content is detected according to the method described in Appendix VI of the British Pharmacopoeia (1993 edition). 25 mg of mebeverine hydrochloride are dissolved in 2 mL of water, acidified with 2M nitric acid, and centrifuged. The supernatant liquid is then used in conjunction with the reaction characteristic for the presence of chlorides.

4.2.4 Melting Point

The melting point of mebeverine hydrochloride is approximately 135°C, according to Appendix VA of the British Pharmacopoeia (1993 edition).

4.2.5 Color Test

A Libeimann's color test has been described, which produces a black color with mebeverine hydrochloride. [2].

THE COLON

Margaret E. Smith PhD DSc, Dion G. Morton MD DSc, in The Digestive System (Second Edition), 2010

Appendix

The appendix is a narrow, tube-like structure. Its wall resembles that of the colon, except that it has a complete layer of outer longitudinal muscle, and numerous lymph nodules, in the mucosa and submucosa, which disrupt the muscularis mucosa, giving it the appearance of isolated lengths of smooth muscle. The appendix is the commonest source of intra-abdominal sepsis (appendicitis). This condition can be life-threatening if the appendix ruptures, thereby allowing the sepsis to spread within the peritoneal cavity (peritonitis). This occurs when the appendix becomes obstructed. An abscess forms within it, resulting in a secondary inflammatory process within the wall. This inflammation can result in thrombosis of the blood vessels (appendicular artery and vein) supplying it. The loss of blood supply leads to gangrene and perforation of the appendix. It is the absence of any secondary blood supply to the appendix (that could prevent gangrene) that makes appendicitis such a dangerous condition.

Inflammatory Disorders of the Appendix

JASON DANIELS, ELIZABETH MONTGOMERY, in Surgical Pathology of the GI Tract, Liver, Biliary Tract, and Pancreas (Second Edition), 2009

Anatomic Abnormalities

The appendix can exhibit a variety of anatomic abnormalities, including atypical location,[2] duplication,[3], [4] and congenital absence.[5] In addition, the appendix can show complete or incomplete septa, which are seen principally in children and young adults and can be associated with acute appendicitis.[6] An abnormally long appendix (normal is 7 to 10cm) has been linked to primary acute torsion, although torsion has also been reported in appendices of normal length.[7] Diverticula of the appendix can be congenital, in which case the muscularis propria is part of the diverticular wall, or acquired, in which case the diverticulum results from increased intraluminal pressure and mucosal herniation through a defect or weak spot of the muscularis propria, often at the site of a penetrating artery. Acquired diverticula are more

common than congenital diverticula and are seen in 1% to 2% of the population.[8] However, the number of acquired diverticula is greatly increased in patients with cystic fibrosis and can be seen in up to 22% of appendectomy specimens (Fig. 15-1).[8]

Gastrointestinal Specimens (Including Hepatobiliary and Pancreatic Specimens)

Susan C. Lester MD, PhD, in Manual of Surgical Pathology (Third Edition), 2009

APPENDIX

Appendices are generally removed due to acute appendicitis, occasionally "incidentally" during operations for other reasons, and as part of a right colectomy.

PROCESSING THE SPECIMEN

1. Record dimensions (length, diameter including range), color (tan/pink, gray/green), external surface (edematous, fibrinous exudate, hyperemia, purulence, perforations, hemorrhagic (may be seen in endometriosis).

   If the mesoappendix is present, record dimensions, color, appearance (edema, fibrinous exudate, purulence).
2. Make a longitudinal section of the tip, just long enough to fit into a cassette. The serosal side may be inked to orient the tip for embedding. The remainder of the appendix is sectioned at 3 mm intervals (Fig. 19-9).
3. Record the thickness of the wall, the diameter of the lumen (dilated, fibrosed, constricted), the condition of the mucosa (glistening, ulcerated, hyperemic), and the contents of the lumen:
   - Fecalith
   - Foreign body (e.g., seeds, gallstone calculus)
   - Purulence or blood (acute appendicitis)
   - Parasites (*Oxyuris vermicularis*)
   - Mucin – may be associated with a mucocele or a mucinous neoplasm (check for mucinous implants on serosa)
   - Fibrous obliteration
4. Submit one longitudinal section of the tip and two transverse sections (one near the resection margin and one near the tip), including any abnormalities seen (perforations, ulcerations, serositis).

   If there is mucin accumulation in the lumen (i.e., a possible cystadenoma or cystadenocarcinoma) or an area suspicious for tumor, submit the entire appendix and submit the resection margin in a separate cassette.

   If the appendectomy was performed for appendicitis, and the appendix is grossly normal, the entire specimen must be submitted.

GROSS DIFFERENTIAL DIAGNOSIS

Appendicitis

is usually apparent as a purulent exudate on the serosal surface of the appendix, often with a gross perforation. More subtle cases may appear edematous or may not be grossly apparent. Surgeons may be incorrect in up to 7% of cases of acute appendicitis (both false-positive and false-negative clinical diagnoses). Thus, histologic confirmation is useful for clinical management after appendectomy.

Neuroendocrine Tumors

(e.g., carcinoid, tubular or goblet cell carcinoid, crypt cell carcinoma) are usually found at the tip of the appendix.

Carcinoids are found incidentally in one to six specimens out of 1000 appendectomies and are the most common appendiceal tumor. Small tumors are often difficult or impossible to see grossly because of their infiltrative growth pattern in the submucosa. The normal architecture may be effaced. Large tumors may be firm, yellow to white, well circumscribed but not encapsulated, and usually look like a bulbous swelling of the tip.

Endometriosis

is not an uncommon finding in the appendix. Often the muscularis propria will appear to be markedly hypertrophied and areas of focal hemorrhage may be present.

Mucocele

is seen as diffuse globular enlargement of the appendix which is filled with mucus. Mucinous cystadenomas and mucinous cystadenocarcinomas have this same appearance.

Adenocarcinoma

of the appendix is rare and has the same gross appearance as a colonic adenocarcinoma. Some tumors may perforate and present as acute appendicitis. These cases may be difficult to distinguish from inflammation grossly.

A Cecal Diverticulum

(thought to be of congenital origin) may present clinically as appendicitis. Intraoperatively, the surgeon finds a pericecal abscess with a normal appendix and a right colectomy is performed. Search for the diverticulum in the proximal cecum with a metal probe – the probe will enter the abscess cavity from the mucosal surface.

Specific Infections