Statistical Analysis

After an initial evaluation for possible misinputs in Microsoft Office 365 Excel, further statistical analyses were performed using IBM SPSS Statistics (version 31, IBM Corp., Armonk, NY, USA). To assess the parametric distribution, Kolmogorov-Smirnov analysis and Q-Q plots were used. For parametric values, continuous variables were presented as mean and standard deviation, while categorical variables were reported as numbers and percentages. No interim analyses were planned or performed, and no formal stopping guidelines were defined for this study.

Baseline demographic characteristics, comorbidities, operative variables, and postoperative complications were compared among the three groups. The Pearson Chi-square test was used to compare nominal variables, including demographic characteristics and comorbidities, with further analysis planned using Phi and Cramer's V for statistically relevant parameters. ANOVA was used to compare means between groups, with post hoc analysis performed to identify statistically relevant groups. When a significant overall difference was detected, post hoc pairwise comparisons were performed to identify intergroup differences using the least significant difference approach.

Repeated measurements of VAS and QoR-40 scores over time were analyzed using repeated-measures ANOVA, with time as the within-subjects factor and group as the between-subjects factor. Sphericity was evaluated using Mauchly's test, and if violated, Greenhouse–Geisser corrections were applied to adjust the degrees of freedom for within-subjects effects. Main effects of time, group, and the time × group interaction were examined. Effect sizes were calculated and reported as partial eta squared (η^2p) to quantify the magnitude of observed effects for both within- and between-subjects analyses.

Regarding study size, the required sample size was determined by analyzing VAS and QoR-40 scores, and thus, repeated measures ANOVA was selected as the statistical method to be used for the minimal patient count. For one between-subjects factor and one within-subjects factor, assuming a moderate effect size for the time interaction (partial eta-squared η^2p of at least 0.06), a type I error of 0.05, statistical power of 80%, and a correlation of 0.5 between repeated measures, a minimum of 54 patients per group was assumed. To compensate for a possible 10% patient loss in each group, a study size of 180 patients was targeted.

Patient Selection Flow Chart