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Alta hospitalaria rápida tras el trasplante hepático: A quién ... y cómo

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vía rápida en trasplante hepático

- Abordaje multimodal y reglado a la recuperación del paciente después de un trasplante hepático
- Inicialmente ideada para la reducción de costes
- Objetivo: acortar la estancia hospitalaria
- Orientada (en general) a minimizar estrés perioperatorio y dolor
- En trasplante, a minimizar la exposición a patógenos hospitalarios
- Mejora la percepción y participación de paciente y familiares
- Maximiza el aprovechamiento de recursos
- Facilita la recuperación, pudiendo llegar a reducir la morbilidad

vía rápida: HISTORIA

- 1992: Chong promueve un alejamiento de la UCI
- 1995: Se establece como vía clínica en cirugía cardiaca (Howard)
- 1997: Plevak plantea la posibilidad de disminuir la estancia hospitalaria al reducir tiempo en UCI
- 1997: Mandell presenta su experiencia con la extubación inmediata tras el trasplante hepático
- 2005: 207/354 pacientes extubados precozmente post TH (Biancofiore)

Cardiac surgery: moving away from intensive care

Jin Long Chong, Ravi Pillai, Anthony Fisher, Catherine Grebenik, Michael Sinclair, Stephen Westaby

Abstract

Objective—To evaluate outcome in patients managed outside an intensive care unit after open heart surgery.

Background—The high cost of cardiac surgery is mainly due to the needs of traditional postoperative care. The requirements for intensive care and treatment has decreased with improvements in techniques of cardiac surgery

The past decade has seen a substantial increase in the demand for cardiac surgery principally through the acknowledged benefits of myocardial revascularisation. Cardiac surgery proves cost effective in terms of quality adjusted life years by improving capacity for work, longevity, and quality of life in all age groups¹ This is, however, an expensive speciality and if we can reduce the cost of heart operations, the procedures may achieve still higher priority.

Fast-track care after cardiac surgery

Claire Howard

This article explains the rationale for fast-track management of low-risk cardiac surgical patients and describes the selection process and care received by these patients at the Royal Brompton Hospital. A review of the fast-track audit is presented and discussed.

Cardiac surgery is one of the great medical achievements of the 20th Century, and the required growth of this specialty has recently been the subject of a Government specialty review (Black et al, 1993). As surgical and anaesthetic practices develop, more people with previously untreatable conditions can safely be offered surgery. The improvement in quality of life offered is literally a lifesaver for patients. However, open-heart surgery using cardiopulmonary bypass induces profound physiological changes and carries risks of morbidity and mortality which medical and surgical nursing staff strive to minimise.

Staff at the RBH have advanced the practice of fast-track care from early extubation to managing the recovery of the low-risk cardiac surgical patient without admission to the adult ICU. The role of the recovery nurse has developed so that he/she now takes the lead in patient management.

The benefits to the patient and his/her family are that they do not experience the psychological stress of an admission to ICU, and the patient spends less time intubated and artificially ventilated, thus avoiding the discomfort and stress of this experience, is able to resume drinking earlier, and has improved continuity of care. Anecdotal evi-

Howard C, British Journal of Nursing,

Fast Tracking in Liver Transplantation

David J. Plevak and Laurence C. Torsher

Fast tracking is an attitude in health care delivery that emphasizes efficient use of resources. Such business principles are operative in today's world economy. However, the phrases "fast tracking," "critical pathways," and "in-hospital care mapping" tend to expose certain sensitivities that, although familiar to the human condition, might be considered perplexing.

If these concepts are so in keeping with the economic mindset of Western society, why did they take until now to reach our liver transplant community? The answer is that revenues, which have been

However, our trek into fast tracking has taken a course similar to that described by Quasha et al 16 years earlier. Dr. M. Susan Mandell recently published her results on early extubation after liver transplantation. Dr. Mandell has granted permission to print that compared with historic controls, patients who received extubation before ICU admission had reduced length of stay in the ICU, decreased need for certain ICU services, and overall lower ICU costs. This was accomplished without any noted complications caused by early extubation.⁵

Liver Transplantation and Surgery, Vol 3, No 4 (July), 1997: pp 447-448

Immediate Tracheal Extubation After Liver Transplantation: Experience of Two Transplant Centers

M. Susan Mandell, MD, PhD*, John Lockrem, MD*, and Scott D. Kelley, MD†

Departments of Anesthesiology, *University of Colorado Health Sciences Center, Denver, Colorado, and †University of California, San Francisco, California

Early tracheal extubation has been safely performed after large operative procedures, questioning the need for routine postoperative ventilation. Because immediate postoperative tracheal extubation of liver transplantation patients has not been previously reported, we performed preliminary studies at two institutions to evaluate potential risk and cost benefit. At the University of Colorado (UC), extubation criteria were derived from the retrospective analysis of patients who were ventilated less than 8 h and experienced an intensive care unit stay less than 48 h in 1994. Preoperative criteria for age, severity of illness, and absence of encephalopathy and coexistent disease were used in a subsequent prospective study in 1995. Donor graft function, blood use, hemodynamic stability, and alveolar-arterial oxygen gradient served as intraoperative criteria. Cost of intensive care services was compared for the 1994 ventilated patients and the 1995 patients whose tracheas were extubated immediately postoperatively. At the second institution, University of California at San Francisco

(UCSF), patients were tracheally extubated immediately postoperatively, based on clinical judgment by the anesthesiologist. A retrospective analysis was then completed. Sixteen of 67 patients at UC and 25 of 106 patients at UCSF were tracheally extubated. There were no reintubations at UC, while 2 of 25 patients at UCSF required reintubation. Prior encephalopathy, poor donor liver function, and an increased alveolar-arterial oxygen gradient were present in the patients who suffered perioperative respiratory failure. Seventeen of 25 patients at UCSF did not have all criteria used at UC but did not require reintubation. Wider limits on age and severity of illness did not preclude successful extubation. Cost analysis at UC showed a significant reduction in intensive care unit services and associated cost for extubated patients. We conclude that immediate postoperative tracheal extubation of selected liver transplantation patients is safe and cost effective.

(Anesth Analg 1997;84:249-53)

Original Article

Fast track in liver transplantation: 5 years' experience

G. Biancofiore*, M. L. Bindi*, A. M. Romanelli†, A. Boldrini*, M. Bisà*, M. Esposito*, L. Urbani¶, G. Catalano¶, F. Mosca‡, F. Filipponi¶

*Cisanello Hospital, Postsurgical and Transplantation ICU, Department of Anaesthesia and Critical Care;

†National Research Council, Department of Biostatistics; University School of Medicine, ¶Liver Transplant Unit,

‡General and Transplantation Surgery, Pisa, Italy

Summary

Background and objective: Reducing postoperative mechanical ventilation in patients undergoing liver transplantation may have clinical and organizational advantages. On the basis of our experience, we here evaluate the possibility of practising immediate tracheal extubation in the operating theatre. **Methods:** In this prospective study, patients consecutively undergoing liver transplantation between 1 June 1999 and 31 May 2004 were extubated in the operating theatre at the end of surgery on the basis of standardized and universally accepted criteria, under conditions of haemodynamic and metabolic stability. **Results:** Two hundred and seven of the 354 patients (58.5%) were extubated immediately after the completion of the surgical procedure (mean time between end of surgery and extubation: 0.4 ± 1.4 min); two were re-intubated. In the last of the 5 yr of the study, the percentage of immediate extubations increased to 82.5%. During the study period, there was a progressive increase in the number

Is a Mandatory Intensive Care Unit Stay Needed After Liver Transplantation? Feasibility of Fast-Tracking to the Surgical Ward After Liver Transplantation

C. Burcin Taner,^{1*} Darrin L. Willingham,^{1*} Ilynn G. Bulatao,¹ Timothy S. Shine,² Prith Peiris,² Klaus D. Torp,² Juan Canabal,³ Justin H. Nguyen,¹ and David J. Kramer¹

Departments of ¹Transplantation, ²Anesthesiology, and ³Critical Care, Mayo Clinic Florida, Jacksonville, FL

The continuation of hemodynamic, respiratory, and metabolic support for a variable period after liver transplantation (LT) in the intensive care unit (ICU) is considered routine by many transplant programs. However, some LT recipients may be liberated from mechanical ventilation shortly after the discontinuation of anesthesia. These patients might be appropriately discharged from the postanesthesia care unit (PACU) to the surgical ward and bypass the ICU entirely. In 2002, our program started a fast-tracking program: select LT recipients are transferred from the operating room to the PACU for recovery and tracheal extubation with a subsequent transfer to the ward, and the ICU stay is completely eliminated. Between January 1, 2003 and December 31, 2007, 1045 patients underwent LT at our transplant program; 175 patients were excluded from the study. Five hundred twenty-three of the remaining 870 patients (60.10%) were fast-tracked to the surgical ward, and 347 (39.90%) were admitted to the ICU after LT. The failure rate after fast-tracking to the surgical ward was 1.90%. The groups were significantly different with respect to the recipient age, the raw Model for End-Stage Liver Disease (MELD) score at the time of LT, the recipient body mass index (BMI), the retransplantation status, the operative time, the warm ischemia time, and the intraoperative transfusion requirements. A multivariate logistic regression analysis revealed that the raw MELD score at the time of LT, the operative time, the intraoperative transfusion requirements, the recipient age, the recipient BMI, and the absence of hepatocellular cancer/cholangiocarcinoma were significant predictors of ICU admission. In conclusion, we are reporting the largest single-center experience demonstrating the feasibility of bypassing an ICU stay after LT. *Liver Transpl* 18:361-369, 2012. © 2012 AASLD.

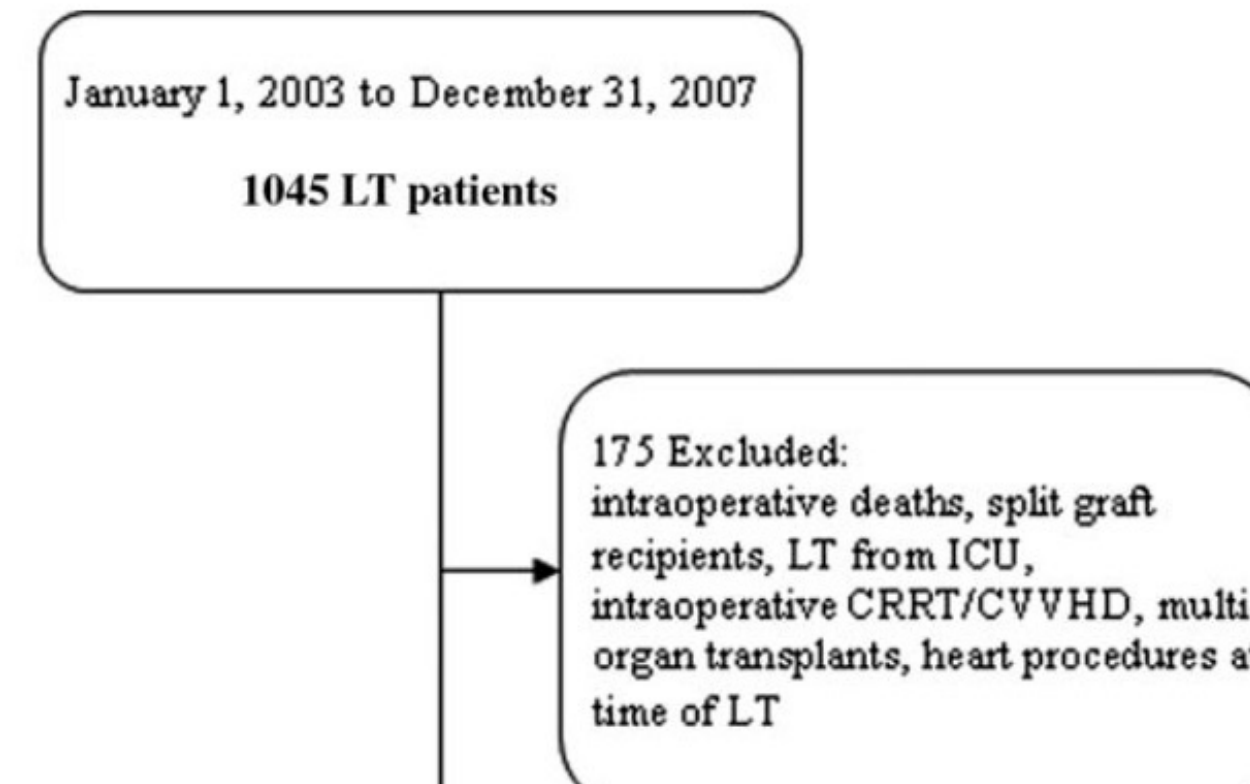
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Received June 6, 2011; accepted October 12, 2011.

Transpl 18:361-369, 2012. © 2012 AASLD.

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available to the LT patient until the patient was transferred to the surgical ward. Logistics, including the availability of 1:1 nursing in the surgical ward, and clinical characteristics, including the full recovery of spontaneous respiration and the absence of hemodynamic instability, were ensured before the ward transfer. Before the transfer to the transplant surgical ward, invasive monitoring devices such as arterial lines and pulmonary artery catheters were removed. The surgical ward was a 28-bed nursing unit dedicated to patients before and after solid organ trans-



team. In the surgical ward, a 1:1 nurse-to-patient ratio was maintained for the first 12 to 24 hours after LT. The patients were monitored by continuous pulse oximetry, continuous electrocardiography, central venous pressure measurements, and noninvasive blood pressure measurements. The hemoglobin concentration was measured every 6 hours in the first 24 hours

vía rápida en trasplante hepático

- Objetivo:

Aplicar el concepto de vía rápida en trasplante hepático en nuestro centro

- Método:

- Plan de acción integral para tratamiento de **todos** los pacientes
- Se delimitan todas las estrategias, desde el estudio preoperatorio, anestesia, cirugía, postoperatorio, farmacocinética y seguimiento

vía rápida en TH: ANESTESIA

- **Inducción:** propofol (1,5-2 mg/kg), rocuronio (1 mg/kg) y fentanilo (5 µg/kg)
- **Mantenimiento:** sevoflurano. Bolo de morfina (0,1 mg/kg) tras la reperfusion
- Reversión con sugammadex
- Vías venosas de alto flujo (yugular, braquial)
- Restricción de fluidos: plasmalyte y albúmina (20%) para restituir pérdidas insensibles
- Transfusión por Hgb < 7 g/dl y SVO₂ < 70%

vía rápida en TH: ANESTESIA

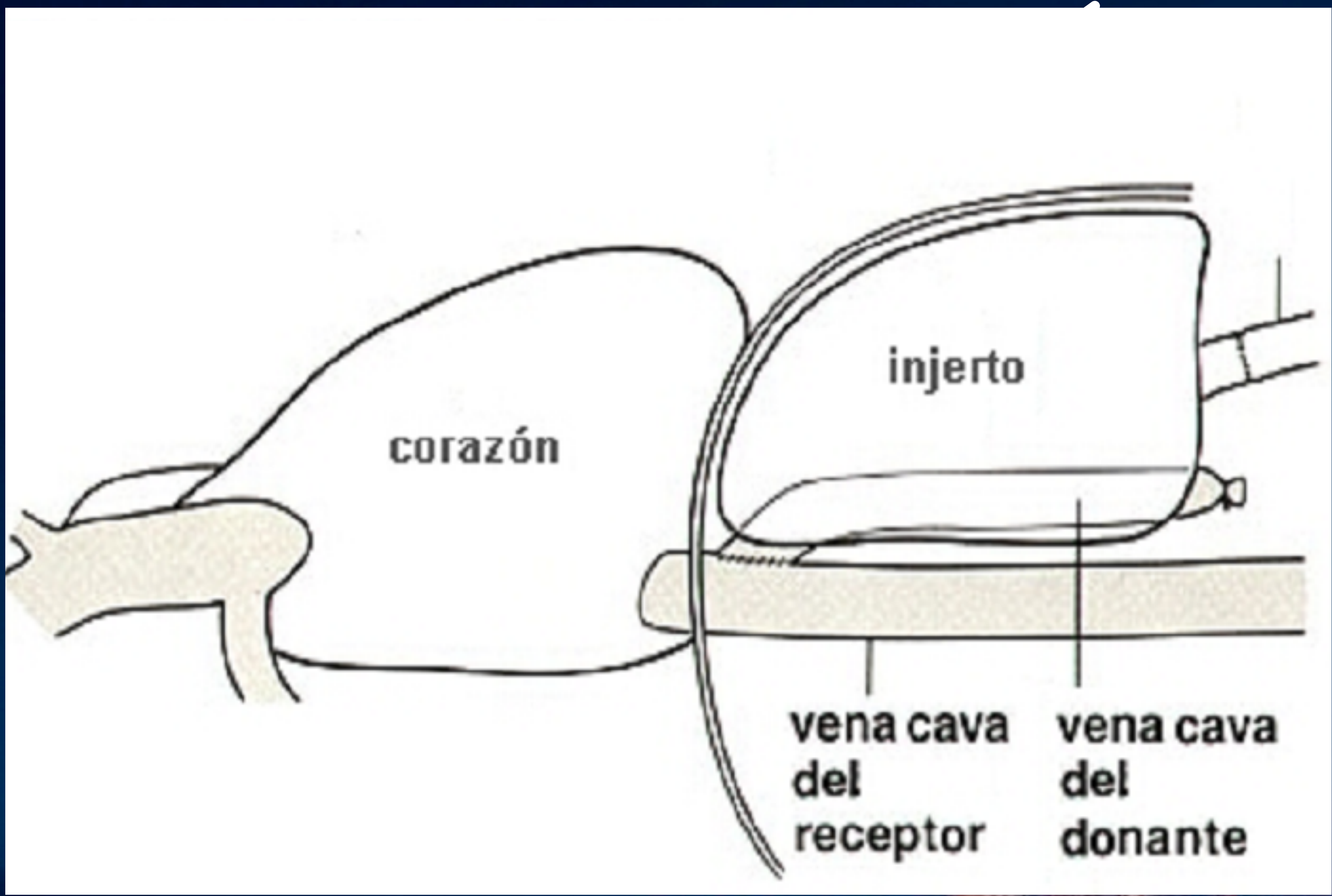
- **Hemoextracción Aguda Preoperatoria** ($Hgb \geq 8$)
 - Máximo 3 unidades de sangre total (450-500 ml/U)
 - Se interrumpe cuando $SVO_2 < 70\%$
 - Se reinfunde a demanda o al iniciar la reconstrucción biliar
- **Recuperación de hematíes** en casos sin CHC
- Corrección de coagulopatía a demanda según **tromboelastografía intraoperatoria**
- **Extubación inmediata** con criterios universales:
 - Seguimiento de órdenes, presencia de reflejo (gag)
 - Volumen tidal > 6 ml/kg, frecuencia < 20 /min, $SPO_2 > 95\%$ con $FiO_2 \leq 50\%$

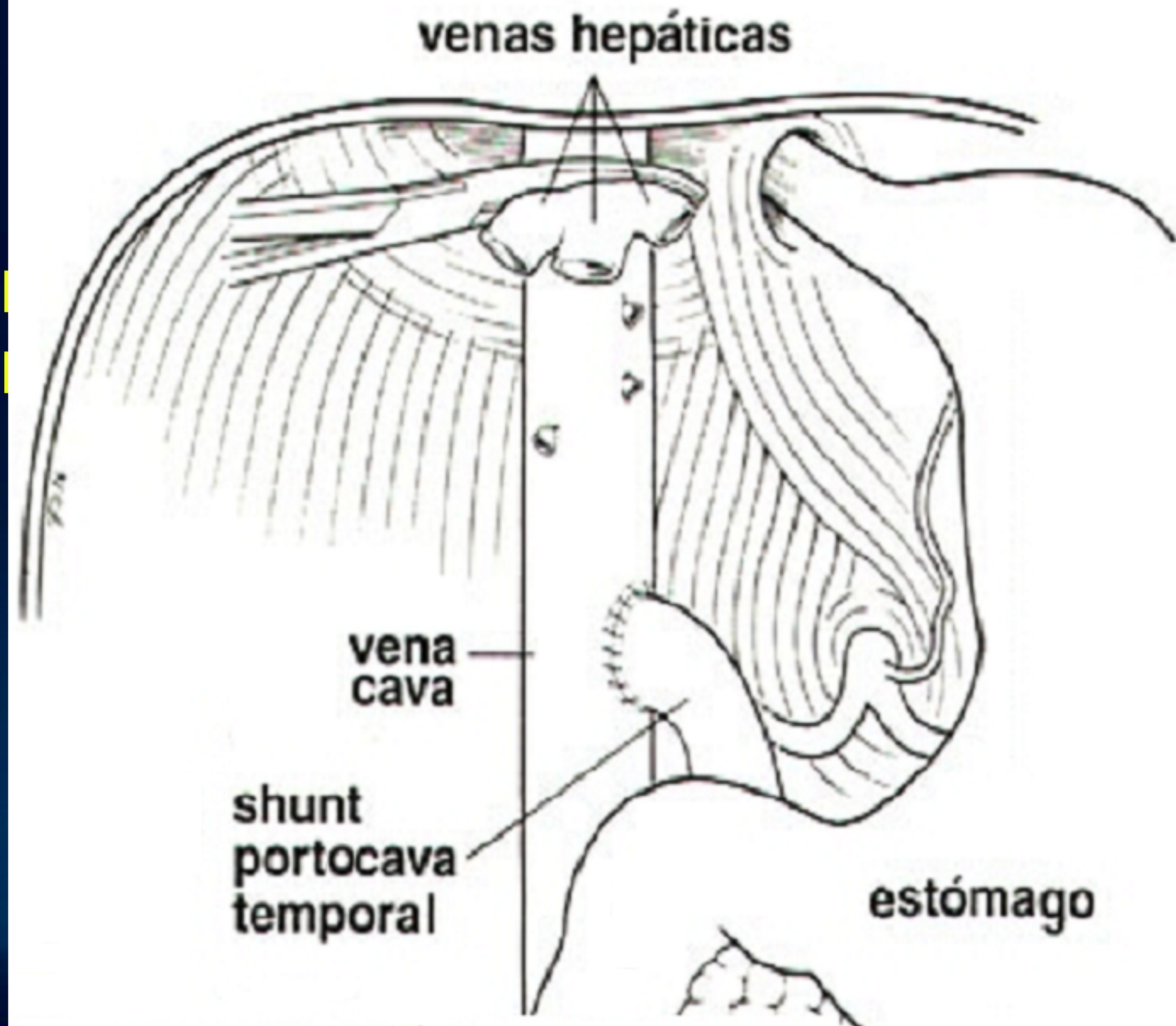
vía rápida en TH: CIRUGÍA

- **Preservación de Vena Cava**
- **Derivación Porto-Cava Temporal**
- Lavado del injerto: plasmalyte 500 ml (portal)
- Reperfusión: Simultánea o Arterial para órganos de donantes > 70 años y donantes en asistolia
- **Medición de flujos**: Medistim
- Anastomosis biliar T-T sin Kehr
- **Sin drenajes**

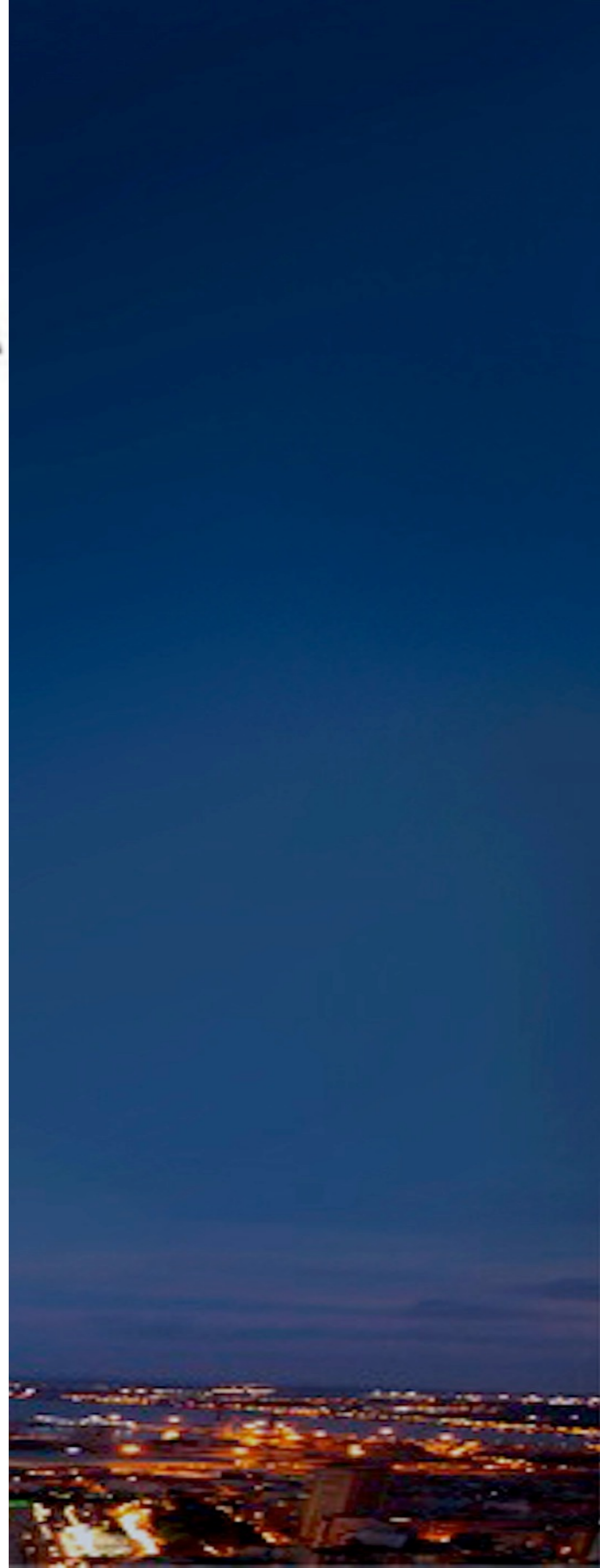
vía rápida en TH: CIRUGÍA

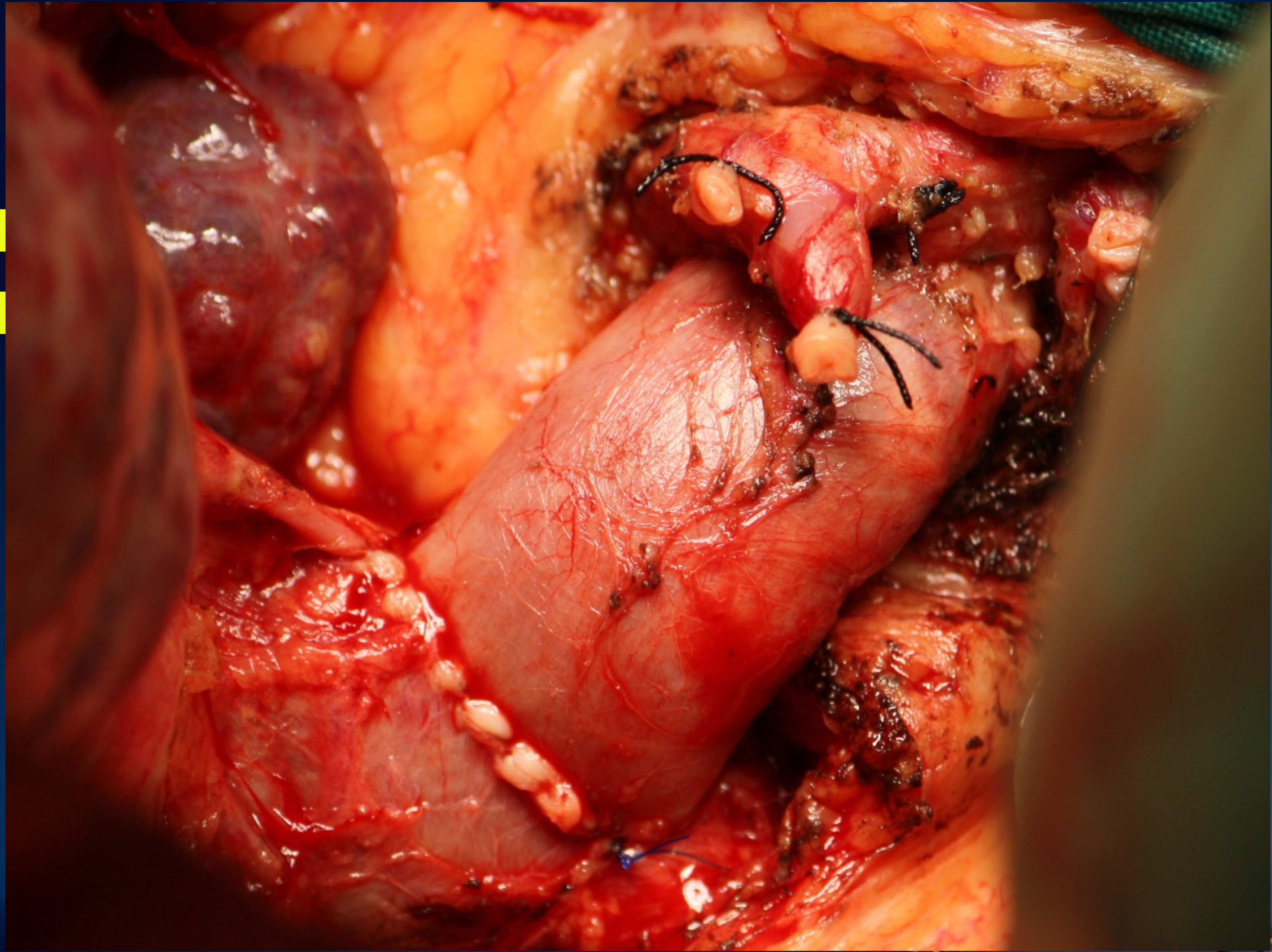






Derivación Portocava Temporal

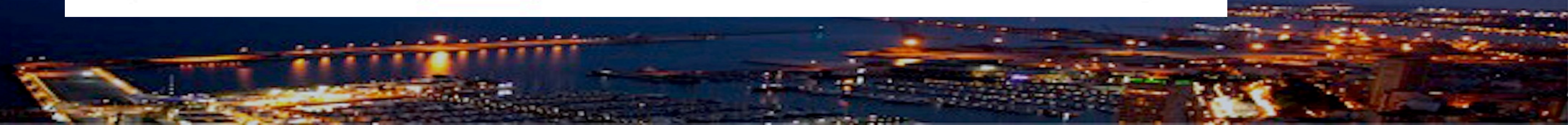
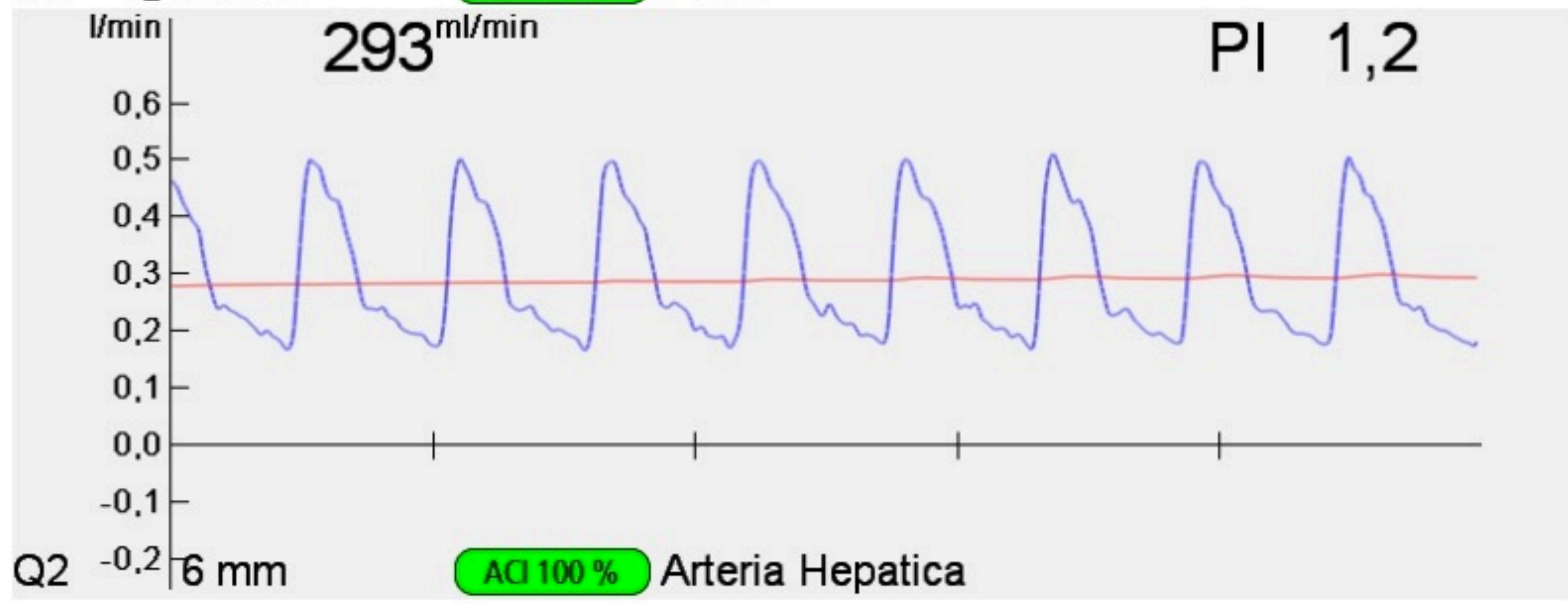
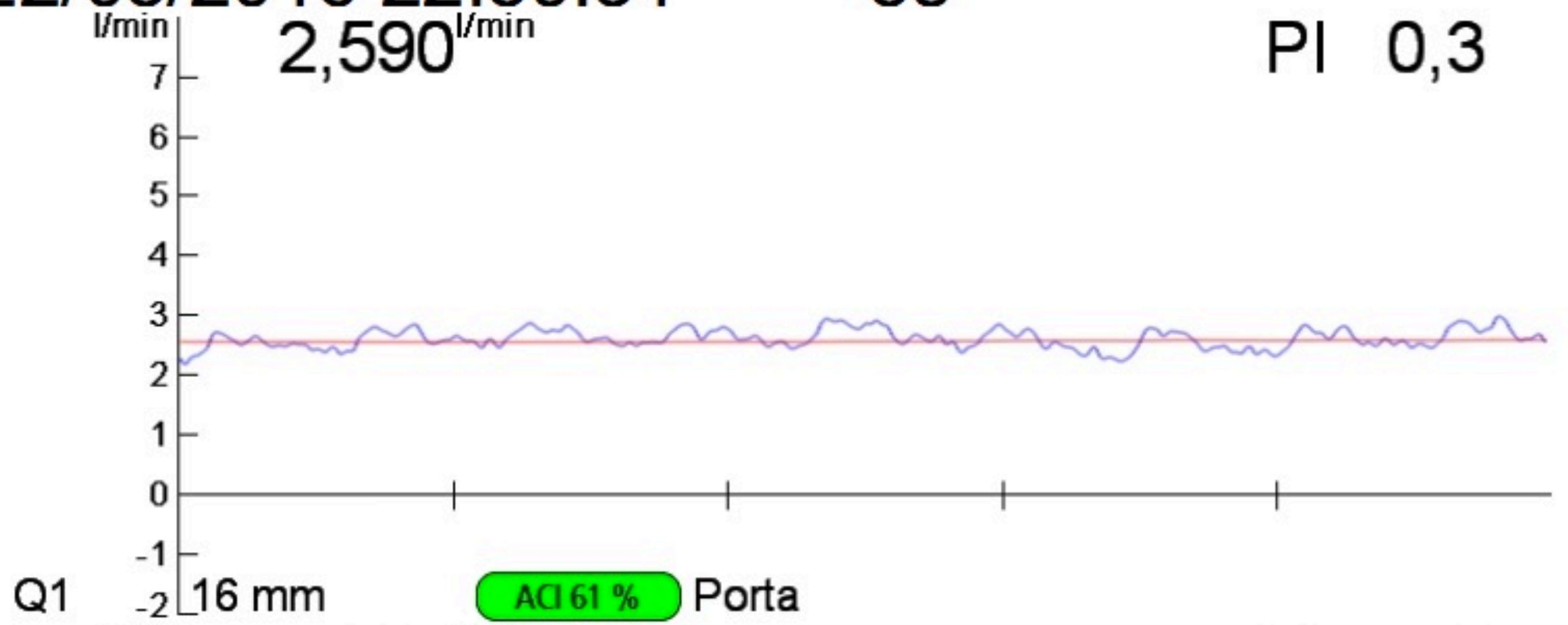




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vía rápida en TH: INMUNOSUPRESIÓN

Esteroides:

Metilprednisolona 500 mg IV tras reperusión completa (porta y arteria)

Pauta de reducción IV (4 días) y VO (9 días)

Prednisona: 10 mg/día hasta el tercer mes
5 mg/día hasta el sexto mes

Advagraf: 0,1-0,15 mg/kg/día VO

MMF: 1 g/12 hr VO (puede reducirse a demanda)

Inducción con basiliximab (Simulect) y retraso en el inicio de ICN si existe disfunción renal previa

vía rápida en TH: POSTOPERATORIO

Ingreso en UCI (Médica o Quirúrgica)

- **Control médico y enfermería 1:1**
- **Monitorización continua**
- Constantes (TA, pulso, temp, SPO₂ y diuresis, ± PAP) horarias
- Ecografía con Doppler en las primeras 12 horas
- **Retirada de apoyo vasopresor y reposición de fluidos**
- **Retirada de vías arteriales (± CSG/PAP) previo al alta a planta**
- **Inicio de dieta basal en UCI**
- Analíticas cada 5-6 horas y a demanda
- Inicio de la curva de monitorización de niveles de IS

vía rápida en TH: POSTOPERATORIO

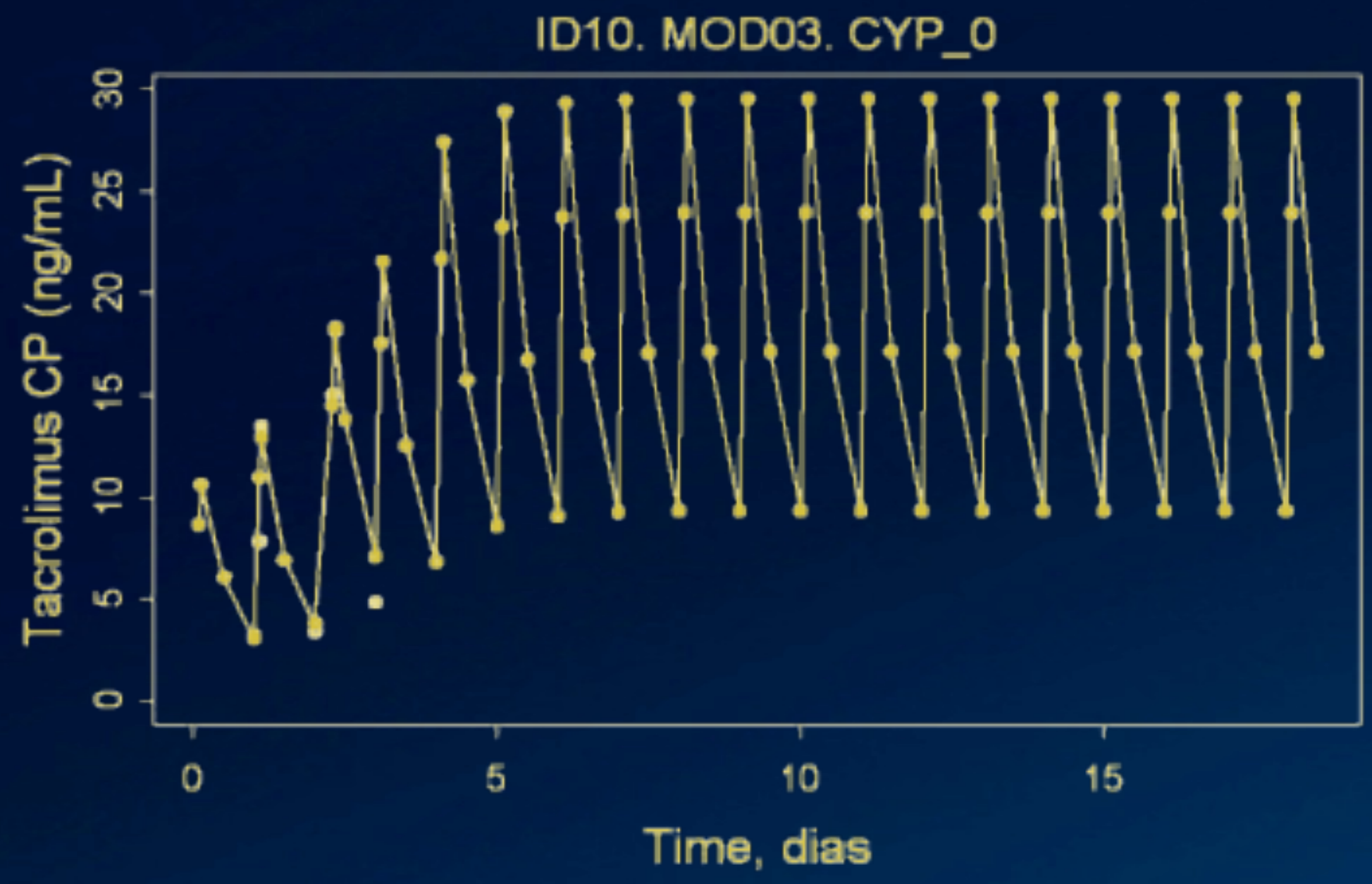
Ingreso en planta de Cirugía

- **Enfermería 1:10-12**
- **Constantes, SPO₂ y diuresis** por turno, y **peso** diario
- Control de **glucemias**
- Se retiran **fluidos** y continúa la **dieta basal**
- **Deambulaci3n inmediata** (suele ser el día del trasplante)
- **Espirometría** incentivada
- Se completa la **curva de monitorizaci3n** de niveles de IS
- **Analíticas** y monitorizaci3n de **niveles** diariamente y a demanda

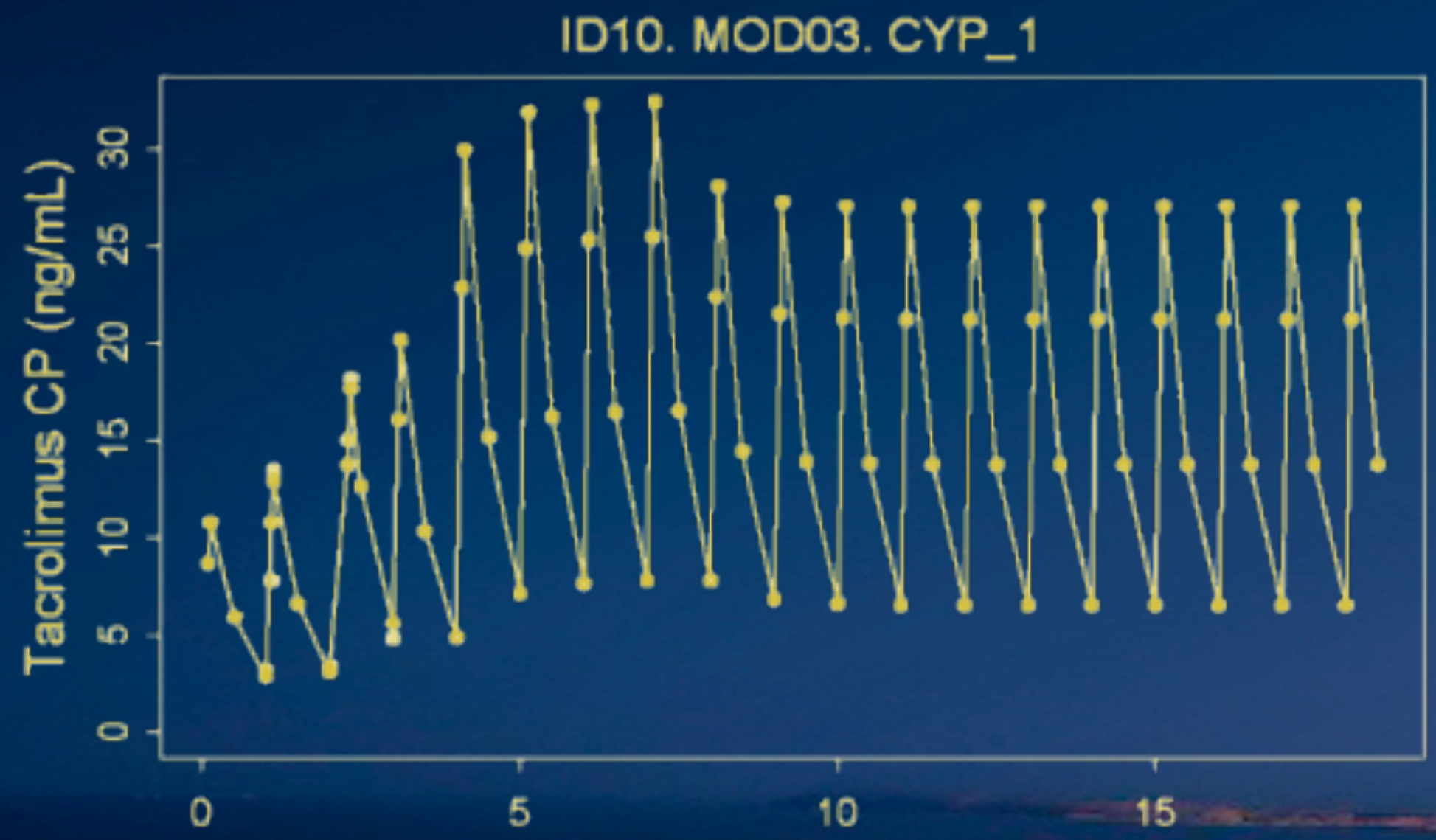


vía rápida en TH: FARMACOCINÉTICA

- **Monitorización de Niveles (tacrolimus):**
 - Curva inicial (tras la primera dosis) de 5 ó 6 puntos (T_0 , T_2 , T_3 , T_5 , T_{12} y T_{24})
 - Determinación basal diaria (valle o T_0)
 - Determinaciones adicionales a demanda
- **Metodología: estimación bayesiana** basada en parámetros individuales (absorción/metabolismo)
- Nivel diana inicial entre 7 y 10 ng/ml (ahora 6-7)



Metabolizador lento



Metabolizador rápido

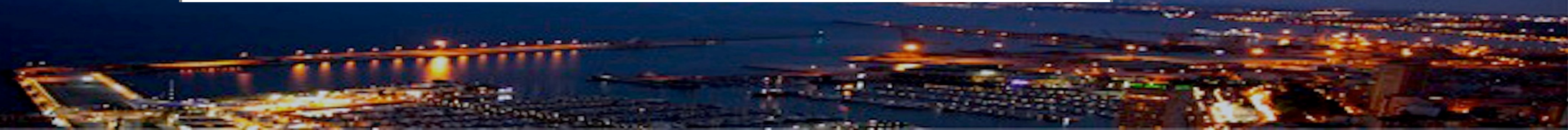
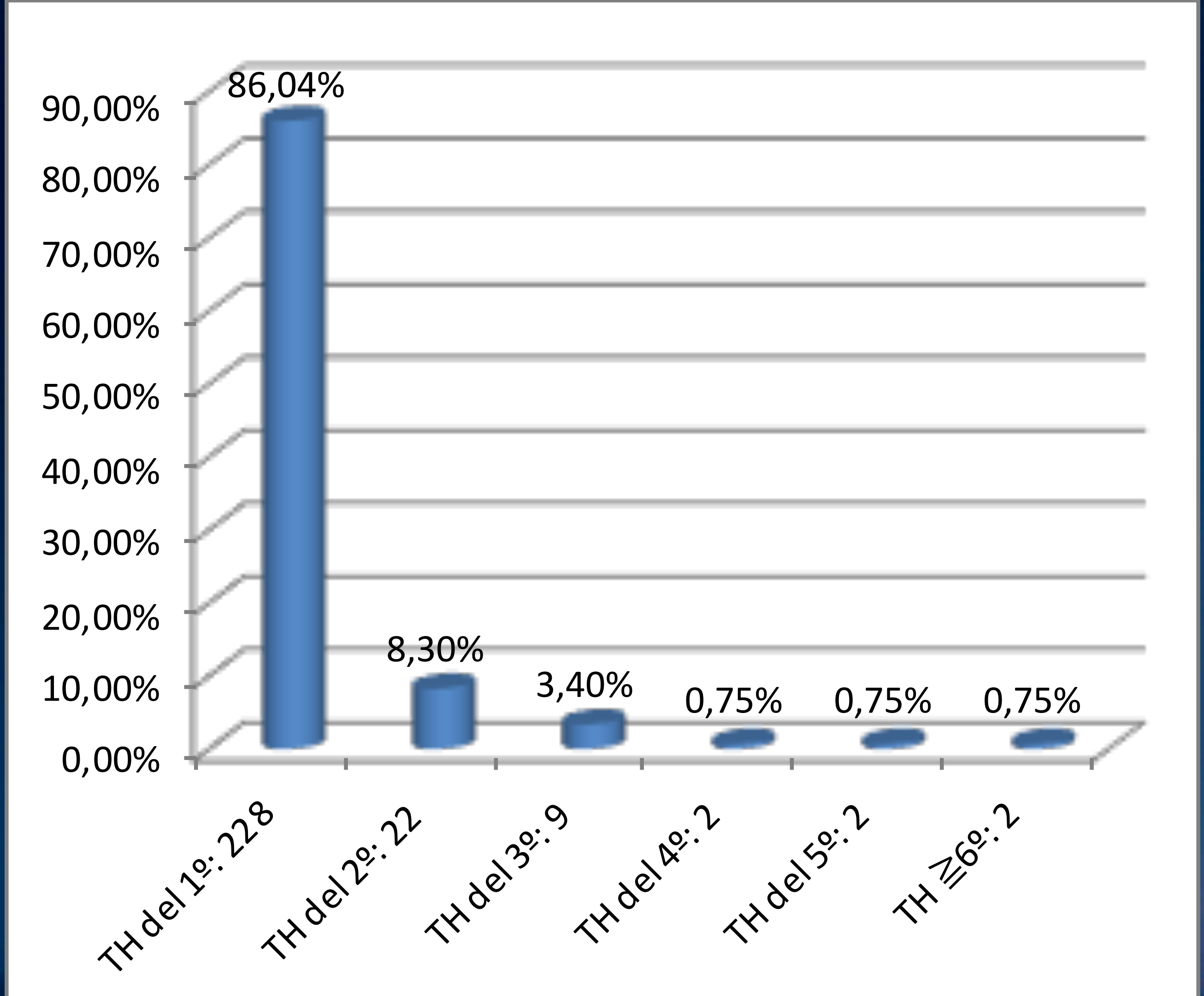


vía rápida en TH: SEGUIMIENTO

- Visitas iniciales **2 veces por semana**
- **Hepatólogos y farmacéutico** en consulta (\pm cirujano)
- Curvas de niveles de inmunosupresión y ajuste a demanda (T_0 , T_2 y T_3)
- Pruebas diagnósticas a demanda
- TACs programados para seguimiento del CHC

vía rápida en TH: RESULTADOS

- 240 trasplantes en 236 pacientes (191♂ / 45♀):
 - Mediana de edad: 57 (rango: 19-70)
 - Alcohol (136); VHC (82); VHB (14); HGNA (8); CBP (7); Polisquitosis (3)
 - CHC en 129 pacientes
 - **MELD-Na: 16,8 ± 8,1**
- Donantes:
 - Mediana de edad: 61,5 (rango: 11-90; P₂₅₋₇₅: 49-74)
 - IRD: 1,84 ± 0,42 (rango: 0,8-3,3; P₂₅₋₇₅: 1,5-2,1)



vía rápida en TH: RESULTADOS

- Isquemia fría: 279 ± 88 min (rango: 130-628)
- Tiempo quirúrgico: $315 \pm 63,5$ min (rango: 167-546)

- **Transfusiones:**

Heterólogas (banco): **31 casos (13%) con 2,4 U/caso**

Autólogas (recuperador): **97 casos (40,4%)**

media de 586 ml/caso

rango: 50-2000; P25-75: 250-775

HAP: 301 U en 163 pacientes (1,85 U/pac)

57 litros

vía rápida en TH: RESULTADOS

Todos los pacientes son extubados en quirófano excepto 4:

- 1 por fallo primario del injerto
- 2 por encefalopatía secundaria a hepatitis fulminante
- 1 obeso (IMC: 39,2) sin criterios de extubación: extubado en UCI tras 2 hr y 45 min

Tiempo máximo hasta **extubación: 30 min**



vía rápida en TH: RESULTADOS

Estancia hospitalaria postrasplante:

- **Mediana UCI: 12,7 horas** (rango: 3,7-799; P₂₅₋₇₅: 9,5-27,2)
- **Mediana Hosp: 4 días** (rango: 2-76; P₂₅₋₇₅: 3-7)
- ≤ 4 días: 133 pacientes **(61%)**

Reingresos (30 días):

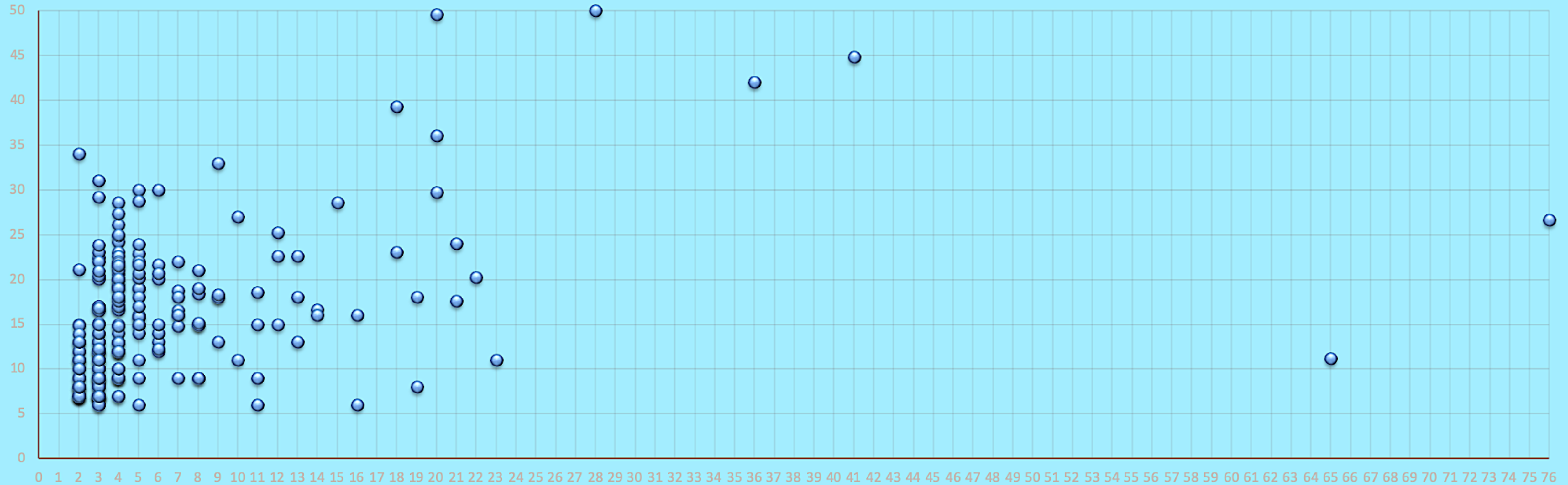
- 76 pacientes (34,9%)
- 38 del grupo de Alta Precoz (**28,6%** frente a **44,7%**; **p=0,015**)
- Estancia media del 1er ingreso (<30d): 6 días

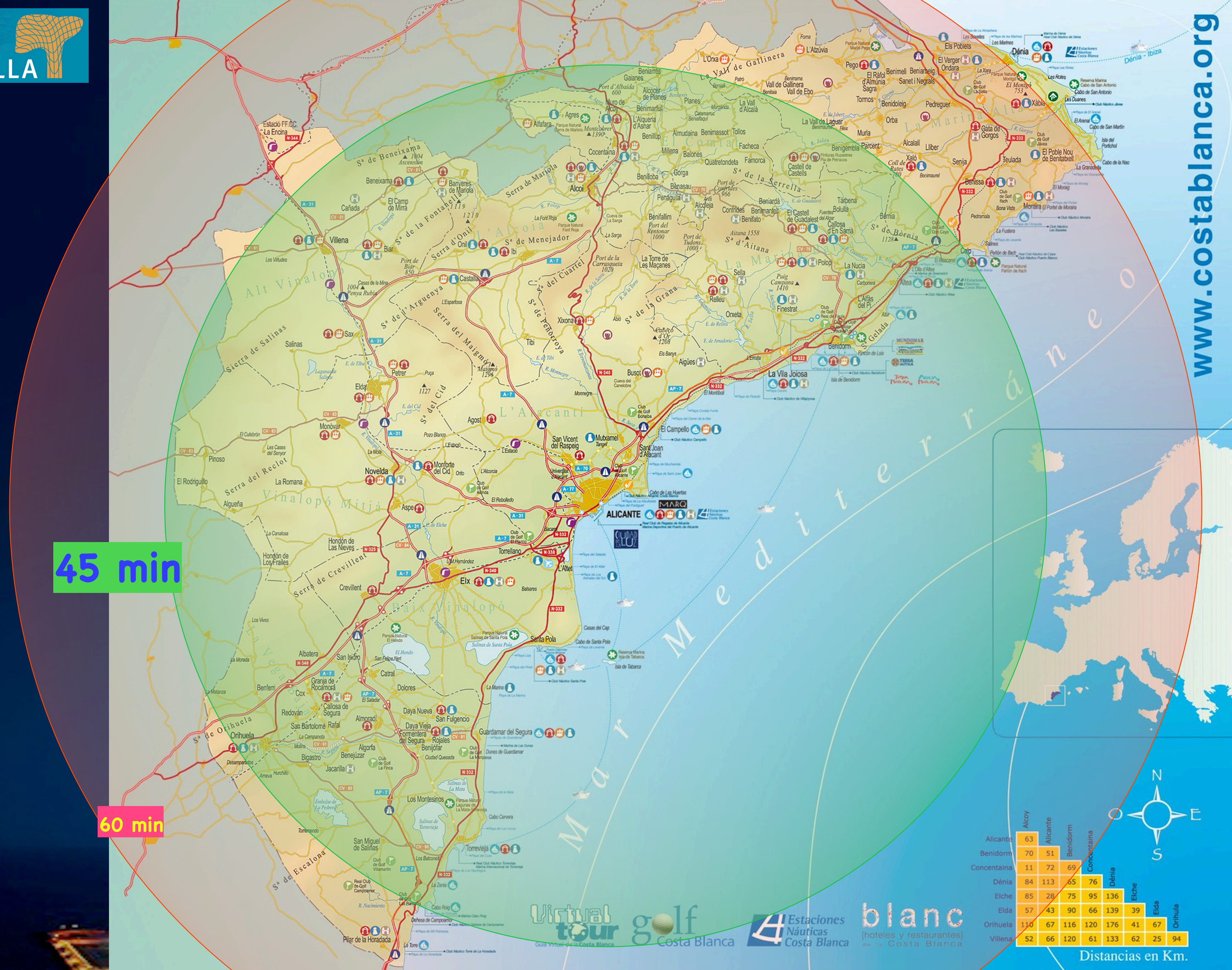
vía rápida en TH: RESULTADOS

| | | |
|--|---|--|
| | | Reingreso 30d: 76 (34,9 %) |
| Vol, total recuperado: 56826 ml (97 casos) | | Estancia media del 1er reingreso ($\leq 30d$): 6,0 días |
| HAP: 301 U en 163 pacientes (1,85 U/pac) | | |
| Nº total de CH usados: 74 | | |
| Total de pacientes transfundidos: 31 (13,14%) | | |
| Altas tras TH: 218 | Estancia = 2 días: 30 (13,76 %) | Reingresos (30d) para el grupo de estancia $\leq 4d$: 38 (28,6 % de 133) |
| | Estancia ≤ 3 días: 87 (39,91 %) | |
| | Estancia ≤ 4 días: 133 (61,01 %) | |
| | Estancia ≤ 5 días: 154 (70,64 %) | |



Estancia hospitalaria por MELD-Na





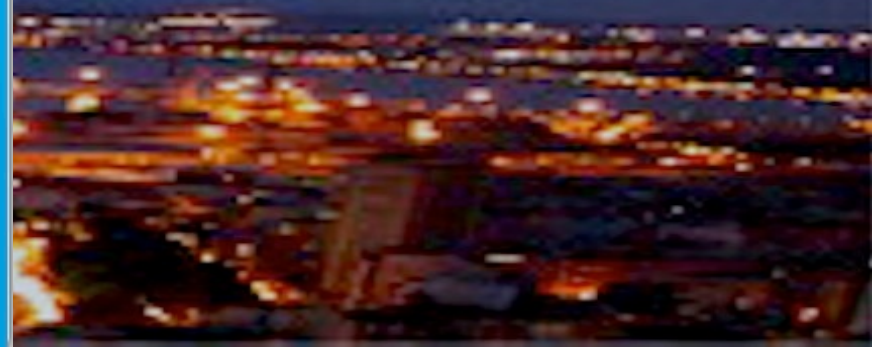
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|------------|-------|----------|----------|------------|-------|-------|------|----------|
| | Alcoy | Alicante | Benidorm | Concepción | Dénia | Elche | Elda | Orihuela |
| Alicante | 63 | | | | | | | |
| Benidorm | 70 | 51 | | | | | | |
| Concepción | 11 | 72 | 69 | | | | | |
| Dénia | 84 | 113 | 65 | 76 | | | | |
| Elche | 85 | 28 | 75 | 95 | 136 | | | |
| Elda | 57 | 43 | 90 | 66 | 139 | 39 | | |
| Orihuela | 110 | 67 | 116 | 120 | 176 | 41 | 67 | |
| Villena | 52 | 66 | 120 | 61 | 133 | 62 | 25 | 94 |

Distancias en Km.



vía rápida en TH: CONCLUSIONES

- La vía rápida en trasplante hepático es factible, especialmente al iniciar un programa
- Es fundamental la participación coordinada de todos los servicios implicados
- El MELD-Na no es un indicador de la duración del ingreso
- Se produce un ahorro considerable de recursos
- Puede ayudar a disminuir la morbilidad

Vía rápida...
¿para todos?

Si



vía rápida en TH: PARA TODOS

- La vía rápida puede aplicarse a todos los pacientes
- Es un plan de tratamiento estructurado, pero no exclusivo para ningún “tipo” de pacientes
- No existe un problema adicional si el paciente cambia “de carril” y pasa a la vía “normal”
- Es mucho más fácil de seguir si se establece como la práctica habitual



COORDINADORES

HEPATÓLOGOS

PSIQUIATRAS

CIRUJANOS

FARMACÉUTICOS

ANATOMOPATÓLOGOS

ENFERMERIA AUXILIARES

ANESTESISTAS

INTENSIVISTAS

PSICÓLOGOS

INFECTÓLOGOS



muchas gracias

