

Gallstones (Part 2/2)

Cholesterol stones are the most common type of gallstones. They are typically radiolucent. Black pigmented stones typically result from hemolysis. Brown pigmented stones are typically associated with infections. Both types of pigmented gallstones are typically radiopaque.



PLAY PICMONIC

Cholesterol Stones

Cholesterol Stones are the Most Common Type

Cholesterol-Burger With Gold Stone And #1 Foam-Finger

Gallstones can be due to precipitation of cholesterol. Under normal conditions, bile can dissolve all the cholesterol excreted by the liver. If the liver produces more cholesterol than bile can dissolve, the excess cholesterol may precipitate as crystals which are then trapped in gallbladder mucus, producing sludge. This is known as cholesterol supersaturation. These crystals may grow and form stones. Cholesterol stones are the most common type (80-90%), especially in Western countries.

Radiolucent

Radiolucent-band

Cholesterol stones are usually radiolucent meaning they are not readily visible on X-ray imaging (10% are radiopaque due to associated calcium).

Pigmented Stones

Black Pigment Stones

Sirius-Black Holding Black Stone

Black pigment stones result from hemolysis and consist primarily of calcium bilirubinate. This can occur in hemolytic disorders like sickle cell anemia, for example.

Hemolysis

Hemolysing-anemone

Extravascular hemolysis increases bilirubin in the bile, increasing the risk of pigmented (black) gallstone formation. These are commonly seen in patients with sickle cell disease or trait

Brown Pigment Stones

Charlie-Brown with Brown Stones

Another type of pigmented stones are brown stones. These stones are associated with a bacterial or parasitic infection of the biliary system.

Infection

Infectious-bacteria

Brown stones are radiolucent and are associated with infections. Brown pigment stones are associated with bacterial and parasitic infections affecting the biliary tract. Infection causes the release of beta-glucuronidase (a lysosomal enzyme that deconjugates direct bilirubin) by injured hepatocytes and bacteria, which hydrolyzes conjugated bilirubin and lecithin in the bile increasing unconjugated bilirubin and fatty acids. This leads to precipitation of calcium carbonate, cholesterol and calcium bilirubinate (dark color) in bile.

Radiopaque

Cloudy-Opaque Lens

Pigmented gallstones are usually radiopaque in contrast to cholesterol stones which are usually radiolucent.