*** Liver fibrosis ***

Fibrosis is the formation of an abnormally large amount of scar tissue in the liver. It occurs when the liver attempts to repair and replace damaged cells.

Fibrosis develops when the liver is repeatedly or continuously damaged. After a single episode of injury, even if severe (as with acute hepatitis), the liver commonly repairs itself by making new liver cells and attaching them to the web of connective tissue (internal structure) that is left when liver cells die. However, if injury is repeated or continuous (as occurs in chronic hepatitis), liver cells attempt to repair the damage, but the attempts result in scar tissue (fibrosis). Fibrosis can develop more rapidly when it is caused by a blockage in the bile ducts.

Fibrosis can sometimes be reversed if the cause is identified promptly and corrected. However, after months or years of repeated or continual damage, fibrosis becomes widespread and permanent. The scar tissue can form bands throughout the liver, destroying the liver's internal structure and impairing the liver's ability to regenerate itself and to function. Such severe scarring is called cirrhosis.

Causes of Liver Fibrosis

Various disorders and drugs can repeatedly or continuously damage the liver and thus cause fibrosis (see table Some Conditions and Drugs That Can Cause Fibrosis of the Liver).

The most common causes in the United States are

- Alcohol abuse
- Viral hepatitis C
- Nonalcoholic fatty liver (fatty liver not due to alcohol use—nonalcoholic steatohepatitis)

Nonalcoholic fatty liver usually occurs in people who have excess body weight, diabetes or prediabetes, and/or high levels of fats (lipids) and cholesterol in the blood. This combination of risk factors for fatty liver disease is often referred to as metabolic syndrome. Over recent years, metabolic syndrome leading to nonalcoholic fatty liver has become increasingly common in the United States. Worldwide, viral hepatitis B is a common cause. Sometimes the cause of fibrosis is not known.

Symptoms of Liver Fibrosis

Fibrosis itself does not cause symptoms. Symptoms may result from the disorder causing fibrosis. Also, if fibrosis progresses, cirrhosis may develop. Cirrhosis can cause complications (such as portal hypertension) that cause symptoms.

Diagnosis of Liver Fibrosis

- A doctor's evaluation
- Sometimes blood tests, imaging tests, or both
- Sometimes liver biopsy

Doctors suspect fibrosis when people have a disorder or take a drug that could cause fibrosis or when routine blood tests to evaluate the liver indicate that the liver is damaged or is malfunctioning. Tests are then done to confirm the diagnosis, and if fibrosis is present, tests are done to determine its severity. These tests can include imaging tests, blood tests, liver biopsy, and sometimes specialized imaging tests to determine how stiff the liver is.

Imaging tests such as ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI) do not detect early or moderately advanced fibrosis. However, these tests may show abnormalities that can accompany cirrhosis and portal hypertension (such as an enlarged spleen or varices).

Certain combinations of blood tests can distinguish between two levels of fibrosis:

Liver biopsy is the most reliable way to detect and stage (determine the amount of) fibrosis and to identify the disorder causing fibrosis. Biopsy is often done to confirm the diagnosis, to identify the cause of the liver disease, to stage the level of

fibrosis or the presence of cirrhosis, as well as to assess the response to the treatment. Because liver biopsy is invasive and can cause complications, doctors may first do blood tests and imaging tests to determine the level of fibrosis and then decide about the need for a liver biopsy. Doctors are increasingly relying on certain specialized imaging tests as noninvasive alternatives to biopsy.

Specialized imaging tests can determine how stiff the liver is. The stiffer liver tissue is, the more severe fibrosis is likely to be. These tests (transient elastography, magnetic resonance elastography, and acoustic radiation force impulse imaging) use sound waves, applied to the abdomen, to determine how stiff the liver tissue is. Unlike liver biopsy, these tests are not invasive and thus have some advantage. Transient elastography and magnetic resonance elastography are being used in people with various liver disorders to diagnose and stage the fibrosis. Additionally, these tests are used to assess the amount of liver fat in people with fatty liver disease. Conventional ultrasonography can be unreliable because results depend on the skill of the person doing the procedure. In contrast, these specialized imaging tests report their measurement in numbers, allowing objective assessment.

Treatment of Liver Fibrosis

Doctors focus on treating the cause, which often stops or slows further scarring of the liver and sometimes results in improvement. Such treatment may include

- Using antiviral drugs to eliminate the virus if people have chronic viral hepatitis
- Not drinking alcohol if people have alcoholic liver disease
- Using drugs to remove heavy metals if people have iron overload (hemochromatosis) or Wilson disease (which causes copper to accumulate)
- Stopping any drug or supplement that is causing fibrosis
- Removing or dissolving a blockage in the bile ducts
- Losing weight and controlling blood sugar and lipid levels in people with nonalcoholic fatty liver

No available drug stops the formation of scar tissue effectively and safely. However, drugs that may reduce fibrosis are currently under study. Silymarin, in milk thistle, or coffee may help protect the liver against fibrosis, but the evidence is not enough to recommend either as treatment.