TIPS for refractory ascites: Superiority of Viatorr® TIPS with controlled expansion

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Disclosure

Speaker name:
Jonel Trebicka

I have the following potential conflicts of interest to report:
Consulting, Lectures

I do not have any other potential conflict of interest
How develops ascites?
Pathophysiology of portal hypertension

- Hepatic resistance
- Portal pressure
- Splanchnic vasodilatation
- Cardiac output
- Effective blood volume
Kidney dysfunction during liver cirrhosis

- Portal hypertension
  - Portosystemic shunting of vasodilators
  - Systemic arterial vasodilatation
  - ↓ Sensitivity of renal circulation to vasoconstrictors
  - Altered renal autoregulation
  - ↓ GFR, ↓ RBF and sodium retention
  - ↓ EABV
  - Activation of RAAS, SNS and AVP
  - Renal failure
  - Marked deterioration
  - Compensatory ↑ CO
  - Encroachment on cardiac reserve
  - Systolic incompetence
  - Acute precipitating event
Therapy of ascites

Max. 5g NaCl/d
Max. fluids 1.5l/d

Loop diuretics
e.g. Furosemid
max. 160mg/d

Aldosteronantagonists
(e.g. Spironolakton)
max. 300mg/d

Max. sodium excretion
+ Water excretion

Gines & Guevara Hepatology 2008; Moore et al Hepatology 2003

If urine-Na < 20mmol/d
or serum-Na < 125mmol/l
no effect of diuretics is expected!
TIPS for portal hypertension

Cardiac output

Effective blood volume

Hepatic resistance

Porta pressure

Splanchnic vasodilatation

Renal perfusion

Trebicka. J Hepatol 2017
Refractory ascites
TIPS controls ascites

Tan et al. J Gastroenterology and Hepatology 2015
Refractory ascites
TIPS improves survival

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>log [HR]</th>
<th>SE</th>
<th>Total</th>
<th>Total</th>
<th>Weight</th>
<th>HR, 95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rössle, 2000</td>
<td>-0.52</td>
<td>0.32</td>
<td>29</td>
<td>31</td>
<td>20.7%</td>
<td>0.59 [0.32, 1.11]</td>
</tr>
<tr>
<td>Ginès, 2002</td>
<td>-0.21</td>
<td>0.32</td>
<td>35</td>
<td>35</td>
<td>20.7%</td>
<td>0.81 [0.43, 1.52]</td>
</tr>
<tr>
<td>Sanyal, 2003</td>
<td>-0.09</td>
<td>0.31</td>
<td>52</td>
<td>57</td>
<td>22.0%</td>
<td>0.91 [0.50, 1.68]</td>
</tr>
<tr>
<td>Salerno, 2004</td>
<td>-0.80</td>
<td>0.35</td>
<td>33</td>
<td>33</td>
<td>17.3%</td>
<td>0.45 [0.23, 0.89]</td>
</tr>
<tr>
<td>Narahara, 2011</td>
<td>-0.92</td>
<td>0.33</td>
<td>30</td>
<td>30</td>
<td>19.4%</td>
<td>0.40 [0.21, 0.76]</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>179</td>
<td>186</td>
<td>100.0%</td>
<td>0.61 [0.46, 0.82]</td>
</tr>
</tbody>
</table>

Heterogeneity: $\chi^2 = 4.92$, $df = 4$ ($P = 0.30$); $I^2 = 19$

Test for overall effect: $Z = 3.35$ ($P = 0.0008$)

Without Rössle, 2000

<table>
<thead>
<tr>
<th>Study or subgroup</th>
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<th>SE</th>
<th>Total</th>
<th>Total</th>
<th>Weight</th>
<th>HR, 95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lebrec, 1996</td>
<td>1.19</td>
<td>0.58</td>
<td>13</td>
<td>12</td>
<td>5.9%</td>
<td>3.29 [1.05, 10.24]</td>
</tr>
<tr>
<td>Fixed</td>
<td>192</td>
<td></td>
<td>198</td>
<td>100.0%</td>
<td></td>
<td>0.68 [0.51, 0.89]</td>
</tr>
<tr>
<td>Random</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.72 [0.46, 1.13]</td>
</tr>
</tbody>
</table>

Heterogeneity: $\chi^2 = 12.79$, $df = 5$ ($P = 0.03$); $I^2 = 61$

Test for overall effect: $Z = 2.75$ ($P = 0.006$)
Refractory ascites

cTIPS is better than bTIPS

Tan et al. J Gastroenterology and Hepatology 2015
Refractory ascites
cTIPS improves survival

Bureau et al. Gastroenterology 2016
BUT,...
High volume shunting might deteriorate clinics

- Cardiac output
- Effective blood volume
- Renal perfusion
- Splanchnic vasodilatation
- Portal pressure
- Hepatic resistance
Cardiac function

Cazzaniga et al. Gut 2007
Cardiac function

Wahnhoff et al. AP&T 2016
Post TIPS gradient

n=99
p=0.01

Passive expansion of Viatorr
GORE® VIATORR® TIPS Endoprosthesis with Controlled Expansion description

- 10 mm VIATORR® devices
- 8-10 mm VIATORR® w/ CX devices
Viatorr CX (VCX) compared to Viatorr and BMS

Case-control study:

- 21 VCX
- 48 Viatorr
- 36 BMS

3 months follow-up

Less ascites

P = 0.006
Viatorr CX (VCX) compared to Viatorr and BMS

Case-control study:

21 VCX
48 Viatorr
36 BMS

3 months follow-up

Less ascites
Less HE

Praktiknjo et al. in preparation
Viatorr CX (VCX) compared to Viatorr and BMS

Case-control study:

21 VCX  
48 Viatorr  
36 BMS  

3 months follow-up

Less ascites  
Less HE  
Improved MELD

MELD 3 months after TIPS

P < 0.05
Viatorr CX (VCX) compared to Viatorr and BMS

Case-control study:

21 VCX
48 Viatorr
36 BMS

3 months follow-up

Less ascites
Less HE
Improved MELD
Less overall decompensation

P < 0.09
TIPS for ascites

If serum-Na < 125 or urine-Na <20 mmol/l then diuretics are unlikely to work, consider a cTIPS.

cTIPS is better than bTIPS for refractory ascites, and cTIPS improves survival in refractory ascites.

VIATORR controlled expansion improves ascites control, reduces hepatic encephalopathy and improved MELD.

VIATORR controlled expansion decreases rate of decompensation and readmission 3 months after TIPS.
Thank you!

Carsten Meier, Claus Pieper, Daniel Thomas, Stefan Fischer, Daniel Küting, Hans Schild, ...

Michael Praktiknjo, Christian Jansen, Alessandra Pohlmann, Christian Strassburg, Nadine Köstlmaier, Teresija Bosnic, Julia Groffy, ...

TIPS-Team Bonn (and many others)
TIPS for HRS

HRS is off-label indication for Viatorr (IFU).

Hepatorenal syndrome

Wong F, Nat Rev Gastroenterol Hepatol 2012
Hepatorenal syndrome

Hepatorenales Syndrom post mortem
TIPS improves renal function

HRS is off-label indication for Viatorr (IFU).

Brensing et al. Gut 2000
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