

Liver Transplant Post-operative Care

Key early management issues:

- Ongoing fluid resuscitation – may require large volumes of IV fluid**
 - Pre-existing ascites/ongoing drain losses/complex intraoperative course may predict those who require large volumes of fluid
 - Frequent clinical and biochemical assessment crucial
 - Any increase in lactate or noradrenaline** consider a minimum 500ml fluid bolus
 - Consider HAS as fluid resuscitation if significant pre-existing ascites
- Potential for bleeding**
- Assessment of early graft function**
 - Clinical/biochemical/haematological/acid base and radiological assessment (Doppler of liver vasculature in 1st 24hrs organised by transplant team)

On Admission:

- Sedation-** patients arrive from theatre sedated and ventilated (see drugs below)
- Bloods-** see dedicated liver transplant results flow sheet for first 24hrs tests/times
- CXR-** to check ETT, Lines and NG tube placement
- Lines:**
 - Arterial x 2 (usually radial and femoral)** transduce both waveforms
 - IJ Vein x 2**
 - 1 quad lumen CVP line
 - 1 rapid infusion MAC line (minimise use, not for vasoactive drugs)
 - PA catheter must be transduced and displayed (if present)
 - Ensure obturator in place when PA catheter removed
- NG tube-** on free drainage
- Urinary catheter**
- Surgical drains**

Drugs:

- Antibiotics (check what has been given in theatre):**
 - Gentamicin 2mg/kg at induction, nil further
 - Amoxicillin 1g at induction and repeated at 8 hours
 - Metronidazole 500mg at induction and repeat at 8 hours

If Penicillin Allergic:

- Vancomycin 1g at induction and repeated at 12 hours (withhold second dose if creatinine clearance following transplant <40ml/min as per Cockcroft-Gault equation)
 - Ciprofloxacin 400mg at induction and repeated at 12 hours
 - Metronidazole 500mg at induction and repeated at 8 hours
- Fluconazole-** 100mg IV daily
 - Pantoprazole-** 40mg IV daily
 - Sedation-** Propofol and Alfentanil
 - Analgesia-** Fentanyl or Morphine PCA when extubated

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6. Immunosuppression:

- Hydrocortisone 100mg IV BD
- Azathioprine 1mg/kg/day orally, (mane) day after transplant (rounded to nearest 25mg e.g. 80kg patient = 75mg/day)
- Tacrolimus bd at 10:00 and 22:00 po/ng starts morning after surgery. Dose determined by Hepatology Consultant. Tacrolimus levels Mon, Wed, Fri

7. Hepatitis B Patients:

- Hepatitis B Immunoglobulin (HBIG)- see instructions in red pharmacy folder and discuss with Hepatology Consultant
- Maybe required if patient known to be hep B positive pre-op or has received hep B +ve graft

Important next steps

1. Markers of acceptable graft function

- Biochemical (falling lactate and no requirement for dextrose)
- Haematological (falling/stable PT)

2. Coagulopathy and haematological considerations

- Correction of coagulopathy should be guided by ROTEM and clinical condition of the patient i.e. whether ongoing bleeding
- Correction of coagulopathy in absence of bleeding is not advised
- In patients at increased risk of hepatic artery thrombosis (HAT) i.e. small artery or jump graft required the surgical team may request some of the following measures:
 - i. Daily aspirin
 - ii. Mini-hep 5000units BD/TDS
 - iii. IV heparin infusion (usually without loading dose with APTT initially every 6 hours to avoid over anti-coagulation)
 - iv. Haemodilution to ensure Hb < 10g/dl

3. Bleeding

- Suspected significant bleeding following correction of coagulopathy contact the surgical liver transplant registrar oncall or if not available the consultant liver surgeon

4. Extubation

- General condition and stability will dictate speed of weaning and extubation
- Stable patients should be extubated **as soon as possible**
- Extubation improves blood supply to the transplanted liver

5. Common pitfalls

- Failure to recognise hypovolaemia. Consider in presence of rising lactate and inappropriate or persistently rising doses of noradrenaline

6. Removal of lines

- Lines should not be removed until radiological confirmation of graft perfusion
- Assess coagulopathy/low platelets- D/W consultant prior to correction/line removal
- IJ MAC line and femoral A-Line should ideally be removed before discharge to HDU

Discharge to transplant HDU:

Discharge paperwork as per unit procedure

Lines: 1 arterial, 1 venflon, 1 CVP monitoring line

**Critical Care Guidelines
FOR CRITICAL CARE USE ONLY**

Blood results sheet for first 24 hours post op

Patient name	Liver Transplant
CHI	Blood Results Sheet (1st 24 Hours)

6 hourly formal blood tests. ABG hourly. Additional blood test maybe required e.g following bleeding
Do "Morning Bloods" at appropriate time, usually 18 hour sample

ABG Table:

Time Taken										
Hour Post-op	0	1	2	3	4	5	6	12	18	24
FiO ₂										
H ⁺										
PaCO ₂										
PaO ₂										
cHCO ₃										
BE										
Lactate										
Glucose										
Na ⁺										
K ⁺										
Ca ²⁺										
Hb (ABG)										

Formal bloods table:

Hb (Lab)									
Platelets									
PT									
APTT									
Fibrinogen									
TCO ₂									
Urea									
Creatinine									
Bilirubin									
ALT									
GGT									
Alk Phos									

Product									
Time	Theatre								
FFP									
Platelet									
Cryo									
RCC									