Colon cancer : is a common *de novo* neoplasia following transplantation. Colonoscopic surveillance with multiple biopsies every 6 months for the first 2 years after transplantation followed by annual examination has been recommended for high-risk patients with ulcerative colitis.

[**Keeffe EB:2001**] **[Bismuth H, 1996]**

SUMMARY

Liver Failure is : the inability of the liver to perform its normal synthetic and metabolic function as part of normal physiology.

Liver failure can complicate almost of liver disease .Though the clinical picture differs ,the overall picture and the treatment remains the same . Liver failure may follow (cirrhosis , viral hepatitis , hepatitis due to drugs ,fatty liver of pregnancy ,……)

Liver failure can be classified according to the course to acute hepatic failure, chronic hepatic failure and acute on top of chronic liver failure .

ALF is a broad term and encompasses both fulminant hepatic failure (FHF) and subfulminant hepatic failure (or late-onset hepatic failure). FHF is generally used to describe the development of encephalopathy within 8 weeks of the onset of symptoms in a patient with a previously healthy liver. Subfulminant hepatic failure is reserved for patients with liver disease for up to 26 weeks prior to the development of hepatic encephalopathy.The most common complication of ALF are hepatic encephalopathy&cereberal oedema which is the leading cause of death .

The most important step in treatment of AHF is to identify the cause of liver failure. Prognosis of ALF is dependent on etiology.
Liver transplantation is the definitive treatment, which is limited by available organs.

On the other hand , CLF or end stage liver disease is an indolent disease; most patients remain asymptomatic until the occurrence of decompensation, characterized by (ascites, spontaneous bacterial peritonitis, hepatic encephalopathy, or variceal bleeding from portal hypertension).when the liver becomes too damaged to sustain life, the only medical resource is liver transplantation.

With the growing disparity between the numbers of suitable donor organs and patients waiting for transplantation , efforts have been made to optimize the allocation of organs , to find alternatives to cadaveric liver transplantation and to develop extracorporeal methods to support or replace the failing organ.

For over 50 years, scientists and physicians have been attempting to develop an artificial liver. This article focuses upon current devices made to provide artificial liver support. Extracorporeal liver support system can be classified into : , Artificial liver support system(non biologic) & Bio artificial liver support system (biologic).

The application of the different liver assist devices, non-biological and biological, have been aimed for different patient groups by the different researchers.
Patients with acute-on-chronic hepatic failure have been mainly included in studies with the non- biological devices, while patients with acute hepatic failure have mainly been included in studies with the biological devices.
Liver dialysis is a detoxification treatment for liver failure with encephalopathy and has shown promise for patients with hepatorenal syndrome.

The successful treatment with an LAD, detoxifying the blood, will prevent the body from eventually developing multi organ failure. Both patients group have a chance of spontaneous regeneration from the acute phase with LAD treatment, but the prognosis for patients without prior history of liver disease is better. Therefore, the prospects of curing patients completely, is better for the patients with acute-on-chronic

hepatic failure. Even though the acute hepatic failure is more challenging to treat, it will save the patients from being transplanted and thus avoiding lifelong immunosuppression.

The aim with an LAD is to support the liver in the acute phase and thus make the patient spontaneously recover, or the LAD will act as a bridge to transplantation. The latter application will prevent the patient from further deterioration of the disease.

The functional requirements of the LAD are to attempt to imitate certain biochemical processes that the native liver routinely performs. In order to conduct these biochemical activities, a LAD will require mechanical functions such as an apheresis unit, a pump for pumping the plasma through the device, and an oxygenator.
Thus, the LAD must implement two basic functional requirements:
•Biochemicalfunctions.
•Mechanicalfunctions.

The liver performs a vast amount of biochemical functions. An optimal device should perform the same functions as a liver.
Briefly, the main functions of the liver are the following:
• Detoxification, and drug metabolism (e.g. cytochrome p450 activity)
• Metabolic function(conversion of ammonia to urea, bilirubin, ….)
•Synthetic function (albumin, coag.Factors, …..)
. Carbohydrate storing & secretion

A bioartificial liver and/or a liver assist device should be able to detoxify, regulate, and synthesize molecules in the fashion of a normal liver.

Scientists and engineers are designing systems using hepatocytes to attend to specific metabolic tasks. The hepatocytes are contained in specially designed bioreactors which keep isolated liver cells in culture for long periods of time so that the cells are available for use in the liver assisting devices.

Scientists and engineers expect that with the development of stem cell technology, highly functional human liver cells will become available, which will greatly increase the progression of a bioartificial liver. Once a bioartificial liver is created, it is expected that no body would die from liver failure.

Some types of developing bio artificial devices include: the Extracorporal Liver Assisting Device (ELAD), HepatAssist, Modular Extracorporeal Liver Support (MELS), and the Amsterdam Medical Center Bioartificial Liver (AMC-BAL).

While the artificial liver dialysis devices include :-
Molecular Adsorbent Reticulating system (MARS) , Single Pass Albumin Dialysis (SPAD) , Prometheus system.

The real need for these complicated devices in patients with fulminant hepatic failure is to prevent or reverse the potentially fatal cerebral edema that occurs in this setting .

In fact , artificial livers Studies are still ongoing to determine the beneficial effects and its future role in the management of liver failure. Survival will be the ultimate outcome parameter for these studies of the artificial liver.

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