



Cirrhosis

Cirrhosis and its Causes

- Cirrhosis is a condition in which there is advanced scarring in the liver. Scarring of the liver is also called fibrosis. Cirrhosis is stage 4 fibrosis—the most advanced stage.
- There are many possible causes of fibrosis and cirrhosis. These include:
 - Chronic viruses, such as Hepatitis B and Hepatitis C
 - Autoimmune processes in which one’s own immune system attacks the liver or bile ducts
 - Alcohol overuse
 - Fat deposits in the liver due to obesity
 - Genetic conditions (alpha-1 antitrypsin, hemochromatosis, Wilson’s disease)
 - Diseases of the biliary tract (Primary biliary cholangitis, Primary sclerosing cholangitis)
 - Others that are less common

Complications of Cirrhosis

- Cirrhosis can occur in the setting of normal liver function with few complications; however, potential complications include:

| Complication | What is it? |
|---|---|
| Lower Extremity Edema | Swelling of the legs, ankles, or feet |
| Ascites / Spontaneous Bacterial Peritonitis | Fluid in the abdomen/infection in the fluid |
| Esophageal Varices (With or Without Bleeding) | These are veins that protrude into the lower esophagus. Scar tissue in the liver makes it more difficult for blood to move through it. The pressure buildup in the veins causes them to protrude into the esophagus. They can rupture and cause bleeding into the GI tract. |
| Hepatic Encephalopathy | Buildup of ammonia toxins which cause difficulty in thinking. The patient may experience forgetfulness, confusion, or coma. |
| Hepatocellular Carcinoma (HCC) | Cancer that starts in the liver cells (hepatocytes) |
| Malnutrition | Excessive weight loss or deficiencies in important vitamins or minerals. |

- Other less common complications include:
 - Hepatopulmonary Syndrome: Low oxygen levels / shortness of breath
 - Portopulmonary Syndrome: High pressures in the arteries of the lung/heart failure
 - Hyponatremia: Low salt levels in the blood **Not from a low sodium/salt diet
 - Hydrothorax: Fluid in the pocket around the lung
 - Hernias: Especially umbilical



Treatments for the Common Complications

| Complication | Treatment |
|---------------------------------------|---|
| Lower Extremity Edema | <ul style="list-style-type: none"> • Low salt diet: ≤ 2000 mg of sodium a day • Reading the labels is important. Count the milligrams of sodium in each serving of food and multiply by the number of servings you are eating. To reduce your sodium intake: 1) Do NOT use the salt shaker 2) Avoid eating out frequently 3) Read labels and avoid salty foods • Medications called diuretics or “water pills” • The combination of spironolactone (Aldactone) and furosemide (Lasix) is commonly used. • Compression (TED) hose and/or elevation of feet |
| Ascites | <p>Ascites is another form of fluid accumulation; therefore, we treat it much the same way that we treat lower extremity edema—with a low sodium diet and, if needed, diuretics.</p> <ul style="list-style-type: none"> • Paracentesis in which ascites fluid is drained from the abdomen. |
| Esophageal Varices (EVs) | <p>We like to know if a cirrhotic patient has EVs so that, if he/she does, we can try to prevent the EVs from bleeding. Bleeding from an EV carries a mortality rate of 14%. We find EVs with an EsophagoGastroDuodenoscopy (EGD). This procedure involves running a small scope down the sedated patient’s throat to look for EVs and other esophagus/stomach abnormalities. It is an outpatient procedure.</p> <ul style="list-style-type: none"> • If EVs are found and are small, they are watched and a blood pressure medication may be used (nadolol, carvedilol, propranolol) to decrease the heart rate and pressure in the veins. • If they are large, rubber bands may be placed around the varices to prevent the EVs from future or repeat bleeding. • EGDs are done every 3 years if no EVs are found and once a year if EVs have been found. |
| Hepatic Encephalopathy (HE) | <p>The buildup of ammonia toxins can cause confusion, forgetfulness, and even coma. Cirrhotic patients with increased ammonia toxins need to have more bowel movements in order to avoid a buildup of these toxins. You should have a goal 2-3 BMs/day.</p> <ul style="list-style-type: none"> • If a patient is not having enough BMs, lactulose is given which can be adjusted to get 2-3 BMs/day. This is especially important when pain medications are taken. • Another option is an antibiotic called Xifaxan. This antibiotic kills some of the bacteria in the gut that make the ammonia toxins. • Avoidance of sleeping pills, high doses of pain pills, and anxiety medications like Ativan and Xanax is also important. |
| Hepatocellular Carcinoma (HCC) | <p>HCC can develop in the liver as it attempts to heal itself. This cancer is very treatable if we find it early.</p> <ul style="list-style-type: none"> • Imaging with ultrasound every 6 months or MRI alternating with US every 6 months is recommended to look for HCC masses. • We may check a “tumor marker” AFP in the blood every 6 months, as well. |
| Malnutrition | <p>Cirrhotic patients tend to lose weight, including fat and muscle mass, and to become deficient of certain vitamins and minerals.</p> <ul style="list-style-type: none"> • Good protein intake is important. Protein supplementation may be needed if weight loss is occurring (Boost, Ensure, Glucerna or BeneProtein). • Vitamins/mineral supplement may be recommended. |



Liver Transplant for Cirrhosis

- Cirrhosis can eventually lead to liver failure. This occurs when the liver stops performing its normal duties because it is too injured. We are working to find medications to reverse this process through research.
- Liver transplantation is sometimes an option for patients with liver failure. There are 2 types of liver transplantation:
 - Cadaveric: A liver from a deceased individual of the same blood type as the donor replaces the failing liver of the recipient. This is usually what comes to mind when people think of liver transplantation.
 - Living Donor: Part of a liver from a living donor, usually a family member or close friend, replaces the failing liver of the recipient. The blood types of the donor and recipient must match or be compatible in this type of liver transplantation, as well. A healthy liver is able to regenerate itself if part is missing; therefore, the donor is able to regenerate their liver shortly after the transplantation.
- It is very difficult to get a cadaveric transplant because there are more people on the list at any given time than there are livers available. For this reason, living donor transplantations are usually more likely and tend to happen faster if there is someone who is willing to donate to the patient.
- For Cadaveric transplants, patients are placed on 1 of 4 transplant lists based on their blood type. A patient's MELD-NA score is calculated from their blood work results with a special formula which uses the bilirubin (makes the skin yellow), INR (thinness of the blood), and creatinine (kidney function) and sodium levels. The lists are scored based on the MELD. The person at the top of each list is the next person who will receive the next available cadaveric liver of that particular blood type. The higher the number, the further up on the list the patient is placed. Typically, but not always, a higher MELD score correlates with a sicker patient. This helps to ensure that available livers are being given to the patients who need them the most. MELD-Na scores range from 6 (a less sick patient) to 40 (a sicker patient).
- Not all cirrhotic patients are eligible for liver transplantation. For example, patients with very low MELD scores, severely obese patients with a Body Mass Index (BMI) over the limit (between >40), and patients who continue to drink alcohol after they are diagnosed with cirrhosis are not considered for transplant. There are other criteria that may exclude a cirrhotic patient from being placed on the transplant list.

Summary

- Cirrhosis is another name for stage 4 fibrosis or advanced scarring in the liver.
- It can cause many different complications that may require treatment.
- **What to avoid:**
 - Any form of Nonsteroidal Anti-inflammatory Drugs (NSAIDs).
 - Example: Ibuprofen, Advil, Aleve, Naproxen, Celebrex, aspirin, Meloxicam
 - Herbal medication, unless discussed with your doctor
 - Unnecessary surgical procedures
 - Alcohol in any form (liquor, wine, and beer)
 - Protein restriction: High protein with fish, chicken, eggs, protein shakes is important
 - Raw or undercooked shellfish (raw oysters / mussels)
- **What is acceptable:**
 - Tylenol or acetaminophen if < 2000mg/24 hours
 - Check medication labels to see if acetaminophen is an ingredient so that you do not accidentally take more than 2000 mg in 24 hours.