

# Methods for Removing Gallstones Without Surgery

## 1. Why calcified stones are not removed without surgery

- They are hard like cement - not dissolvable by medications.
- The gallbladder is usually damaged and not functioning well.
- Breaking stones can cause fragments to block ducts and cause pancreatitis.

## 2. Current methods (rare or experimental)

- Lithotripsy (ultrasound or laser): used for kidney stones, risky for gallbladder.
- Endoscopic fragmentation: complex and rarely performed.
- Injection of solvents: under research but not widely used.

## 3. Emerging technologies (future)

- Nanoparticles: under development to break down stone structure internally.
- Gene therapy: aimed at altering bile composition via liver enzymes.
- Robotic 3D-navigation: for targeted, non-removal gallstone destruction (future).

## 4. Why surgery is still preferred

- Stones often return if the gallbladder is left.
- Calcified gallbladder walls mean poor function and inflammation risk.
- Surgery prevents life-threatening complications quickly.

## 5. What to do now

- Follow a bile-friendly diet, avoid stone growth and spasms.
- Have regular ultrasounds and liver enzyme checks.
- Monitor medical innovations - technology is advancing fast.

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