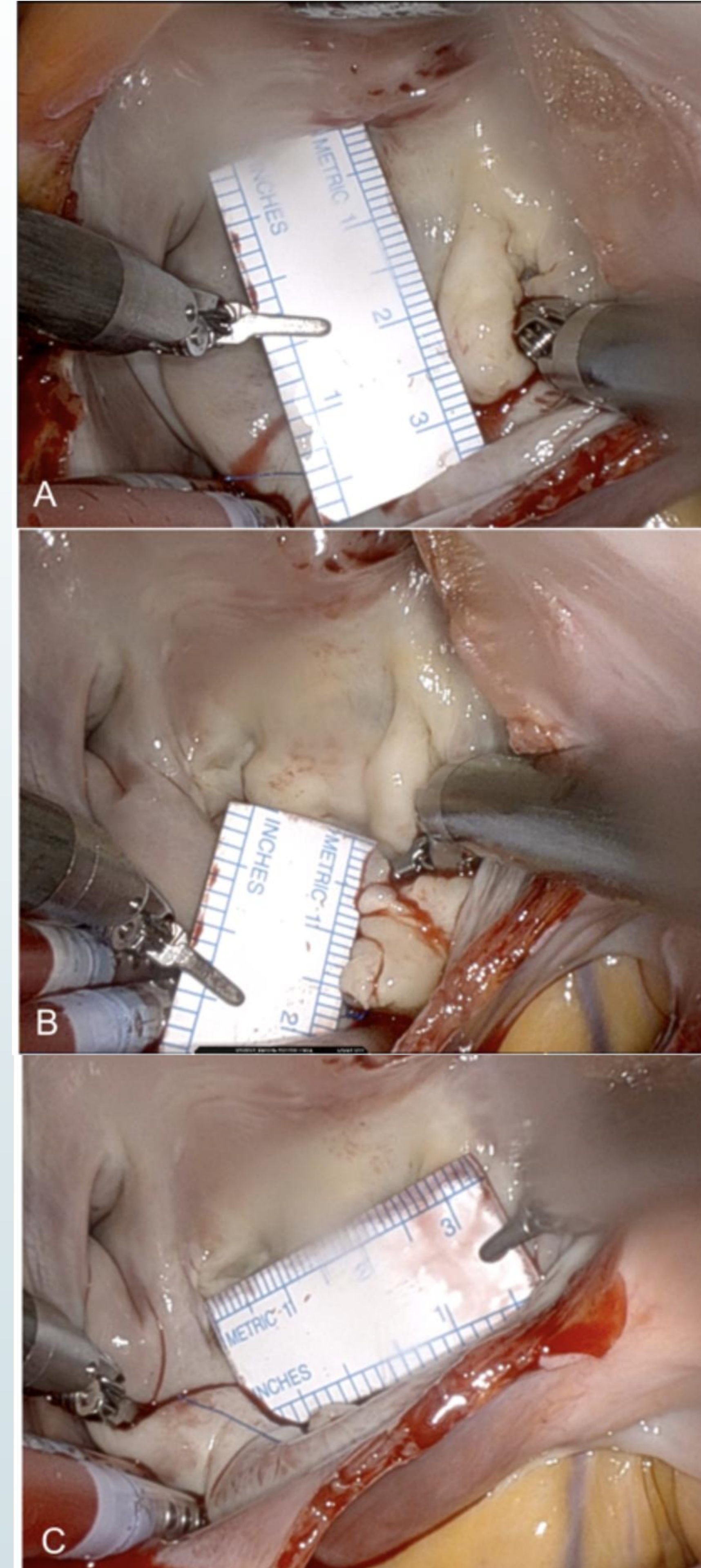


Objective

Correct technique and appropriate ring sizing are essential for successful repair of the mitral valve. Various methods for ring size selection for mitral annuloplasty exist that rely on different anatomic measurements. The correlation of the ring sizing technique that incorporates both leaflet lengths with methods that use intertrigonal distance, intercommissural distance, and anterior leaflet length was studied in our series of robotic mitral repair cases.

Methods

Measurements of leaflet lengths, intertrigonal distance and intercommissural distance from consecutive 100 robotic mitral repair cases for degenerative mitral valve disease with or without additional procedures were studied. The ring sizes implanted using the formula Anterior leaflet length + Posterior leaflet length - 20mm = Anteroposterior ring diameter were compared against resulting ring sizes from other measurements. Postoperative coaptation lengths were measured with echocardiography. Leaflet lengths were also measured intraoperatively with a surgical ruler for confirmation



Operative measurement of A) anterior leaflet, B) posterior leaflet, and C) intertrigonal distance

Results

A large variance was observed between the studied method with the intertrigonal distance method (Intraclass correlation=0.414) and similarly between the studied method and the intercommissural distance method (Intraclass correlation=0.327). The ring sizes calculated with our method yielded a range of ring sizes for each anterior leaflet length with moderate agreement (Intraclass correlation=0.655). The mean postoperative coaptation length was 9.9 ± 2.2 mm. 69 patients in our cohort reached the three-year follow up and one non-cardiac mortality was recorded. At three years, two patients had moderate and one patient had severe recurrent mitral regurgitation

Conclusion

There is high variability between the methods used to determine the annuloplasty ring size during mitral valve repair. The method utilizing both leaflet lengths to aim for a sufficient coaptation length may be a reliable and universally reproducible approach. Our midterm results are promising, however, further studies with longer follow-up times are needed to validate the durability of this ring size calculation technique.