Point-of-care haemostatic management in orthotopic liver transplantation of a patient with a coronary stent

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BACKGROUND

Challenges in Orthotopic Liver Transplantation(OLT)

- Distinct phases with specific physiological alterations and major hemodynamic fluctuations.
- Transfusion more often refers to blood products than RBCs.
- Coagulation defects, conventionally determined, do not predict blood product requirements.
- OLT without intraoperative transfusions showed better early outcome; preemptive FFP transfusion should be avoided.

Challenges in haemostatic management in OLT

- Reduced levels of both procoagulant factors and inhibitors.
- Thrombocytopenia/dysfunction is counterbalanced by the increased levels of fVIII and vWf.
- Hyperfibrinolysis is a major issue after reperfusion.
- ESA 2013: “We recommend the use of perioperative ROTEM/TEG monitoring for targeted management of coagulopathy”.
- Goal-directed POC parameters algorithmic approach.
- ROTEM-based clot strength showed hypocoagulation correlated to the level of liver impairment, but
- TGT (thrombin generation test) indicated a preserved or increased thrombin release suggesting even a potential for hypercoagulability.
- ROTEM may not be appropriate for haemostasis assessment in patients with cirrhosis and may lead to unnecessary coagulation factors transfusion (!)

CASE REPORT

- ❖ Male, 66 y, wt 78kg, ht 173 cm
- ❖ NASH Cirrhosis MELD score 17
- ❖ Four HE episodes, type II diabetes
- ❖ Coagulation profile : PT 16/11.2, APTT 39.5/31, FIB 2.43g/dl, PLTs 134000 μ /l
- ❖ ICH, PTCA (LAD stent) 1 y ago, PAPs 68mm, EF 60%,
- ❖ Aspirin, clopidogrel, diuretics, β -blocker, insulin, prazole

Orthotopic liver transplantation (piggy pack technique)

- ❖ Hbg 9.9 (start) – 9.3 (end) g/dl
- ❖ 3 PRBCs after reperfusion at Hbg 6.6 g/dl
- ❖ Fluids balance +5150 ml
- ❖ Anhepatic phase 2.5 hrs, uneventful reperfusion
- ❖ Total OLTx duration 8 hrs.
- ❖ Acceptable haemodynamics CI 3.1-4.8, PVRI 60-96, Ca-vO₂ 2.9-4.2, SvO₂ 85-76%
- ❖ ICU, 2 d mechanical ventilation.
- ❖ 1 mo in ward, chest pain episode, transient and improving CNS impairment.
- ❖ Satisfactory graft function, discharged 1 month later.

REFERENCES

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- Herbstreit F. Monitoring of haemostasis in liver transplantation: comparison of laboratory based and point of care tests. Anaesthesia. 2010;65(1):44-9

DISCUSSION

Haemostatic management and transfusions were directed by ROTEM® following a published algorithm.(Goerlinger K, 2006, rev.2014). PLT aggregometry was not available.

We compared standard haemostatic lab tests data (SLT) to ROTEM data, suggesting **agreements and disagreements** on patient's haemostatic state interpretation.

BASELINE

No bleeding

A10_{EX} 51mm MCF_{FIB}10mm

INR 1.82 (*agreement*)

APTT high (*agreement*)

Fib 2.09g/L (*agreement*)

PLTs 103000 μ /L (*agreement*)

PREANHEPATIC PHASE

No bleeding

A10_{EX} 57mm MCF_{FIB}12mm

✓ **No action**

ANHEPATIC PHASE

Mild bleeding

CT_{EX}103sec CFT_{EX}403sec

A10_{EX}25sec MCF_{FIB}11sec

INR 2.07 (*agreement*)

APTT 138.4sec (*agreement*)

Fib 1.35g/L (*disagreement*)

PLTs 148000 μ /L(*dis/mnt*)

✓**TRANSFUSION: 1 g TXA, 3 units FFP, 6 units Platelets**

NEOHEPATIC PHASE

Mild bleeding

CT_{EX}78sec CFT_{EX}235sec

A10_{EX}32sec MCF_{FIB}13sec

INR 2.35 (*disagreement*)

APTT 67.4sec

Fib 0.91g/L(*disagreement*)

PLTs 118000 μ /L(*agreement*)

✓**No PLTs transfused (although considered)**

✓**PLT related hypercoagulative danger/ increased mortality**

✓**Coronary stent in place**

✓**TRANSFUSION: 10 units cryoprecipitate (to enhance clot strength, counterbalancing low PLTs count)**

✓**Bleeding ceased completely**

LEARNING POINTS

- ❑ Intraoperative standard lab tests during OLT may lead to improper even dangerous decisions especially in the presence of co-morbidities affecting haemostasis.
- ❑ Point-of-care haemostatic management along with close surgical bleeding evaluation contributed to successful decision making in the management of this complex case.