Authors' objectives
To evaluate whether transjugular intrahepatic portosystemic shunts (TIPS) are more effective than endoscopic treatment (ET) in the prevention of variceal rebleeding.

Searching
The authors searched the electronic databases of MEDLINE and EMBASE (January 1988 to January 1999) using textwords ‘varices’ or ‘variceal bleeding’ and ‘TIPS’. The authors also searched the bibliographies of retrieved articles as well as published citations and abstracts from international conferences held between January 1995 and January 1999 (American Digestive Disease Week, American Association for the Study of Liver Diseases, European Association for the Study of Liver Diseases, and United European Gastroenterology Week).

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) with median follow-up ranging from 10 to 32 months.

Specific interventions included in the review
Transjugular intrahepatic portosystemic shunts (TIPS) compared with endoscopic treatment (ET), sclerotherapy or ligation, with or without the addition of beta-blockers.

Participants included in the review
Patients with at least one episode of esophageal variceal bleeding.

Outcomes assessed in the review
Variceal rebleeding, death, and encephalopathy.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection. Agreement between the reviewers for the selection of relevant articles was 100%.

Assessment of study quality
The authors used a quality scoring (maximum score = 82) which was based on a previous publication (see Other Publications of Related Interest no.1) and modified appropriately for evaluation of trials on variceal rebleeding. The evaluation covered randomisation methods and efficacy, compliance, follow-up schedule, a priori estimates of sample size, number of withdrawals, analysis of withdrawals, evaluation of response, patients' characteristics, patients' enrolment, description of therapeutic intervention, timing of events, and report of complications. Two reviewers independently assigned an overall quality score for trials (published as peer-reviewed articles). Any differences were resolved by consensus.

Data extraction
Data were extracted independently from each report by two reviewers using a predefined review form and disagreement was resolved by consensus.

Data were extracted for the categories of study design, definition of variceal rebleeding, indications for cross-over from ET to TIPS, definition of post-treatment HE, prophylactic treatment for HE, number of patients with variceal bleeding, total number of patients included in the study, exclusion criteria, mean age, sex, number of patients with Child-Pugh...
Class C Cirrhosis, number of patients with alcohol-induced cirrhosis, number of patients crossed over from ET to TIPS, number of patients crossed over from TIPS to ET, follow-up (in months), and numbers of patients with variceal rebleeding, death or encephalopathy (subgrouped into numbers for TIPS, ET and OR with 95% CIs).

Methods of synthesis
How were the studies combined?
The pooled odds ratio (OR) and 95% confidence intervals (CIs) were calculated using the Mantel-Haenszel fixed-effect model as modified by Robbins et al. (see Other Publications of Related Interest no.2) and the DerSimonian and Laird random-effects model. When statistical significance was present, the authors also calculated the number-needed-to-treat (NNT).

How were differences between studies investigated?
A chi-square test for heterogeneity was performed.

Sensitivity analyses were performed for type of publication, methodological quality score, mean duration of follow-up, type of ET, etiology, and severity of liver disease.

Results of the review
Eleven RCTs were included in the review with 811 participants (403 patient treated with TIPS and 408 patients treated with ET).

Variceal rebleeding was significantly more frequent with ET (46.6%) than with TIPS (18.9%), OR = 3.80, 95% CI: 2.76, 5.23; p < 0.001 but there was no difference in mortality (OR = 0.97, 95% CI: 0.71, 1.34). The absolute risk difference in favour of TIPS was 0.28 (95% CI: 0.22, 0.34) and the NNT to prevent variceal rebleeding in 1 patient was 4 (95% CI: 3, 5).

Post-treatment encephalopathy occurred significantly less often after ET (19%) than after TIPS (34%), OR = 0.43, 95% CI: 0.30, 0.60; p < 0.001.

In the studies showing resource use, this was more extensive for TIPS.

Publication bias assessment showed that 165 null or negative studies would be needed to render the results of this analysis not statistically significant.

There was no evidence of statistical heterogeneity for any of the analyses for rebleeding (P > 0.21), or death (P = 0.77), or death due to other causes (P = 0.98), or for encephalopathy (P = 0.55).

The sensitivity analyses did not alter the main conclusion, and sole comparison with endoscopic ligation did not alter these results.

Authors’ conclusions
The authors state that in patients with variceal bleeding, TIPS compared with ET reduces the rebleeding rate, but does not improve survival, and increases the incidence of encephalopathy in a period of 1 to 2.5 years. Because the follow-up in the TIPS studies is relatively short and TIPS dysfunction rate is anticipated to increase with time, a surgical shunt may yet be a better therapeutic option in patients with relatively good liver function and recurrent variceal bleeding despite ET. Thus, TIPS cannot be recommended as the first choice treatment for prevention of variceal rebleeding, but should be reserved only for patients with recurrent variceal bleeding in whom ET fails.

CRD commentary
This is a good systematic review. The authors have clearly stated their research question and inclusion and exclusion criteria. The literature search appears thorough although it does not mention the inclusion of unpublished data or whether there were any language restrictions on the search. The quality of the included studies was assessed using an
extensive criteria. The authors have reported on how the articles were selected, and on how many of the reviewers were involved in the data extraction.

The data extraction is reported in tables and text and the studies are appropriately combined in a quantitative pooling which assessed results using both fixed-effect and random-effects models. There were tests for heterogeneity and the authors have performed additional sensitivity results as well as discussing some methodological and data limitations of studies included in the review. The authors’ conclusions appear to follow from their results.

Implications of the review for practice and research
Practice: The authors state that TIPS cannot be recommended as the first choice treatment for prevention of variceal rebleeding, but should be reserved only for patients with recurrent variceal bleeding in whom ET fails.

Research: There were no stated implications for research.

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Other publications of related interest

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.