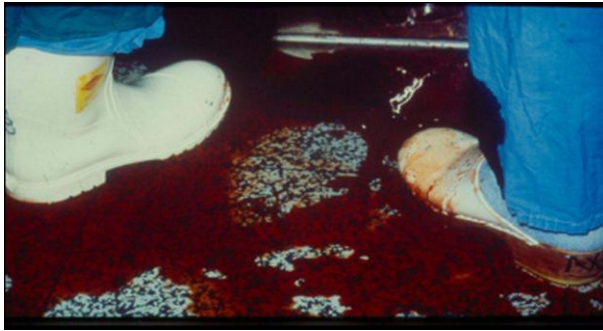
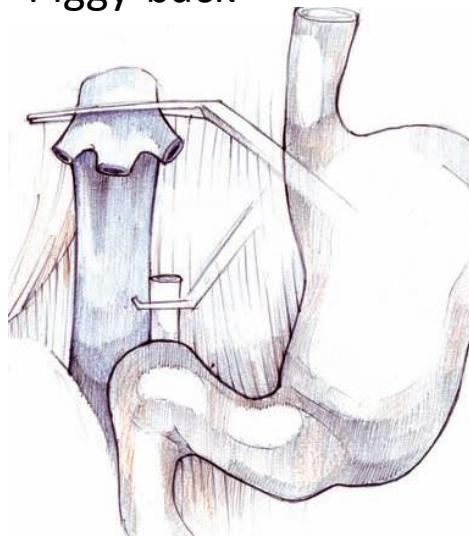




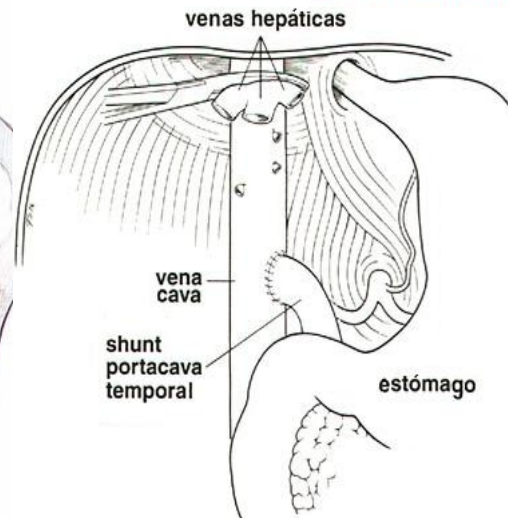
MANEJO INTRAOPERATORIO DEL PACIENTE DE ALTO RIESGO



Piggy-back

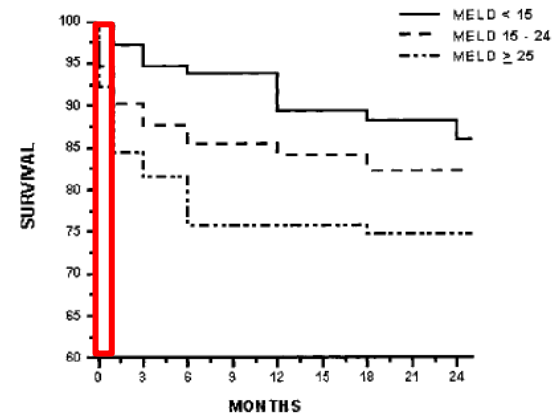
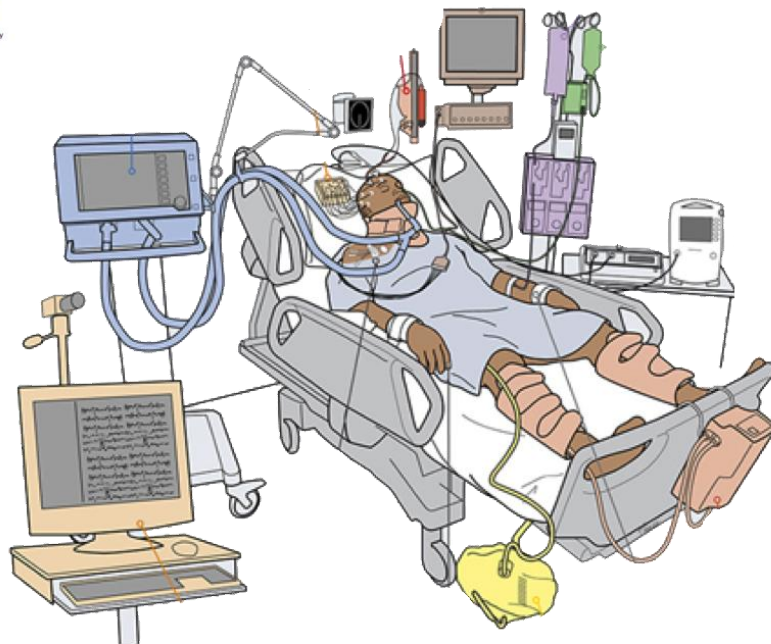
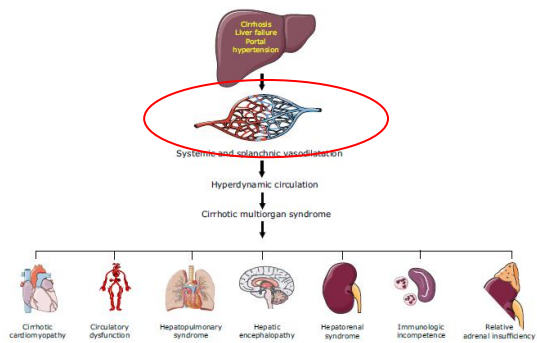


Shunt Portacava Temporal



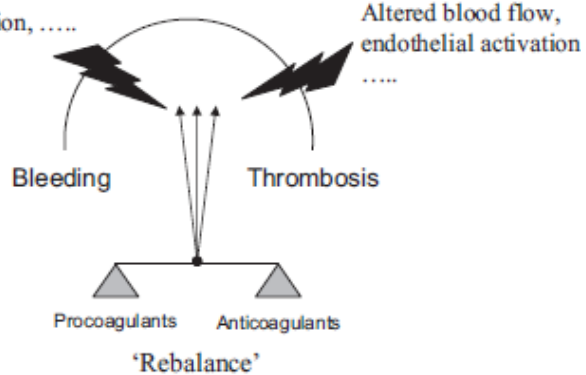
❖ Manejo anestésico

❖ Técnica quirúrgica

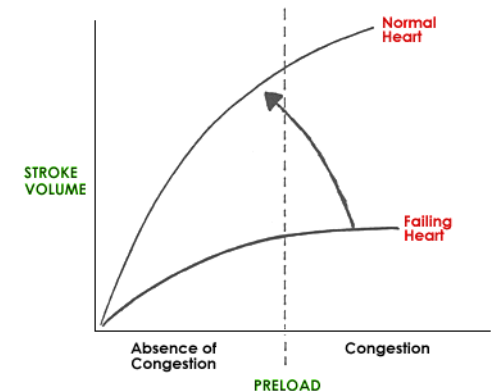
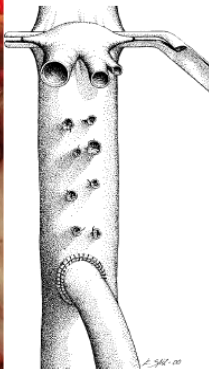
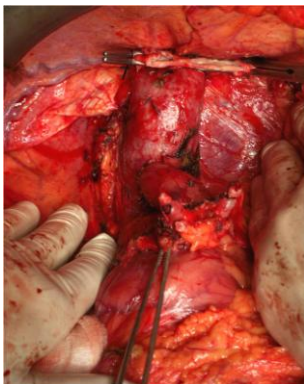
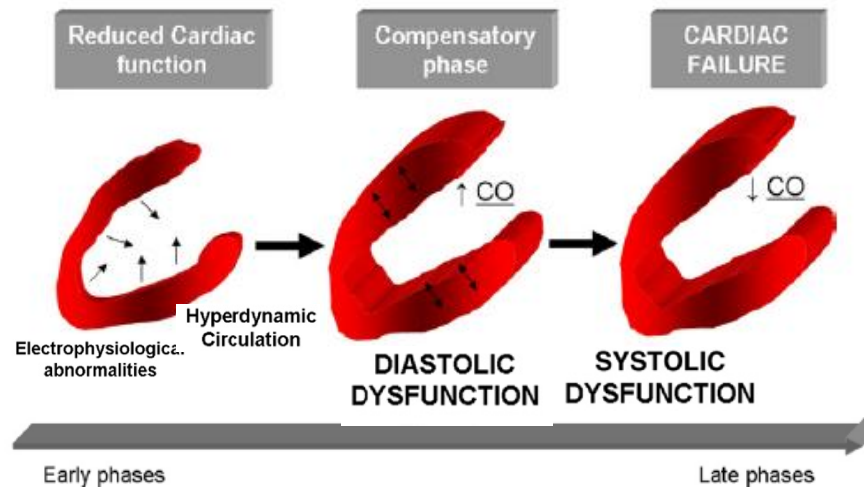


Onaca NN. Liver Transpl 2003

Renal failure, infection,



....a medida que la enfermedad progresa....



➤ Catéter arteria pulmonar/SVO₂ ??



Submit a Manuscript: <http://www.wjgnet.com/esps/>
Help Desk: <http://www.wjgnet.com/esps/helpdesk.aspx>
DOI: 10.4254/wjh.v7.i10.1302

World J Hepatol 2015 June 8; 7(10): 1302-1311

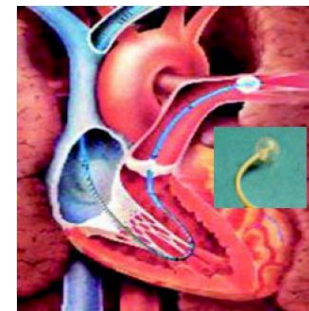
ISSN 1948-5182 (online)

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REVIEW

Hemodynamic monitoring during liver transplantation: A state of the art review

Mona Rezai Rudnick



The traditional pulmonary artery catheter is less frequently used due to its invasive nature and known limitations in measuring preload but still plays an important role in measuring CO when required and in the management of portopulmonary hypertension. **Transesophageal echocardiography** is finding an increasing role in the realtime monitoring of preload status, cardiac contractility and the diagnosis of a variety of pathologies.

LIVER TRANSPLANTATION 14:917-918, 2008

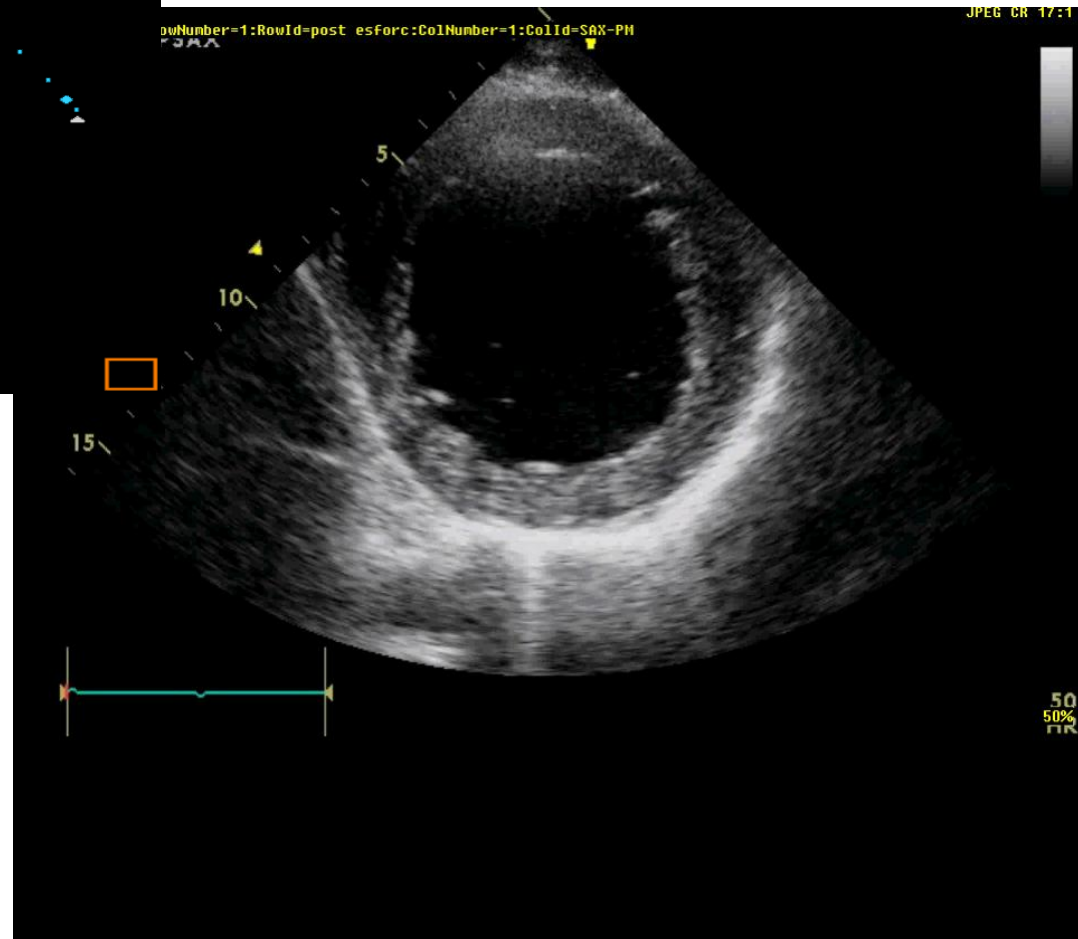
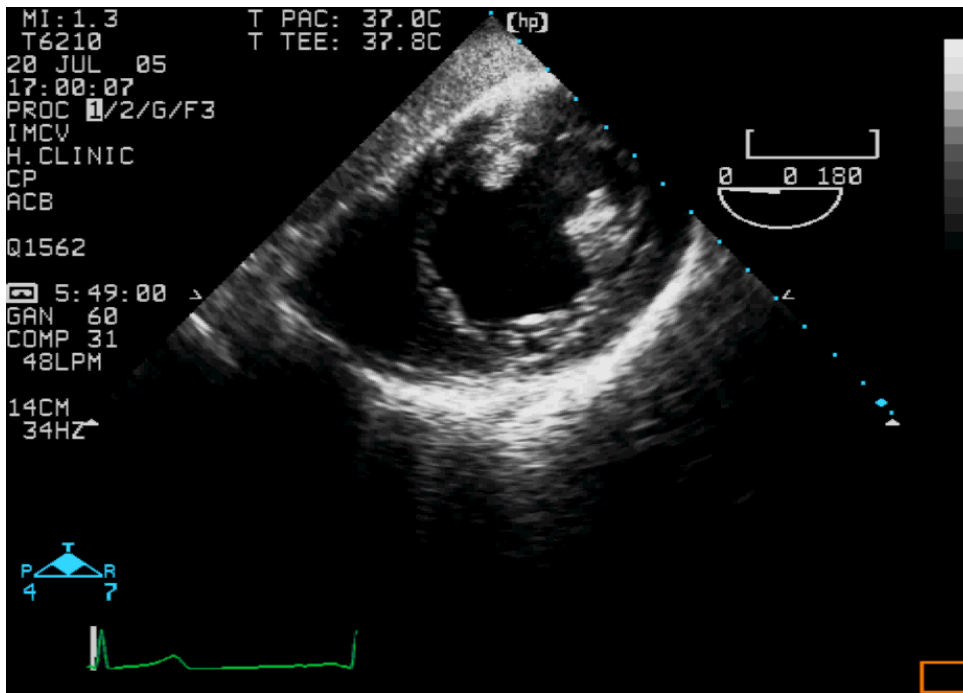
EDITORIAL

Pulmonary Artery Catheter: Rest in Peace? Not Just Quite Yet . . .

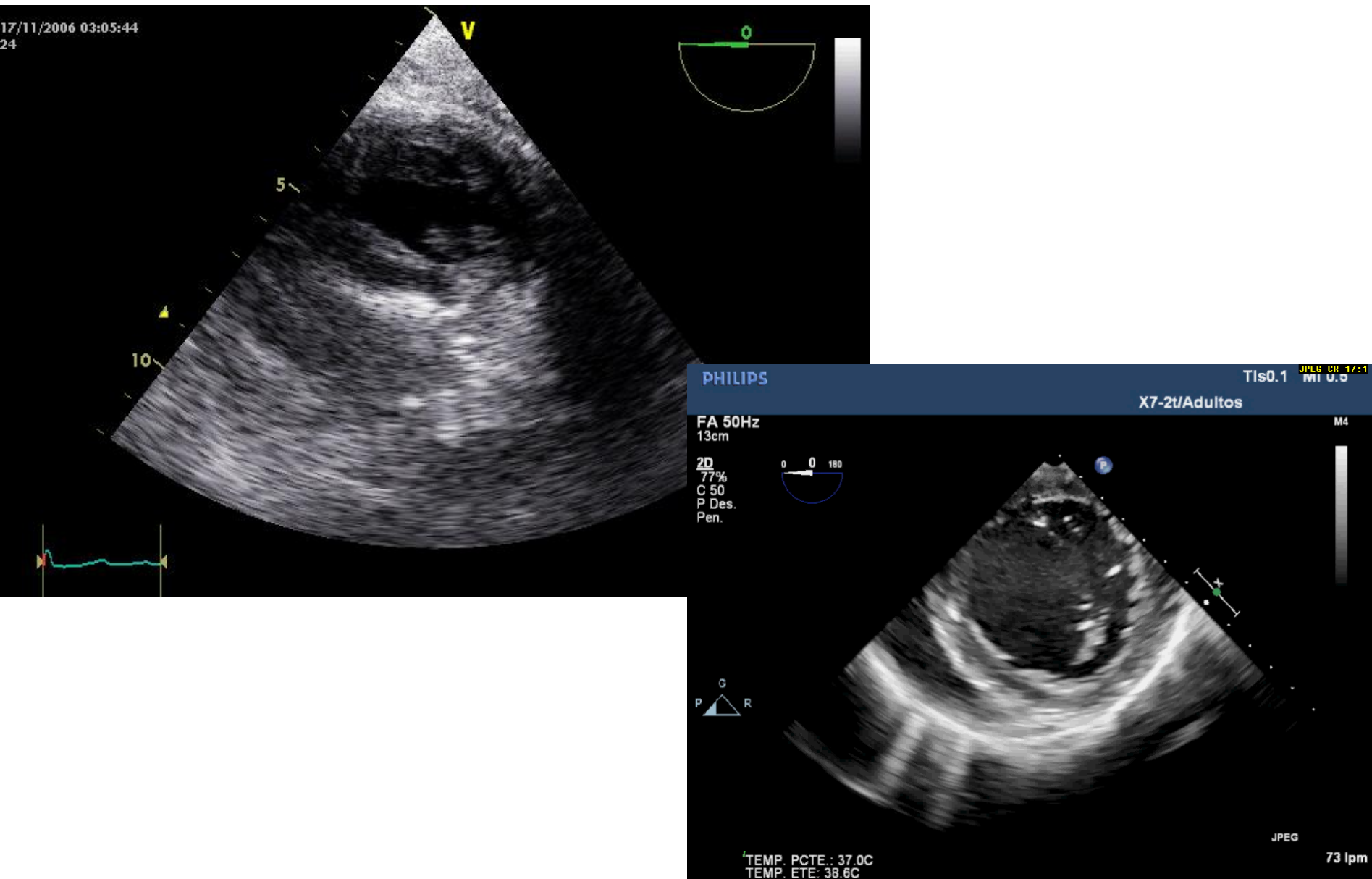
Andre M. De Wolf

Again, TEE is one alternative, but its use is limited to the operative period, and few LTx anesthesiologists have sufficient experience

¿Se contrae bien o no?



Estado de la volemia



FA 61Hz
11cm

M3

2D
41%
C 56
P Des.
Gral.G
P RTEMP. PCTE.: 37.0C
TEMP. ETE: 41.0C

LVOTO SAM

TIs1.1

JPEG CR 14:1
MI 0.8

S7-2omni/TEE

M3

JPEG

86 lpm

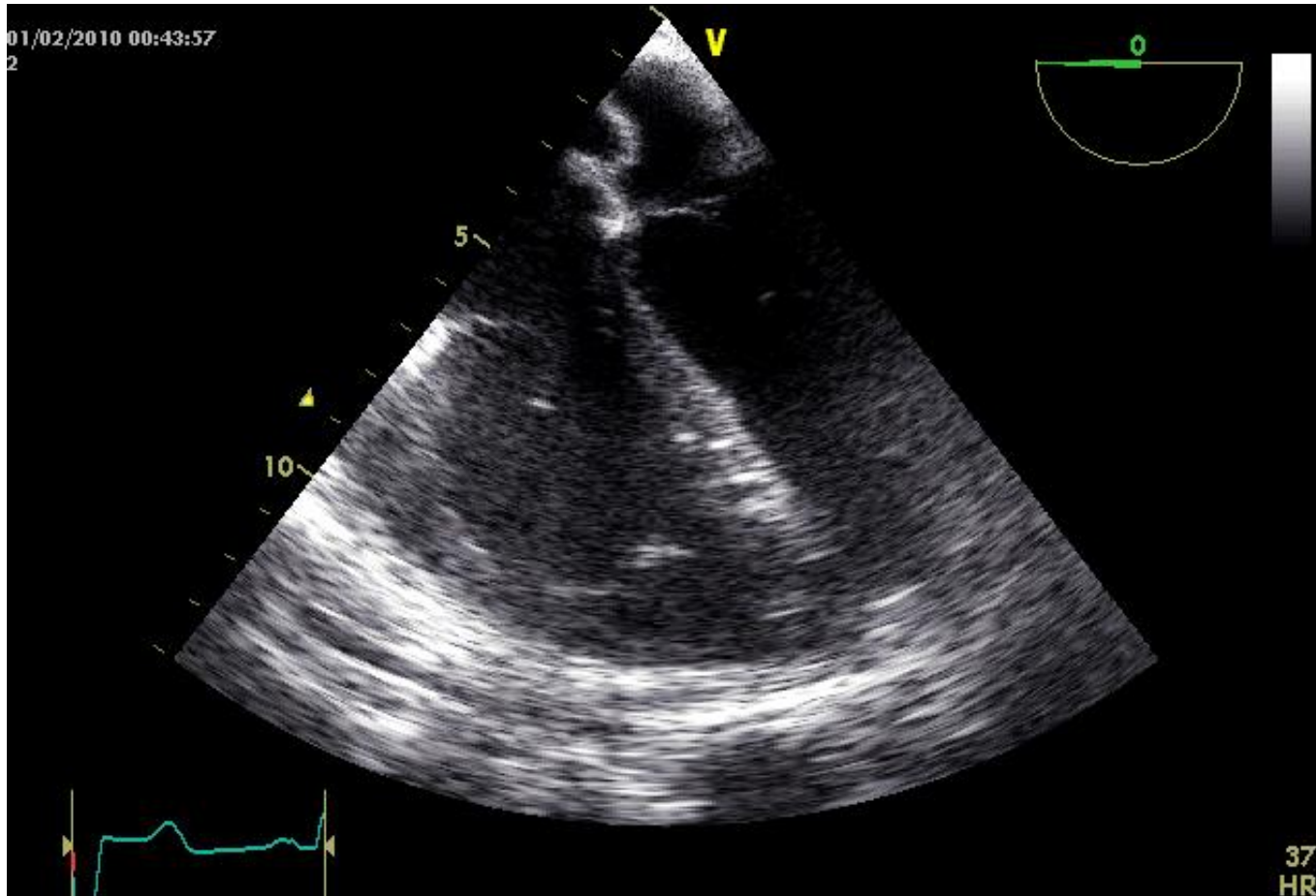
G
P R

JPEG

68 lpm

- Estado de hipovolemia, inotrópicos...

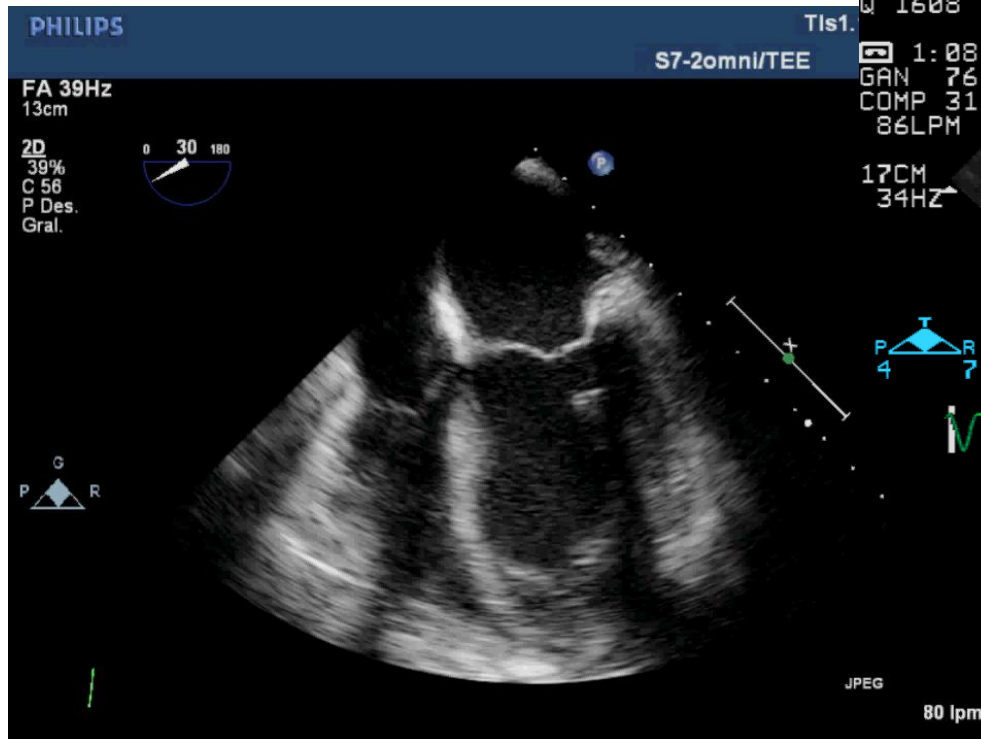
¿Hay algún impedimento a la salida del flujo sanguíneo VD?



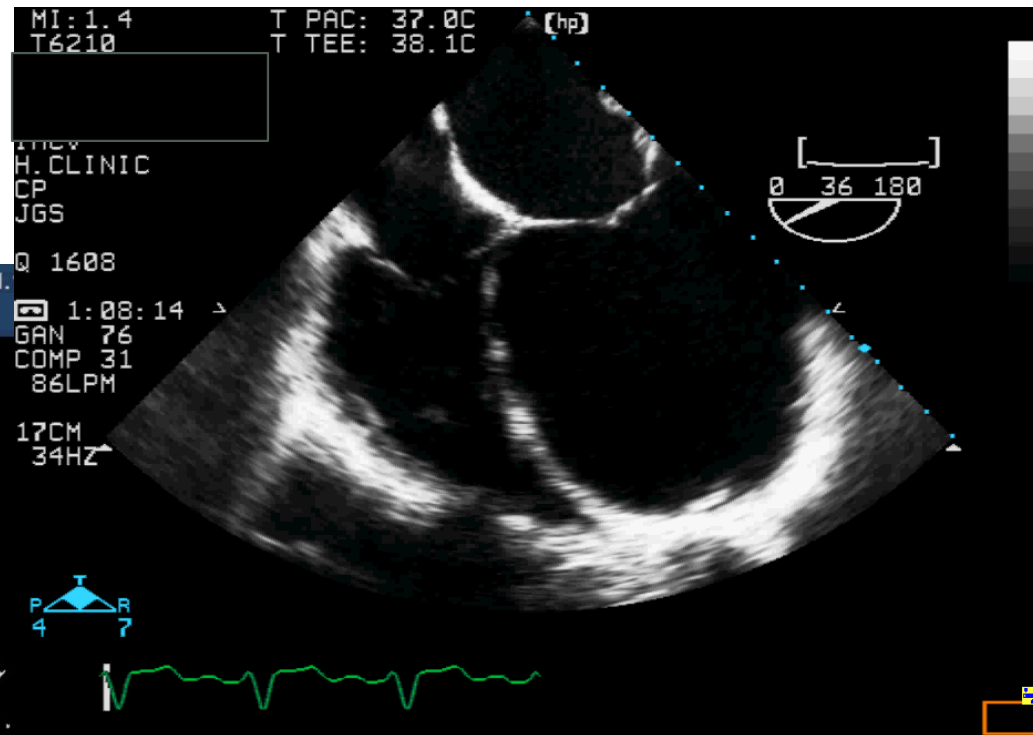
HTP + fallo VD

Postreperfusion

■ Contractilidad global

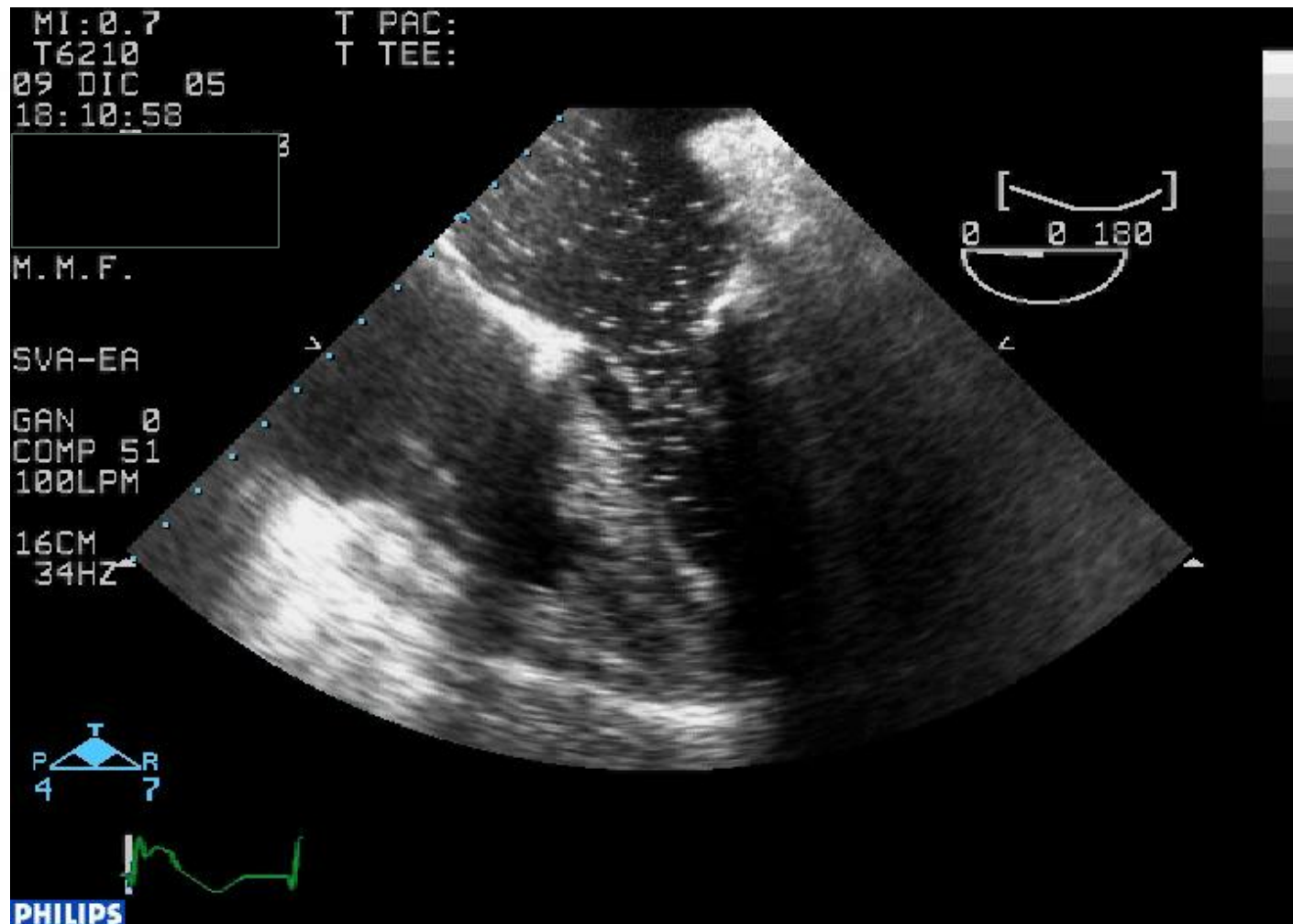


Normal



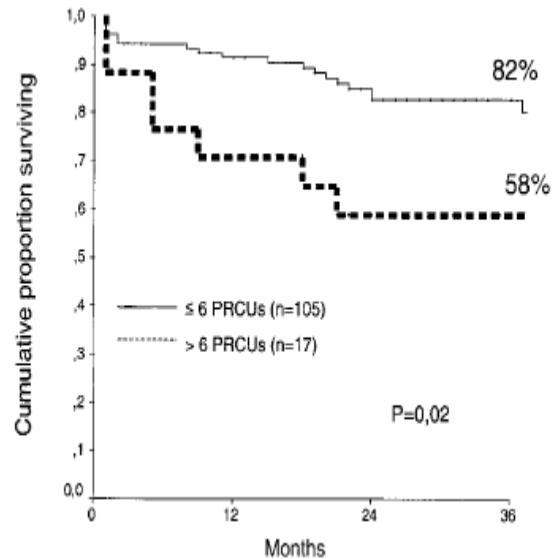
Hipopcinesia global

DETECCIÓN AIRE/TROMBOS

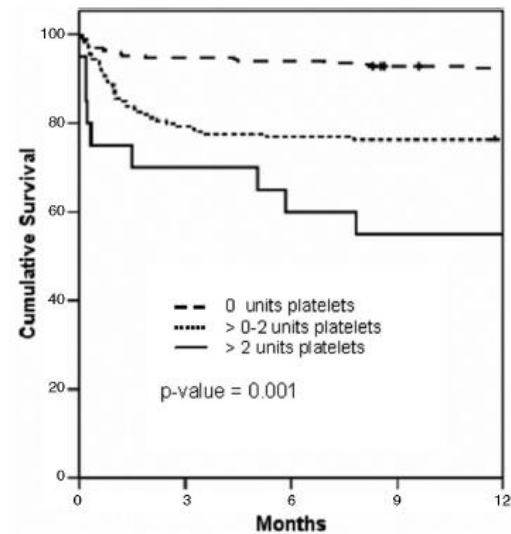




Manejo del sangrado y la coagulación

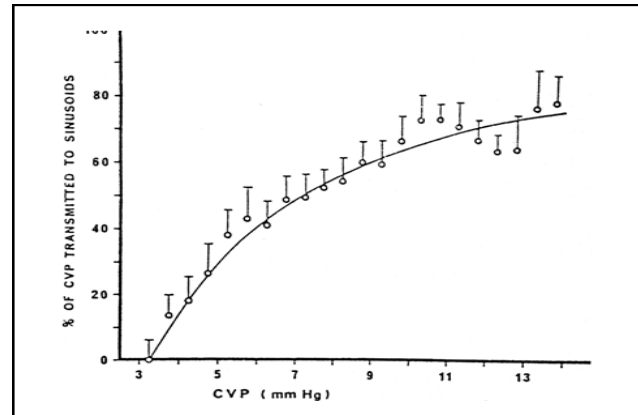
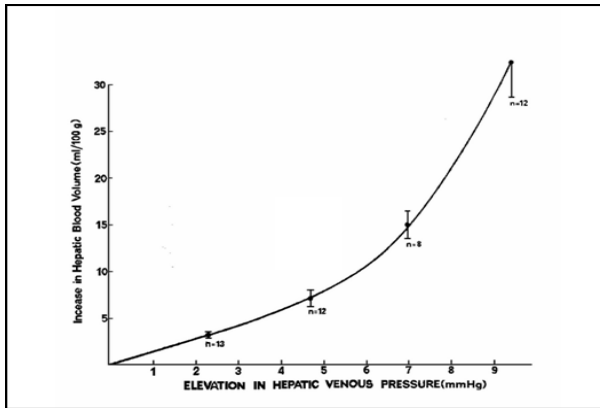


Ramos E. Liver Transpl 2003



De Boer MT. Anesth & Analg 2008

Implicación de la presión venosa central en el flujo hepático



Giannini EG. Hepatology 2014

- Disminuye el sangrado
- Disminuye congestión del injerto

Massicotte L. Liver Transplant 2006
Schroeder RE. J Cardio Vasc Anesth 2004

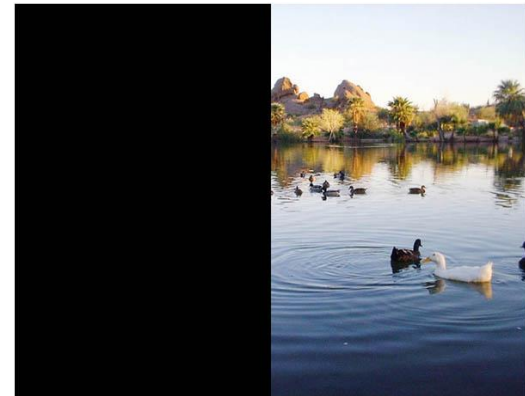
- Coagulopatía dilucional

- ✓ Fluidoterapia restrictiva
- ✓ Vasodilatadores
- ✓ No PEEP

- ✓ Preoperative conventional coagulation test are a poor predictor of blood loss during surgery
- ✓ Efficacy of correction of laboratory abnormalities does not reduce, and may in fact promote, bleeding.

Reyle-Hahn, Liver Transpl Surg, 1997
Steib, Can J Anaesth, 2001
Massicotte, Transplantation , 2008

- ✓ Los tiempos de coagulacion (aPTT, TP/INR), no cuentan la historia completa: omiten los factores anticoagulantes

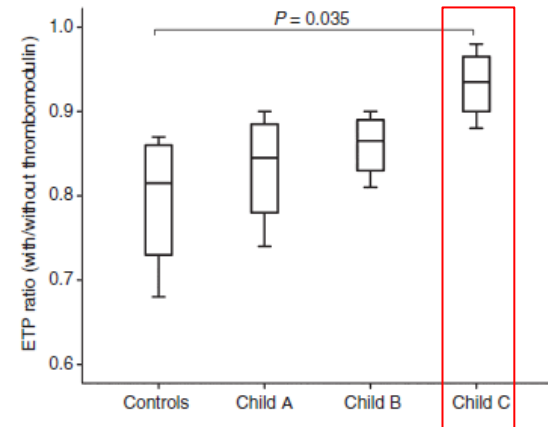
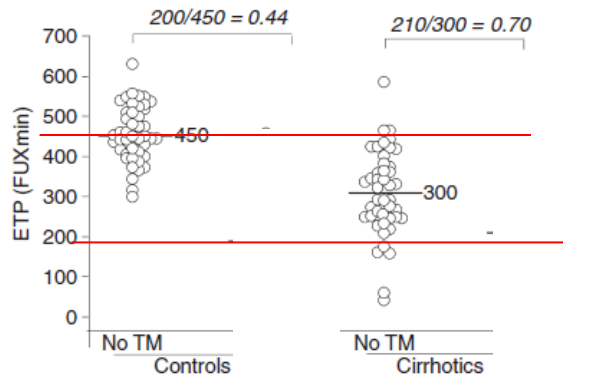


Evidence of Normal Thrombin Generation in Cirrhosis Despite Abnormal Conventional Coagulation Tests

Armando Tripodi, Francesco Salerno, Veena Chantarangkul, Marigrazia Clerici, Massimo Cazzaniga, Massimo Primignani, and Pier Mannuccio Mannucci

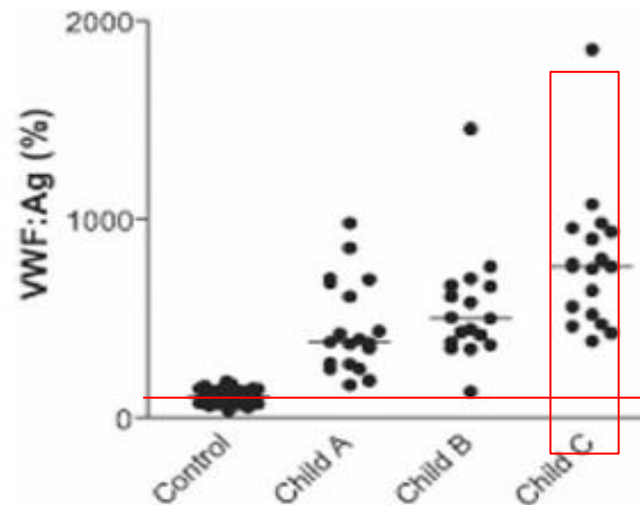
HEPATOLOGY, Vol. 41, No. 3, 2005

.....the reduction of procoagulant factors in patients with cirrhosis is compensated by the reduction of anticoagulant factors, thus leaving the coagulation balance unaltered. These findings help clarify the pathophysiology of hemostasis in cirrhosis, suggesting that bleeding is mainly due to the presence of hemodynamic alterations and that conventional coagulation tests are unlikely to reflect the coagulation status of these patients.



Elevated Levels of von Willebrand Factor in Cirrhosis Support Platelet Adhesion Despite Reduced Functional Capacity

Lisman T, Hepatology 2006



NO corrección cifras de laboratorio..... en ausencia de sangrado activo



INR > 3

FHA

500 ml ▲ PP 7 mmHg

Trombosis portal (dicumarinicos.....)

Factor protrombinico (10-30 u/K)

Gorlinger, TMH, 2012

Factor VIIa (80 µg/k)

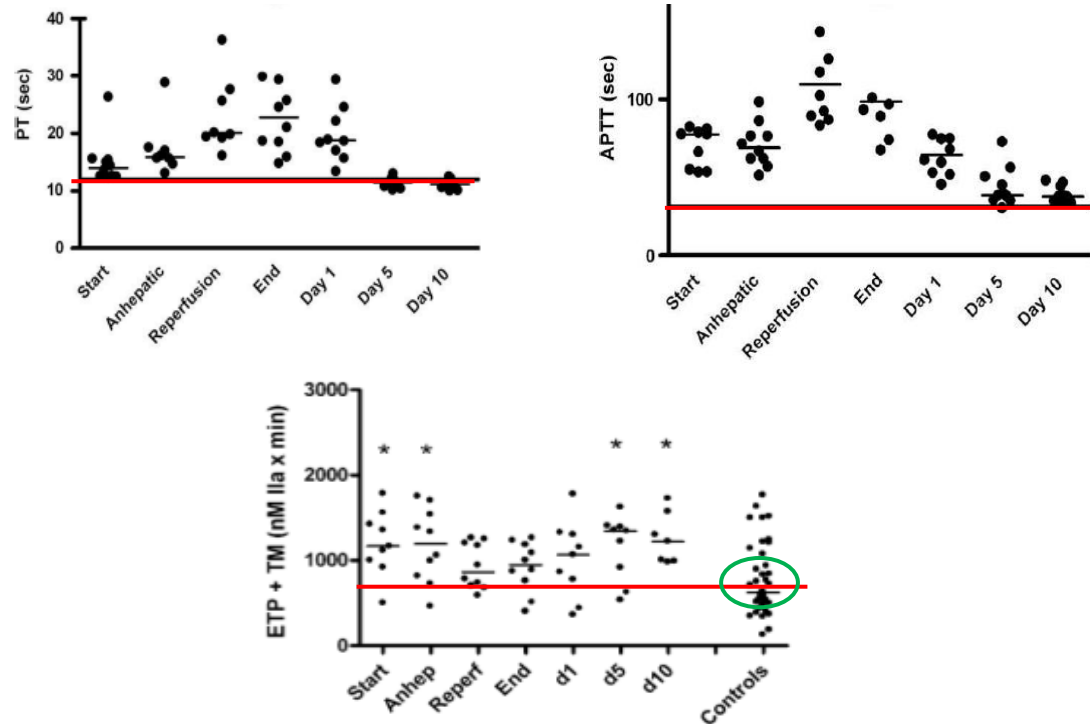
Planinsic, LT, 2005

Lodge, LT, 2005

Normal to increased thrombin generation in patients undergoing liver transplantation despite prolonged conventional coagulation tests

Lisman, J of Hepatol, 2010

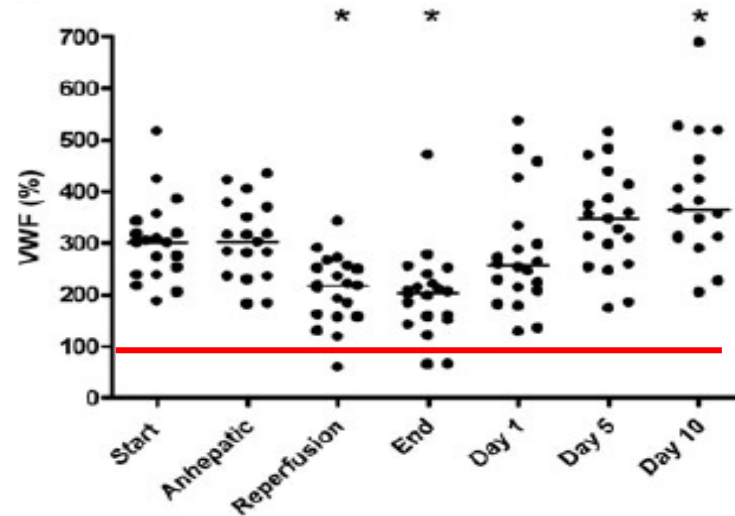
In conclusion, thrombin generation during and after liver transplantation is equal or superior to thrombin generation in healthy volunteers in the presence of exogenous thrombomodulin. These results **support the recently advocated restrictive use of plasma during liver transplantation.**



Development of a Severe von Willebrand Factor/ADAMTS13 Dysbalance During Orthotopic Liver Transplantation

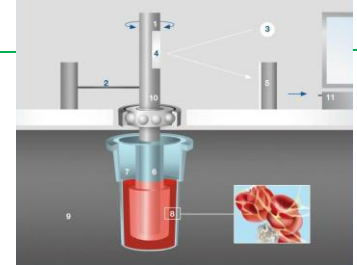
Pereboom, AJT, 2009

In conclusion, we have shown that patients undergoing liver transplantation have persistently elevated levels of VWF and an increasing functional capacity of the VWF-platelet system.



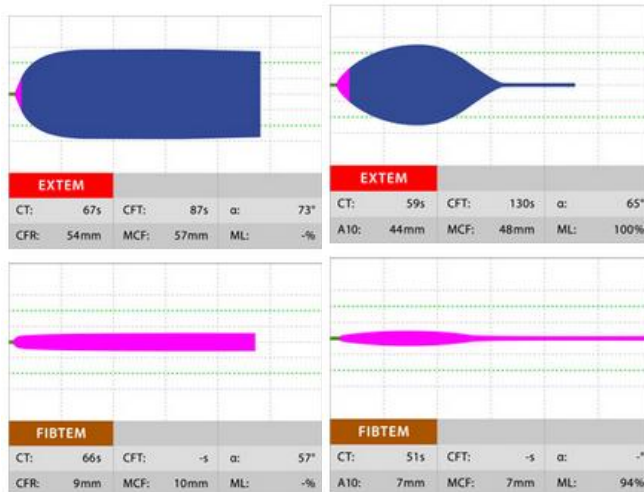
Tromboelastografía

Tromboelastografía TEG® Tromboelastometría ROTEM®



Indicación terapéutica

Reposición derivados hemáticos



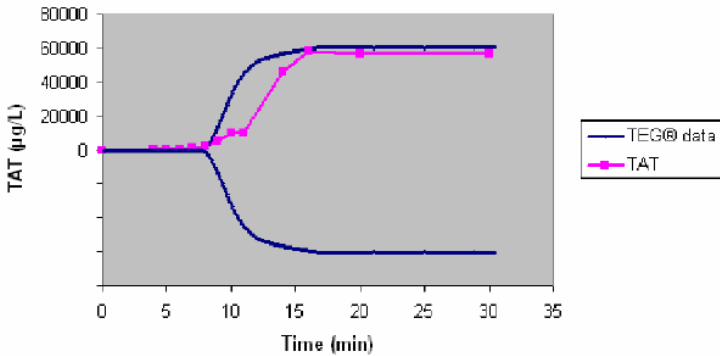
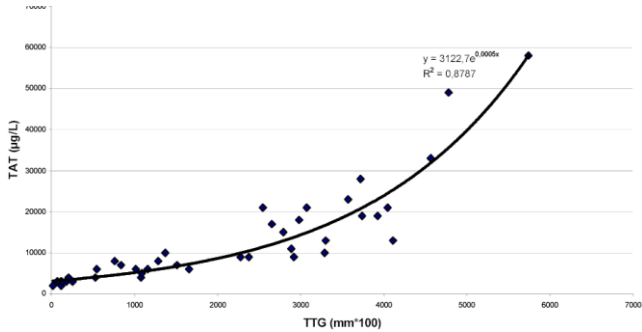
...a significant reduction in the use of fresh frozen plasma ,
and platelets with a small increase in fibrinogen transfusion

Antifibrinoliticos

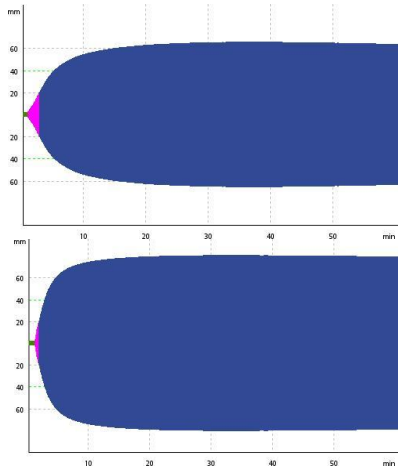
Wang Y Transplat Proc 2010



Evaluation of the Profile of Thrombin Generation during the Process of Whole Blood Clotting as Assessed by Thromboelastography



Rivard GE . J Thromb Haemost 2003



Máxima amplitud > 45 mm, previo al clampaje vascular, administración de heparina iv 3-5000 U

Hannaman MJ. Transplantation Reviews 2011

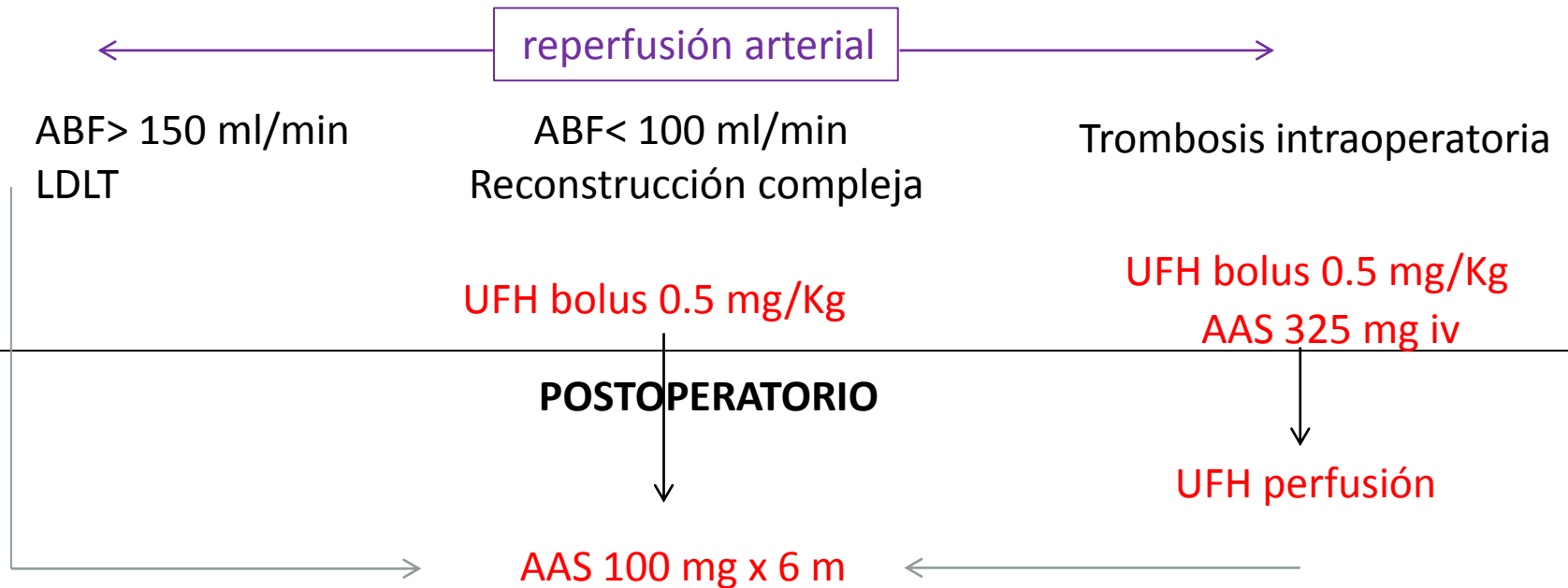
Cuando ?
Como ?

- Identificar pacientes de alto riesgo (etiología, trombosis ..)
- Tromboelastometria: Máxima amplitud (clot firmness)
- Características del injerto (LDLT)

INTRAOPERATORIO

- Normovolemia
- No profilaxis con antifibrilolíticos

- Quirúrgicos



CONCLUSION

Con mayor frecuencia se aceptan pacientes de alto riesgo, así como órganos sub-óptimos que plantean un nuevo reto en el manejo intraoperatorio.

- La valoración continua de la función cardíaca y del proceso activo de la coagulación son indispensables para un adecuado manejo.
- La identificación de receptores con potencial riesgo de complicaciones vasculares facilita la decisión de iniciar la tromboprofilaxis.



GRACIAS