



# ANASTOMOSIS VASCULARES Y SUS COMPLICACIONES

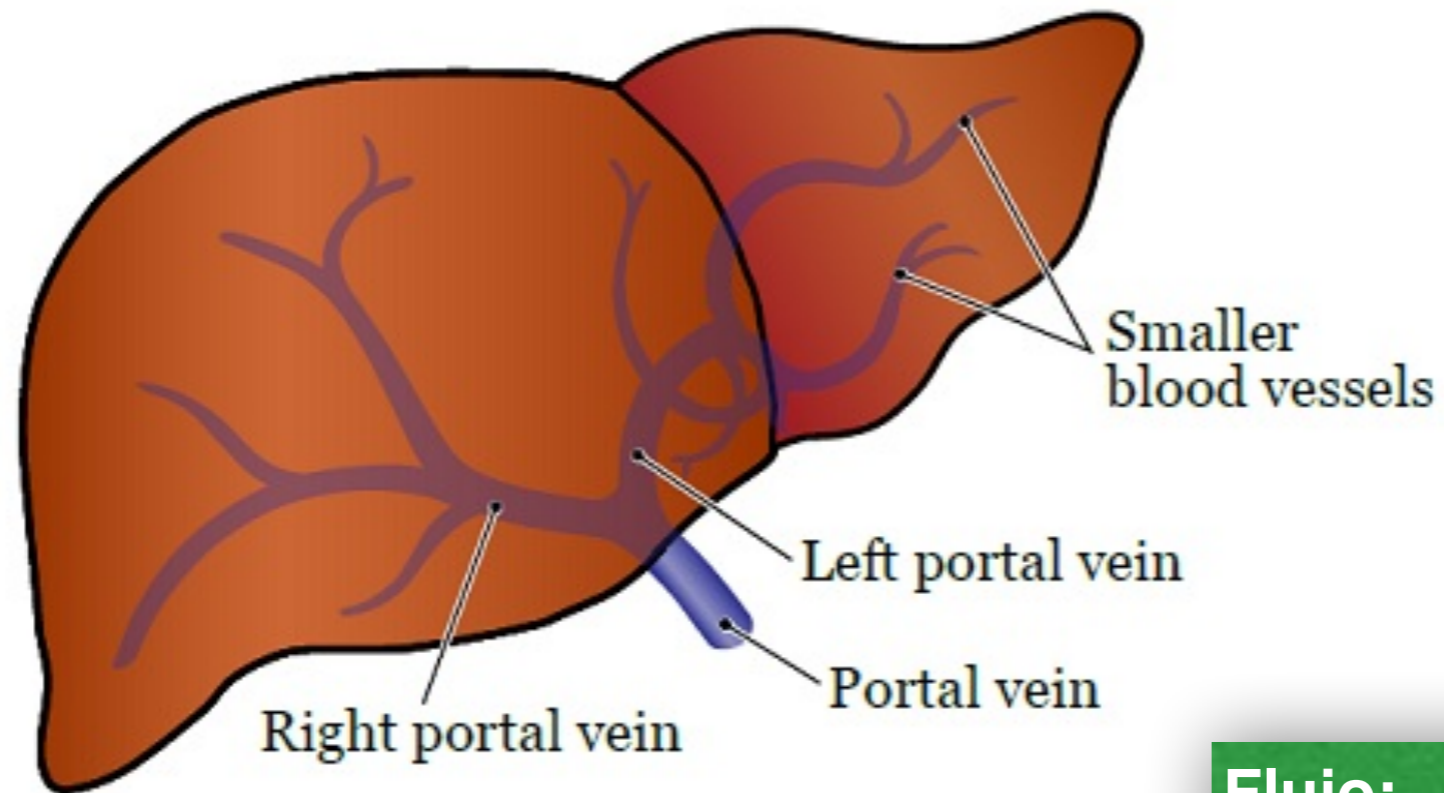
## Anastomosis venosas

**José María Álamo**  
**Hospital Virgen del Rocío**  
**Sevilla**



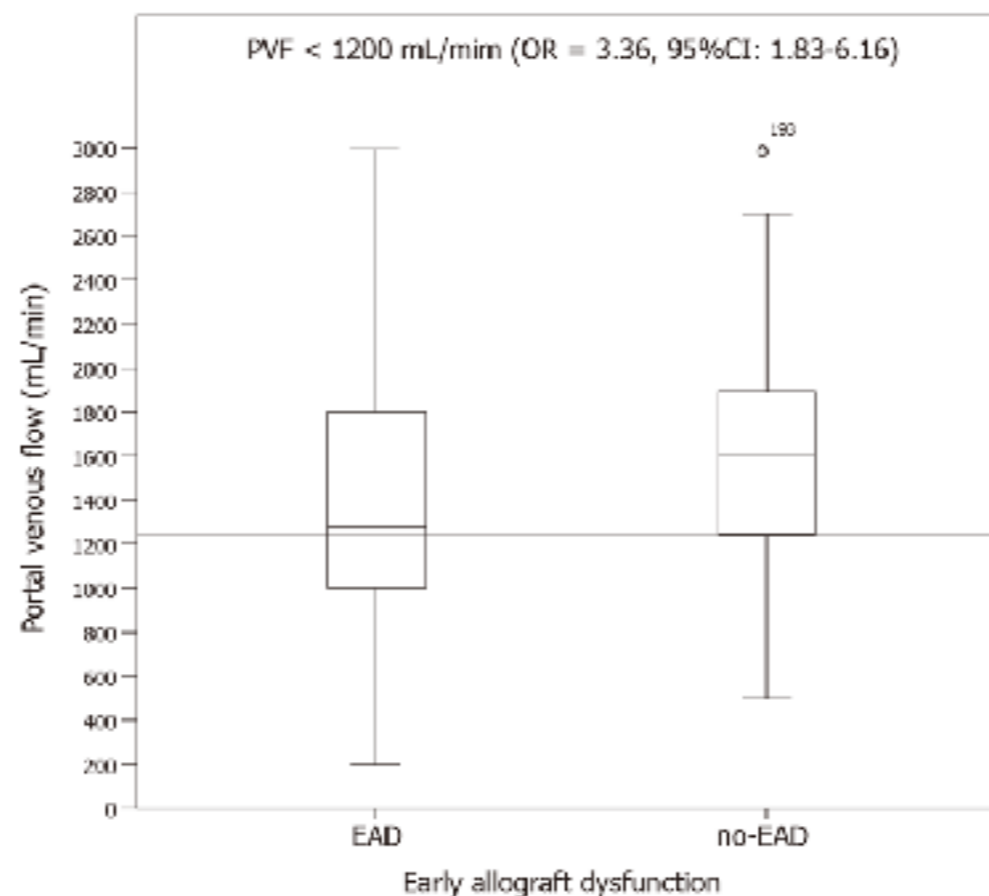
# Revascularización portal

# Flujo portal

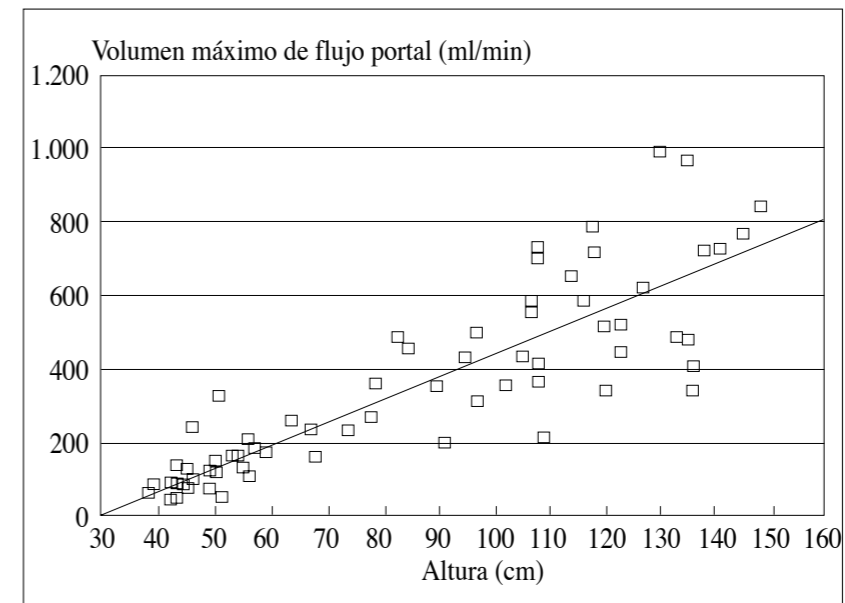
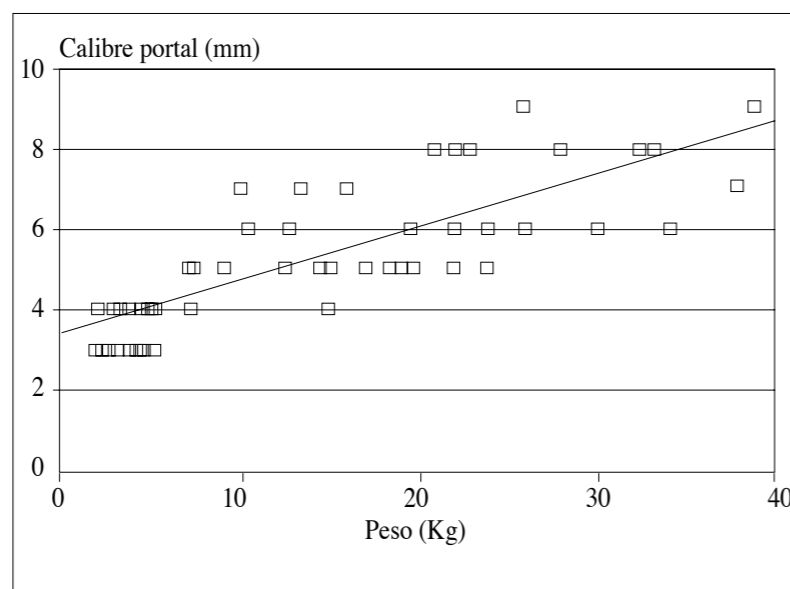


**Flujo:**  
**1200-1500 cc/min**  
**20,22 cc/kg/min**

# Flujo portal



Lozano P, World J Hepatol 2019





## Shunt espleno-renal

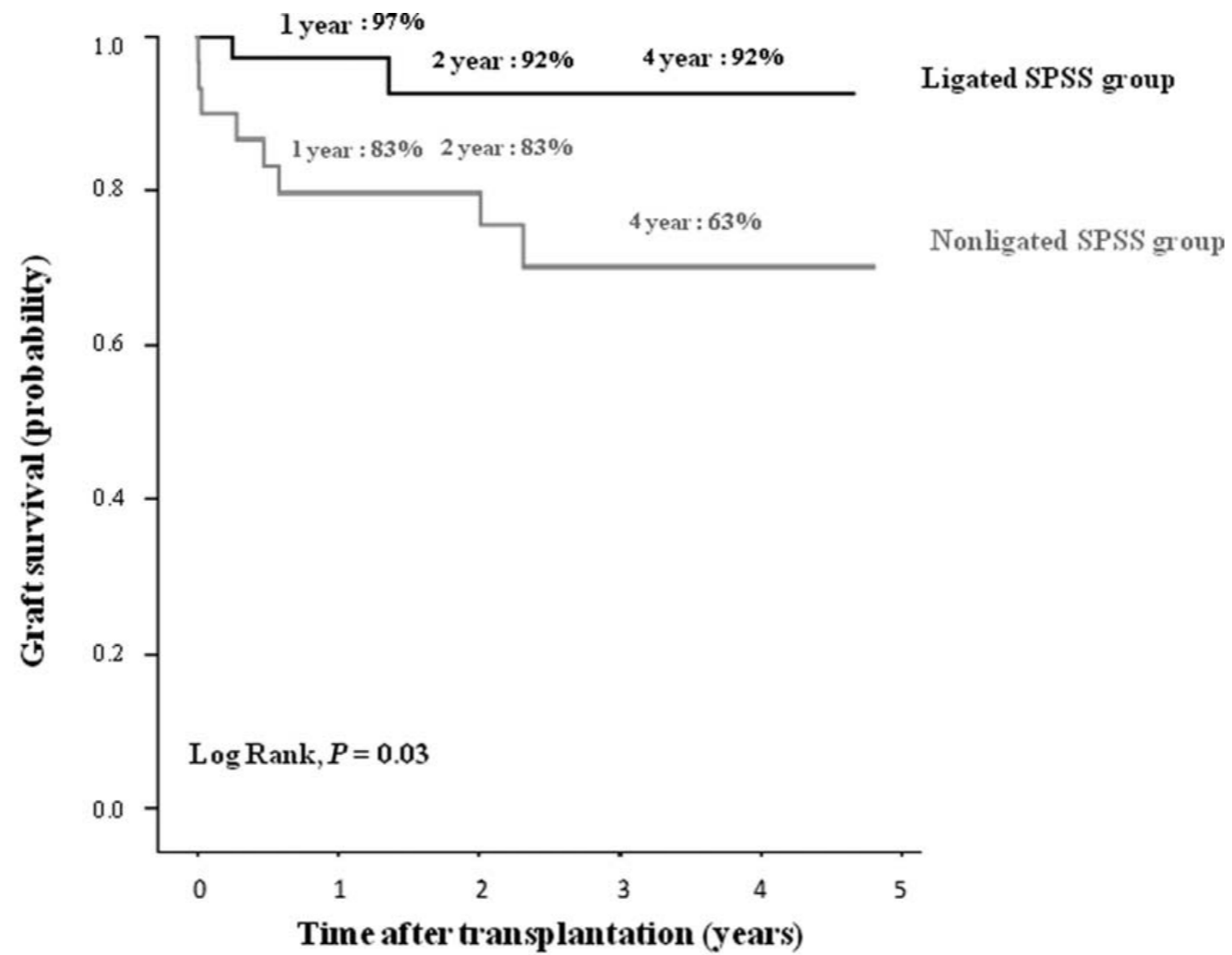


No PVT

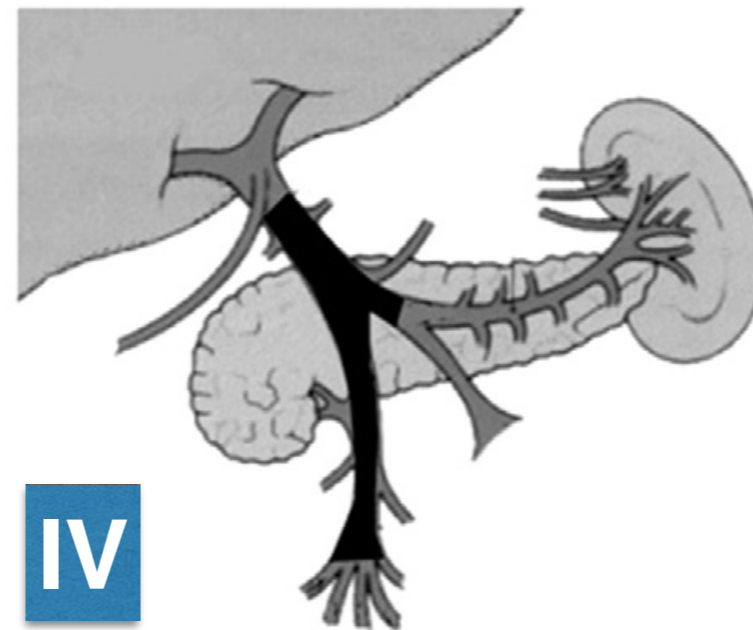
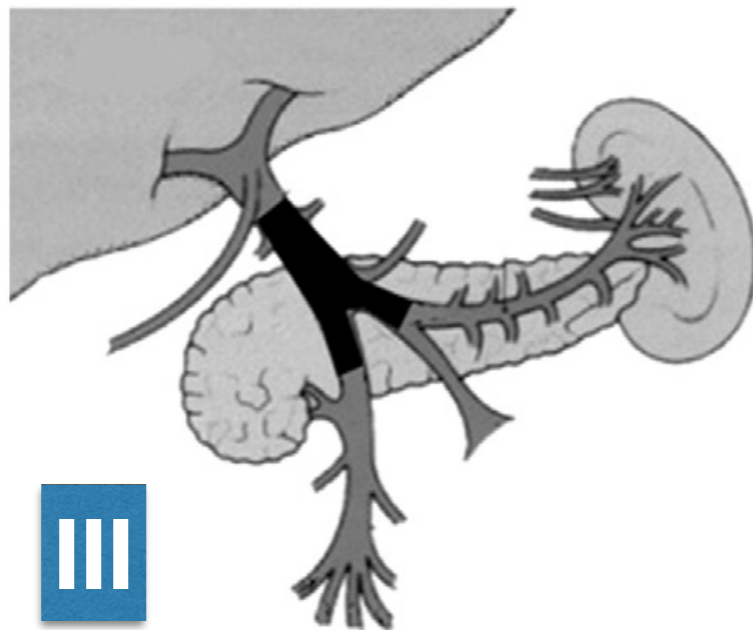
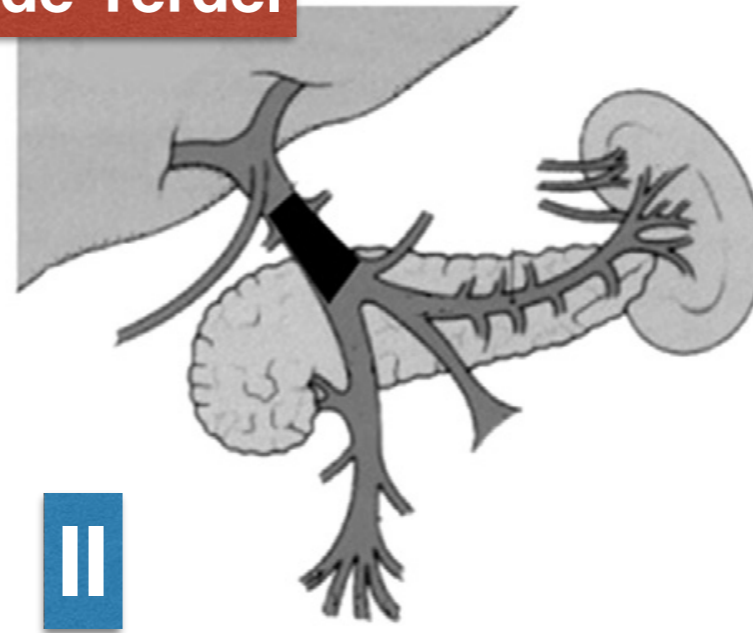
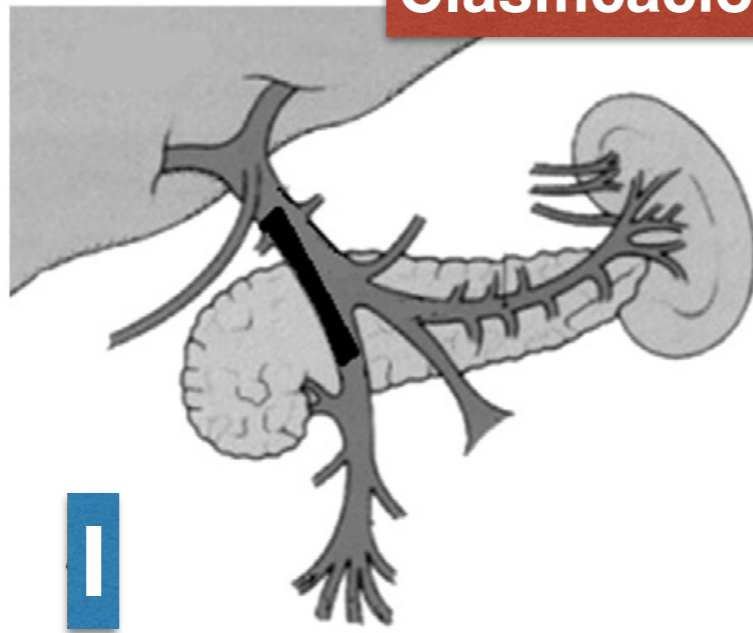


Ligadura calibrada de VRI

# Shunt patente



## Clasificación de Yerdel



# Trombosis portal

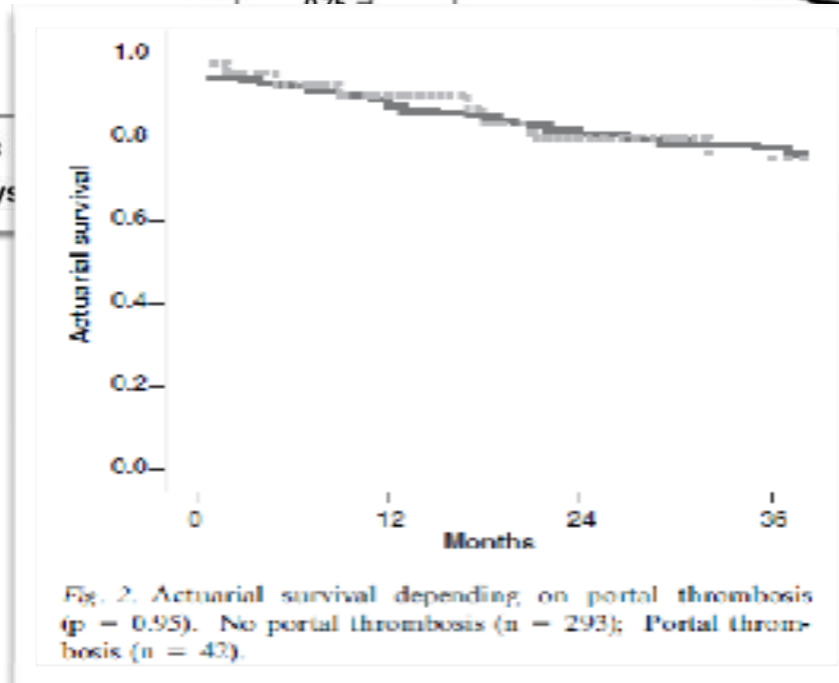
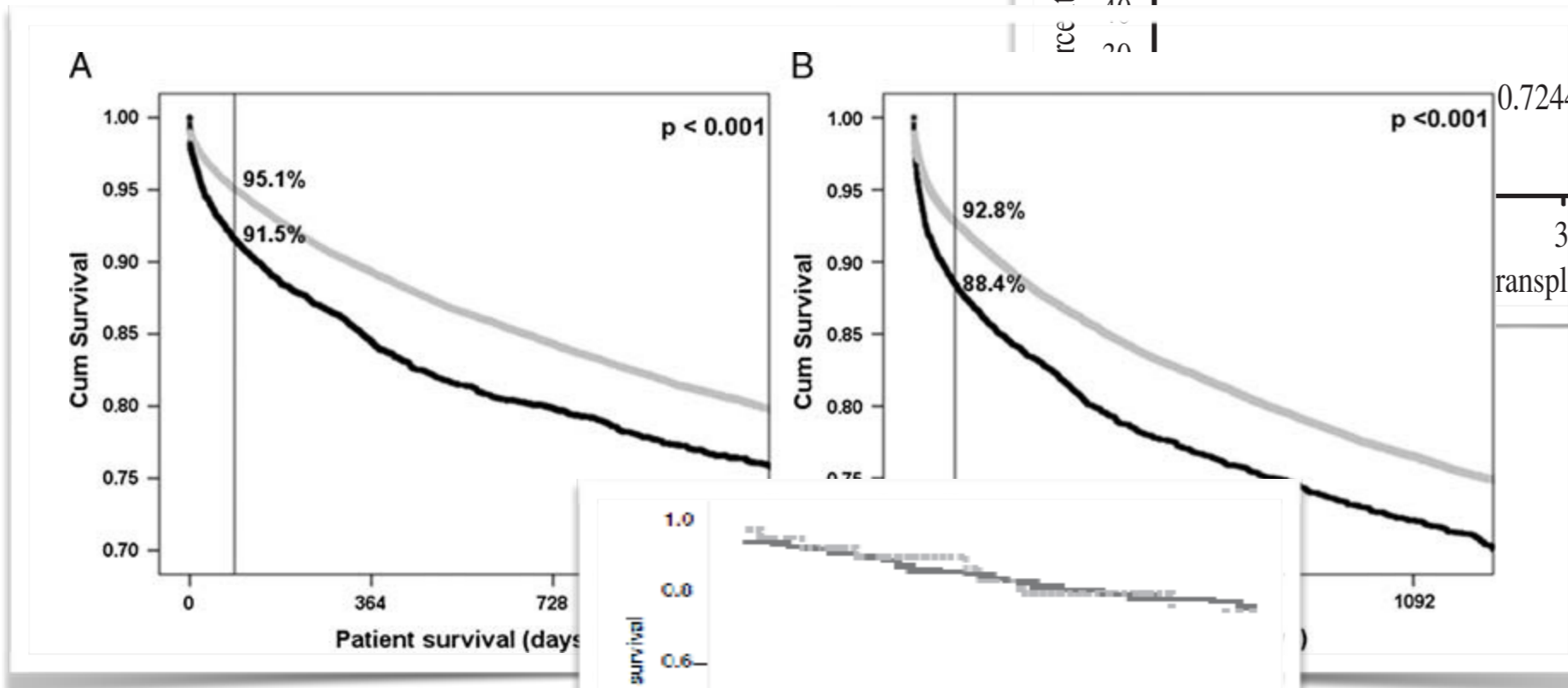
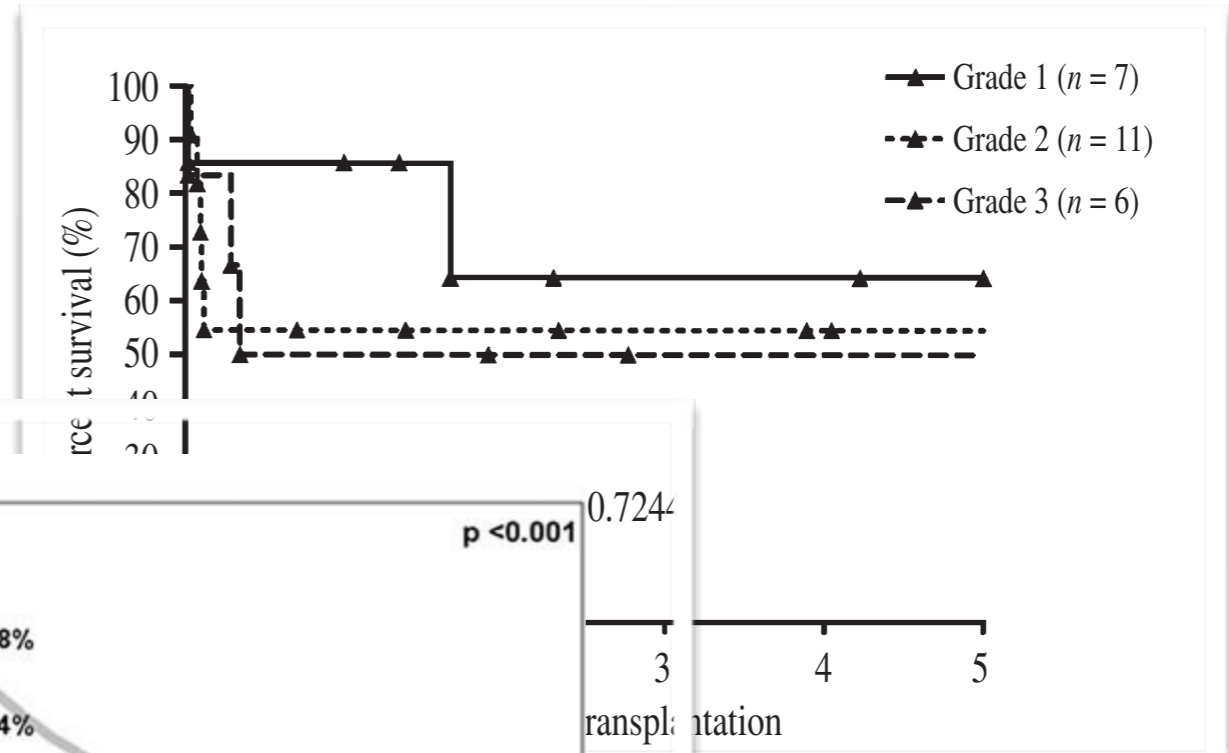
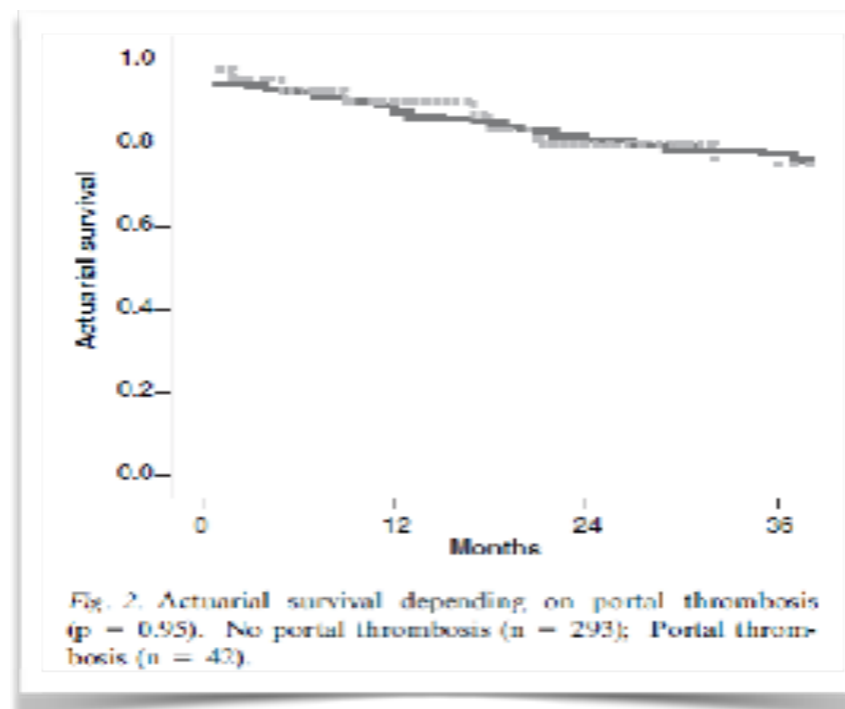


Fig. 2. Actuarial survival depending on portal thrombosis ( $p = 0.95$ ). No portal thrombosis (n = 293); Portal thrombosis (n = 43).



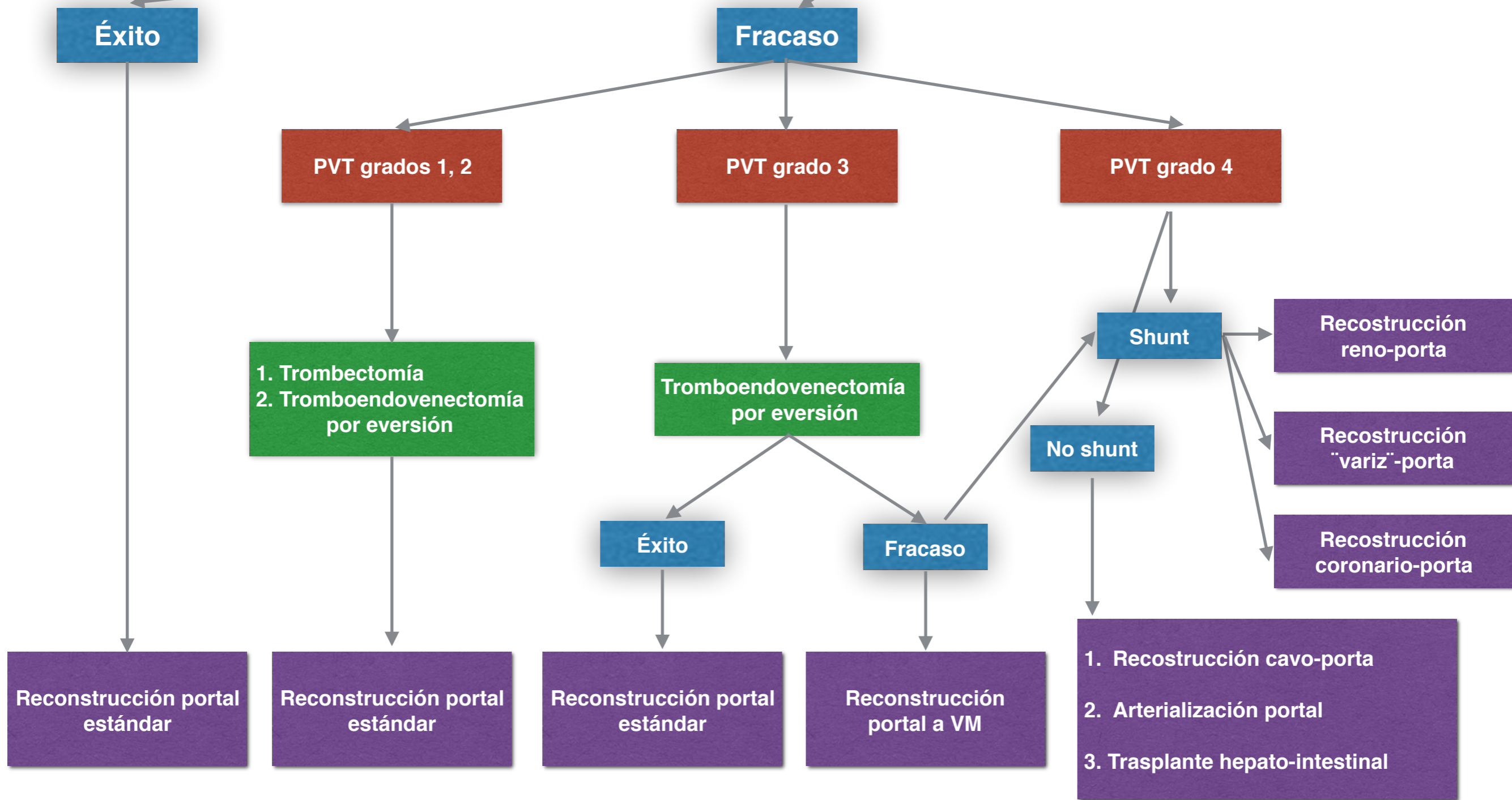
# Trombosis portal

1. Selección pacientes
2. Selección técnica quirúrgica



**Prevención de PVT**

1. Screening radiológico periódico
2. Anticoagulación, TIPS si fracaso o contraindicación



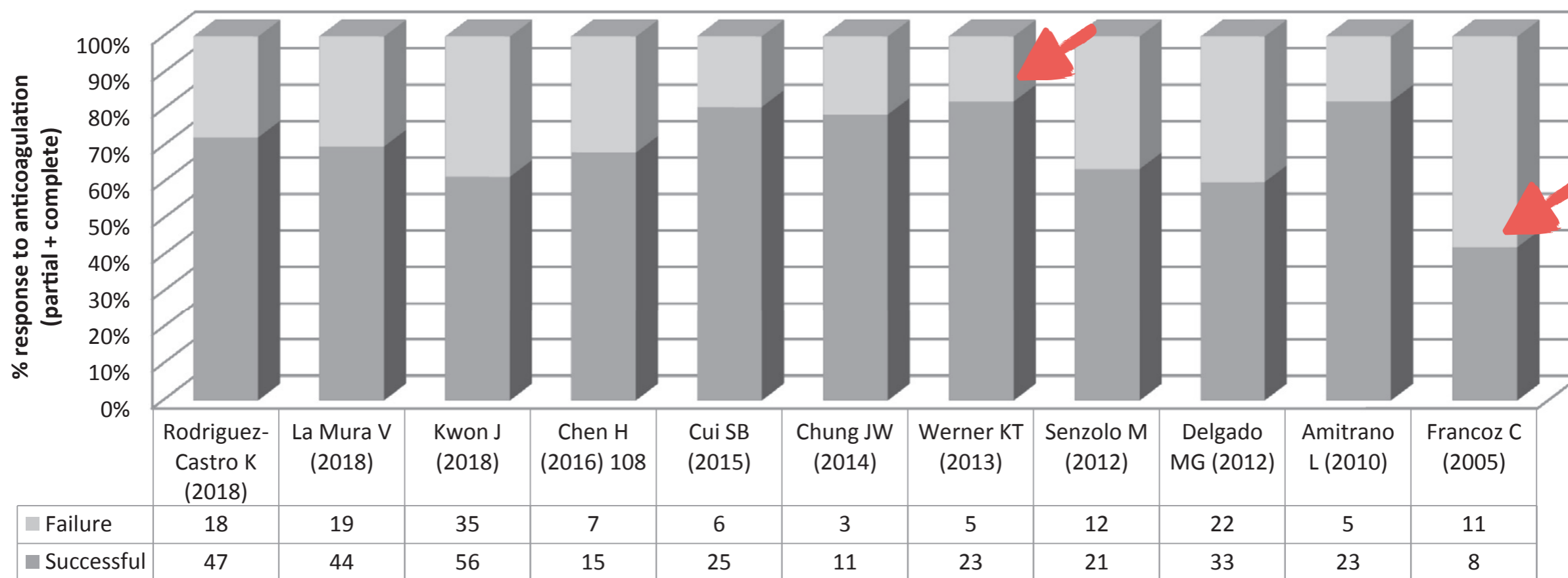


## REVIEWS IN BASIC AND CLINICAL GASTROENTEROLOGY AND HEPATOLOGY

Douglas J. Robertson and Vincent W. Yang, Section Editors

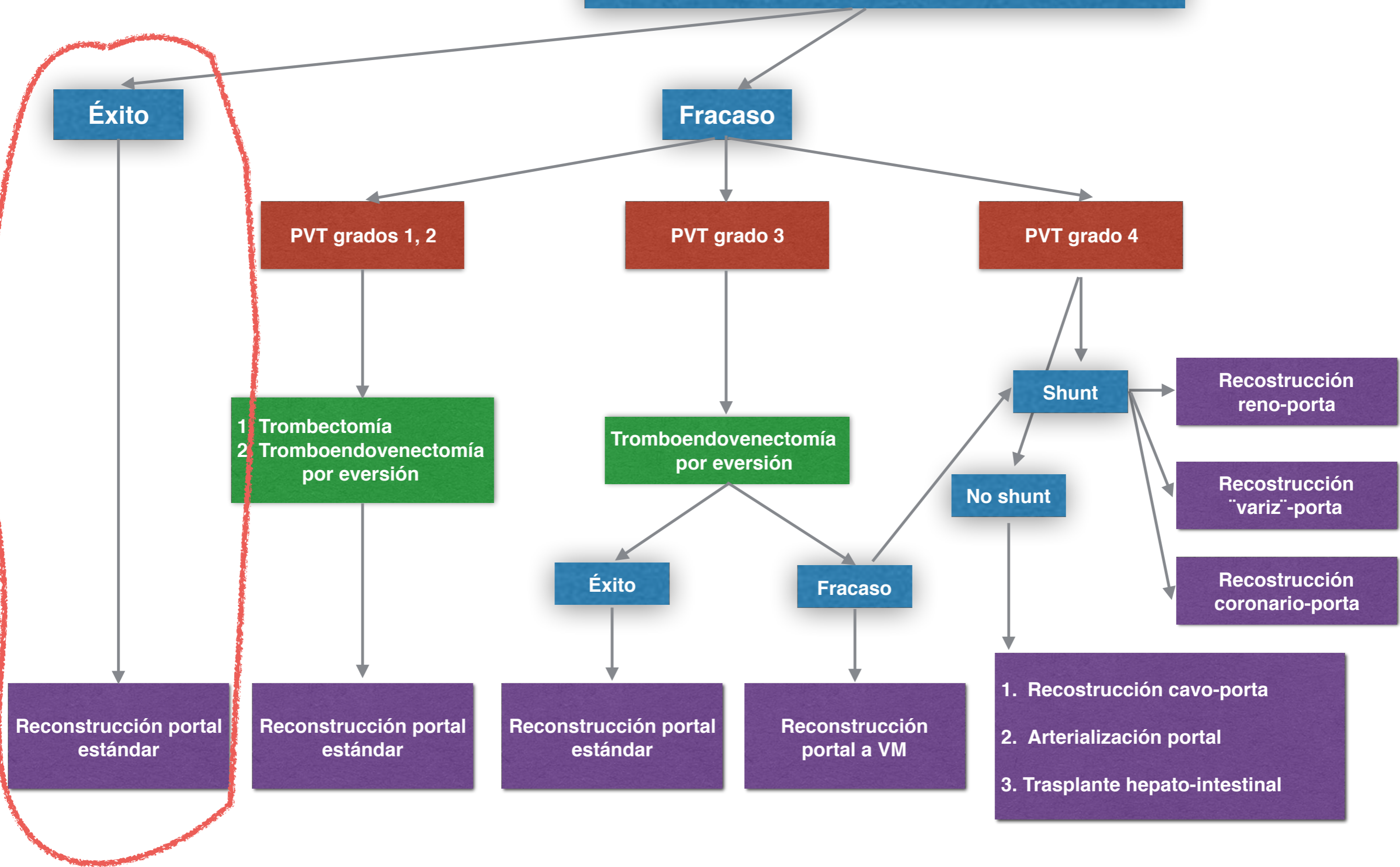
### Diagnosis, Development, and Treatment of Portal Vein Thrombosis in Patients With and Without Cirrhosis

Nicolas M. Intagliata,<sup>1</sup> Stephen H. Caldwell,<sup>1</sup> and Armando Tripodi<sup>2</sup>



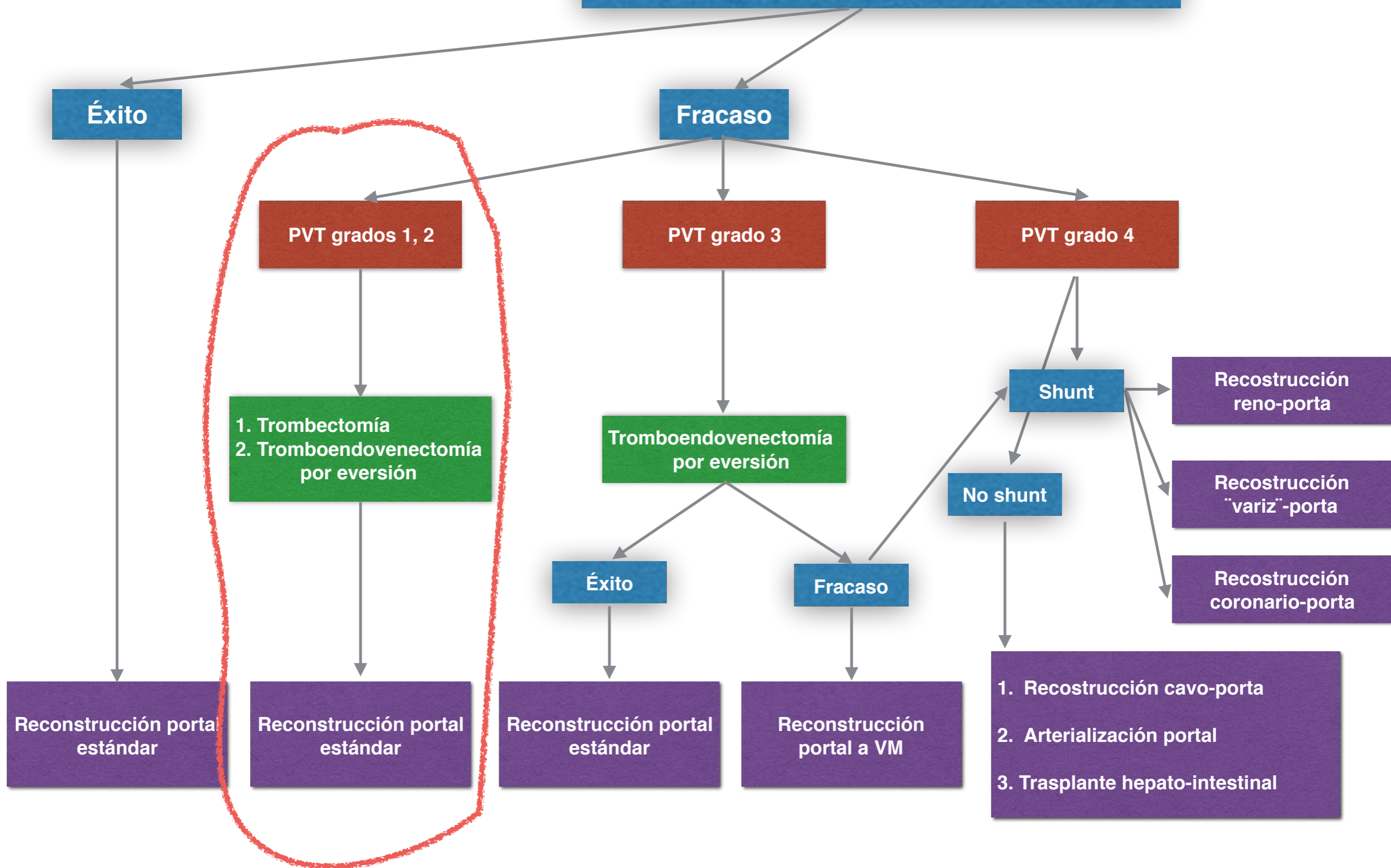
**Prevención de PVT**

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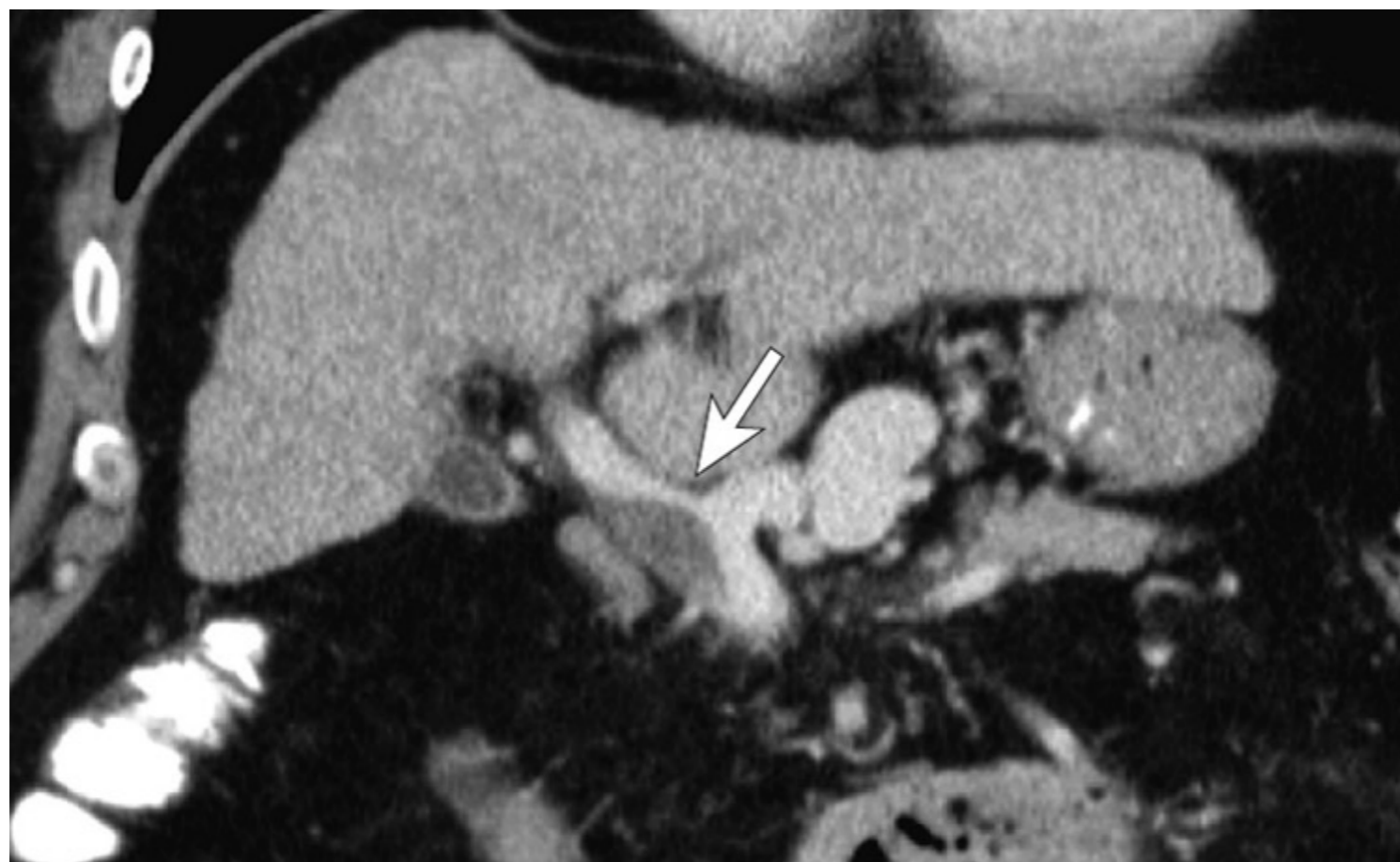
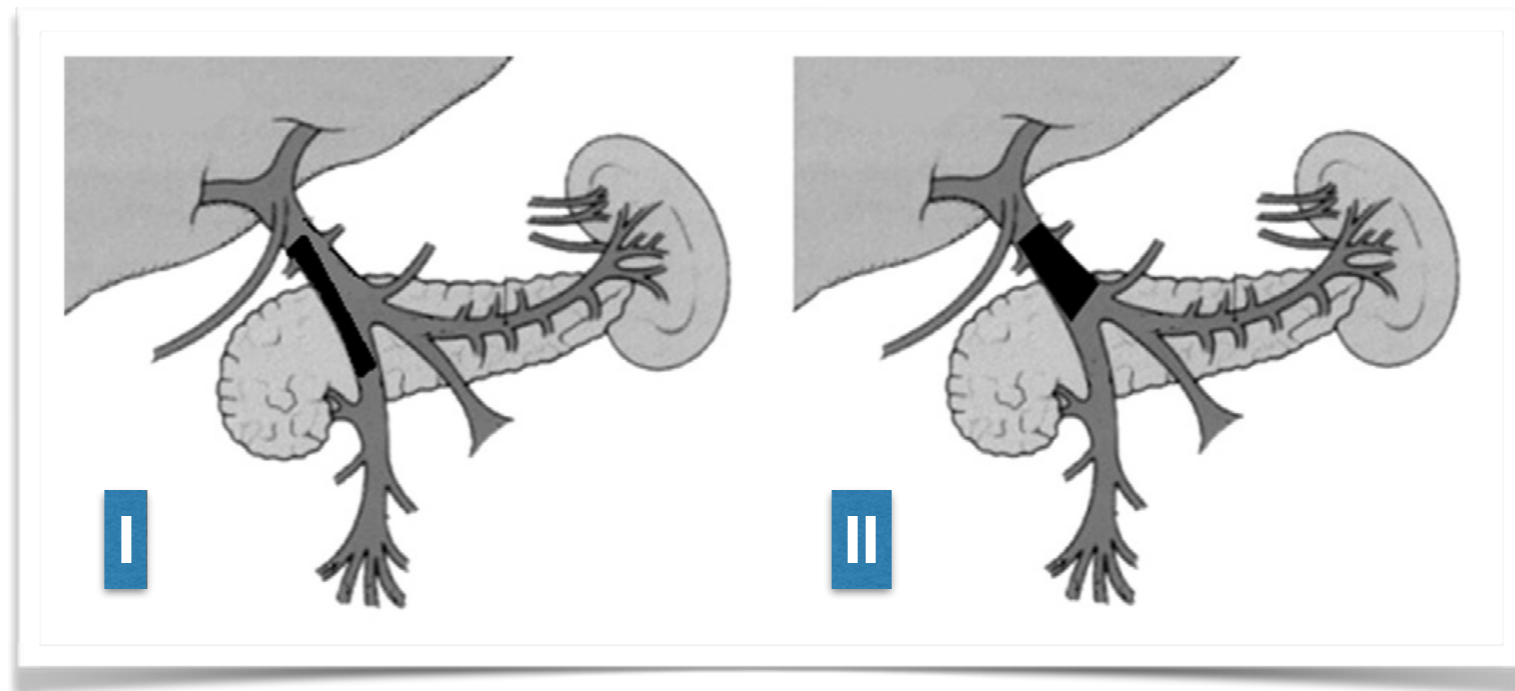


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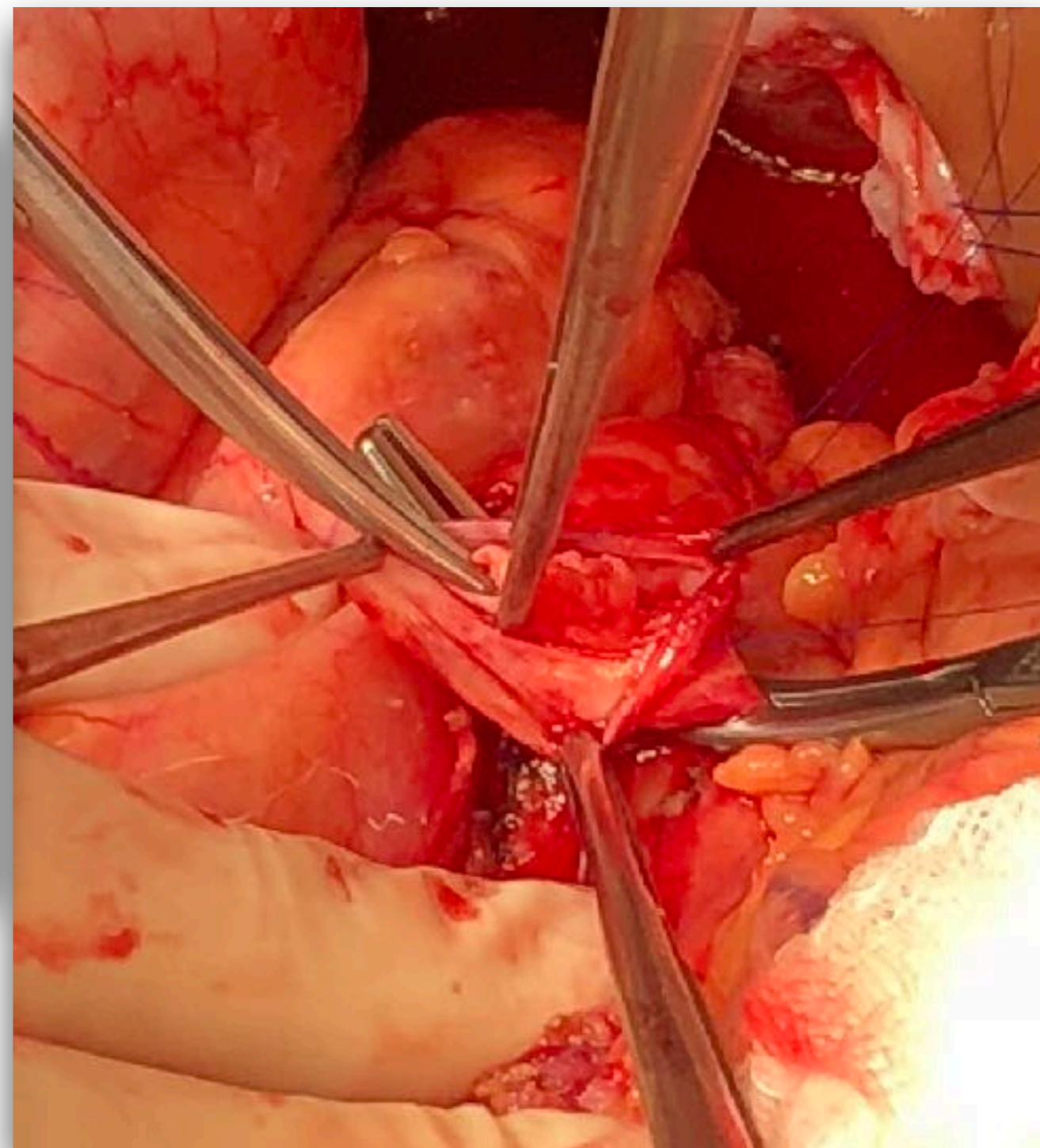
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2. Anticoagulación, TIPS si fracaso o contraindicación







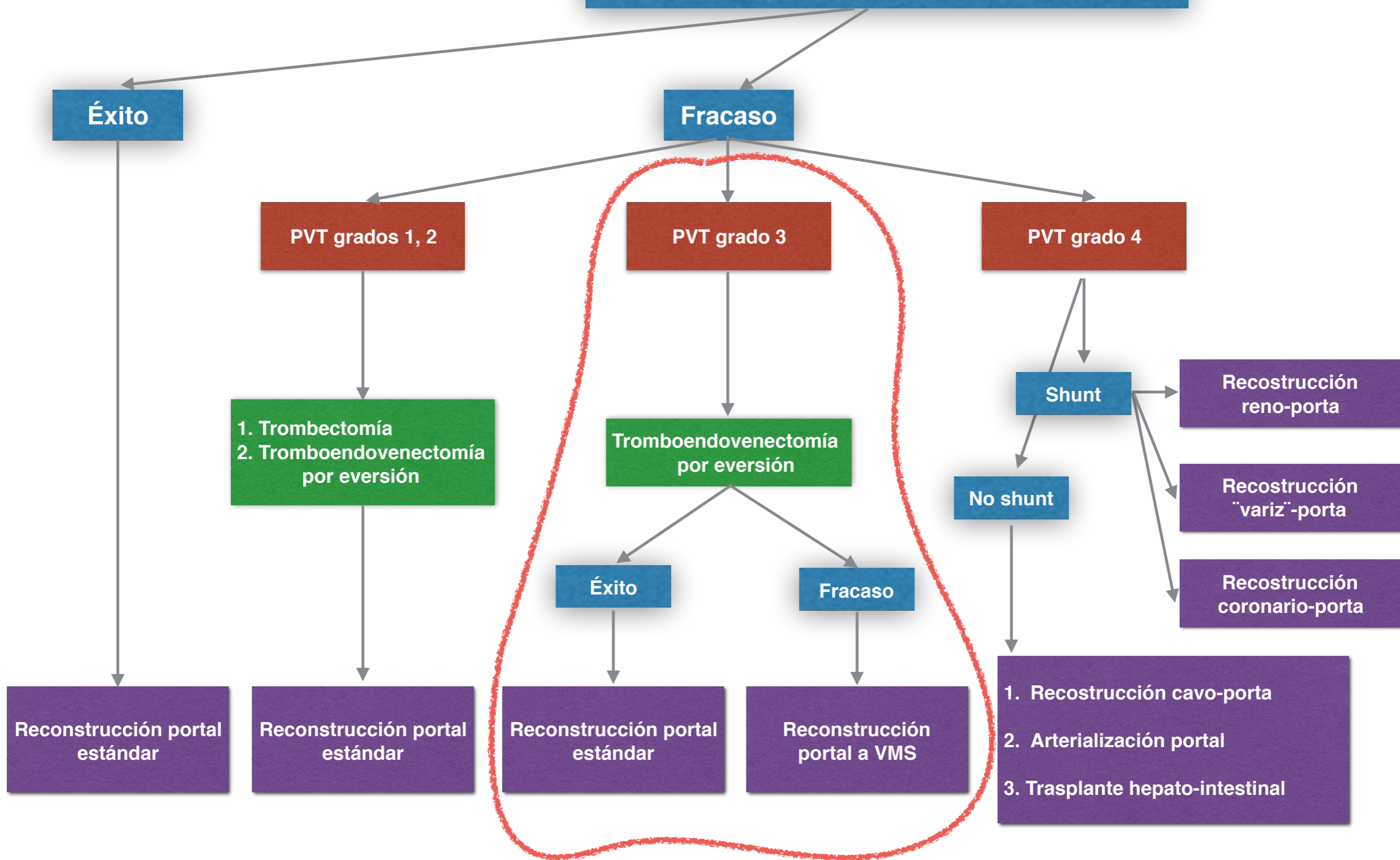
# Trombectomía



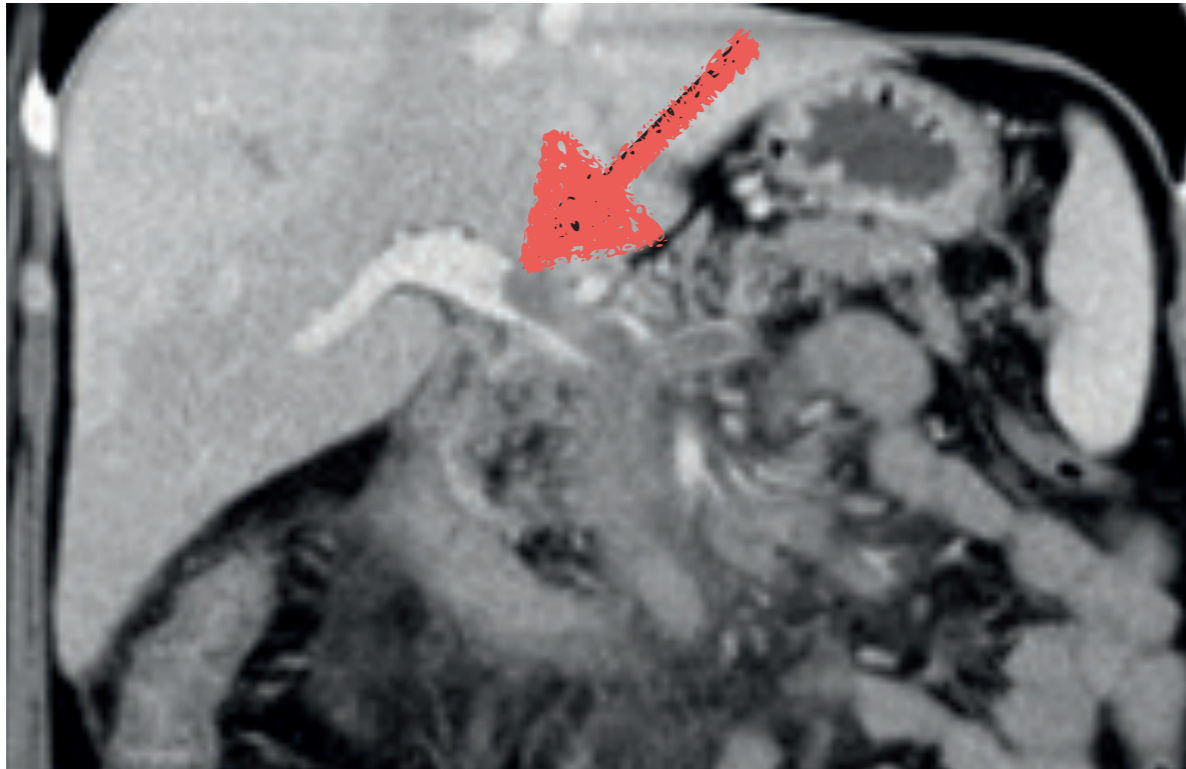
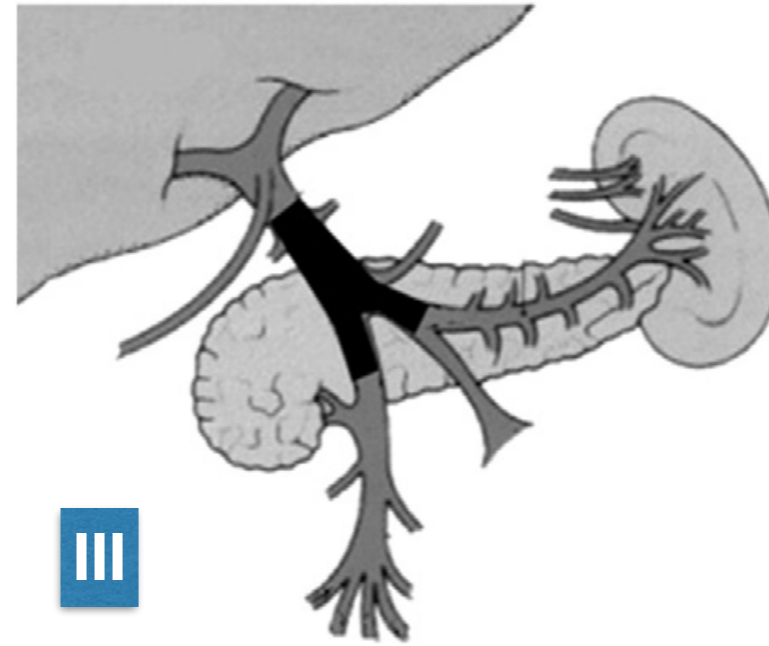


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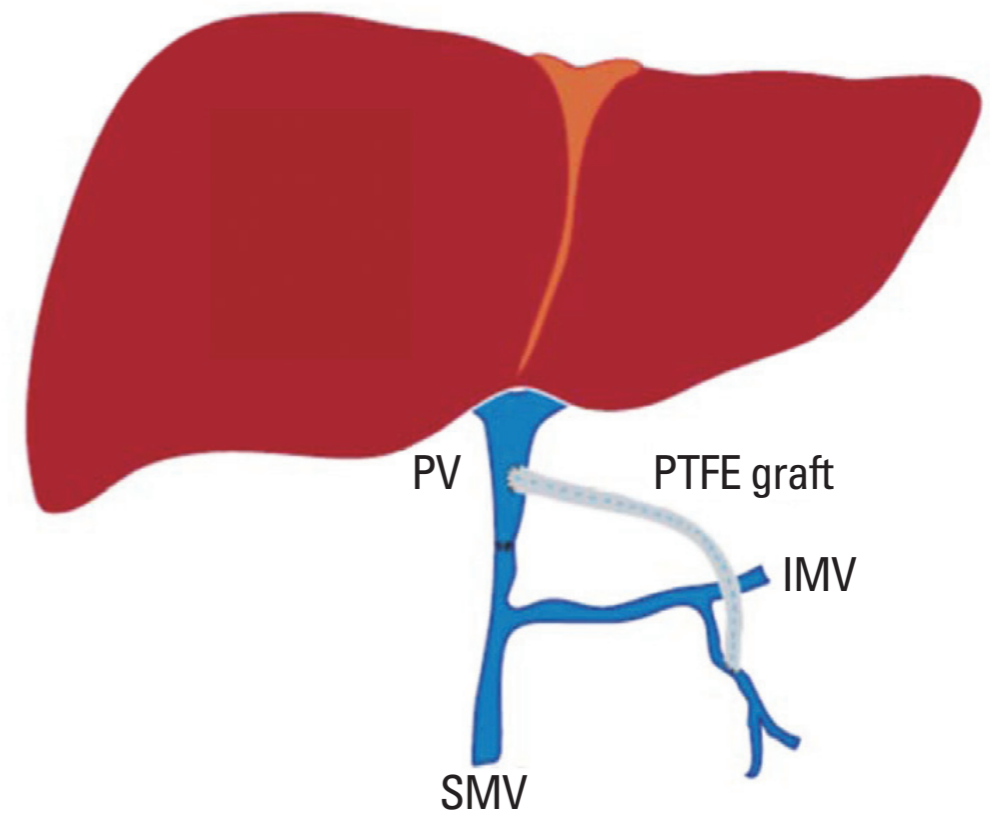
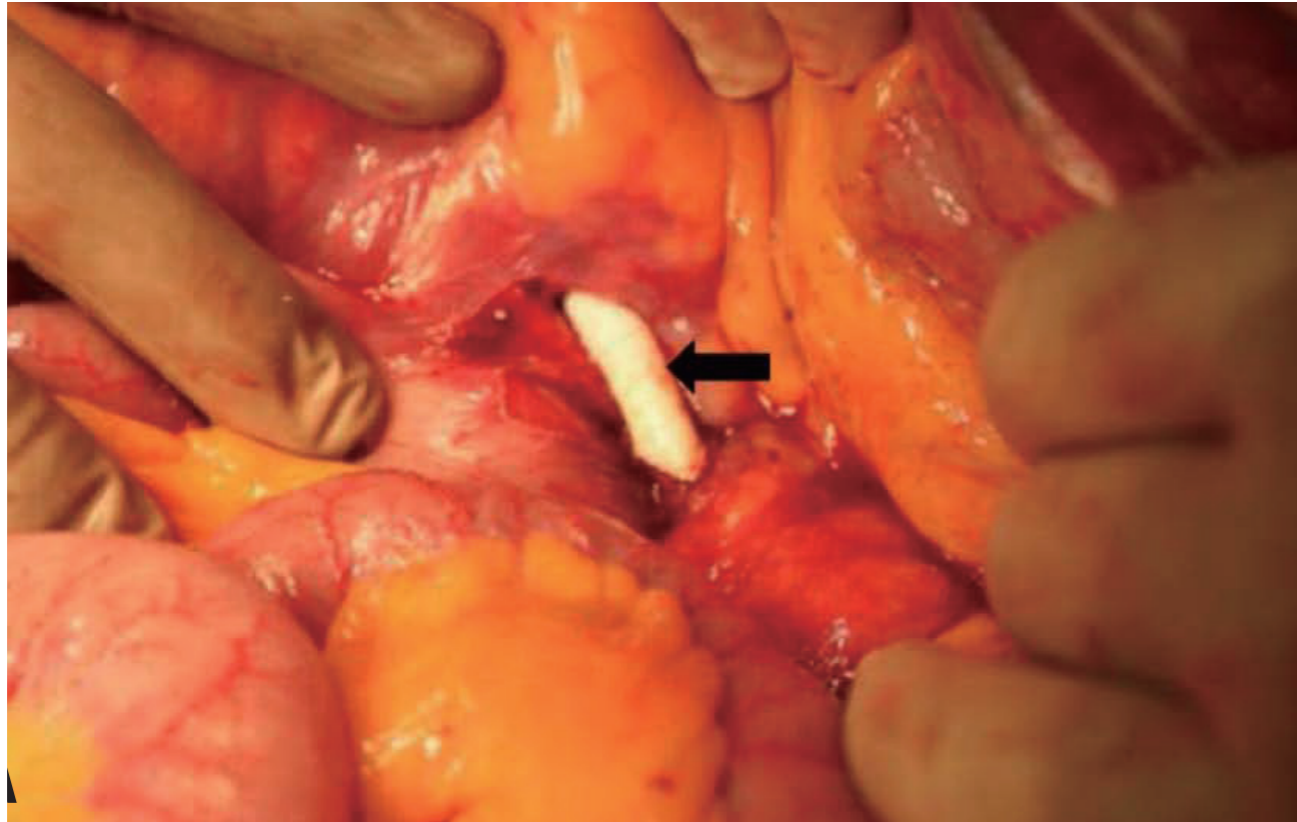
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2. Anticoagulación, TIPS si fracaso o contraindicación







# Reconstrucción portomesentérica



# Re-trombosis portal



Trombectomía

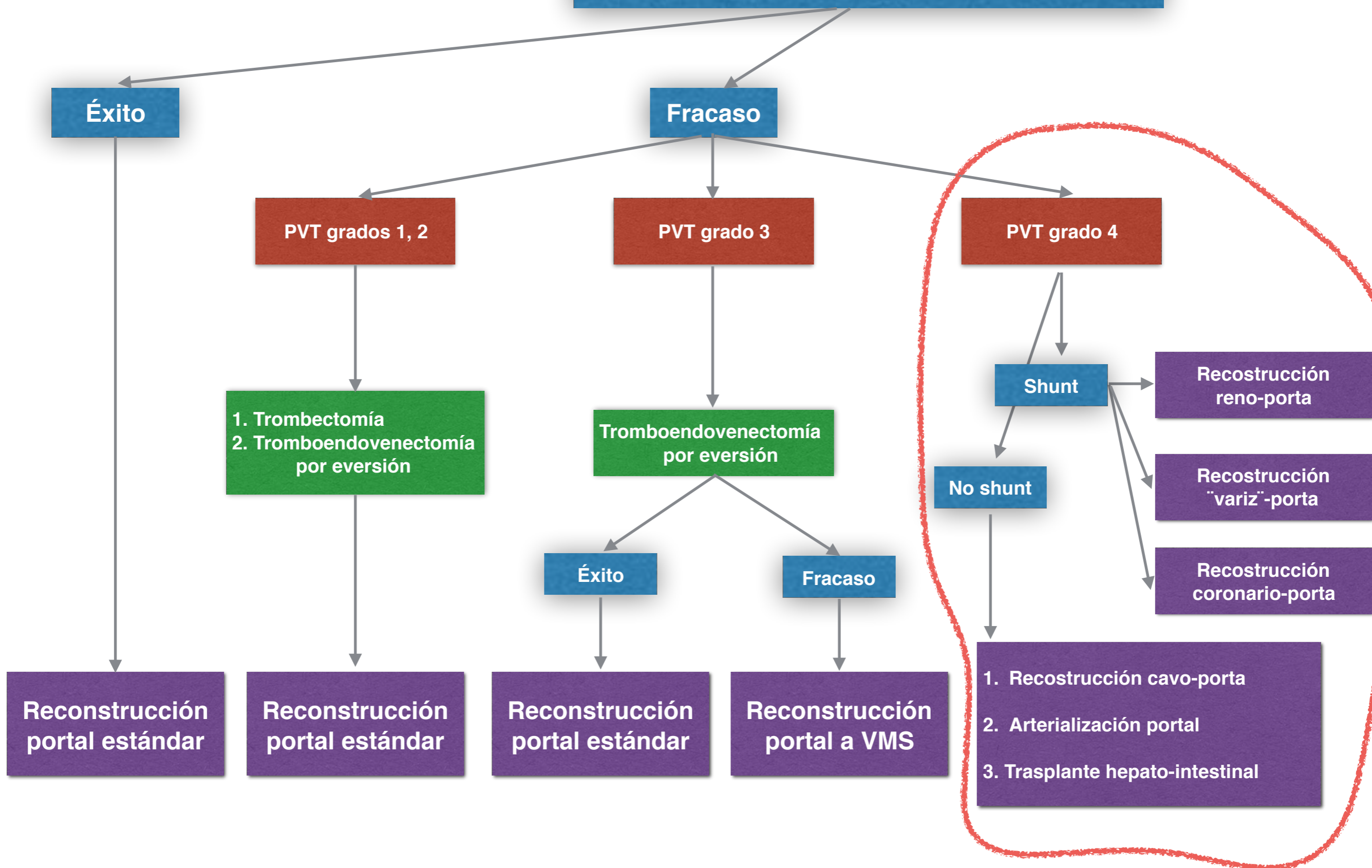


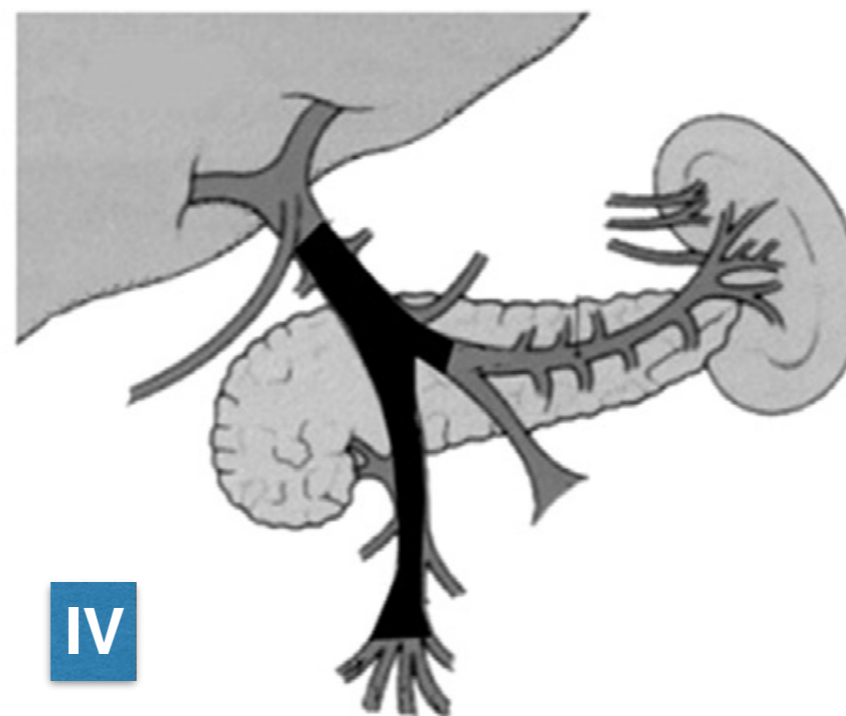
reTOH



**Prevención de PVT**

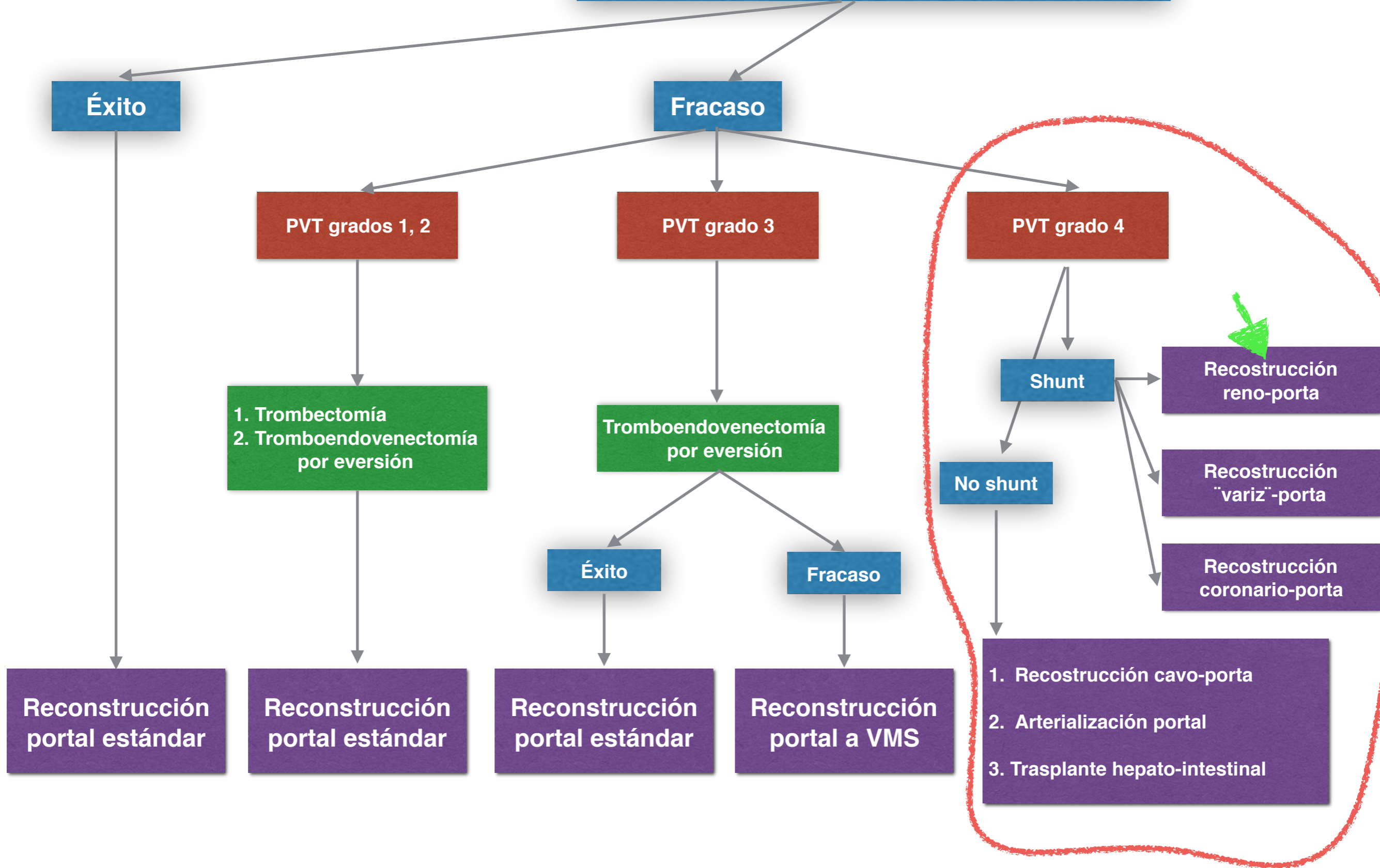
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2. Anticoagulación, TIPS si fracaso o contraindicación





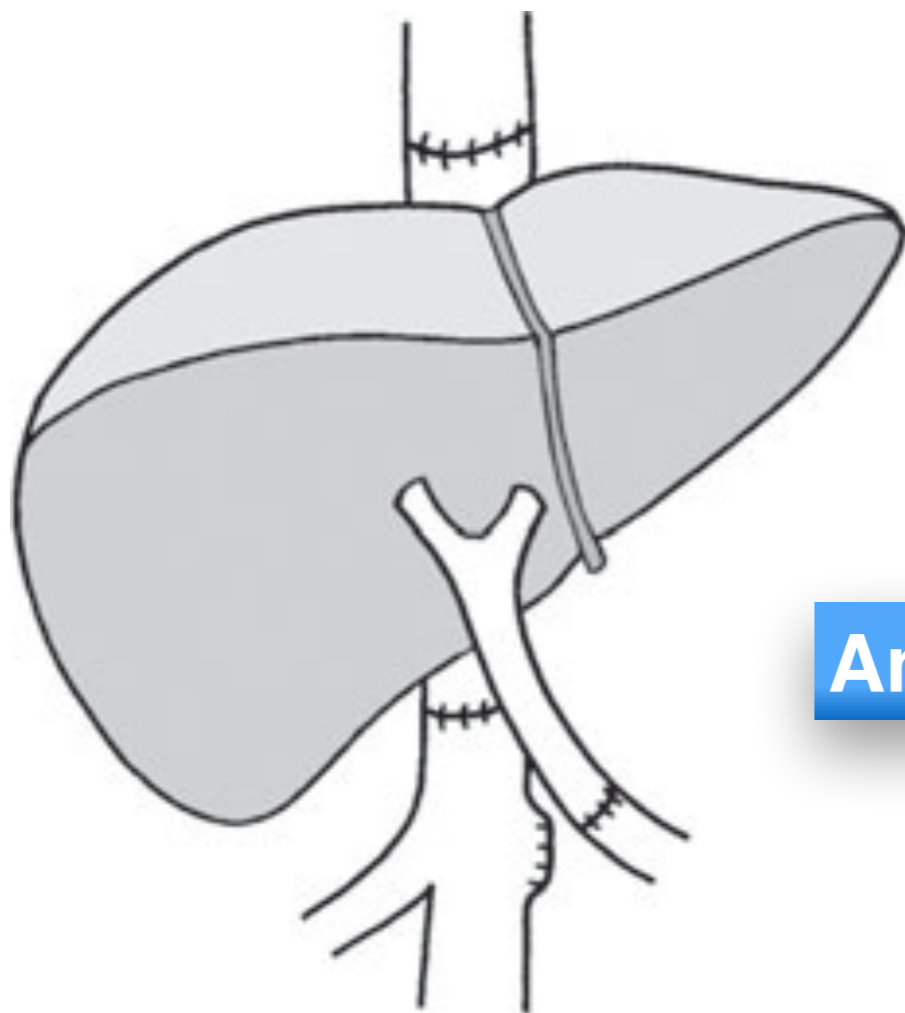


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 2. Anticoagulación, TIPS si fracaso o contraindicación



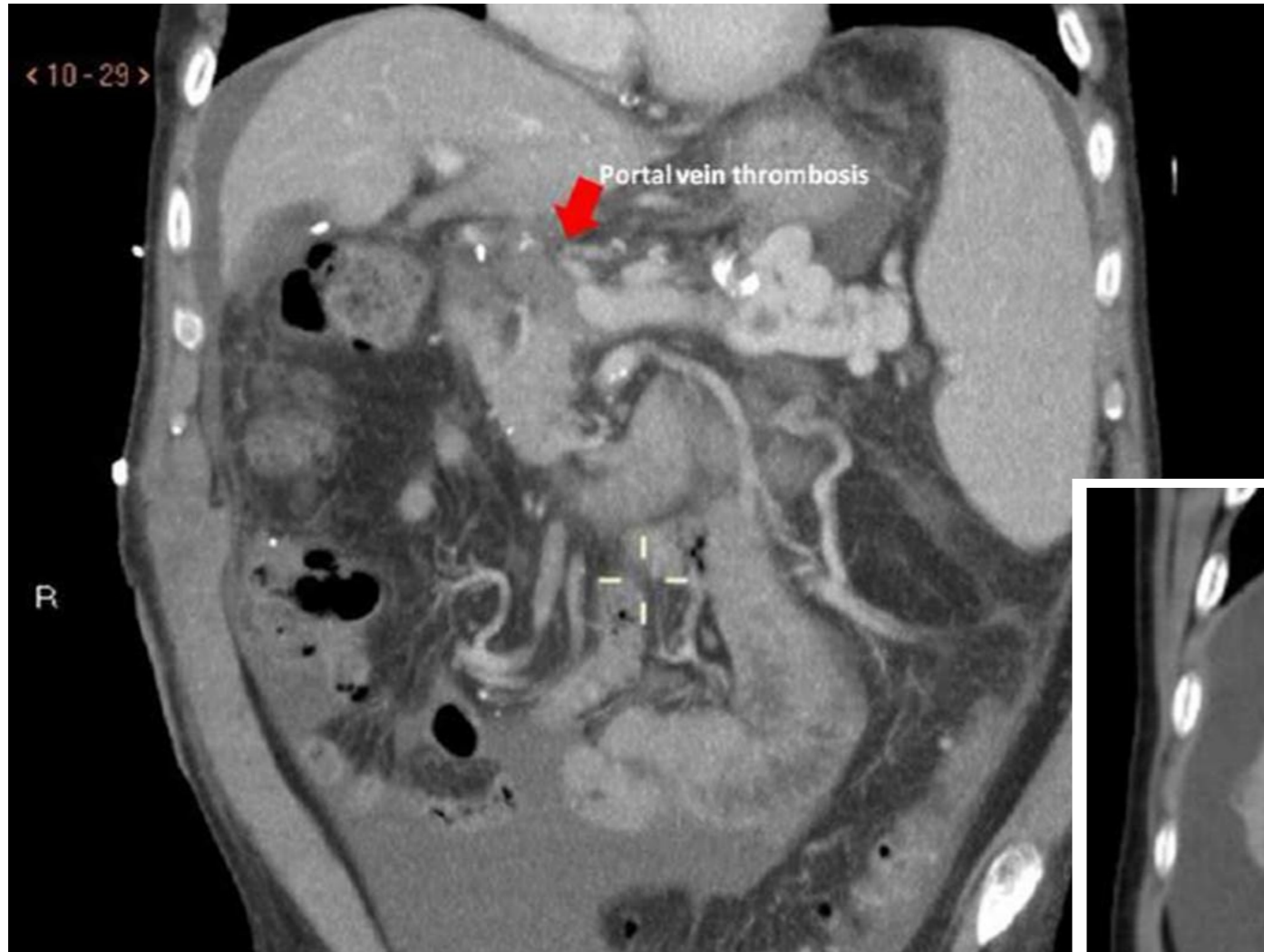


## Shunt espleno-renal



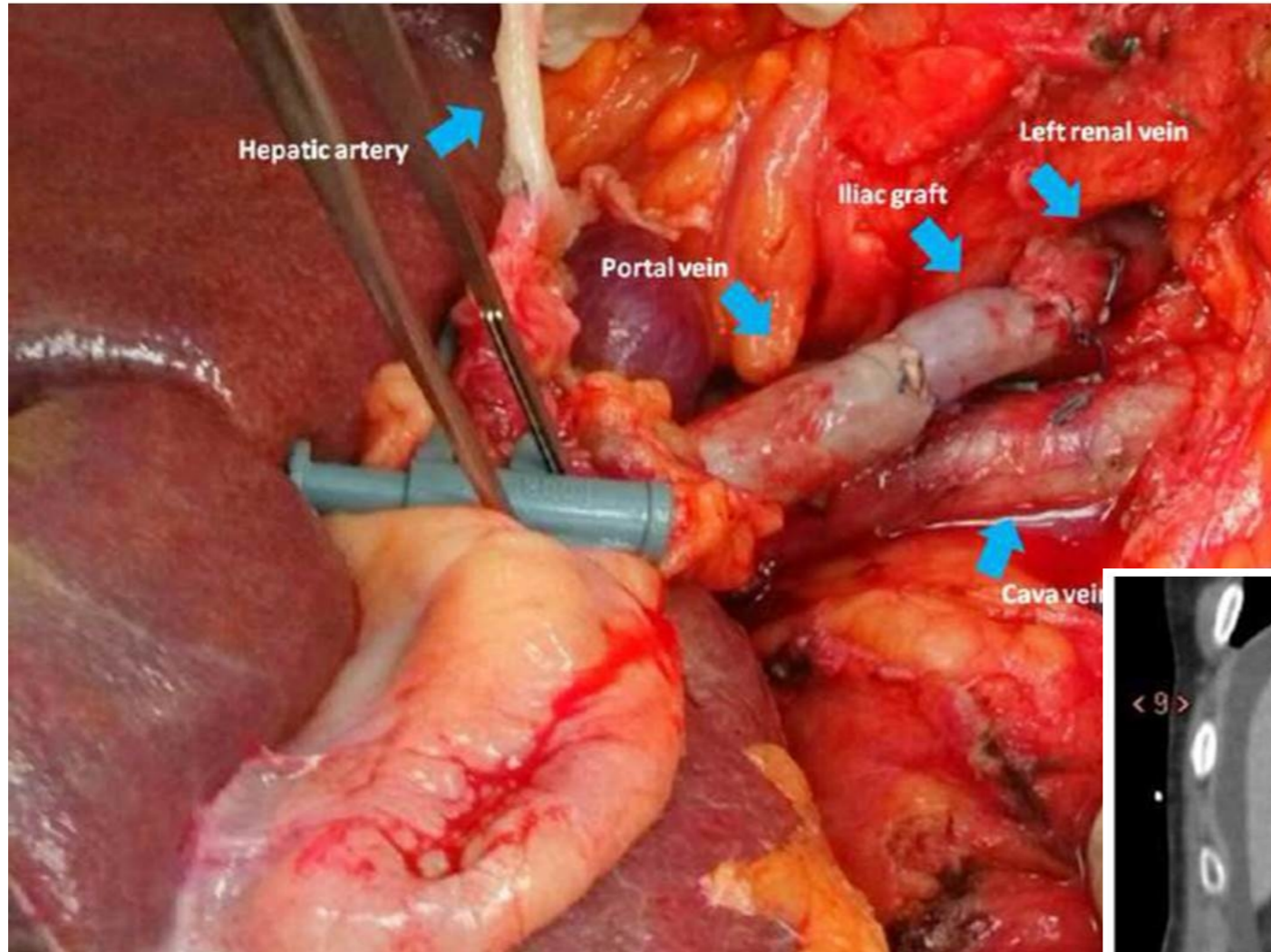
Anastomosis reno-porta TT

# Shunt espleno-renal



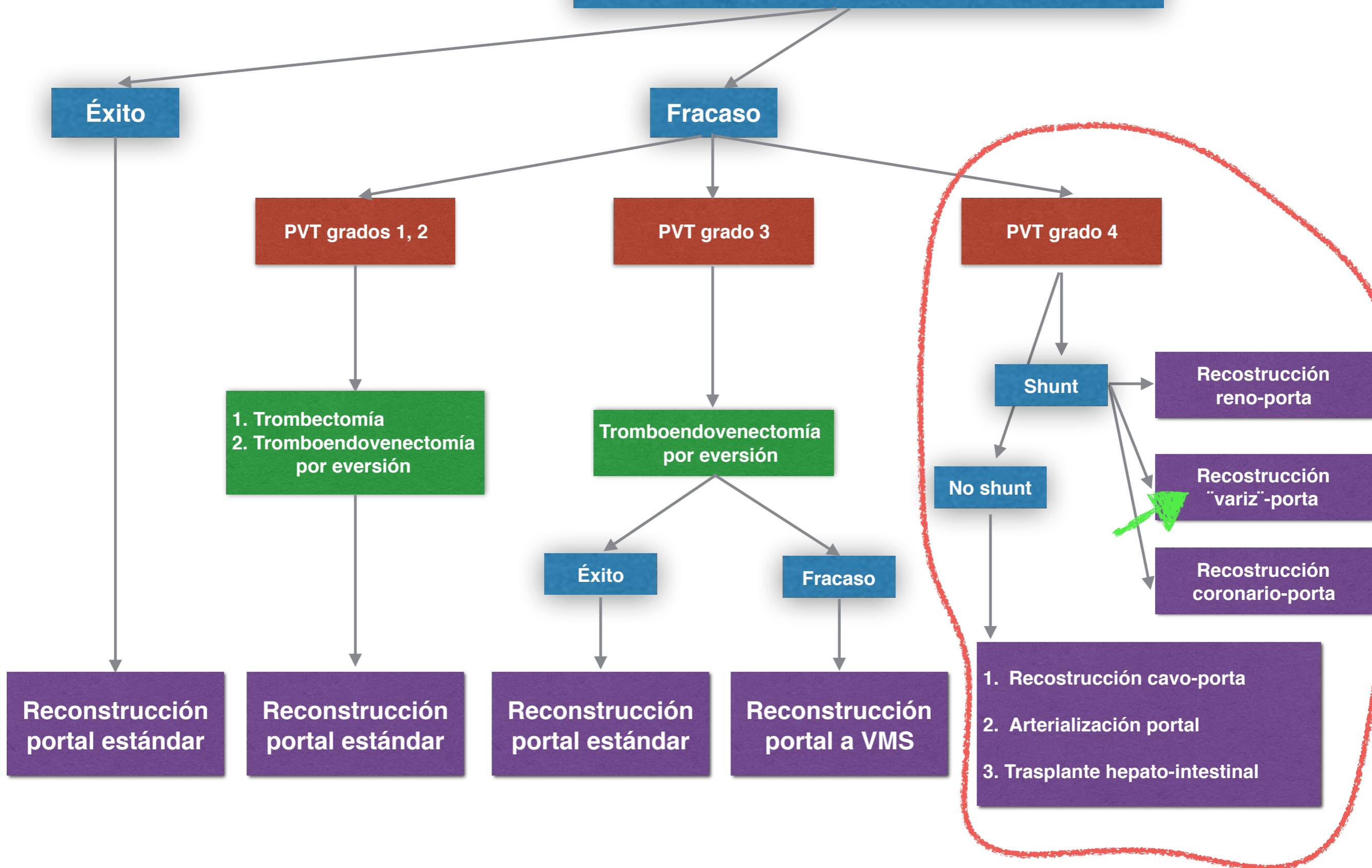


# Shunt espleno-renal



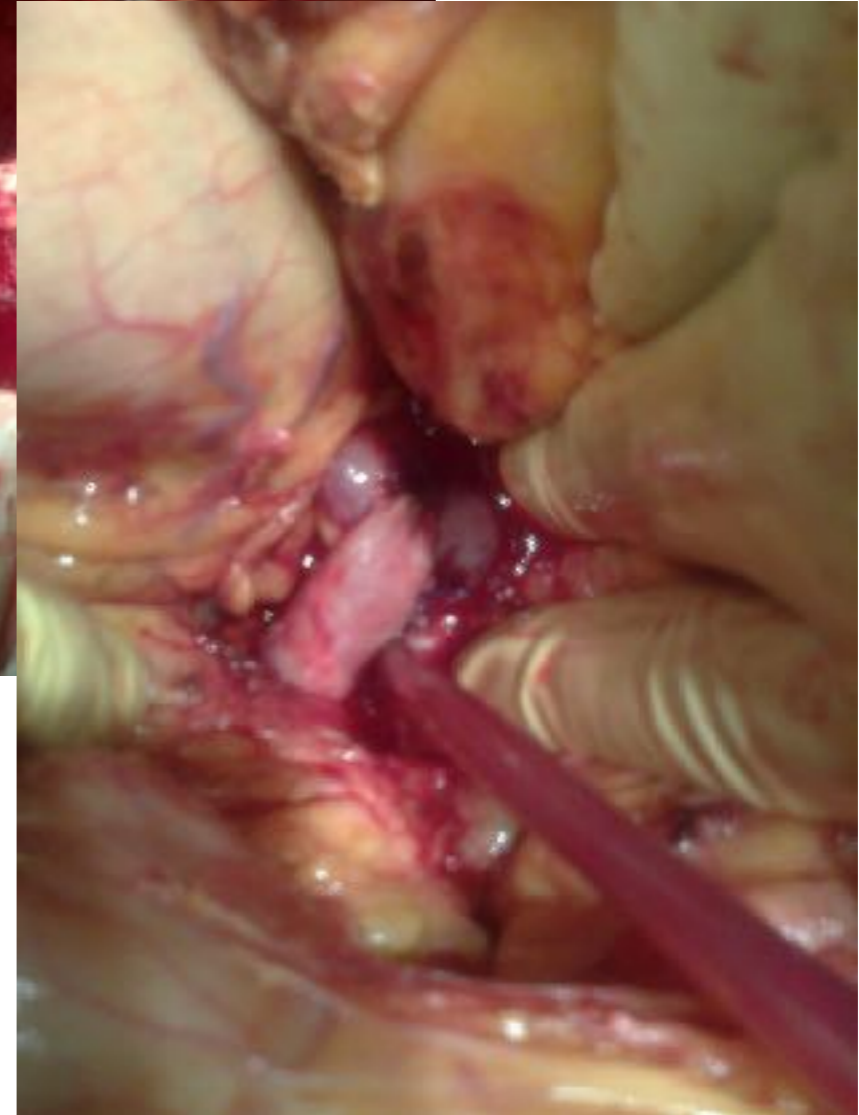
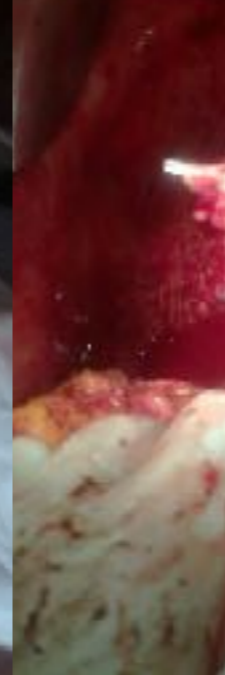
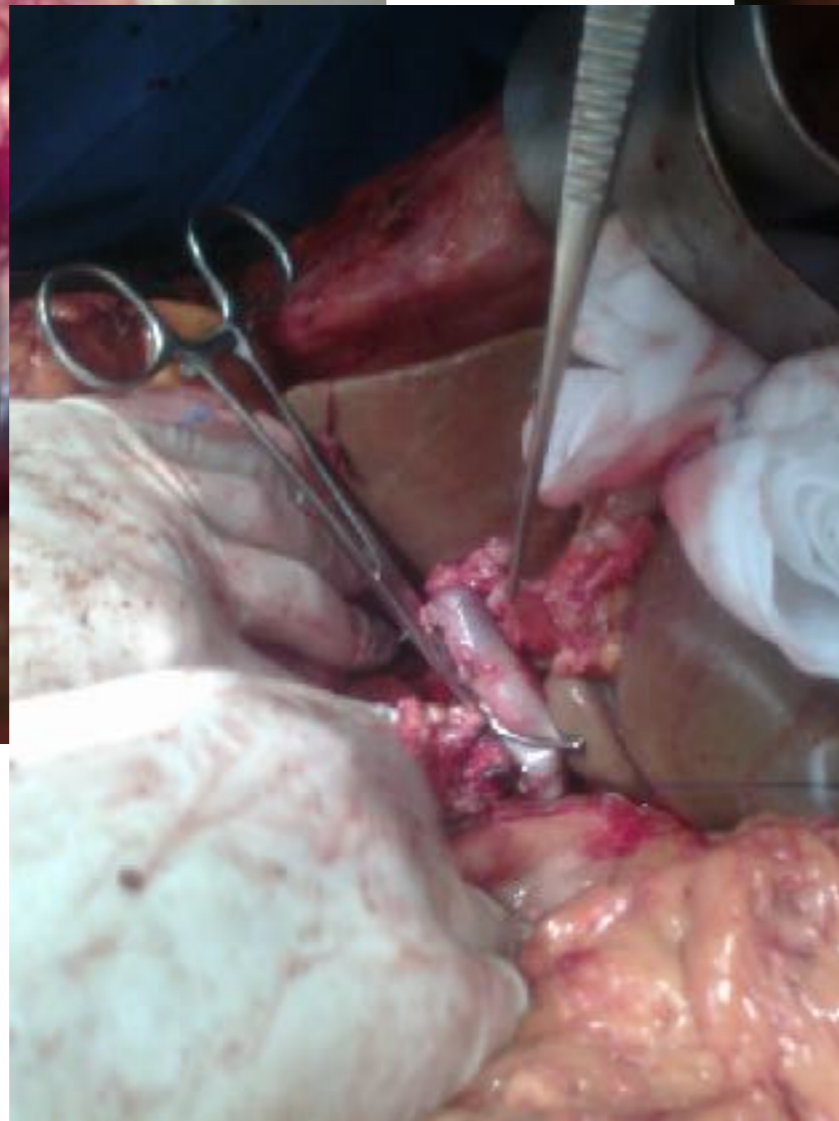
**Prevención de PVT**

1. Screening radiológico periódico
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## Variz coledociana



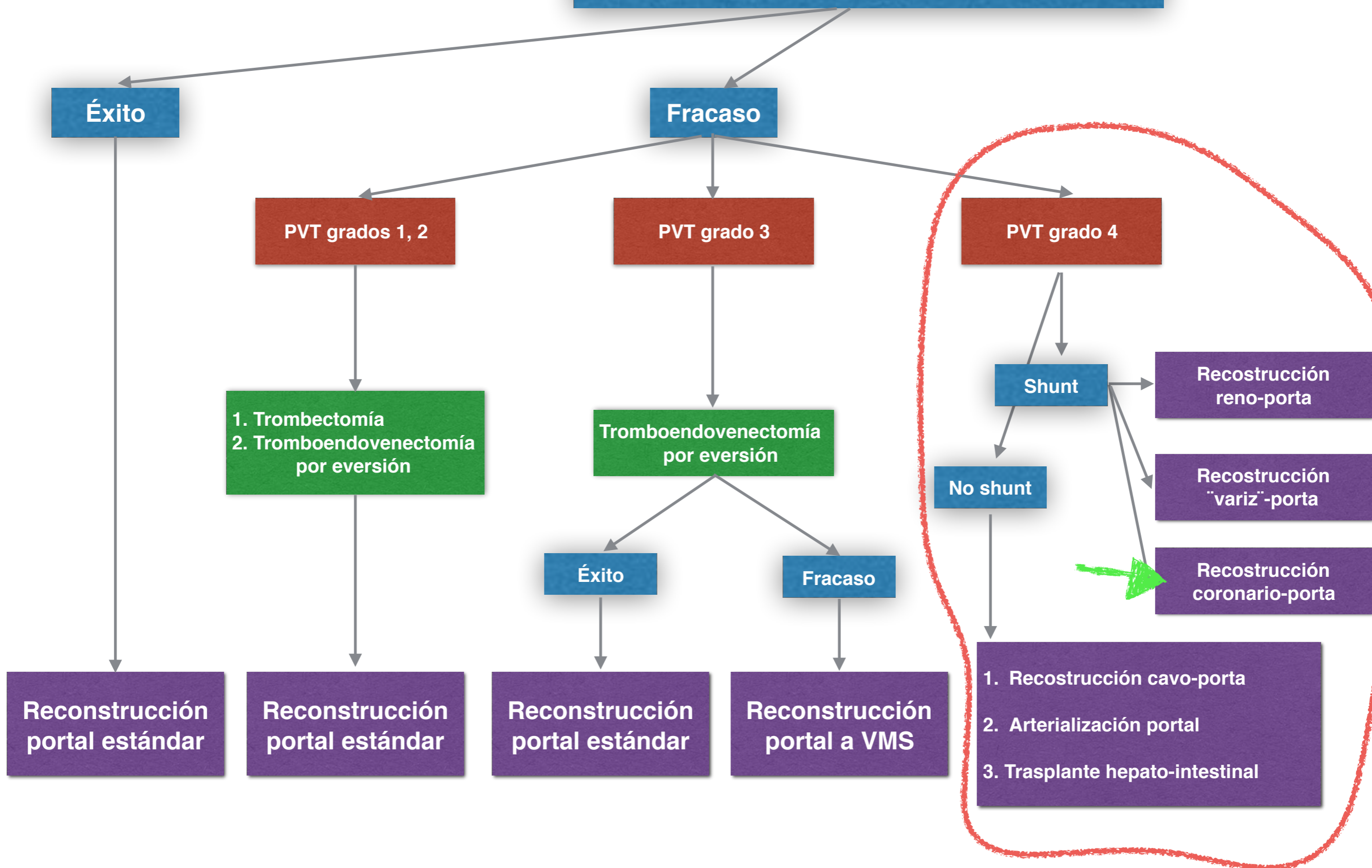
**Table 3: Reported cases of use of pericholedochal varix to graft portal vein anastomosis**

1 <sup>st</sup> author <sup>ref</sup> , year of report	N	PVT Grade	Biliary reconstruction	Outcome
Hiatt <sup>78</sup> , 1986	1	Yerdel 4	Duct to duct	Patent and well, 12 months
Santoni <sup>79</sup> , 1990	1	Diffuse	NA	Died 12 months, patent
Cherqui <sup>80</sup> , 1993	1	Diffuse	NA	NA
Kniepeiss <sup>81</sup> , 2011	1	Diffuse	NA	Patent and well, 6 months
Lee <sup>82</sup> , 2014	1	Yerdel 4	NA	Patent and well, 24 months
Kim <sup>83</sup> , 2014	2	Yerdel 4	Roux-en-Y	Patent and well, 22, 21 months
Moon <sup>47</sup> , 2014	2	Diffuse	NA	Patent and well, 44, 92 months
Bharathy <sup>84</sup> , 2017	1	Diffuse	Roux-en-Y	Patent and well, 39 months
Yu <sup>85</sup> , 2017	1	Diffuse	Roux-en-Y	Patent and well, (stent), 9 months



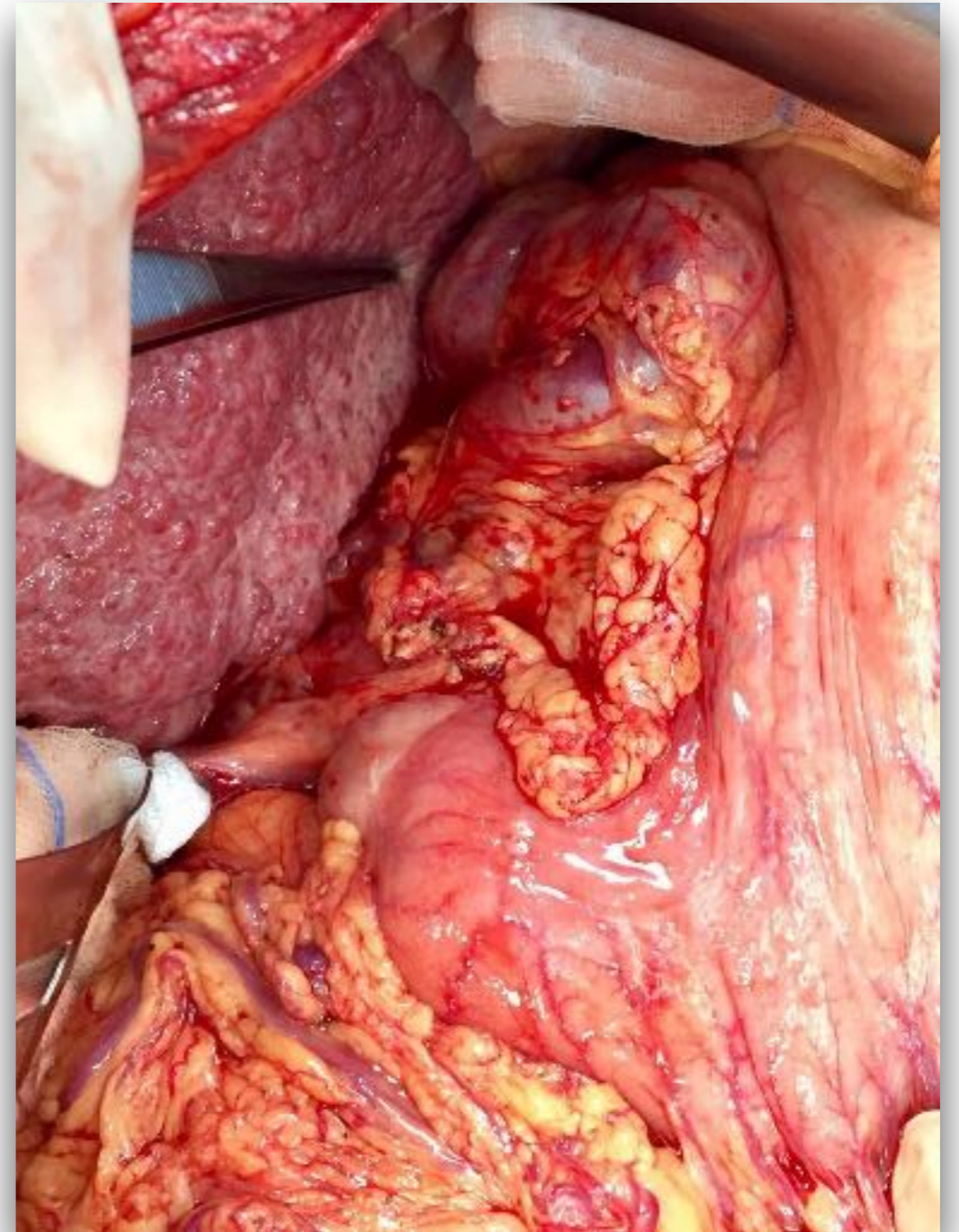
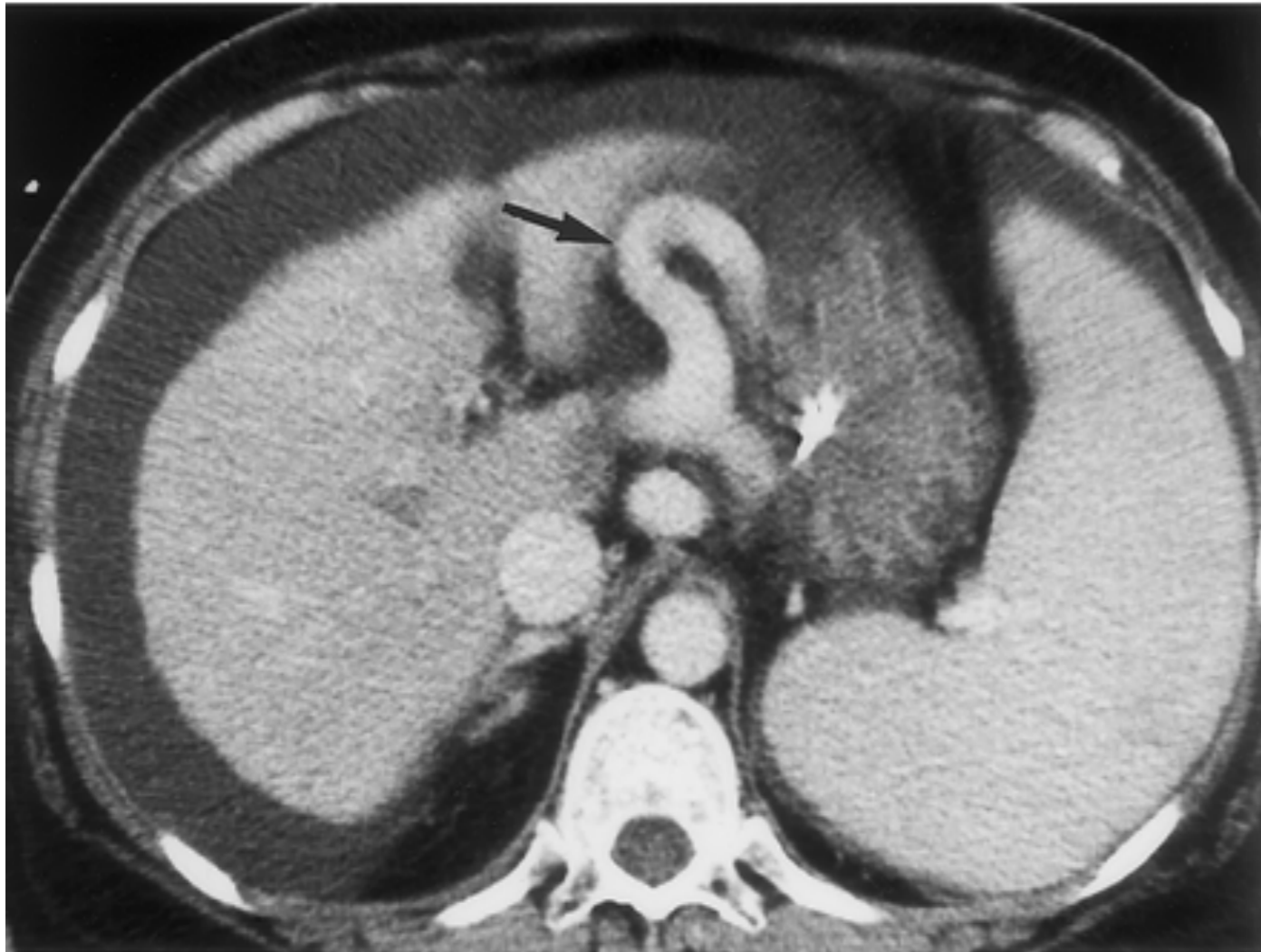
**Prevención de PVT**

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## Variz coronaria



**Table 2: Reported cases of use of left gastric vein for portal vein inflow in complex PVT**

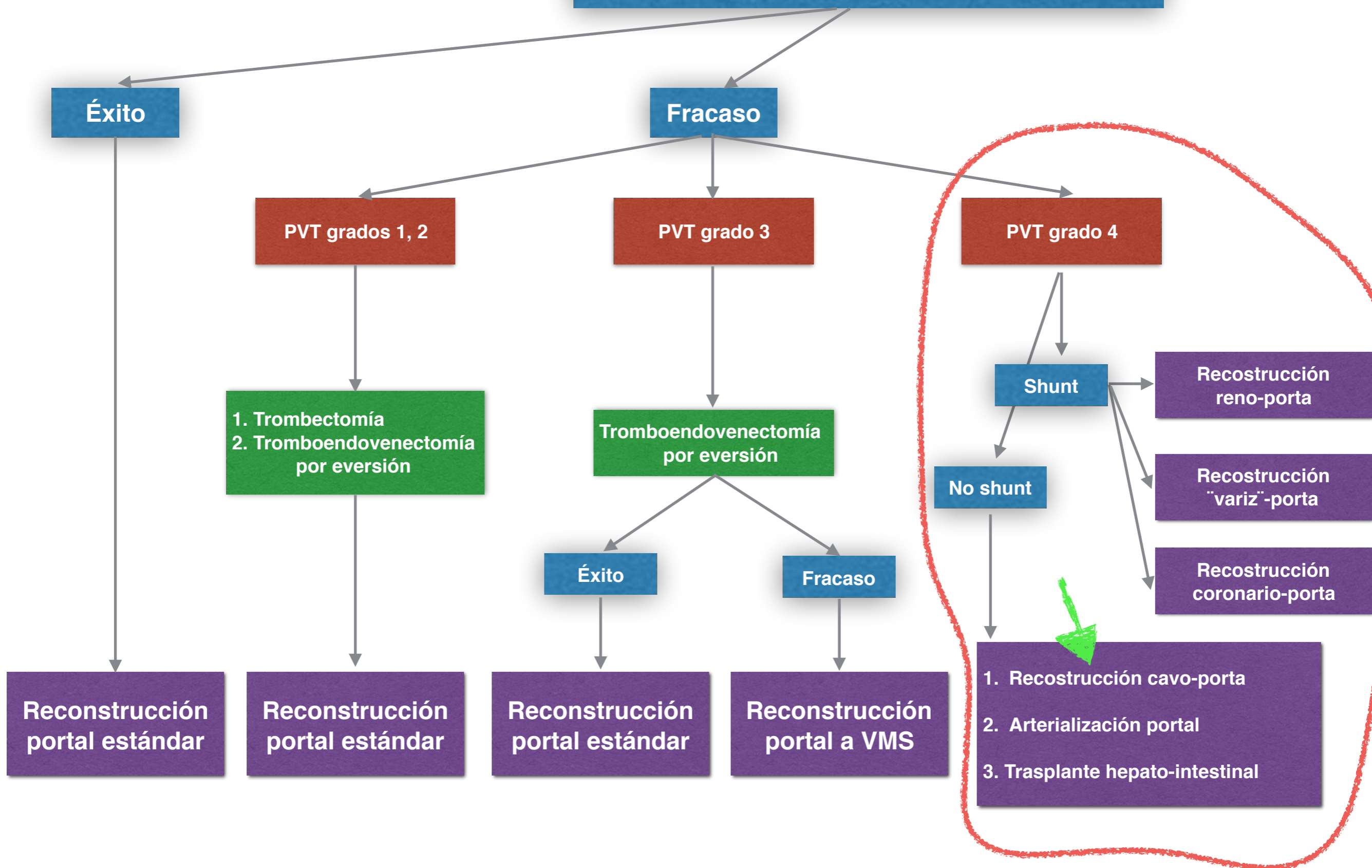
1 <sup>st</sup> author <sup>ref</sup> , year of report	N	Outcome (shunt patency, patient last follow up status, duration)
Czerniak <sup>69</sup> , 1990	1	Patent, well, 3 months
Stieber <sup>13</sup> , 1991	1	Patent, well, 6 years
Orlando <sup>22</sup> , 2004	2	NA
Maluf <sup>70</sup> , 2006	1	Patent, well, 24 months
Llado <sup>34</sup> , 2007	5	NA
Pan <sup>38</sup> , 2009	4	NA
Wu <sup>71</sup> , 2009	3	Patent, well, 21, 36, 36 months after LT
Ramos <sup>40</sup> , 2010	1	NA
Kim <sup>46</sup> , 2011	3	Shunt patent, long term in 2, thrombosed in 1 patient, all patients well at last follow up
Ravaioli <sup>44</sup> , 2011	3	NA, 1 patient died, 2 alive at last follow up
Hibi <sup>48</sup> , 2014	1	NA
Alexopoulos <sup>72</sup> , 2014	5	All shunts patent (1 after surgical revision), all patients well, median follow up 2.3 years
Wang <sup>73</sup> , 2014	1	Patent, well, 1 year
Teixeira <sup>74</sup> , 2016	2	Patent, well, 5 years, 1 month
Safwan <sup>75</sup> , 2016	1	Patent, well, 3 months
Gomez Gavara <sup>54</sup> , 2018	3	Patent and well at 1, 2, 2 years

**Footnotes:** NA, not available

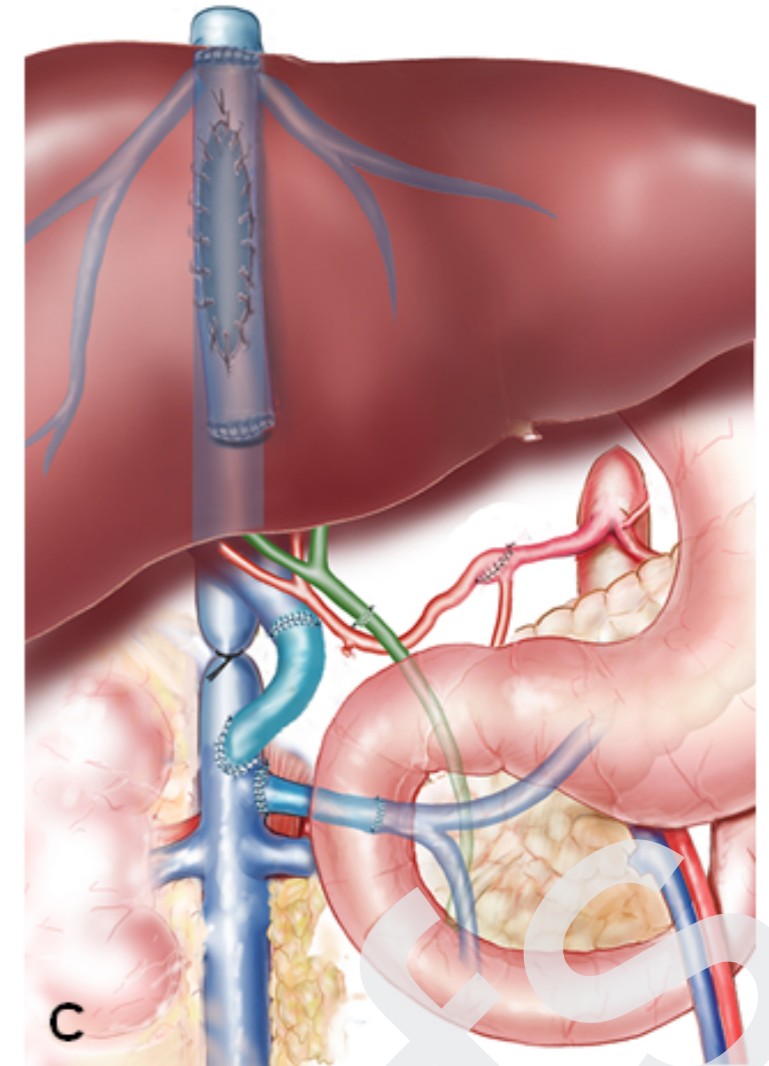
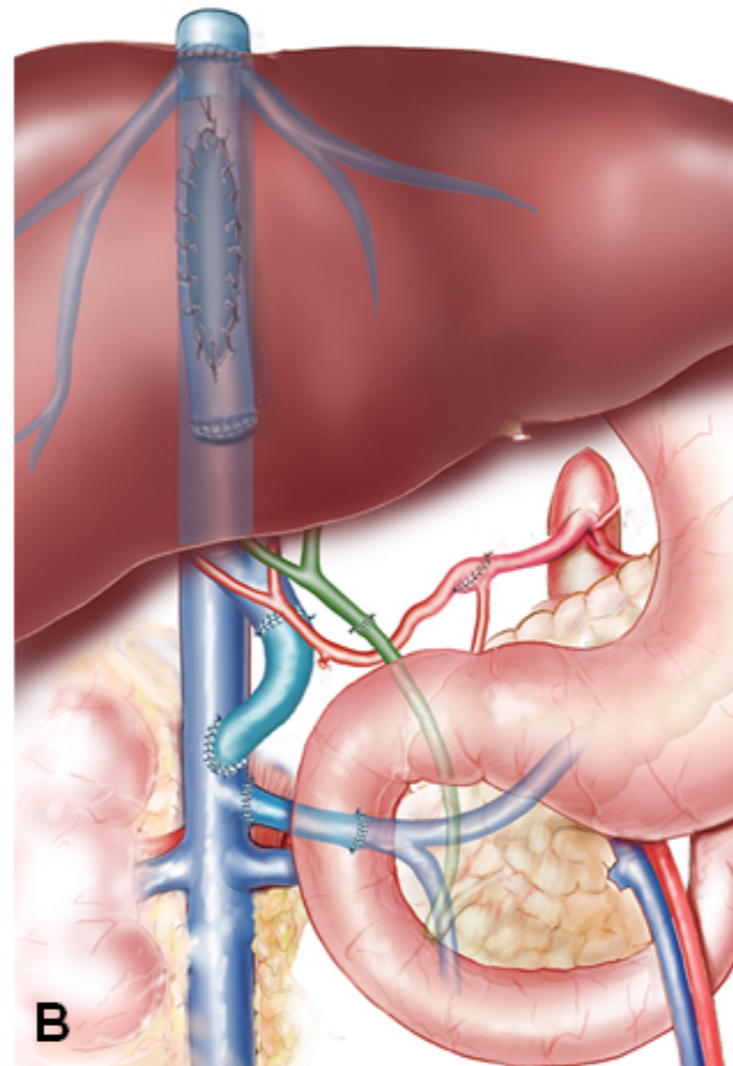
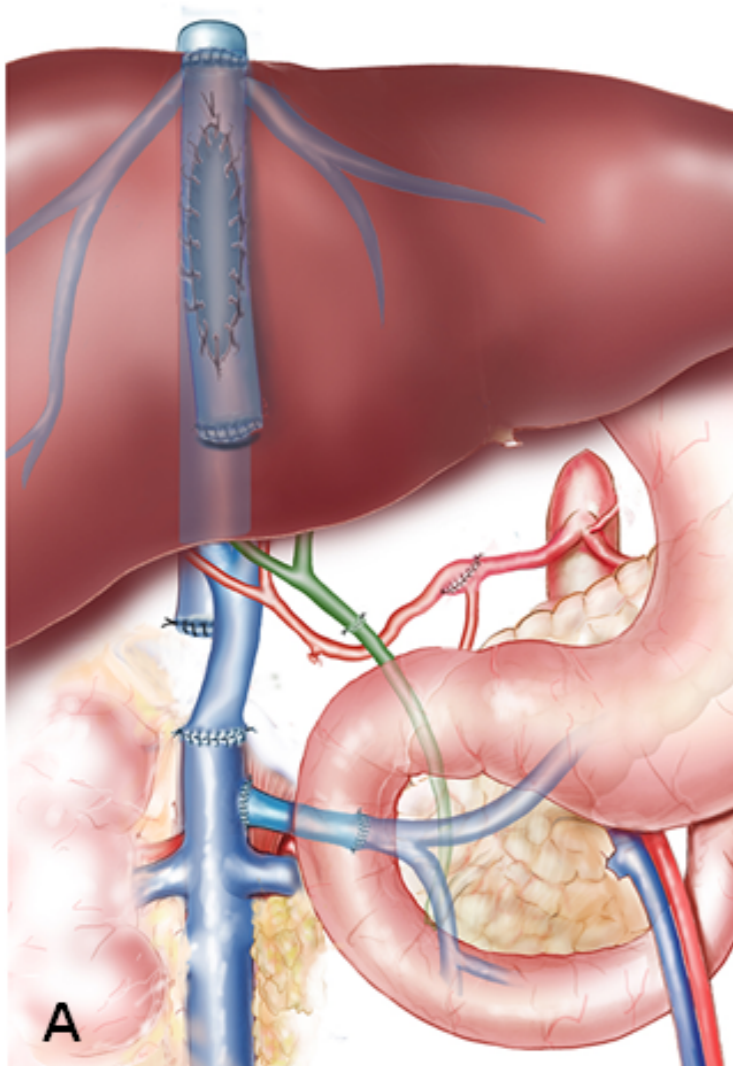


**Prevención de PVT**

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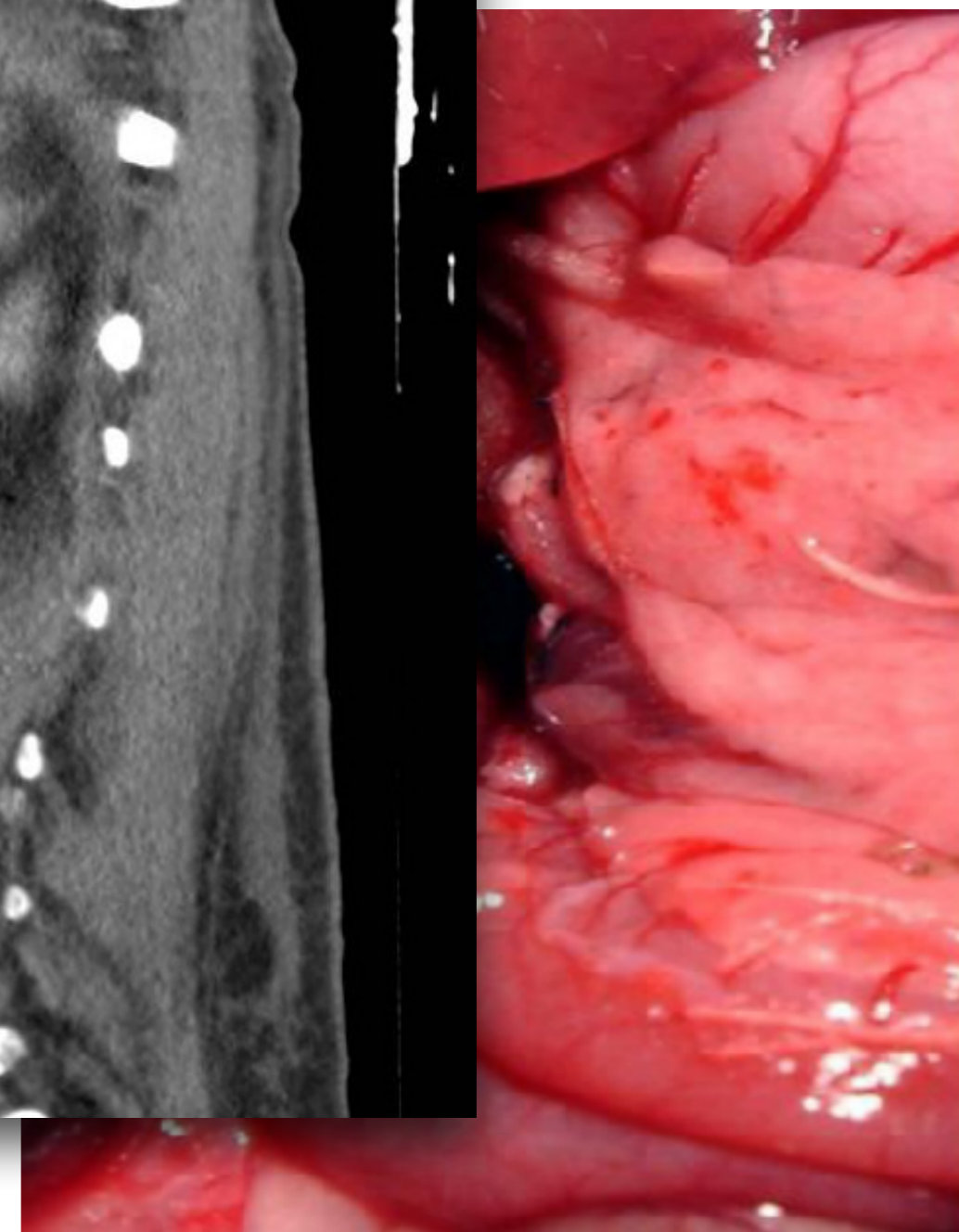
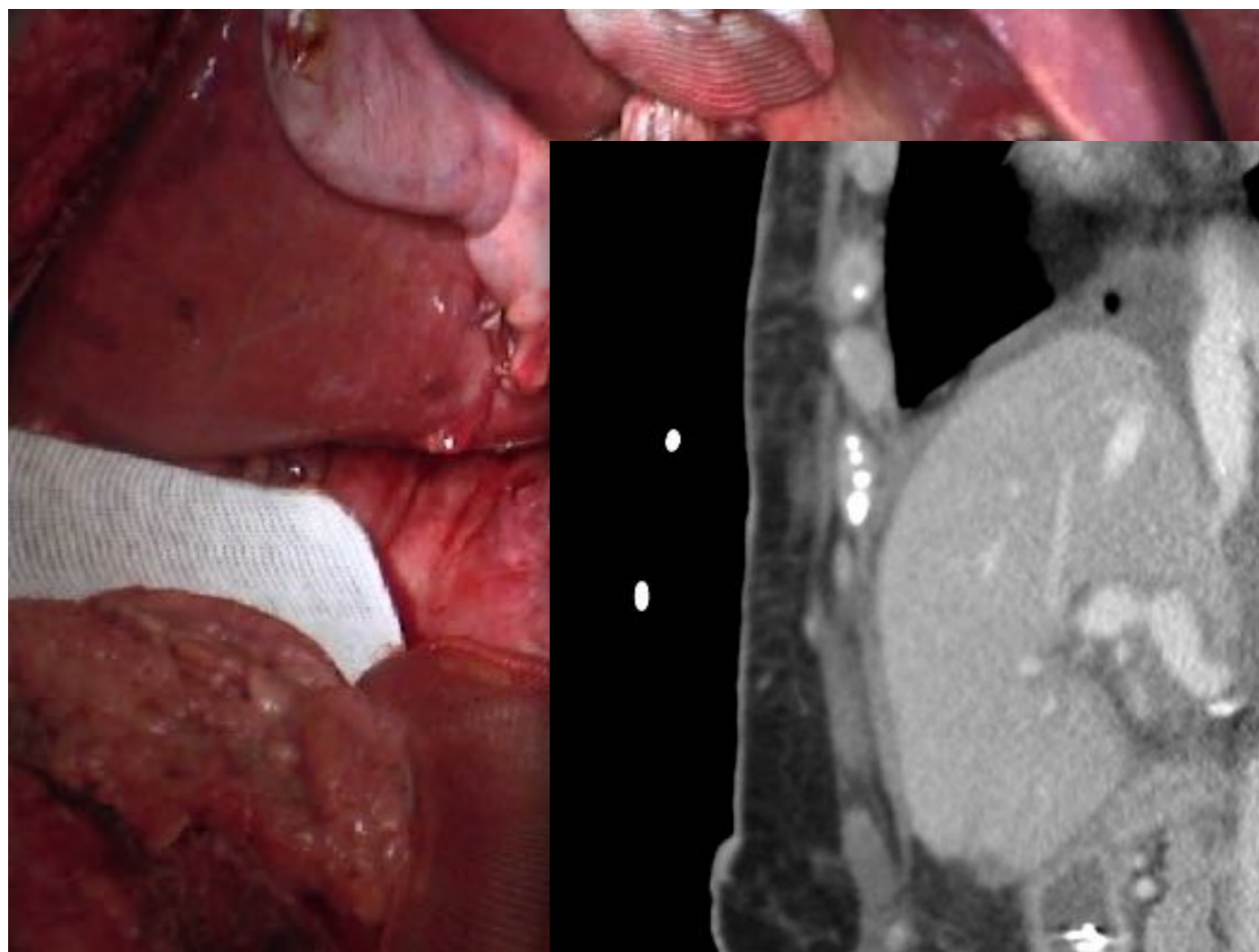


# Derivación cavo-porta





# Derivación cavo-porta





**TABLE 3.** Postoperative Complications and Long-term Follow-up

Patient No.	Type of Caval Inflow	Postoperative Complications		Long-term Complications	Status/ Follow-up Duration
		Related to Portal Hypertension	Not Related to Portal Hypertension		
1	CPA	Variceal bleeding, ascites	None	Chronic rejection	Died due to liver failure while awaiting retx/7 months
2	RPA	None	None	Lymphoproliferation	Alive/12 years
3	RPA	None	None	Acute encephalopathy	Alive/10 years
4	RPA	None	Cerebral hemorrhage, peritonitis, and hepatic artery thrombosis	—	Died due to cerebral hemorrhage/3 months
5	RPA	Ascites	None	None	Died due to sepsis/3 months
6	CPA	None	None	None	Alive/10 years
7	RPA	None	None	None	Died due to myocardial infarction/4 years
8	RPA	Variceal bleeding, ascites	Acute renal failure	None	Alive/9 years
9	RPA	None	Acute renal failure	None	Alive/7 years
10	RPA	None	Non	None	Alive/8 years
11	RPA	Ascites	Acute renal failure, urinary tract infection, acute pulmonary odema	Biliary stenosis, pneumonia	Died of sepsis/3 years
12	RPA	None	Thrombosis right portal vein, acute rejection, acute renal failure	None	Died due to HCC recurrence/6 years
13	RPA	None	Neck hematoma	Renal dysfunction	Alive/7 years
14	RPA	Ascites	Acute Rejection, Acute renal failure	None	Alive/4 years
15	RPA	None	Acute renal failure pneumonia	Renal dysfunction	Alive/3 years
16	RPA	Variceal bleeding, ascites	Acute renal failure	Renoportals thrombosis	Died due to variceal bleeding/1 year
17	CPA	None	Cavoportal anastomosis and Hepatic artery thrombosis, Septicemia	None	Alive/2 years
18	RPA	Ascites	Acute renal failure	None	Alive/2 years
19	RPA	None	None	None	Alive/6 months
20	RPA	None	Urinary tract infection	None	Alive/6 months

CPA indicates cavoportal anastomosis; retx, retransplantation; RPA, renoportals anastomosis.

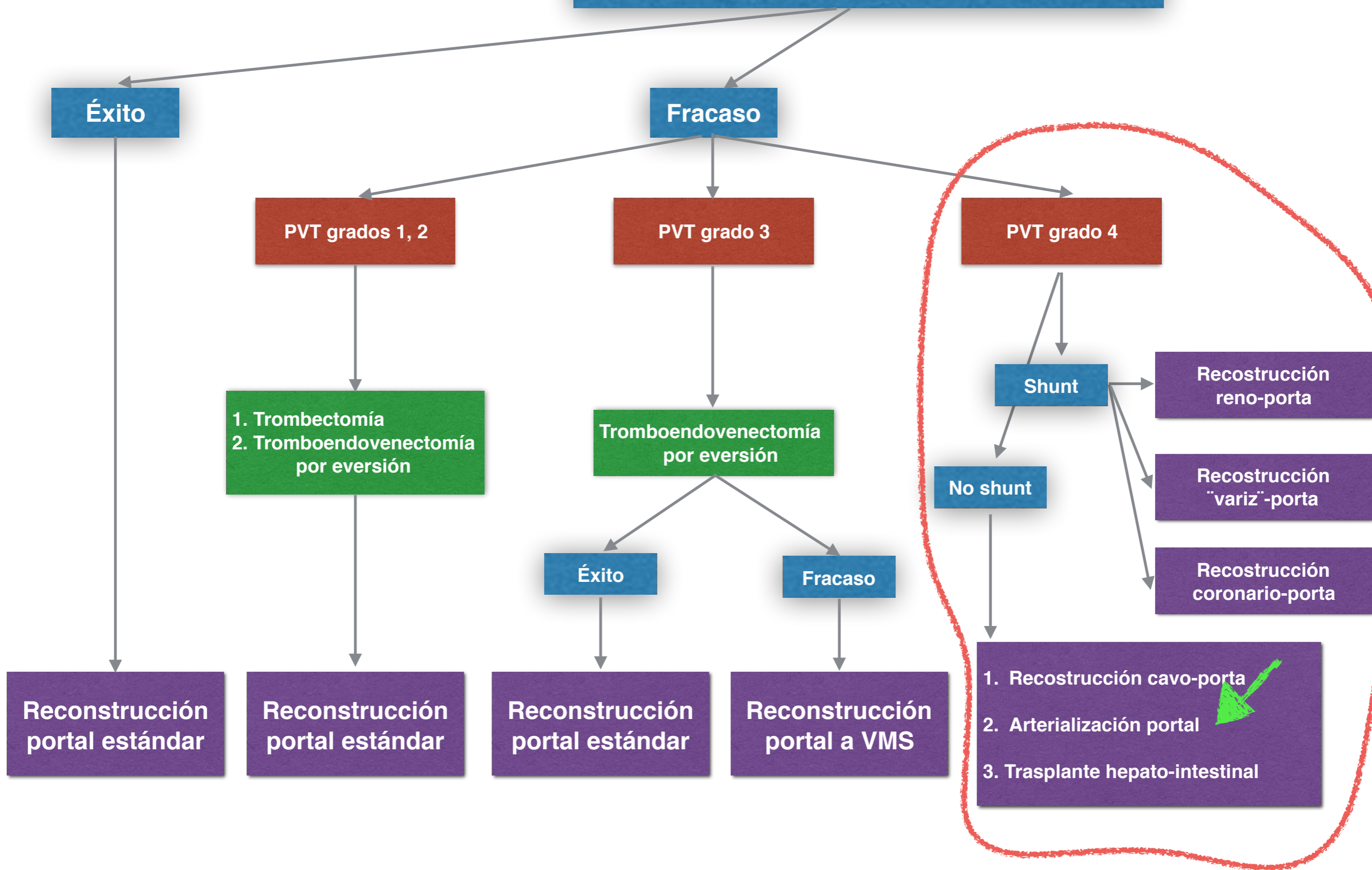
# Derivación cavo-porta

Table 3. Mortality, cause of death and survival of patients who underwent CPHT or RPA during LTx in the case of diffuse PVT

Author (reference)	Patients (n = 53)	Mortality and cause of death, n = 14 (26%)	Survival/follow-up, n = 39 (74%)
Tzakis et al. (12); Pinna et al. (44)	15	n = 5 Sepsis and multiorgan failure (n = 3) Pulmonary embolism (n = 1) Cardiac arrest (n = 1)	n = 10 6–11 months
Olausson et al. (46)	6	n = 1 Sepsis and multiorgan failure	n = 5 3–13 months
Santaniello et al. (45)	1		n = 1 9 months
Weeks et al. (47)	1		n = 1 20 months
Azoulay et al. (13)	8	n = 3 Chronic graft rejection (n = 1) Cerebral hemorrhage (n = 1) Cardiac arrest (n = 1)	n = 5 2–37 months
Shrotri et al. (48)	1		n = 1 12 months
Gerunda et al. (17)	2	n = 1 Severe graft rejection and multiorgan failure (n = 1)	n = 1 12 months
Urbani et al. (49)	6	n = 1 Pulmonary sepsis and multiorgan failure (n = 1)	n = 5 3–23 months
Varma et al. (38)	1		n = 1 12 months
Kato et al. (15)	3	n = 1 Sepsis (n = 1)	n = 2 2–48 months
Bakthavatsalam et al. (50)	1		n = 1 12 months
Kumar et al. (35)	1		n = 1 18 months
Verran et al. (36)	1		n = 1 6 months
Sheil et al. (16)	1		n = 1 No data
Ceulemans et al. (51)	5	n = 2 Sepsis (n = 1) Renal insuycency (n = 1)	n = 3 12–24 months

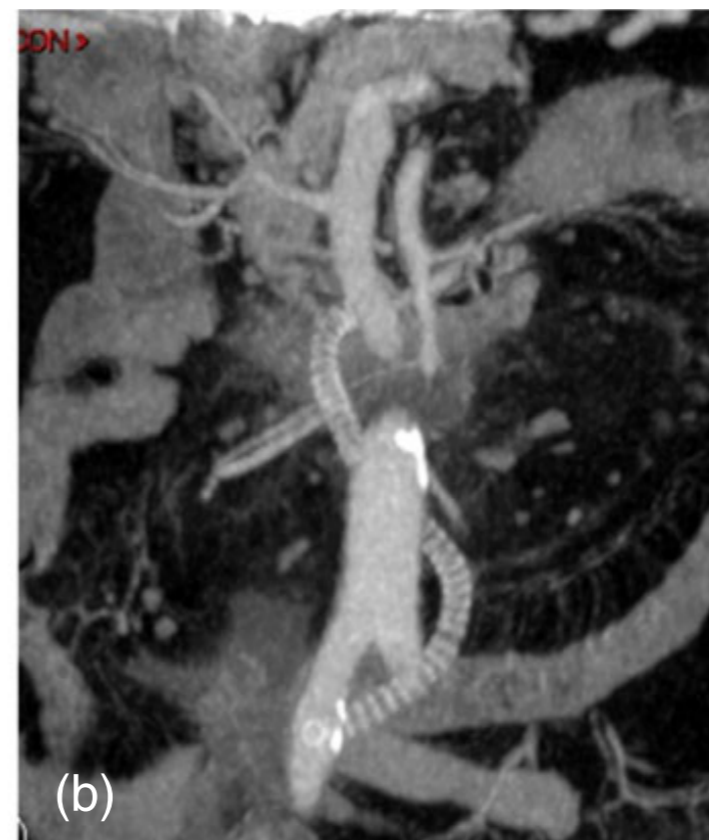
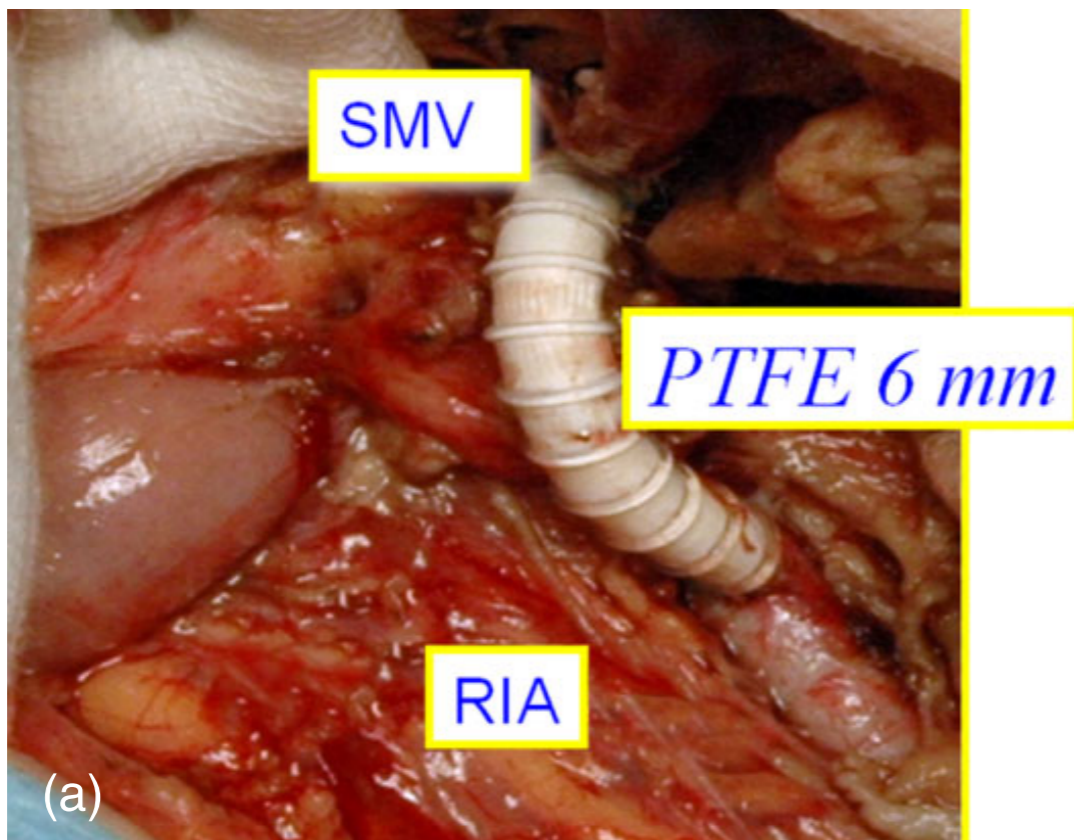
**Prevención de PVT**

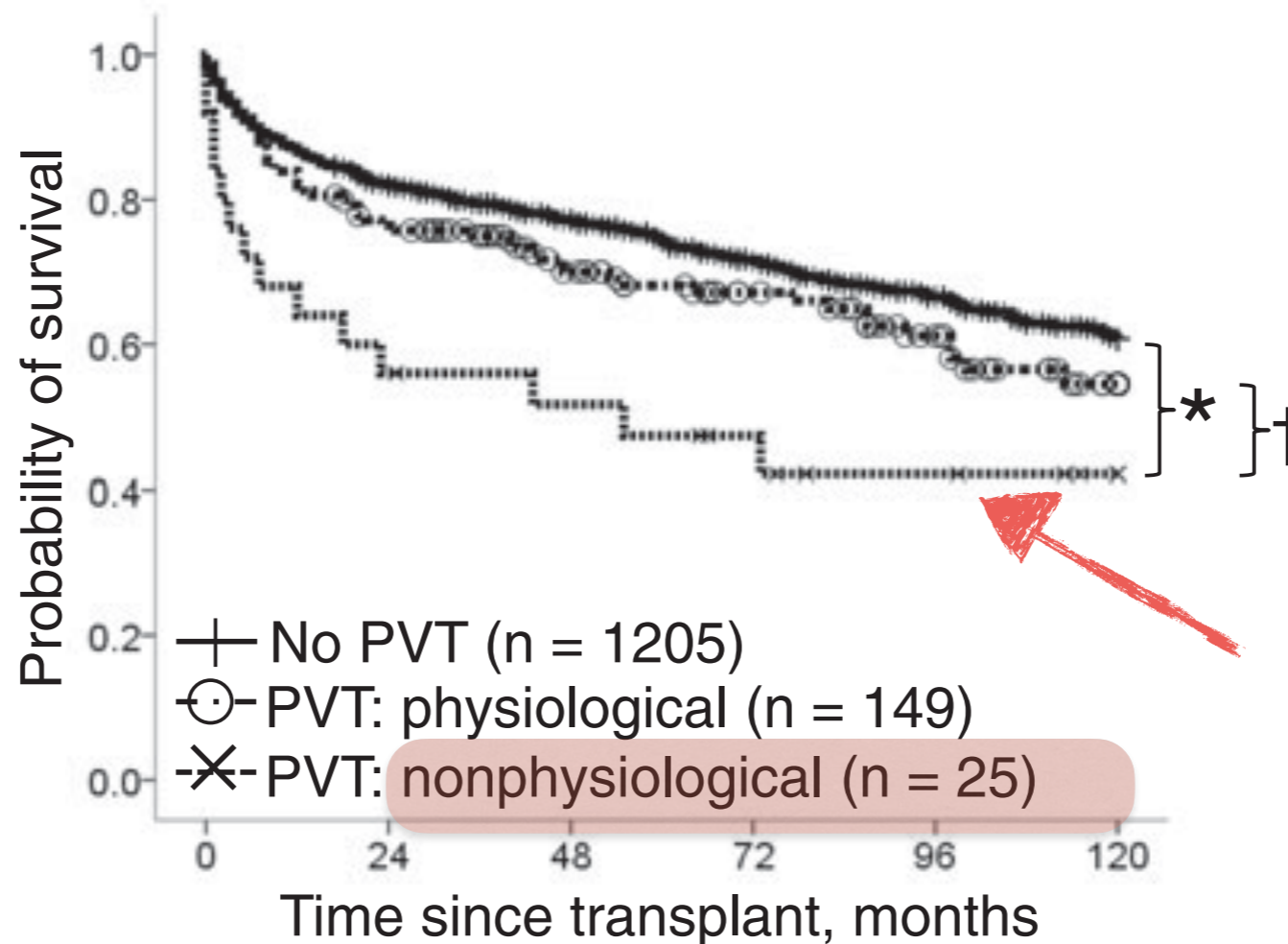
1. Screening radiológico periódico
2. Anticoagulación, TIPS si fracaso o contraindicación





# Arterialización portal



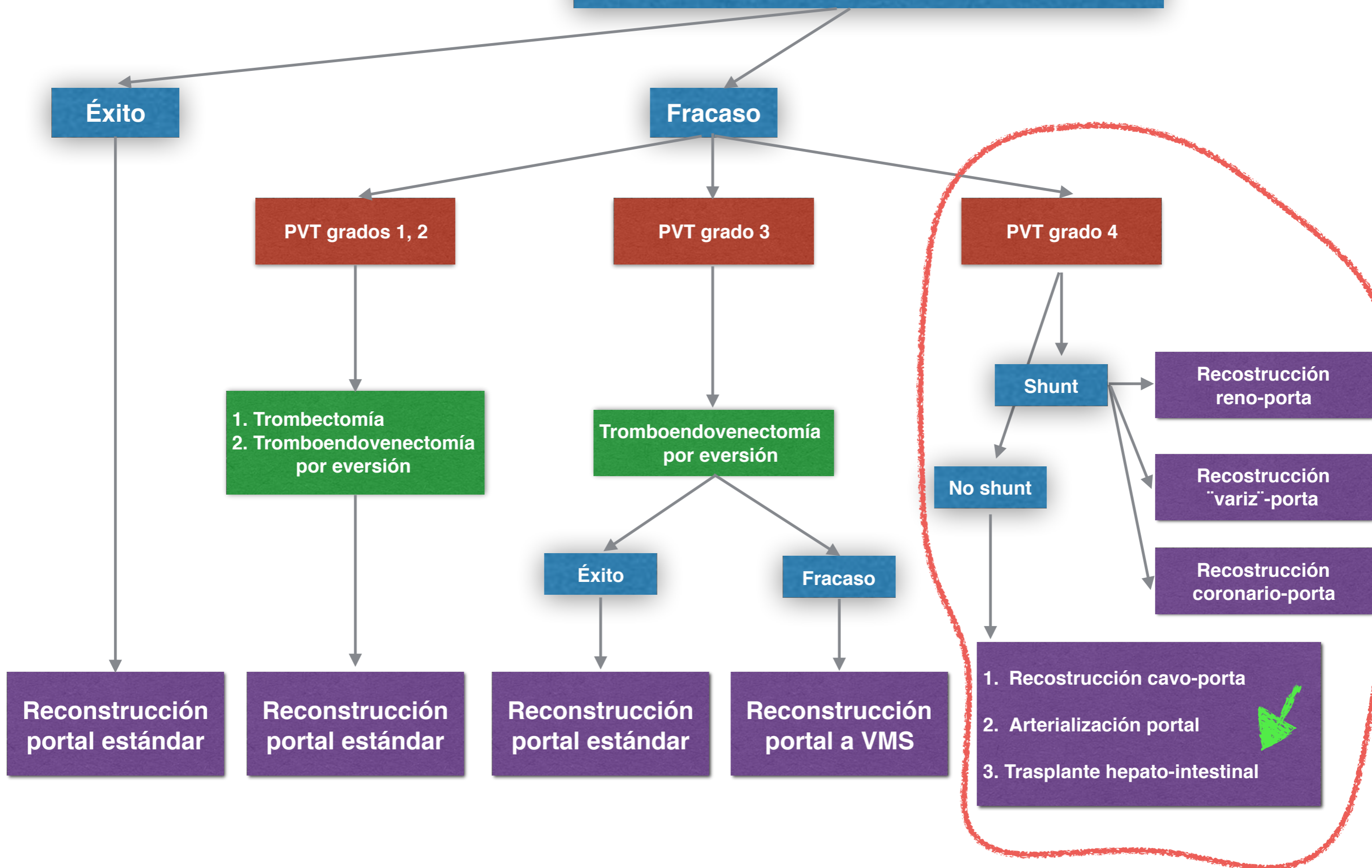


Number at risk

No PVT	1205	954	752	567	408	234
PVT: physiological	149	111	81	61	43	22
PVT: non-physiological	25	14	12	9	6	3

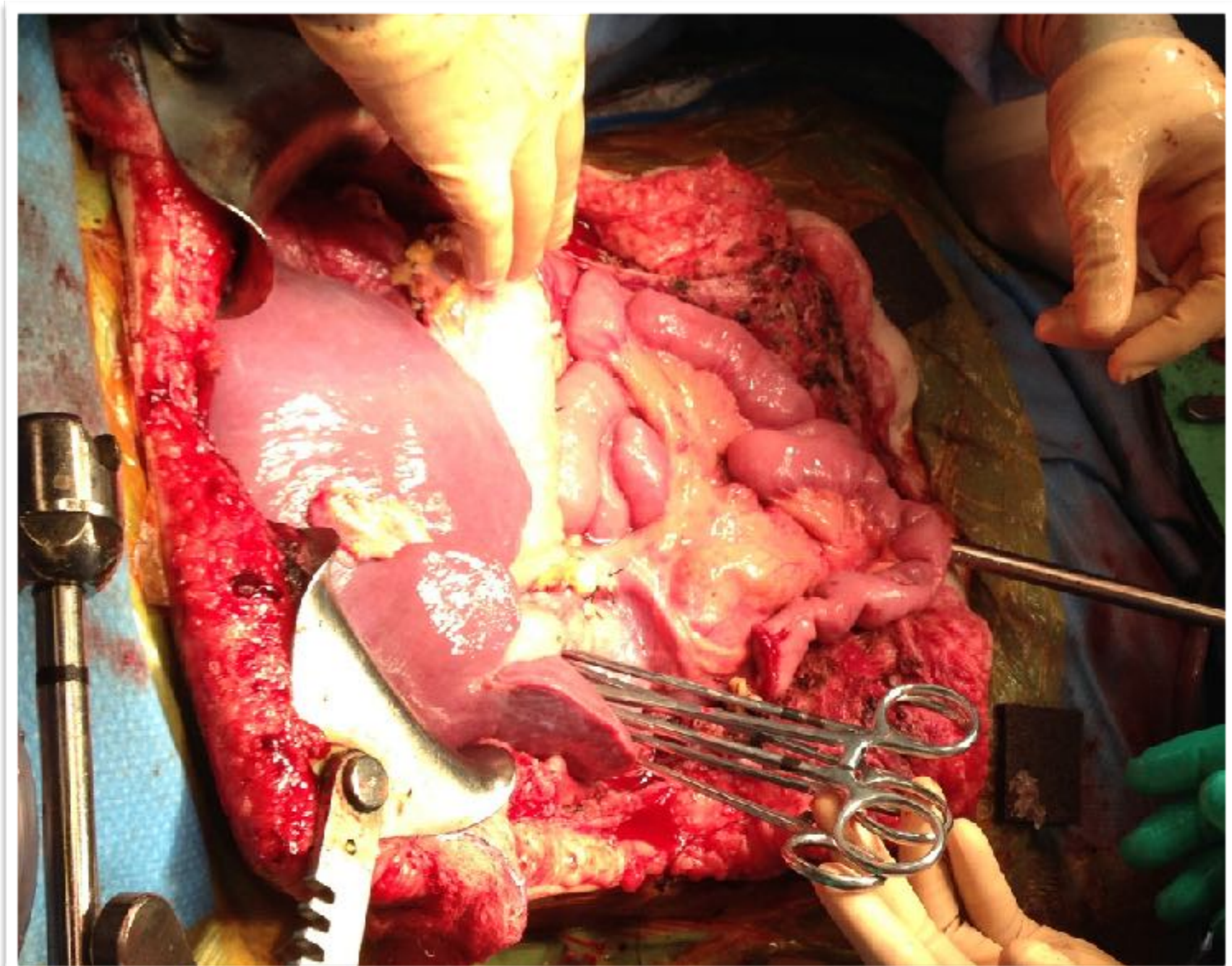
**Prevención de PVT**

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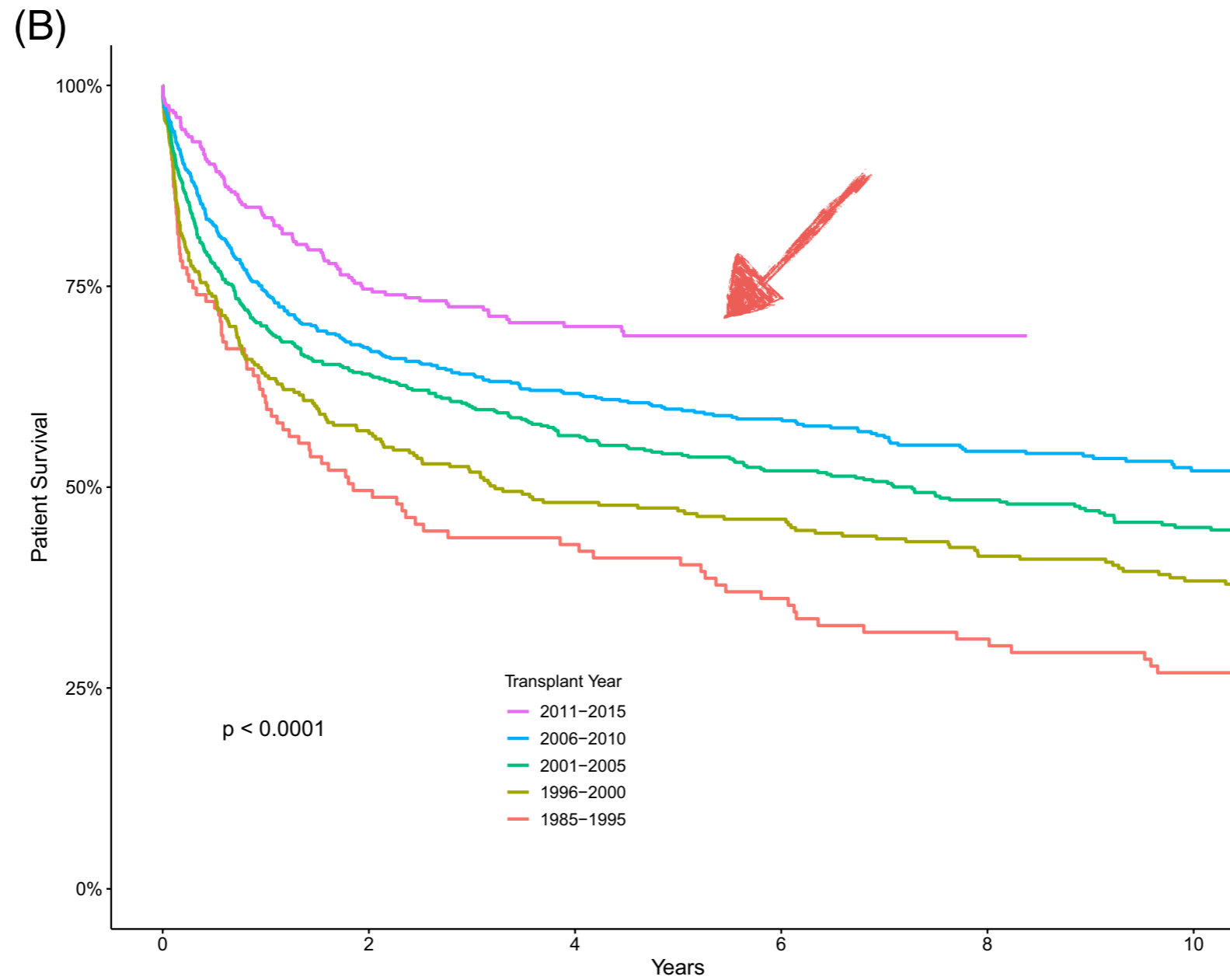




# Trasplante hepato-intestinal

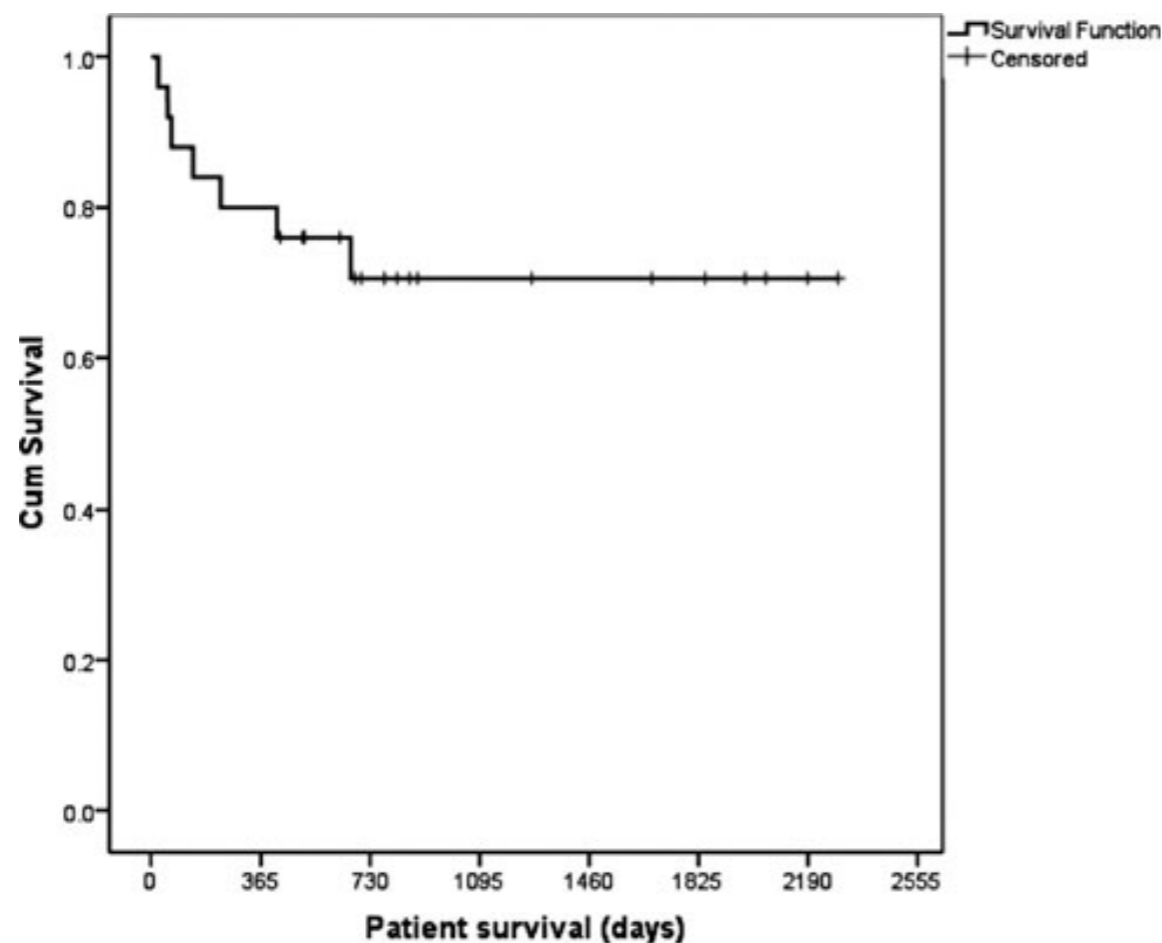


# Trasplante hepato-intestinal



## Multivisceral Transplantation for Diffuse Portomesenteric Thrombosis

*Rodrigo M. Vianna, MD,\*† Richard S. Mangus, MD,\* Chandrashekhara Kubal, MD,\* Jonathan A. Fridell, MD,\*  
 Thiago Beduschi, MD,\* and A. Joseph Tector, MD, PhD\**



**TABLE 6.** Surgical complications

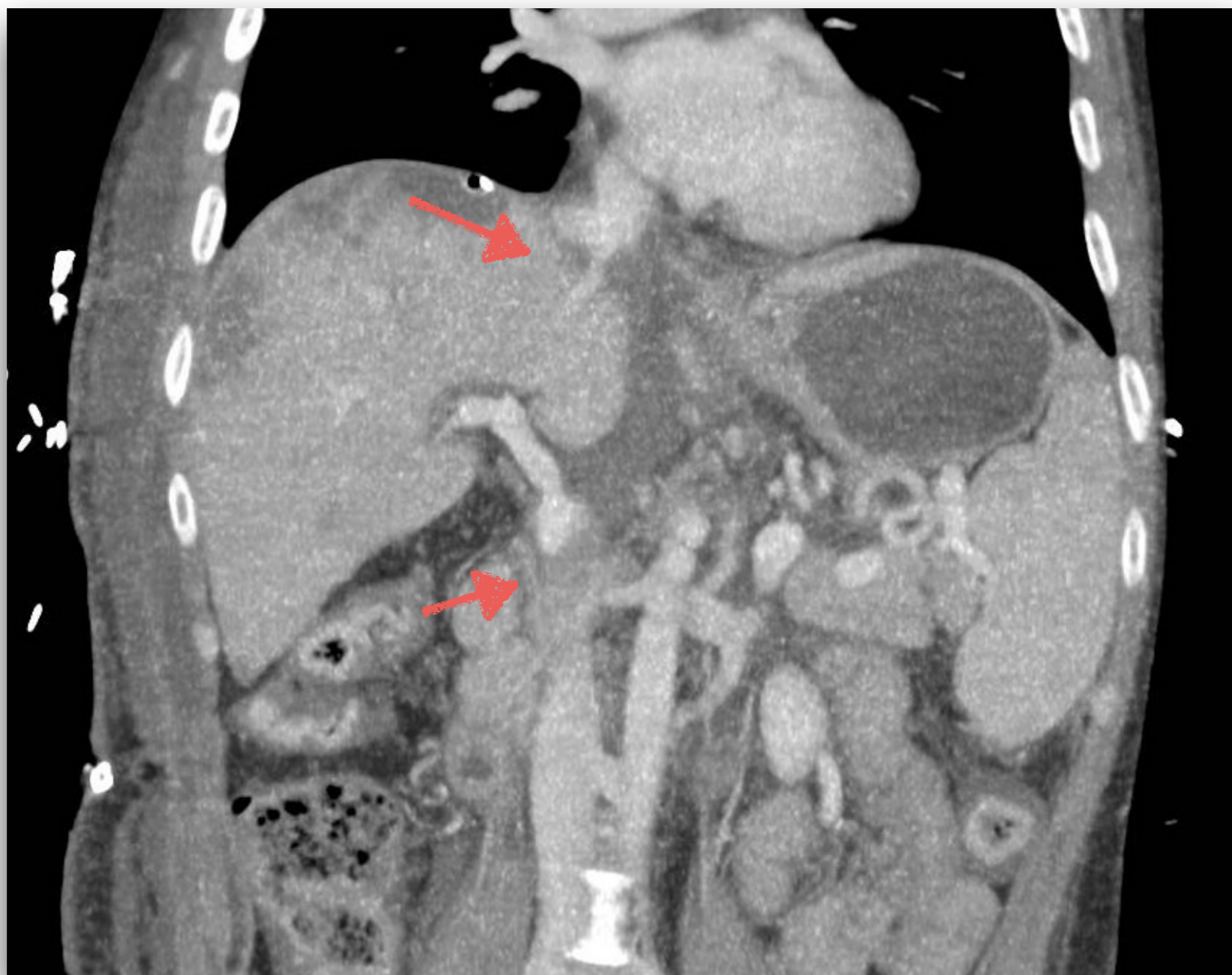
Surgical Complications	n	%
Bleeding	2	8
Bowel obstruction	1	4
Complicated diverticulitis	1	4
Ileocolic/rectal anastomosis leak	2	8
Wound dehiscence requiring surgery	3	12
Infected intra-abdominal fluid collections	5	20





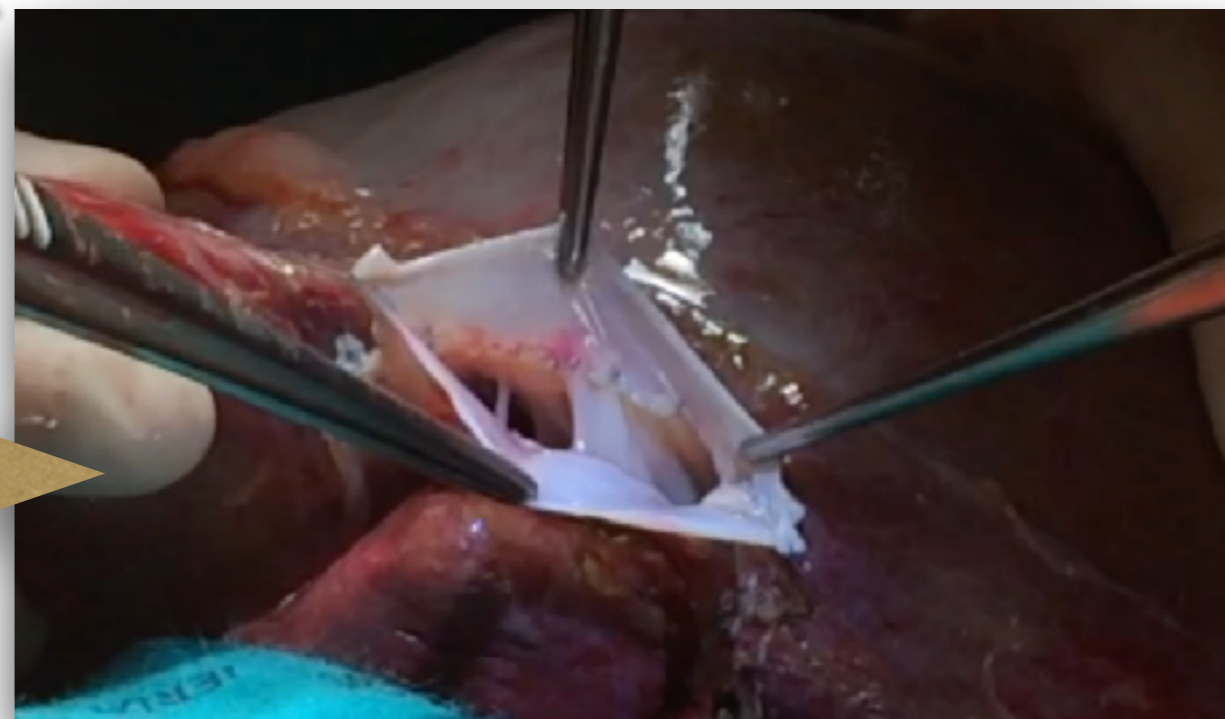
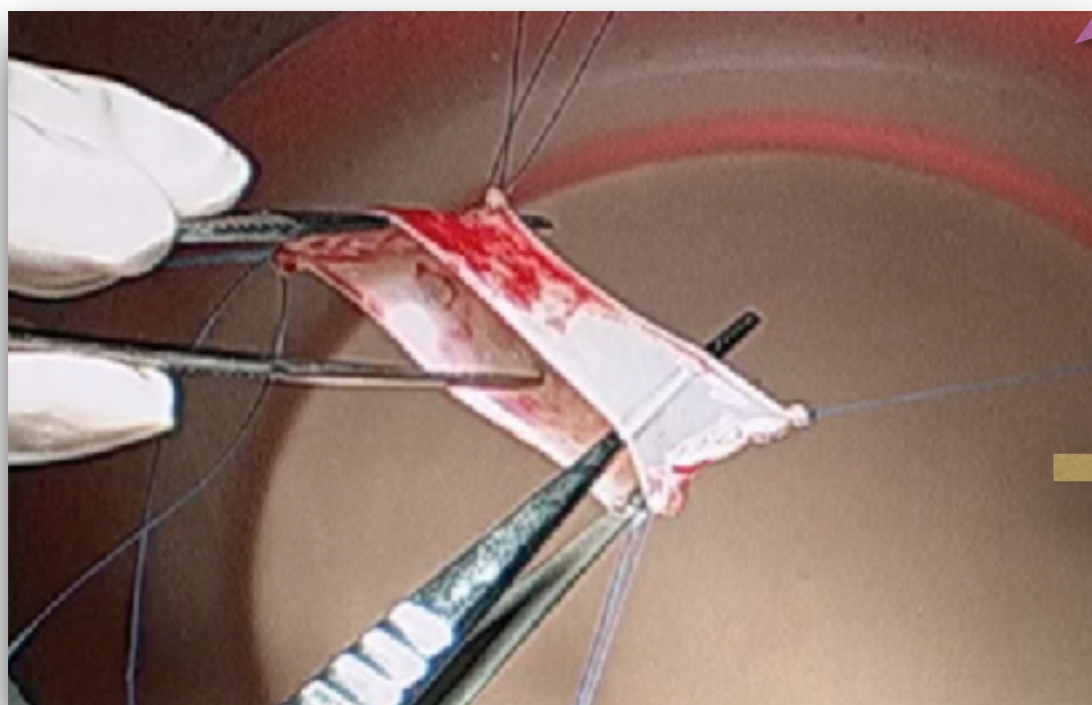
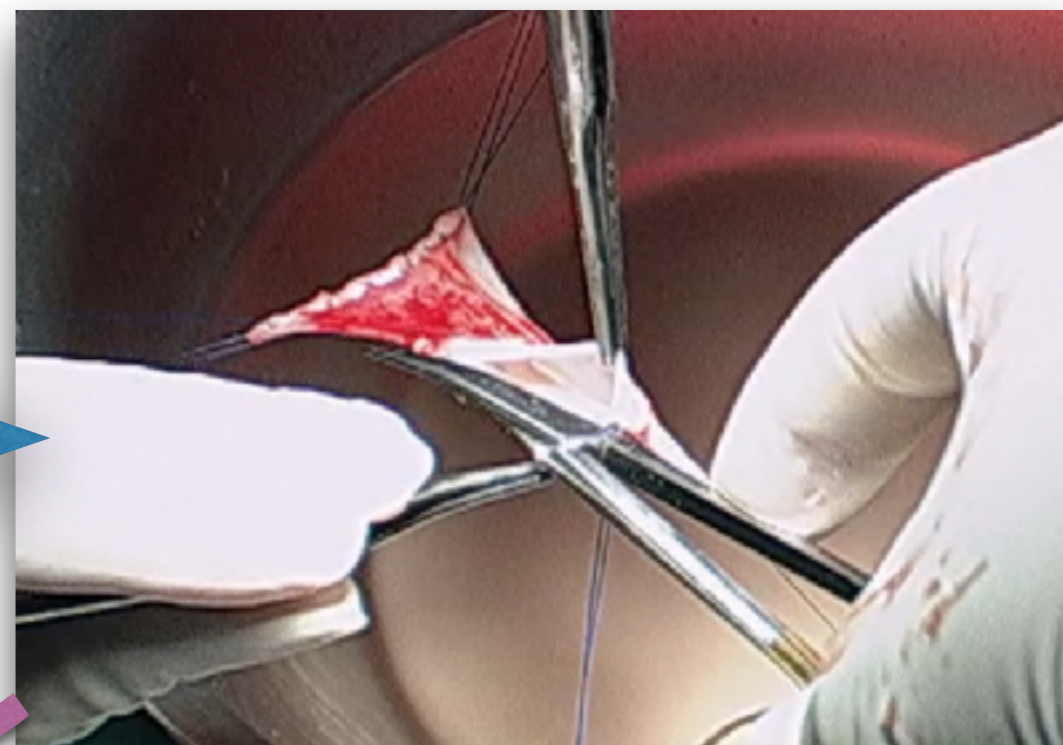
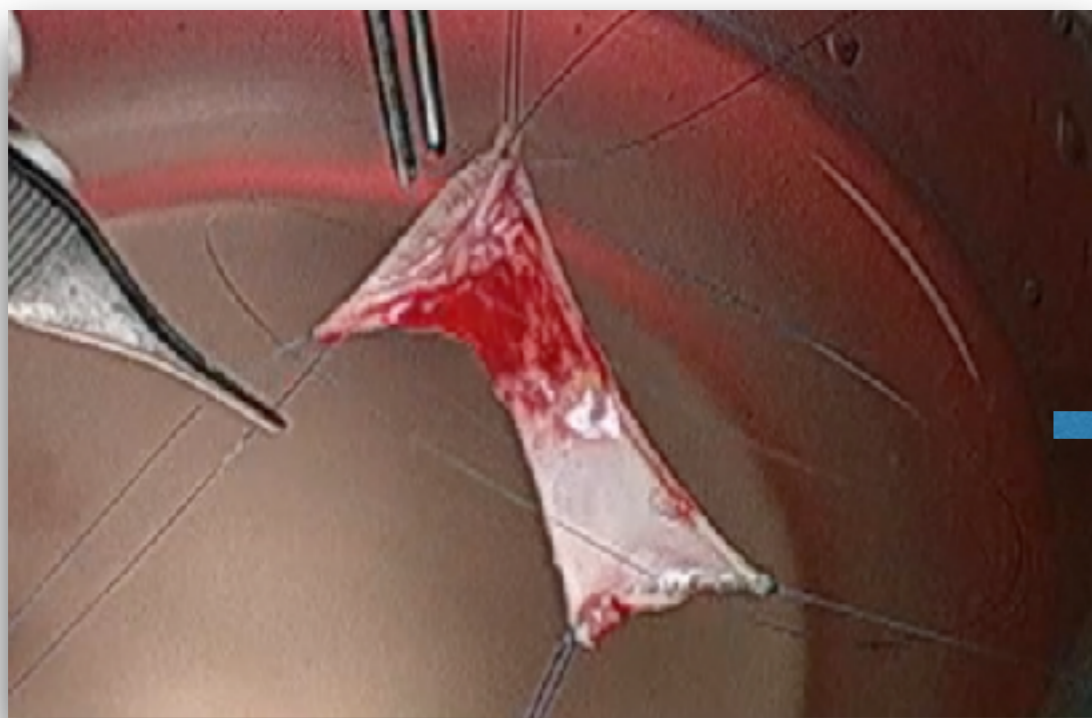
# Reconstrucción venosa suprahepática

# Cavo-cavostomía TT



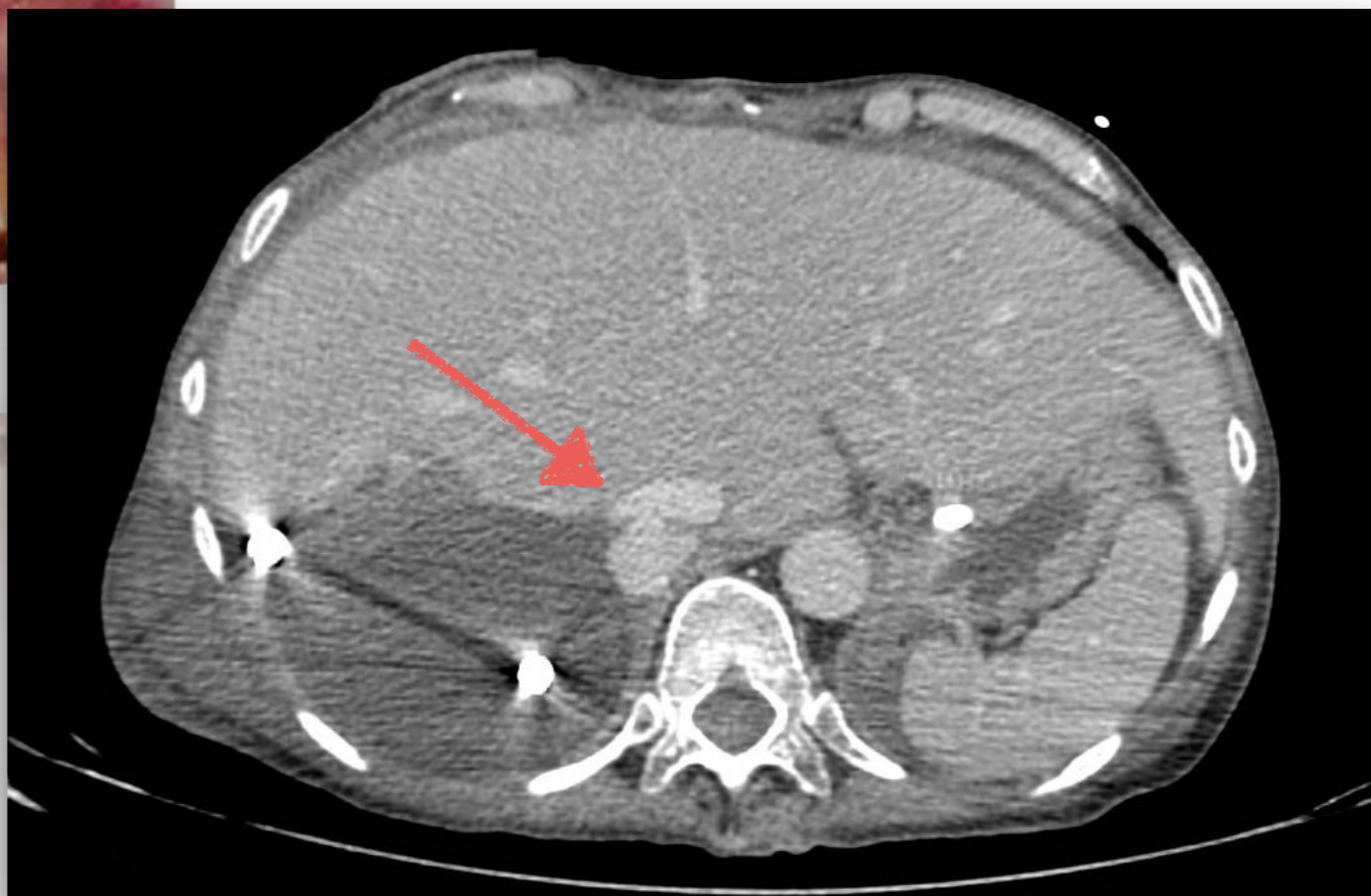
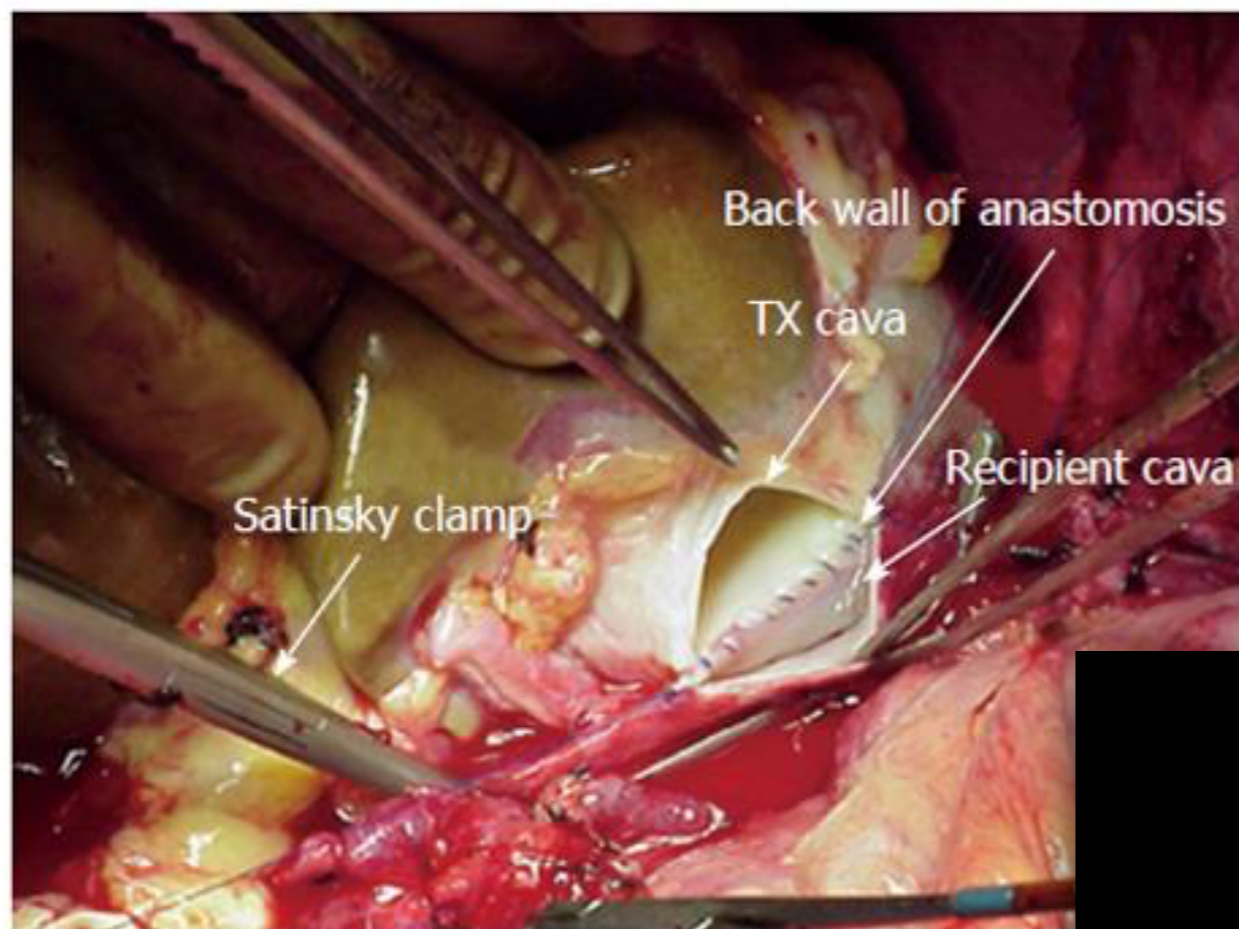


# Cavo-cavostomía TT

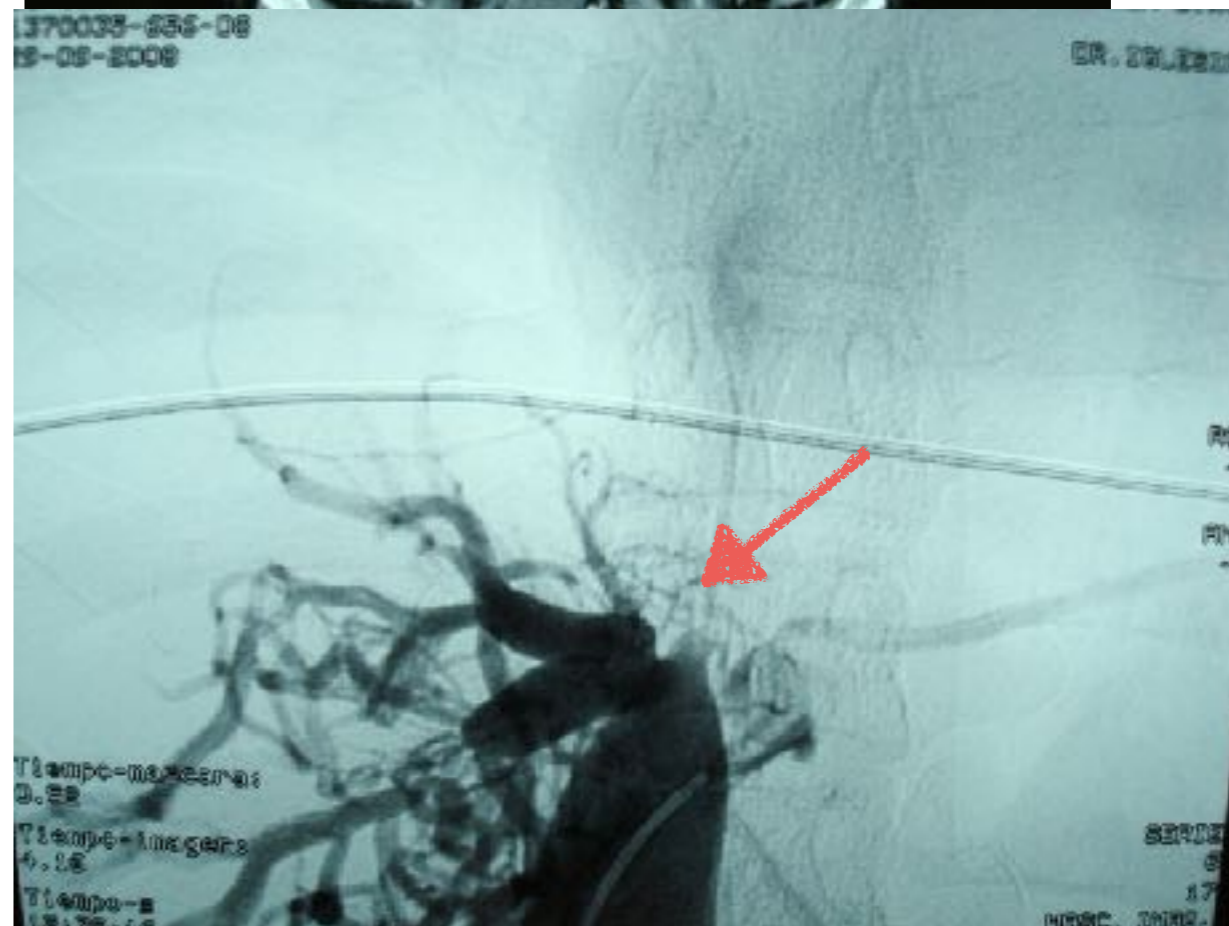
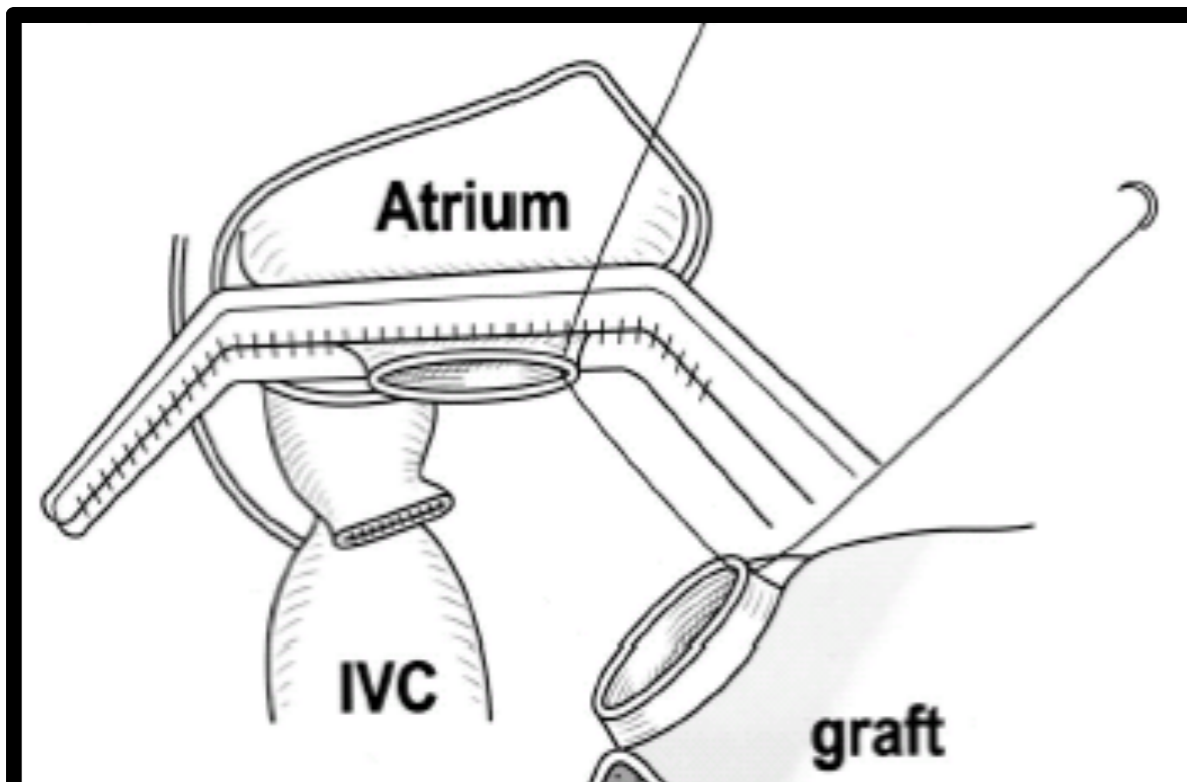




# Cavo-cavostomía LL







## CONTROVERSIAS

1. Evitar “improvisaciones” preTOH
  - Screening TC
  - Análisis de shunts y circulación colateral
2. ¿Se deben incluir en LE pacientes con previsión de revascularización de riesgo?