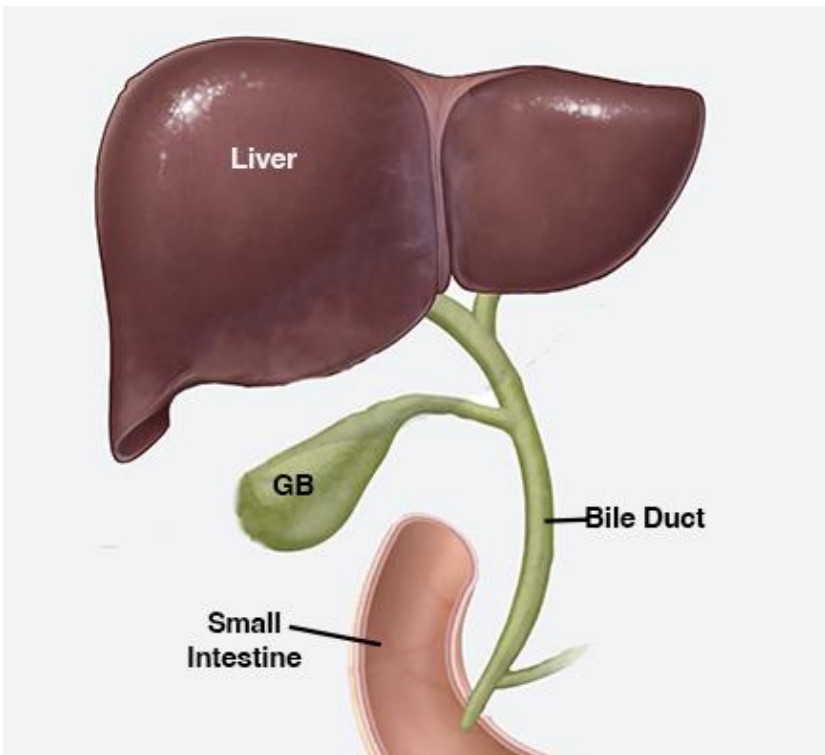




Understanding the HIDA Scan

Ok. Here is a common situation faced by gastroenterologists. A patient presents with recurrent attacks of right upper abdominal pain over the past six months. The pain often occurs after eating and shoots to the right shoulder blade. Mother and sister had gallbladder disease, and both had their gallbladder removed. We strongly suspect gallbladder disease and perform a gallbladder ultrasound. The ultrasound of the gallbladder is either normal or equivocal. Now what???

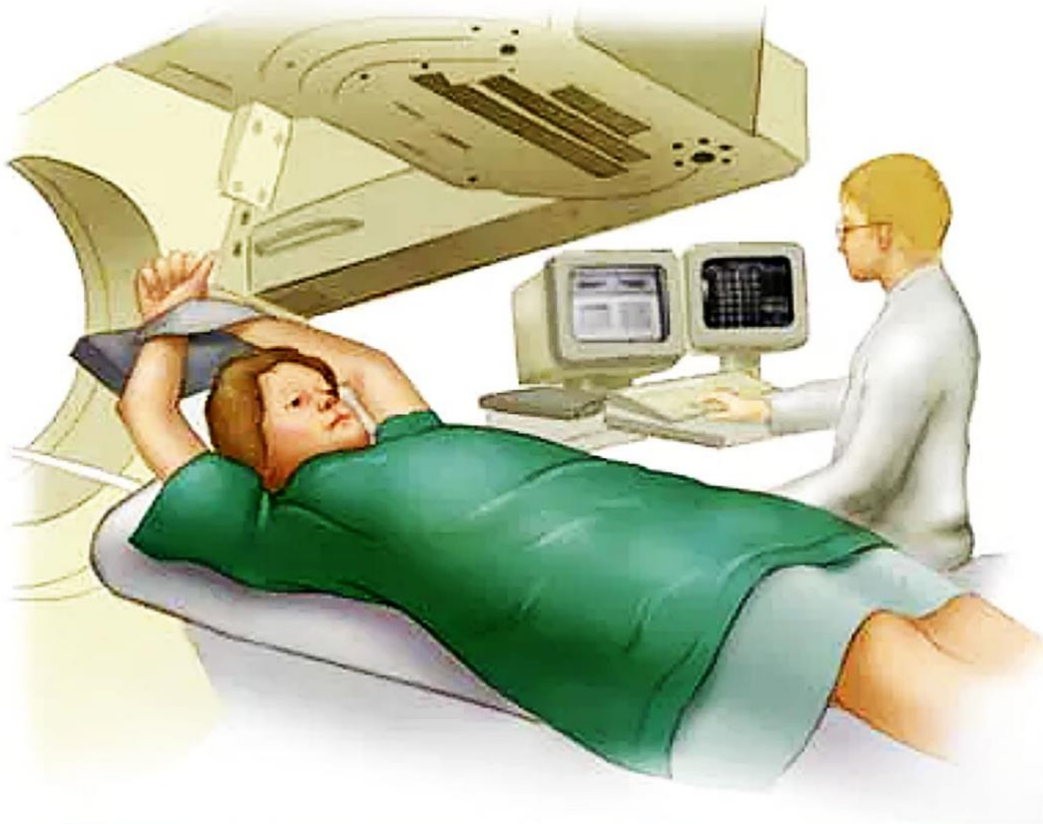
First, you need to know that a gallbladder ultrasound exam accurately evaluates the gallbladder and checks for gallstones - even more accurate than a CT scan. However, no test in medicine is 100% correct. In fact, the gallbladder ultrasound misses about 10% of gallstones and gallbladder disease. So, the patient above could be suffering from gallbladder disease even though the ultrasound test was not diagnostic. In most cases, the next step would be a **HIDA scan**.



What is a HIDA Scan?

A HIDA scan is a type of nuclear medicine imaging procedure. Unlike traditional imaging tests such as X-rays or MRIs, a HIDA scan uses a small amount of radioactive material to produce images of the liver, gallbladder, and bile ducts. The radioactive tracer, usually a form of iminodiacetic acid, is injected into a vein in your arm. The tracer travels through your

bloodstream to your liver and is stored in your gallbladder, making it visible with a special camera, providing real-time images of the gallbladder. Special software calculates the volume of your gallbladder.



The formal name is Hepatobiliary iminodiacetic acid (HIDA) scan
Hepata means *liver*, and **Biliary** refers to the *bile ducts*
Iminodiacetic acid is the name of the radioactive tracer.

Bile is a yellow digestive fluid that helps the body break down fats and absorb specific vitamins. The liver produces bile 24/7. Between meals, liver bile is temporarily stored and concentrated in the gallbladder sac. Overnight, the gallbladder expands to store the concentrated bile. When you eat breakfast, the gallbladder contracts and squeezes bile down the bile duct and into the small intestine to aid the digestive process.

Why is a HIDA Scan Done?

A HIDA scan is typically ordered when a patient presents symptoms that suggest problems with the gallbladder, liver, or bile ducts. The gallbladder ultrasound and the HIDA scan measure two different things.

1. The gallbladder ultrasound evaluates the anatomy of the gallbladder. It measures the thickness of the gallbladder wall, its size, and the presence of stones or polyps within it. (It can also evaluate the liver, bile ducts, pancreas, and other adjacent organs.)
2. The HIDA scan measures the function of the gallbladder. How well does it work? How much does it contract when eating? Is there any blockage of flow through the bile duct?

Before and After Scans

In most cases, the HIDA scan is used to measure the gallbladder volume before and after breakfast. The HIDA scan calculates the gallbladder volume after an overnight fast AND recalculates the residual volume after the “first meal.” The first meal is usually simulated by injecting a hormone called CCK (cholecystokinin) into a vein and “tricking the gallbladder” that you had breakfast. **KEY POINT: *The normal gallbladder should contract at least 35% of its volume with the day's first meal.***

Preparing for a HIDA Scan

Preparation for a HIDA scan is relatively straightforward. However, there are a few key steps patients should follow to ensure accurate results:

1. Fasting: You will be asked to fast overnight before the scan. This means no food or drink, although small sips of water may be allowed. Fasting helps ensure that the gallbladder is not actively releasing bile, which could affect the accuracy of the scan.
2. Medications: Inform your doctor about any medications you are taking, as some may need to be temporarily discontinued before the test. This includes medicines that affect bile production or flow, such as opioids or certain antibiotics.
3. Pregnancy: If you are pregnant or suspect you might be, inform your doctor before the scan. While the radiation exposure from a HIDA scan is minimal, it is generally avoided during pregnancy unless necessary.

What to Expect During the HIDA Scan

The HIDA scan is a non-invasive and typically painless procedure, but understanding what to expect can help ease any anxiety.

1. Injection of the Radioactive Tracer: The procedure begins with injecting the radioactive tracer into a vein in your arm. You may feel a brief sting as the needle enters your skin, but the injection itself is usually painless.

2. Imaging Process: After the injection, you will lie on an exam table. A gamma camera, which detects the radiation emitted by the tracer, will be positioned over your abdomen. The camera will take a series of images over 1-2 hours, tracking the flow of the tracer through your liver, gallbladder, bile ducts, and into your small intestine.
3. CCK Injection: Your doctor may inject a hormone called cholecystokinin (CCK) during the scan. CCK causes the gallbladder to contract, allowing the doctor to assess how well the gallbladder functions in terms of bile release.

Understanding Your HIDA Scan Results

After the HIDA scan, a radiologist will analyze the images and provide a report to your doctor.

The results of the scan can reveal various important details about your digestive health:

- Normal Results: If the tracer moves smoothly from your liver, through the bile ducts, and into your small intestine, this suggests that your liver, gallbladder, and bile ducts are functioning normally.
- Abnormal Gallbladder Function: If the gallbladder fails to fill with the tracer or does not release bile properly after the injection of CCK, this could indicate cholecystitis or other gallbladder dysfunctions. **Remember: *The normal gallbladder should contract at least 35% of its volume after CCK stimulation. A value much lower than this would indicate a diseased gallbladder. A number much higher than this would indicate a healthy gallbladder.***
- Bile Duct Obstruction: If the tracer cannot pass through the bile ducts, this could indicate a blockage due to gallstones, tumors, or scarring.
- Biliary Dyskinesia: If the gallbladder does not contract adequately after CCK injection, it may indicate biliary dyskinesia. In this condition, the gallbladder does not function appropriately despite the absence of gallstones.

Risks and Considerations

While the HIDA scan is generally considered safe, it's important to be aware of potential risks and considerations:

- Radiation Exposure: The risks from this radiation are very low, and the benefits of having the results from the HIDA scan greatly outweigh the risks. The amount of radiation used in a HIDA scan is minimal and comparable to other diagnostic imaging tests, such as a Head CT scan. However, if you are pregnant or breastfeeding, discuss the risks with your doctor.
- Allergic Reactions: Although rare, some patients may experience an allergic reaction to the radioactive tracer. Symptoms might include itching, rash, or difficulty breathing. If you experience any of these symptoms during or after the procedure, seek medical attention immediately.
- False-Negative Results: In some cases, a HIDA scan may produce false-negative results, meaning that the scan appears normal despite the presence of a problem. The HIDA scan is often used with other tests to confirm a diagnosis.

Post-Procedure Care

After your HIDA scan, you can typically return to your regular activities immediately. The radioactive tracer will leave your body naturally over the next day or two. Drinking plenty of fluids can help expedite this process. To protect other people from radiation, plan to keep a distance of at least 3 feet for a few hours. This is long enough for some radioactivity to decay and your body to remove the rest. Brief close contact, such as walking past others, is safe. If you were given CCK during the scan, you might experience mild abdominal cramping or nausea, but these symptoms usually subside quickly.

Your doctor will discuss your results, usually within a few days. Depending on the findings, additional tests or treatments may be recommended to address any issues detected by the scan.

Conclusion

A HIDA scan is a valuable diagnostic tool that helps doctors evaluate the function of the liver, gallbladder, and bile ducts. The scan can identify various conditions, from gallbladder disease to bile duct obstructions, by providing detailed images of how bile moves through these organs. If your doctor recommends a HIDA scan, understanding the process and what to expect can help you feel more prepared and confident about your care.

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