

Commentary: Why the difference?



Carl L. Backer, MD

From the Division of Cardiovascular–Thoracic Surgery, Ann & Robert H. Lurie Children’s Hospital of Chicago, and Department of Surgery, Northwestern University Feinberg School of Medicine, Chicago, Ill

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Address for reprints: Carl L. Backer, MD, Division of Cardiovascular–Thoracic Surgery, Ann & Robert H. Lurie Children’s Hospital of Chicago, 225 E. Chicago Ave, mc 22, Chicago, IL 60611 (E-mail: cbacker@luriechildrens.org).

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The surgeons from Shanghai Children’s Medical Center have reported their outcomes in infants and children with anomalous origin of the left coronary artery from the pulmonary artery (ALCAPA).¹ Their series of 105 patients in the past 10 years had an overall mortality rate of 14%. The most recent Society of Thoracic Surgeons Congenital Heart Surgery database report has a total of 135 patients operated on for this diagnosis between 2015 and 2018.² In that series, there was no mortality! That is obviously quite a large difference in outcomes. The surgical group from Shanghai relates the relatively high mortality in their series to late referrals, resulting in poor function at the time of the operation. I am not sure that is the full answer.

In our own series of 36 patients with ALCAPA, the median age at surgery was 6 months, not that much different from the median age in the Shanghai series of 7.6 months.³ In fact, our mean age was 2.5 ± 5.1 years. In that series of 36 patients, there was no mortality, and only 2 patients required temporary postoperative mechanical support; one was 5 weeks old, the other was 2 months old. Another important (I think) difference in our series was that no patient underwent mitral valve intervention at the time of the ALCAPA repair.

What else besides late referral could account for the difference between the Shanghai series and the Society of Thoracic Surgeons database and our own local series? One major difference is that in the Shanghai series 50% of the patients underwent a concomitant mitral intervention. This resulted in a median crossclamp time of 78 minutes for those patients. The median crossclamp time in our series was 48 minutes. Could an extra 30 minutes of ischemia time be detrimental to the outcome of a group of patients with myocardial ischemia by definition? Another interesting finding regarding mitral valve intervention in the Shanghai series was that the probability of greater than or equal to moderate mitral insufficiency on long-term follow-up was substantially greater in those patients who had mitral intervention than those who did not. In our series, without mitral intervention on any



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Central Message

There is a dramatic difference in outcomes for children with ALCAPA when comparing the results from Shanghai Children’s with centers from North America. What accounts for this?

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patient, all patients had improvement in the degree of mitral insufficiency, and none have required mitral valve reintervention.

Another difference I noted was that the technique of coronary transfer was substantially more complex in most patients than in our series. We used a large coronary button strategy in nearly all of our patients. The Shanghai group used a combination of an aortic wall flap and left coronary artery flap in 43% of their patients and a tubular extension technique suturing together the edges of a large cuff in 22% of the patients. This more complex reconstruction may have contributed to the longer crossclamp times. In addition, this increases the potential for twisting, stenosis, and thrombosis of the anastomosis. Finally, I noted that they closed the main pulmonary artery directly in some of their patients. We have used a pericardial patch in all pulmonary artery reconstructions to prevent tension across the coronary artery reimplantation.

In summary, I am not sure that late referral (with attendant low function) is entirely the reason for the relatively high mortality in the series from Shanghai Children’s Medical Center. I am also concerned about prolonging the ischemia time with concomitant mitral valve intervention that may not be necessary and complex surgical tunnels and flaps that prolong clamp times and increase potential for anastomotic complications. For this patient population, as Shakespeare said, “Striving to [be] better, oft we mar what’s well.”

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