Comparative clinical outcomes of various annuloplasty rings of mitral valve repair surgery: A network meta-analysis

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Background

The aim of this network meta-analysis was to evaluate the effect of five different valve materials in mitral valve repair.

Methods

PubMed, Embase, Cochrane library and Web of science were searched to identify relevant primary case-control studies published between 1995 and 2019. Cochrane Risk of Bias tools were used to quality appraise the studies. Three researchers independently screened the literature and extracted the data. Traditional meta-analysis and network meta-analysis were performed by Review Manager 5.3, ADDIS and R software 3.6.2. The funnel plot was used to assess the publication bias. Inconsistency between direct and indirect comparisons was also not significant.

Result

We identified total of 1437 articles through database searching, but only 12 random-trials were included, involving 2196 patients with five different types of materials were included in the data extraction and quality assessment stage. Five types of annuloplasty rings, including flexible ring, rigid ring, semi-flexible ring, semi-rigid ring and autologous ring, were compared, in terms of mortality, treatment success rate, re-operation and recurrence. Semi-rigid ring performed relatively better for long-term mortality, while rigid ring might be the best choice in close cases to reduce recurrence and re-operate rate. To increase treatment success, semi-flexible ring seemed to be better. And the network meta-analysis showed that semi-flexible ring ranks first in mortality.

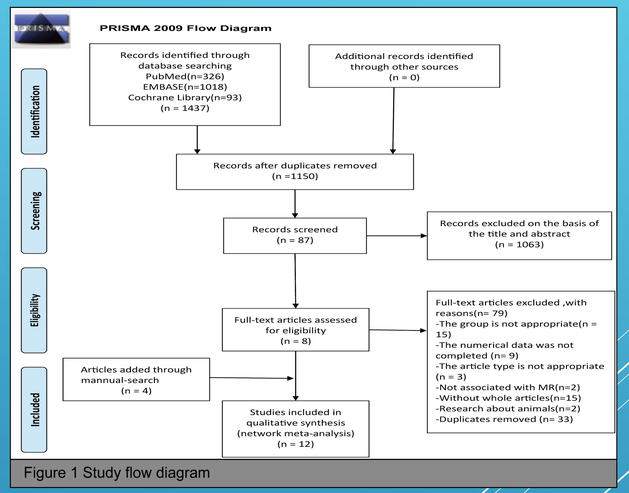


Figure 1 Study flow diagram

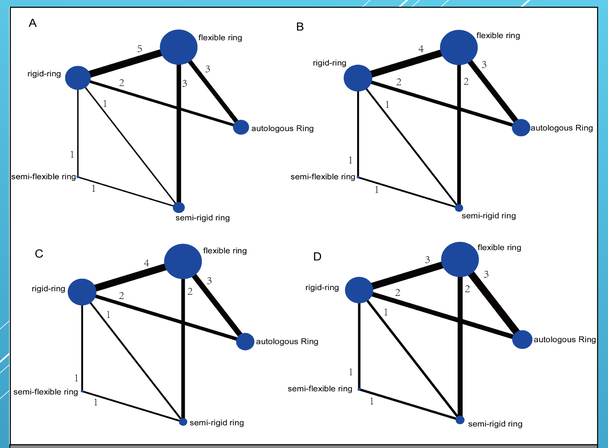


Figure 2: Network of comparisons of five annuloplasty rings for mitral valve repair
(A) mortality; (B) Recurrence; (C) Clinical cure rate; (D) Re-operate rate.

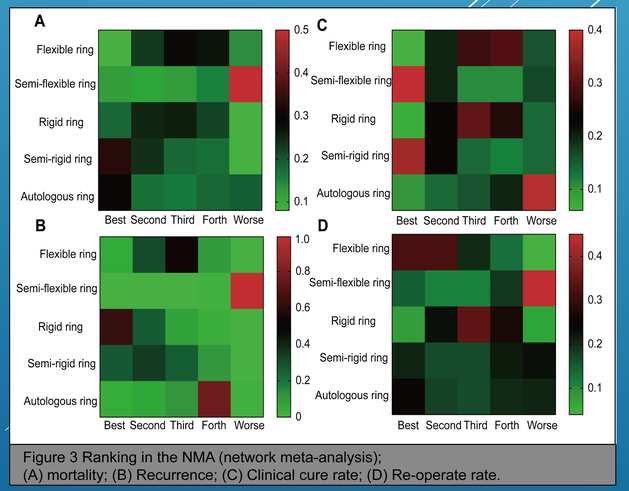


Figure 3 Ranking in the NMA (network meta-analysis);
(A) mortality; (B) Recurrence; (C) Clinical cure rate; (D) Re-operate rate.

Conclusions

We recommended using rigid ring as the most suitable material for mitral valve repair when we used recurrence and re-operate rate as primary outcome.