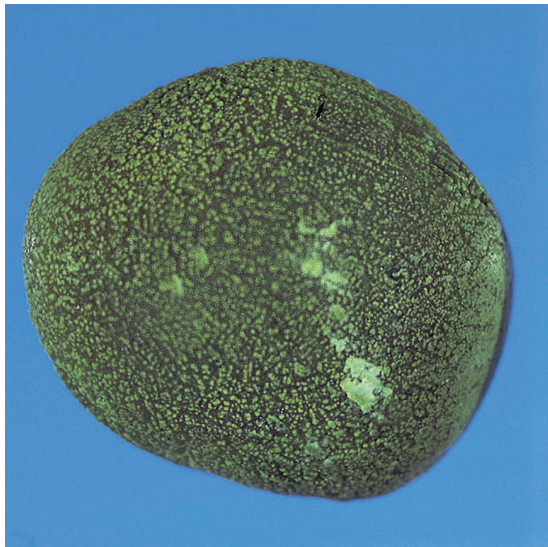


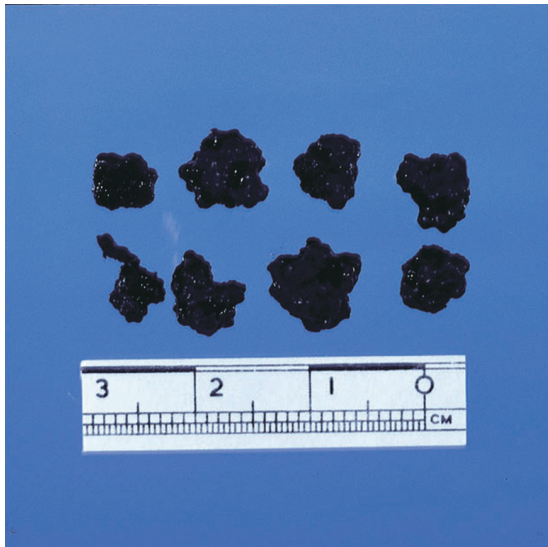
Case 90 A collection of calculi



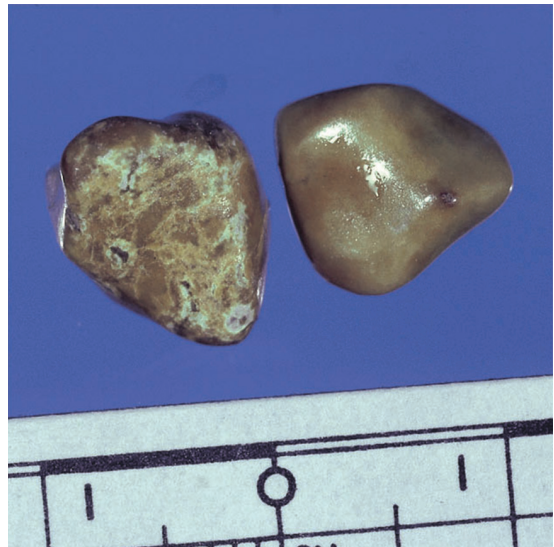
(a)



(b)



(c)



(d)

Figure 90.1

Figure 90.1 shows examples of gallstones removed from four different patients at cholecystectomy. Look at them carefully!

Name the principal constituents of the calculi in each example

- Specimen A – cholesterol.
- Specimen B – cholesterol.
- Specimen C – bile pigment.
- Specimen D – mixture of bile pigment and cholesterol.

What are the other names commonly given to the calculi shown in A, B and D?

- Specimen A – a cholesterol 'solitaire'.
- Specimen B – a collection of 'mulberry stones'.
- Specimen D – mixed faceted stones.

If the stones shown in A and D are cut open, what would be the appearances of their cut surfaces?

The cholesterol stone, A, would show radiating crystals of cholesterol. The mixed stone, D, would show concentric

trunc rings of cholesterol and pigment. Diagrams of the various stones are shown in Fig. 90.2.

Cholesterol is insoluble in water. What mechanism keeps it in solution in bile? What relationship has this with the aetiology of cholesterol-containing stones?

Cholesterol is held in solution in bile as a mixed micelle with bile salts and phospholipids. The bile of patients with cholesterol-containing calculi shows a reduction in the concentration of these substances in relation to the cholesterol content, which favours cholesterol deposition ('lithogenic' or stone-forming bile).

What associated diseases may be found in patients who develop pigment stones?

Pigment stones occur particularly in patients with the haemolytic anaemias, for example sickle cell disease, where an excess of bile pigments from extensive red cell breakdown are deposited in the biliary tract.

List the possible consequences of having a stone, or stones, in the gallbladder

These can be classified as follows:

- Gallstone(s) may be entirely symptomless – in fact, about 10% of the adult population of the UK have them, females more than males.
- Biliary colic: Caused by a stone lodging at the neck of the gallbladder or in the duct system.
- Acute cholecystitis: The gallbladder outlet is obstructed, and the contained bile is concentrated and sets up a chemical inflammatory reaction in the gallbladder wall. Secondary bacterial infection may occur. Repeated attacks of inflammation may result in the changes of chronic cholecystitis (see Case 89, p. 183).
- Mucocele of the gallbladder: Occasionally a calculus impacts at the neck of an empty gallbladder. The goblet cells in its wall continue to secrete mucus, which distend it to a considerable size.
- The stone (or stones) may migrate into the bile duct system, with attacks of biliary colic. If impaction occurs at the lower end of the common bile duct, obstructive jaundice results, with pale stools and dark urine. If infection follows, the patient becomes seriously ill with high fever and rigors – acute cholangitis.

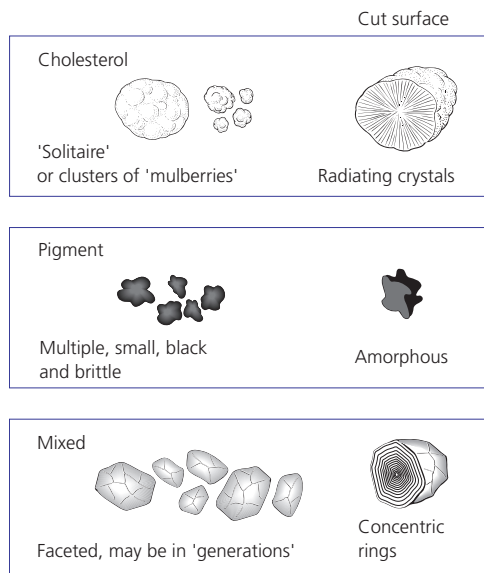


Figure 90.2 Varieties of gallstones.

- Carcinoma of the gallbladder: This is uncommon. When it does occur, it is nearly always associated with the presence of gallstones.
- Acute or chronic pancreatitis: Both have a strong association with gallstone disease.
- A large stone in the gallbladder may fistulate into the adjacent first part of the duodenum, travel along the intestine and impact at its narrowest part – about 0.6 m from the ileocaecal valve, to produce acute intestinal obstruction (gallstone ileus).