Systematic appraisal of the role of metallic endobiliary stents in the treatment of benign bile duct stricture
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CRD summary
This review assessed the use of metallic endobiliary stents in the management of benign biliary strictures. The authors concluded that, owing to a lack of long-term data, metallic endobiliary stents should not be used for benign stricture in those patients with a predicted life expectancy of greater than 2 years. The authors’ conclusions are appropriate and appear reliable.

Authors’ objectives
To assess the use of metallic endobiliary stents in the treatment of benign biliary strictures.

Searching
MEDLINE (from January 1966 to November 2003) and EMBASE (from January 1980 to November 2003) were searched; the search terms were reported. The studies were restricted to articles reported in English. In addition, the references of identified studies were checked.

Study selection
Study designs of evaluations included in the review
No inclusion criteria in relation to study design were stated. The included studies were all case series.

Specific interventions included in the review
Studies that assessed metal endobiliary stents were eligible for inclusion. Studies that assessed plastic stents were excluded.

Participants included in the review
Studies that assessed participants with benign biliary stricture were eligible for inclusion. Studies that assessed participants with malignant strictures were excluded. The aetiology of benign biliary stricture in the included participants were, most commonly, post-operative biliary strictures, stenosed biliary-enteric anastomoses, and biliary stricture following liver transplantation. The median duration of stricture prior to the insertion of metallic stents in the 14 studies (36%) reporting these data was 15 months (range: 1 week to 96 months). The median participant age in the 24 studies reporting these data was 54 years (range: 3 months to 92 years).

Outcomes assessed in the review
The outcome of primary interest was stent patency. This was defined as the initial period of patency of the index metal stent, defined as from stent placement until any episode of occlusion. Any subsequent period of stent patency obtained by therapeutic intervention was excluded from the analysis. The other outcomes assessed included complications and the management of stent occlusion.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Two independent reviewers extracted the data and cross-checked for any discrepancies. Data were extracted on the time to occlusion, mortality rates, treatment of occluded stents and any other complications.

**Methods of synthesis**

**How were the studies combined?**

The studies were grouped by outcome and combined in a narrative. Median percentages of patients were calculated for the outcomes of interest. Publication bias was not assessed.

**How were differences between studies investigated?**

Differences between the studies in terms of the aetiology and duration of stricture before stent placement, indications for metal stent insertion, and the route of stent insertion, were discussed in the text.

**Results of the review**

Thirty-seven case series were included; data from 400 participants with benign biliary strictures were included in the analysis.

Stent patency.

In the 34 studies reporting the length of follow-up, the median follow-up time was 31 months (range: 1 to 111). During follow-up, 139 (35%) patients experienced stent occlusion. The median delay to the first episode of occlusion was 9 months (range: 1 week to 67 months). There was no evidence that the aetiology underlying stricture had any effect on the time to occlusion. The number of stents known to have occluded on an annual basis was 70 at year 1, 98 at year 2 and 107 at the end of year 3. The number of stents known to be patent without prior occlusion was 258 (65%) at 1 year, 151 (38%) at 2 years, 99 (25%) at 3 years, 54 (14%) at 4 years and 16 (4%) at 5 years.

Route of stent insertion.

Stents were inserted via the percutaneous transhepatic route in 199 (50%) participants, via endoscopic retrograde access in 69 (17%), and via a combination of these two approaches in 42 (11%). In the 25 studies that reported data on the diameter-length of the stent, the median stent diameter was 10 mm (range: 5 to 12) and stent length was 34 mm (range: 10 to 78).

Complications.

Stent migration or dislodgement was reported in 15 participants (4%). Other complications included hepatic abscess or sepsis (5), bile leak (2), haemobilia (3) and stone formation above the stent (2).

**Authors' conclusions**

There was a critical lack of data on long-term patency. Therefore, metallic endobiliary stents should not currently be used for benign stricture in those patients with a predicted life expectancy of greater than 2 years.

**CRD commentary**

The review question was clearly defined in terms of the interventions, participants and outcome measures. Only two databases were searched for relevant studies and no efforts were made to identify either foreign language or unpublished studies. This means that potentially relevant studies might have been missed. It appears that two reviewers were involved in selecting the studies, and efforts were made to minimise reviewer bias and errors in the data extraction process. The quality of the primary studies was not assessed. However, this is consistent with the inclusion of case series studies. Adequate study details were presented to allow the reader to assess whether the authors' conclusions are consistent with the evidence reviewed. The use of a narrative synthesis was appropriate given the differences between the studies. Overall, the authors' conclusions are appropriate and are likely to be reliable.
Implications of the review for practice and research
Practice: The authors stated that, owing to the lack of data on long-term patency, metallic endobiliary stents should not currently be used for benign stricture in patients with a predicted life expectancy of greater than 2 years.

Research: The authors stated that longer term follow-up studies of a greater duration than 3 years are needed to assess the patency of metallic endobiliary stents for benign stricture.

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