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Liver Failure

MUDr. Jan Stašek

Learning Outcomes

- Student will learn to classify Acute Liver Failure and Acute on Chronic Liver Failure
- Student will learn how to make the initial evaluation in a patient with Liver Failure
- Management of hepatic encephalopathy, spontaneous bacterial peritonitis and variceal bleeding will be discussed

Signs of Liver Failure

- Icterus (total and free bilirubin)
- Coagulopathy (INR >> aPTT)
- Encephalopathy (ammonia, GABA)
- Hypoglycaemia, lactic acid elevation
- Hypotension, hyperkinetic circulation

Classification of Acute Liver Failure (ALF)

ALF cathegory	Time interval between icterus and encephalopathy
Hyperacute	0 – 7 days
Acute	8 – 28 days
Subacute	28 days - 12 weeks

Causes of Acute Liver Failure

Viral hepatitis	Acute hepatitis A, B, C, D, E, seronegative hepatitis
	Cytomegalovirus, Herpes simplex, chickenpox, EBV
Prescription medication	Paracetamol
	Antituberculotic drugs
	Aspirin (Reye‘s syndrome in children)
	Idiosyncrastic reactions (antiepileptics, antibiotics, NSAIDs)
Toxins	Tetrachlormethane, *Amanita phalloides*, alcoholic hepatitis
Vascular causes	Ischaemia, veno-occlusive disease, Budd-Chiari syndrome
ALF in pregnancy	HELLP syndrome, liver rupture, acute steatosis (AFLP)
Other causes	Wilson‘s disease, autoimmune hepatitis, lymphoma, carcinoma, hemophagocytic lymphohistiocytosis
	Trauma

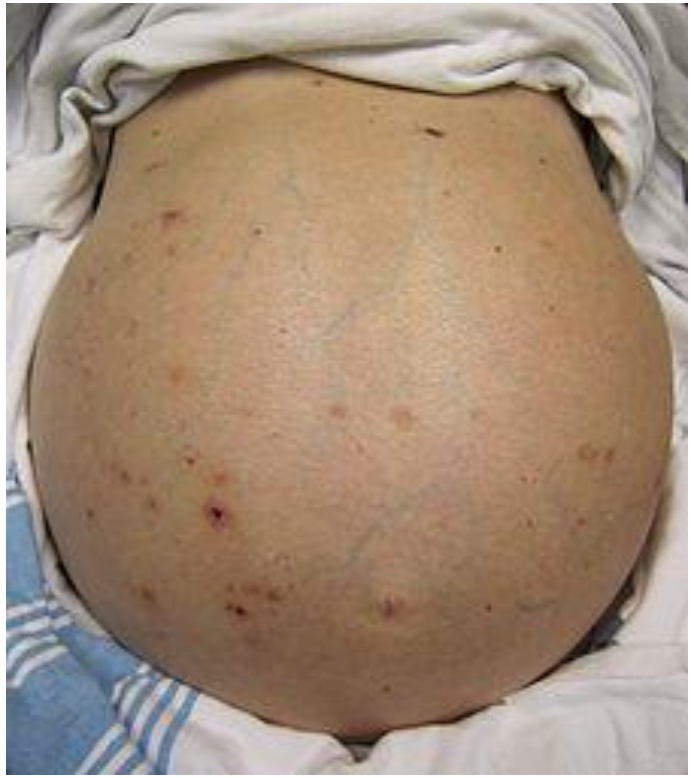
Acute on Chronic Liver Failure (ACLF)

- Compensated chronic liver disease (***cirrhosis***)
- Acute exacerbation
- Triggering event – most often infection or haemorrhage
  - respiratory, urinary, spont. peritonitis, skin infection…
  - variceal bleeding, trauma, surgery…

Spontaneous bacterial peritonitis

- Bacterial translocation through dysfunctional intestinal wall into ascites
- Poor local signs, frequently without fever
- Deterioration of liver functions (coagulopathy, jaundice, encephalopathy)
- Diagnosis – ascites cytology (PMN > 0,25 x 10^9 / liter), cultivation
- Therapy – conservative (antibiotics, e.g. cefotaxime, meropenem)

Paracenthesis



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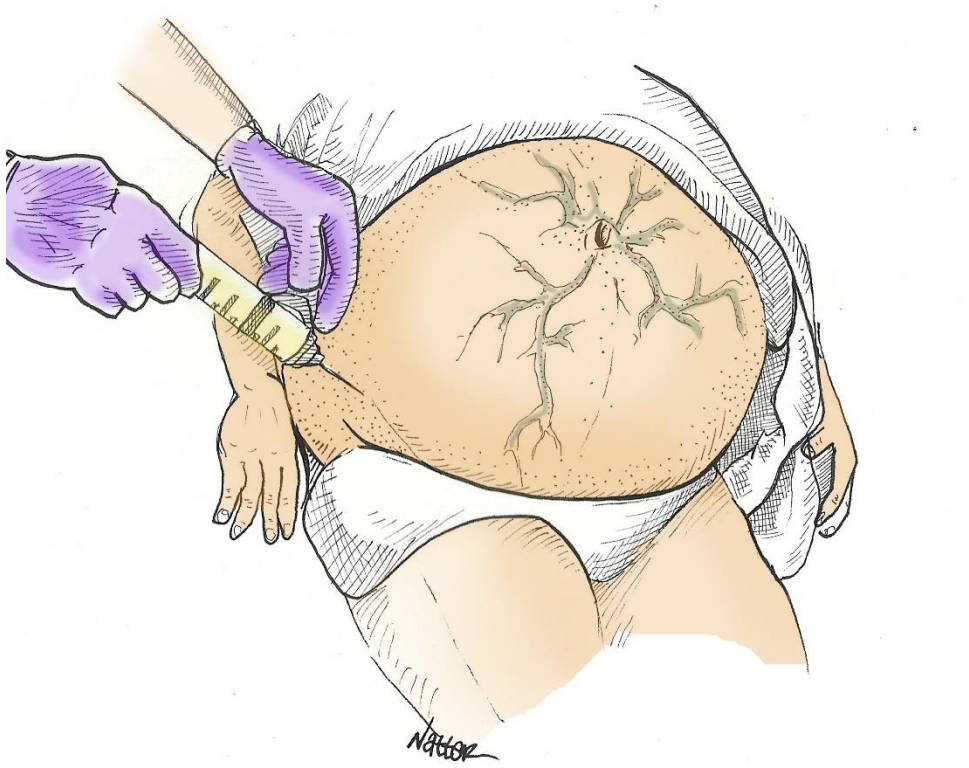


https://www.coreimpodcast.com

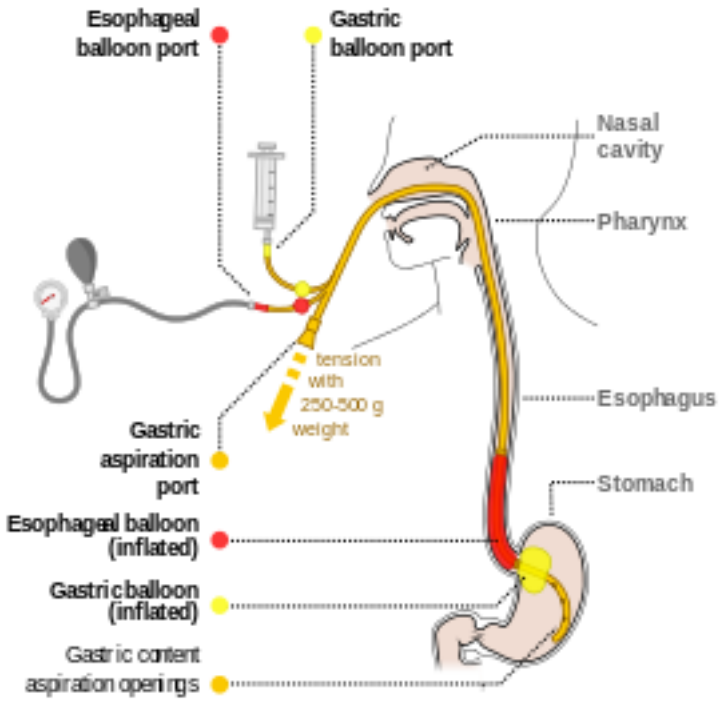
Spontaneous versus secondary peritonitis

	Spontaneous peritonitis	Secondary peritonitis
Pathogenesis	Bacterial translocation	GI perforation, local inflammation
Etiology	Mostly monobacterial (G-)	Polymicrobial (plus anaerobes)
Clinical signs	Liver dysfunction	Sepsis, septic shock
Therapy	Antibiotics	Surgery + antibiotics

Oesophageal variceal bleeding

- Two i.v. lines, *nasogastric tube*, urinary catheter
- Crystalloids, red blood cells, fresh frozen plasma, prothrombin complex concentrates
- Terlipressin, Blakemore-Sengstaken‘s tube
- Endoscopic ligation or sclerotisation of varices
- TIPS, oesophageal stent

Blakemore-Sengstaken‘s tube



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Initial investigation

- Electrolytes, total and free bilirubin, liver enzymes, glycaemia, albumin, renal parametres, lactate, ammonia levels, inflammatory markers (IL-6)
- Blood count, coagulation profile (INR)
- Toxicology screening, paracetamol levels
- Viral serology, auto-antibodies
- Copper levels, ceruloplasmin
- US of liver, incl. vascular sonography, CT of abdomen

Management of a patient with liver failure

- ABCD approach
- Therapy of the underlying cause
- Organ support
- Prevention of ***hepatic encephalopathy***
- Treatment of intracranial hypertension (in ALF)

Hepatic encephalopathy

Stage	Signs	Glasgow Coma Scale
I	Inattention, apraxia, fine tremor, uncoordinated movement	15
II	Lethargy, disorientation, apraxia, asterixis (flapping tremor), dysarthria	11 – 14
III	Confusion, sopor, asterixis, ataxia	9 – 10
IV	Coma, decerebration	≤ 8

Prevention and therapy of hepatic encephalopathy

- Osmotic laxatives (e.g. Lactulose 20 – 30 ml TID to achieve several stools a day)
- Non absorbable antibiotics appl. through nasogastric tube or per os (e.g. rifaximin 400 mg TID)
- Stage III and IV of hepatic encephalopathy = cerebral oedema →
- → position, osmotherapy, *ICP monitoring…*

Further organ support

- Oxygenotherapy, mechanical ventilation if needed
- Circulatory support (norepinephrine, vazopressin, terlipressin)
- Hepatorenal syndrome therapy (albumin infusions, terlipressin)
- Nutrition, thiamine and minerals supplementation, prevention of hypoglycaemia
- Correction of coagulopathy only ***in case of bleeding*** !

Liver transplantation

- *Orthotopic Liver Transplant* (OLT)

- King‘s College criteria:
  - paracetamol induced ALF
  - non-paracetamol ALF
  - INR, bilirubin, pH, creatinine, encephalopathy a their progression in time

- Key factor is early communication and quick transfer to a transplant centre !

Take home message

- Therapy of a patient with hepatic failure (ALF and ACLF) consists mainly of correction of the underlying cause, prevention of hepatic encephalopathy and organ support

- Liver transplant is a life-saving procedure in otherwise fatal progressive liver failure

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Lékařská fakulta Masarykovy univerzity
2021