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ADVANTAGE OF 16S rRNA SEQUENCING ANALYSIS IN COMBINATION WITH CULTURAL METHODS FOR THE MANAGEMENT OF COMPLICATED INFECTIOUS ENDOCARDITIS REQUIRING SURGERY

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Introduction. Infective endocarditis (IE) remains a major clinical challenge due to difficulties in microbiological diagnosis. Conventional blood cultures often fail, resulting in culture-negative IE and limiting targeted antimicrobial therapy. This study aimed to evaluate the impact of 16S rRNA gene sequencing on etiologic diagnosis and management of non–device-related IE requiring surgery.

Materials and Methods. We prospectively analyzed 149 patients who underwent surgery for non– device-related IE between 2022 and 2024. All patients had blood cultures, valve tissue cultures, and molecular analysis of excised valves using 16S rRNA sequencing. Outcomes were compared with a retrospective cohort of 512 surgically treated IE patients with similar characteristics but without molecular diagnostics.

Results. Mean age was 64 years, with females representing one third of cases. The aortic valve was most frequently involved. Valve cultures were positive in 10–12% of cases, whereas 16S rRNA sequencing identified pathogens in 37–39%. The combined use of molecular diagnostics and blood cultures reduced culture-negative IE from approximately 16% to 9–11%. Molecular findings enabled optimization of antimicrobial therapy and were associated with reduced mortality.

Conclusions. Incorporation of 16S rRNA sequencing improves etiologic diagnosis and management of IE. Given the high concordance with blood cultures, molecular testing may be reserved for cases with negative blood cultures or suspected atypical pathogens.