

Short Antero-posterior Distance May Predict Conversion To Sternotomy In Minimally Invasive Cardiac Surgery Through A Right Mini-thoracotomy

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Background

Minimally invasive (MIS) approaches have become increasingly common for cardiac surgery. A retrospective review of MIS mitral valve surgeries has shown very low rate of conversion to complete sternotomy, with the conversions mostly being for major bleeding, severe pulmonary adhesions, and aortic dissection.¹ Small body habitus, in particular, a short anterior to posterior (AP) distance, may be a risk factor for difficult access to the mitral valve through a right mini-thoracotomy incision, however this has not been previously studied.

Methods

A retrospective chart review of minimally invasive right mini-thoracotomy procedures from March 2015 to May 2019 at Vancouver General Hospital was performed. Eighty six patients who had pre-operative chest CT scans were included. The five patients who were converted to sternotomy were compared to those who were not converted. All CT scans were evaluated and the AP distance at the level of the mitral valve (measured from the posterior surface of the sternum to the anterior aspect of the vertebral body, figure 1) was recorded. Two-sample t-test was used to compare the means of the measures between the groups and two-tailed p-values reported. F-test was used to compare the variances between the groups.

Results

The average age did not differ between groups (60 ± 26.6 years vs 58.9 ± 15.0 years, converted vs not converted, respectively). The AP distance on CT chest was significantly smaller in the group of patients who were converted (9.71 ± 1.88 cm vs 12.18 ± 2.43 cm, $P = 0.0287$, converted vs not converted, respectively). There were no peri-operative deaths or strokes or wound infections. Of the patients who were converted to sternotomy, none required mitral valve replacement instead of repair.

Conclusion

We observed that a shorter AP distance on CT chest was associated with the need to convert to a sternotomy in patients undergoing right mini-thoracotomy cardiac surgery. Based on our observations, patients with an AP distance of 8 cm or less are no longer offered a minimally invasive approach because of the high likelihood of conversion to sternotomy.

References

1. Vollroth M, Seeburger J, Garbade J, et al. Minimally invasive mitral valve surgery is a very safe procedure with very low rates of conversion to full sternotomy. *Eur J Cardio-thoracic Surg.* 2012;42(1). doi:10.1093/ejcts/ezs195

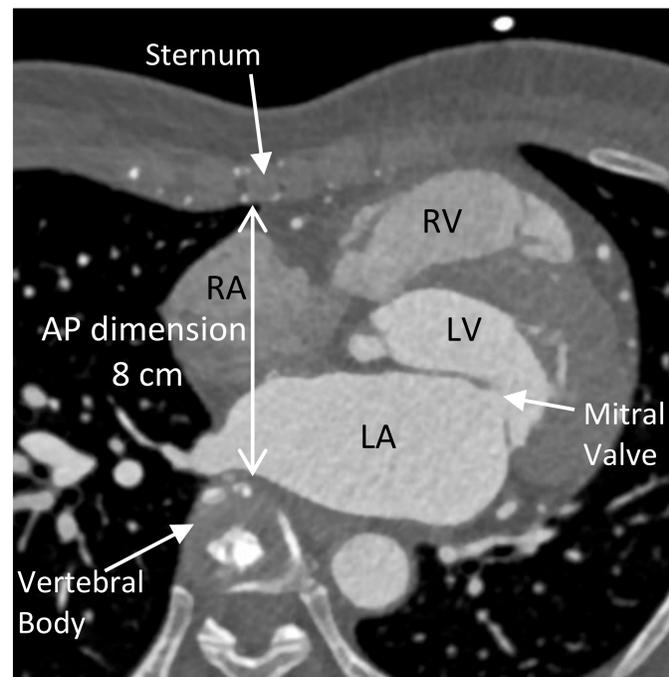


Figure 1. The level of antero-posterior distance was measured at the level of the mitral valve in CT scans as shown.