DEFINITION

1. **Appendicitis** is the term applied to inflammation of the *vermiform appendix* which, in humans, has no known function. It is rich in lymphoid tissue which gradually atrophies with advancing age. In the vast majority of cases, appendicitis is an acute condition.

CLINICAL MANIFESTATIONS

2. **Acute appendicitis** is the most common abdominal surgical emergency, apart from trauma. It may occur at any age, affecting males more often than females, but the majority of patients are between 10 and 40 years old.

3. Typically, the patient has central abdominal pain which may be associated with loss of appetite, nausea and/or vomiting, mild fever and leucocytosis. After a few hours pain is felt in the right lower abdomen.

4. This classical presentation is more often absent than present, due principally to variations in the position of the appendix within the abdomen, so that appendicitis may be very difficult to diagnose. A consequence is that, at appendicectomy, even highly competent surgeons find an apparently normal appendix in about 20% of cases. However, the risk of operation is outweighed by that of morbidity associated with the possible complications of untreated appendicitis.

5. Appendicitis sometimes resolves without treatment, and may then be referred to as **subacute appendicitis,** but more often develops into an abdominal emergency requiring operation. Recurrent low-grade appendicitis is sometimes called **chronic appendicitis,** but the existence of chronic appendicitis as a separate entity is very doubtful.

6. The most frequent complication of acute appendicitis is **perforation** of the appendix, causing **peritonitis.** This may become localised, forming an **appendix abscess** (not always in the same part of the abdomen), or generalised which is more serious. Perforation carries a 2% risk of mortality. Rare complications include thrombosis in the portal veins and bacteraemia.

AETIOLOGY

7. In most cases of appendicitis there is **obstruction** of the lumen associated with infection. Pressure increases within the appendix as it distends with mucus, causing reduced venous drainage, thrombosis, haemorrhage, oedema and bacterial invasion of the wall of the appendix. Progressing over several hours, this leads to gangrene and perforation, unless the obstruction is relieved and recovery ensues.

8. Obstruction may be caused by a stricture or kink of the appendix, or blockage of the lumen by worms, a swallowed foreign body or more often a **faecolith.** The formation of faecoliths suggests some kind of stasis of the appendix. Tumours of the appendix itself (about 0.3% of surgically removed appendices contain a carcinoid tumour) or pressure from an adjacent tumour, are possible but far less common causes of obstruction.

9. Obstruction of the appendix is not found in every case of appendicitis and the cause of inflammation then usually remains unknown.

10. Among those cases in which the removed appendix appears to be quite normal, certain subgroups have been identified. These include some with minimal, focal inflammation, easily missed on routine histological examination, and others in which measurements of cytokine expression indicate the presence of low-grade inflammation. These, and other rarely-available esoteric tests, suggest that the frequency of "unnecessary" appendicectomy is much lower than has been hitherto supposed.

11. The **epidemiology** of appendicitis has given rise to many theories about possible underlying aetiological factors.

    11.1. Appendicitis is far more common among Europeans, Americans and Australasians than in Asians, Africans and Polynesians. Those from the latter races who emigrate to westernised countries appear to acquire the local susceptibility. This, and increasing incidence in parts of Africa, suggests that a lower-fibre diet is a factor but the dietary fibre theory is seriously challenged. The declining incidence of the disease is not parallelled by an increase in the consumption of fibre in populations.

    11.2. A positive correlation has been found between potato consumption and appendicitis. A higher intake of fruit and vegetables other than potato is associated with a lower incidence. However, no actual causative or protective agent has been identified.

    11.3. Some studies have shown increased frequency of appendicitis among immediate family members, suggesting that a genetic factor may play a part in some cases. A possible explanation is an hereditary abnormality in the position of the appendix with comparatively poor blood supply. Another factor could be shared dietary habits.

    11.4. Clusters of appendicitis have been reported, suggesting the involvement of an unidentified, perhaps infectious, environmental agent. In America, it is estimated that 5% of cases are caused by *Yersinia enterocolitica* infection.

    11.5. Although chronic "nonspecific" appendicitis is probably not a separate entity, the appendix can be a seat of chronic inflammation in some specific chronic inflammatory disorders such as Crohn's disease, tuberculosis and schistosomiasis.

11.6. Despite the lack of a pathological basis for a clinical diagnosis of chronic appendicitis, the long-held belief in “grumbling appendix” can possibly be explained by recurrent faecolithic obstruction. However, it is just as likely that the symptoms are caused by the irritable bowel syndrome and elective appendicectomy in such cases is rarely justifiable.

11.7. Postoperative appendicitis is the occurrence of acute appendicitis in the period closely following an unrelated operation, especially a major operation involving laparotomy. It is probably related to faecal stasis.

11.8. The incidence of appendicitis has declined dramatically by about 50% from its peak, reached about 50 years ago. The reasons for this are not clear, but unproven theories include improved nutrition, decrease in dysenteric and parasitic diseases and changes in intestinal flora, possibly associated with the widespread use of antimicrobial therapy.

CONCLUSION

12. Appendicitis is an abdominal condition which is usually acute and potentially dangerous. In many cases, its cause is unknown although various factors which contribute to its development have been identified.

Subacute appendicitis is a mild form of acute appendicitis.

Chronic appendicitis *per se* probably does not exist and cases labelled thus are usually examples of a recurrent form of the disease.

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GLOSSARY ON APPENDICITIS

Bacteraemia	The presence of living bacteria in the blood.
Carcinoid tumour	A benign, but sometimes locally invasive, tumour arising from neuro-endocrine cells.
Crohn's disease	An inflammatory disease, most commonly affecting the lower intestines.
Cytokines	Substances secreted by T-cells and other lymphocytes when interacting with antigens, e.g. in the presence of infection.
Faecolith	A small concretion of faecal material, alternatively referred to as a coprolith.
Gangrene	Death of tissue, usually associated with failure of blood supply and/or infection.
Irritable bowel syndrome	A common disorder of intestinal motility with no inflammation or anatomical abnormality.
Laparotomy	An operation through the abdominal wall into the peritoneal cavity.
Leucocytosis	An increase, above the normal range, in the number of circulating white blood cells.
Lumen	The space inside a tubular organ.
Lymphoid	Resembling or pertaining to lymphocytes, lymph nodes or lymph.
Morbidity	The state of being diseased. Alternatively, the ratio of the number of sick individuals to the population in a community.
Oedema	Swelling of tissue by excess fluid.
Peritonitis	Inflammation of the membrane lining the abdominal cavity and the outer covering of its contained viscera.
Portal veins	Blood vessels leading from the gastro-intestinal tract to the liver.
Schistomiasis	A tropical or subtropical disease caused by certain parasitic worms.
T-cell	A type of lymphocyte specialised for antigen recognition.
Vermiform appendix	A blind diverticulum (side-passage) of the caecum, the first part of the large intestine.
Yersinia enterocolitica	Synonym: Pasturella X. A widely-occurring bacterium, commonly causing diarrhoea.

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