Appendix 1 Supplementary methods

Registration

The current analysis aimed to provide a provisional overview of long-term hybrid ablation of atrial fibrillation (AF) outcomes to accompany this narrative review. We did not register this protocol.

Search and inclusion

A systematic search was applied to three electronic databases (PubMed, Embase, Cochrane Library) containing the following criteria: 'thoracoscopic ablation', 'hybrid ablation', 'atrial fibrillation' and all other possible alternative spelling. The search was performed by two independent reviewers. Articles were included for the pooled analysis of freedom from atrial tachyarrhythmia (ATA) recurrence when reporting on (I) consecutive patients undergoing hybrid ablation using (II) Kaplan-Meier (K-M) survival analysis. Articles were screened based on title and abstract (n=12,212) and afterwards, based on full-text.

Data extraction and outcomes

The outcomes for this provisional presentation of real-world hybrid AF approach were freedom from ATA recurrence on antiarrhythmic drugs (AADs) and off AADs, and safety outcomes including conversion to sternotomy, re-thoracotomy, stroke, bleeding and pacemaker implantation rates. The K-M curves and numbers at risk at each specific timepoint were extracted from the included studies.

Risk of bias

The current provisional presentation of real-world long-term hybrid ablation outcomes included single and multiple-arm studies. As all studies reported on consecutive patients and duplication was avoided, all results were considered relevant for the data presentation. No specific risk of bias assessment was performed.

Statistical analysis

Studies with K-M curves on freedom from ATA recurrence were included and their K-M curves were extracted from the original papers, together with the numbers at risk, as recently proposed by Liu and colleagues (58). This data were uploaded in a web-based application and converted to individual patient data. Eventually, the reconstructed time-to-event data were presented in a new pooled K-M curve, stratified by allowance of AADs. Finally, for the safety outcomes, data were pooled with a random-effects model and presented as percentages and 95% confidence intervals.

References

58. Liu N, Zhou Y, Lee JJ. IPDfromKM: reconstruct individual patient data from published Kaplan-Meier survival curves. BMC Med Res Methodol 2021;21:111.