Bovine Arch Anatomy Influences Recoarctation Rates in the Era of the Extended End-to-End Anastomos

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Bovine Arch Influences Re-Coarctation Rates in the Era of Extended End-to-End Anastomosis

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BACKGROUND: Arch branching has never been shown to influence recoarctation after extended end-to-end anastomosis via thoracotomy, yet in each study bovine arch identification is grossly underreported. This study aims to (1) assess chart review reliability in bovine arch identification; (2) determine recoarctation risk with a bovine arch; and (3) explore an anatomic explanation for recurrent arch obstruction based on arch anatomy.


METHODS: Echocardiograms from these patients were reviewed for arch anatomy and compared with the echocardiographic reports. Recurrent arch obstruction was defined as an echocardiographic gradient across the repair of 20 mm Hg or greater. For cases with angiographic images (n = 17), a scaled clamping distance between the left subclavian artery and the maximal proximal clamp location on orthogonal projections was then calculated across arch anatomies.

RESULTS: Chart review identified 6.1% (3/49) of patients with a bovine arch compared with 28.6% (14/49) on targeted image review. A total of 28.6% (4/14) of patients with a bovine arch had a follow-up gradient of 20 mm Hg or greater. Only 5.7% (2/35) of patients with normal arch branching had a follow-up gradient of 20 mm Hg or greater. The mean clamping index was significantly diminished in patients with bovine arch anatomy.

CONCLUSIONS: Arch anatomy often goes undocumented on preoperative imaging, yet children undergoing extended end-to-end repair with bovine arch anatomy are at a significantly increased risk of recoarctation. This may be due to a reduced clampable distance to facilitate repair. These results should be considered in the preoperative assessment, parental counseling, and surgical approach for children with discrete aortic coarctation.