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Commentary: Inverted coronary arteries mostly seen in complex forms of transposition of the great arteries

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In this issue of the *Journal*, Fricke and colleagues¹ report on the “Outcomes of the Arterial Switch Operation (ASO) in Patients With Inverted Coronary Artery Anatomy.” The overall early mortality of ASO with inverted coronary mortality of 7% (3/43) was greater but not statistically different ($P = .17$) compared with ASO and normal coronary arteries. Late reintervention rate was 23% (9/39), principally caused by right ventricular outflow tract obstruction. There was no late coronary reintervention.

The term “inverted coronary” was coined at Boston Children Hospital.² This pattern is named “double loop coronary artery” at the Marie Lannelongue Hospital classification, Paris.^{2,3} Basically, inverted coronary in transposition of the great arteries (TGA) has the same coronary pattern as a normal heart coronary anatomy, with sinus 1 giving the right coronary artery (RCA) and sinus 2 the main stem left coronary. A variant is when sinus 1 gives also the left anterior descending artery. Using the double-loop terminology, there is a posterior loop formed by the left main stem coronary or the circumflex and an anterior loop formed by the RCA or by the RCA and the left anterior descending artery.^{3,4}

It is fascinating to observe that the coronary patterns seen in Australia are very different from those in North America and Europe. In the article discussed here, inverted coronary is present dominantly in TGA with intact ventricular septum (37.2%, 16/43) and less frequent in Taussig–Bing (25.6%,

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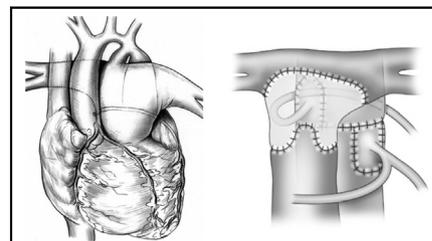
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Taussig–Bing.

CENTRAL MESSAGE

The article from Fricke and colleagues confirms that complex coronary patterns are today no longer a risk factor in large centers.

11/43). It is the opposite in Western countries,⁵ with inverted coronary mainly seen in Taussig–Bing and sometimes in TGA with ventricular septal defect but exceptionally in TGA with intact ventricular septum.²

The major difficulty with inverted coronary artery that we see in TGA or double-outlet right ventricle with ventricular septal defect (Figure 1, A) is to manage together the major diameter discrepancy between the very large pulmonary trunk and the smallish aortic root, the constant side-by-side vessels, and the frequent association with aortic arch obstruction, as well as a potential subaortic obstruction in Taussig–Bing.

The other issue is managing the smallish aortic valve annulus that will become the pulmonary annulus after ASO, with ultimately a significant risk of pulmonary stenosis.⁶ When the vessels are side by side, it is challenging to avoid a compression of the RCA, often embedded in the aorta, that could be compressed by the reconstructed neo-pulmonary

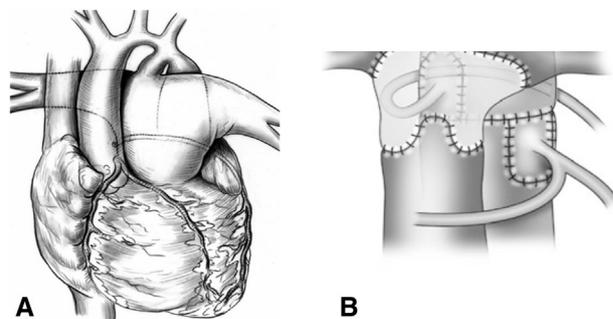


FIGURE 1. Taussig–Bing.

artery (PA) trunk. It is useful to mobilize the PA trunk to the right in incising the right PA branch⁴ (Figure 1, B).

The article from Fricke and colleagues confirms that complex coronary patterns are today no longer a risk factor in large centers and that ASO surgery may approach nearly 0% early mortality in the future.⁶

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