



### **Case Report:**

## **Intercoronary Continuity: A Rare Variant of Coronary Circulation.**

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**Abstract:** Coronary circulation if significantly diseased usually develop collaterals between the distal portion of the diseased vessel and the normal artery to accomplish flow in vessel distal to the diseased segment. These collaterals can be intracoronary or intercoronary. Coronary collaterals have to be differentiated from intercoronary continuity, which is a very rare variant of coronary circulation usually seen in angiographically normal looking arteries. In our patient, although proximal left anterior descending artery revealed significant lesion but intercoronary continuity was seen between normal right coronary artery and left circumflex artery on angiography.

**Key Words:** Intercoronary continuity; Collaterals; Angiography

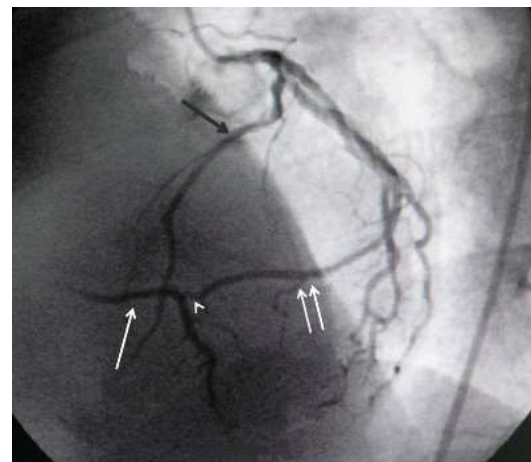
### **Introduction:**

Intercoronary artery continuity is a rare variant of the coronary circulation and is thought to be congenital in origin. Its functional significance is still a dilemma; however one may speculate that it may act as a natural bypass, if either of the parent arteries develops significant atherosclerosis.

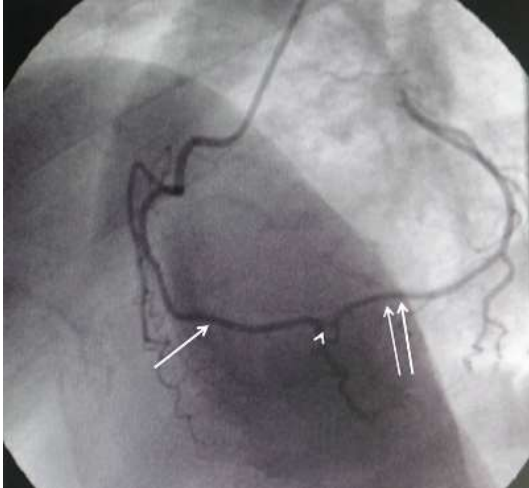
### **Case Report**

A 45 years old male, diabetic, non-hypertensive patient presented with history of chest pain on exertion. He had recent anterior wall myocardial infarction. The electrocardiogram showed ischemic changes in anterior leads. 2D echocardiography revealed regional wall motion abnormalities in the left anterior descending artery territory with normal left ventricular function. The stress test for evaluation of symptoms was positive at high workload. Coronary angiography was done via right femoral route. Selective left coronary artery angiogram showed significant stenosis in the proximal part of the anterior descending artery and normal caliber circumflex artery, with simultaneous visualization of distal portion of the right coronary artery

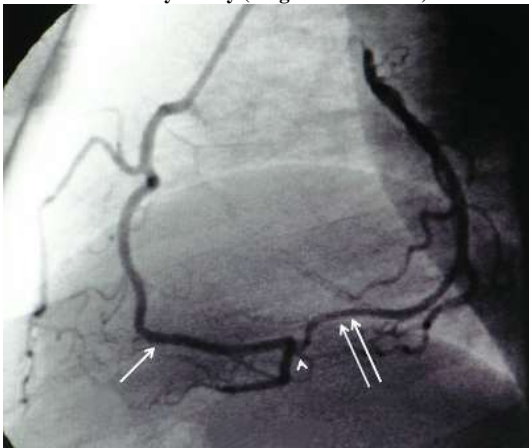
(Fig.1) with retrograde filling through an intercoronary connection between right coronary artery and left circumflex artery. Selective right coronary angiogram showed normal caliber right coronary artery with simultaneous visualization of normal left circumflex artery through retrograde filling via an intercoronary connection near the crux (Fig.2 & Fig.3).



**Fig. 1: Left coronary angiogram in left anterior oblique view shows retrograde filling of right coronary artery (Single white arrow) through an intercoronary connection (Arrow head) from left circumflex artery (double white arrows). Left anterior descending artery is represented by single black arrow.**



**Fig. 2: Right coronary angiogram in left anterior oblique view with cranial angulation shows retrograde filling of the left circumflex artery (Double white arrows) through an intercoronary connection (Arrow head) from the right coronary artery (Single white arrow).**



**Fig. 3: Right coronary angiogram in left anterior oblique view with caudal tilt shows retrograde filling of left circumflex artery (double white arrows) through an intercoronary connection (White arrow head) from the right coronary artery (Single white arrow).**

### Discussion

Coronary cascade is a rare variant of the coronary circulation in which the intercoronary communication is large enough to be identified angiographically between right coronary artery and left coronary artery in the absence of coronary artery stenosis.(1) True prevalence of intercoronary continuity is unknown. Atak *et al* reported one case among 7,986 coronary angiograms.(2) In a postmortem study of 100 human hearts from individuals with an average age of 61 years, 7 cases of intercoronary artery were reported.(3)

Intercoronary continuity is found either as continuity between the anterior and posterior interventricular arteries in the distal portion of the posterior interventricular groove or as continuity between the distal right coronary artery and the left circumflex arteries in the posterior atrioventricular groove as is visualized in this patient. Although the normal heart normally contains a profusion of small interconnecting vessels between the two major arteries, they are not usually visualized during angiography. However when these direct anastomosis are large enough to be identified angiographically, they can be differentiated from collaterals

on the basis of the prominent straight connection between the two unobstructed major arteries often at or near crux, in contrast to tortuous collateral vessels between the patent vessel and the obstructed vessel.(4) In cases of intercoronary continuity reported in adult hearts, there is a persistence of the type of coronary circulation observed in the fetus.(3)

Blood flow is usually bidirectional in intercoronary continuity; (direct continuity between the main coronary arteries) as well as in collateral coronary circulation (anastomosis between branches of main arteries). Intercoronary connections are larger calibre arteries ( $\geq 1$  mm), extramural, and straight as compared to collaterals, with a well defined muscular layer. It is suggested that defective embryological development allows the existing intercoronary channel to remain prominent and maintain a large caliber. Collaterals are usually present in association with hemodynamically significant narrowing of a coronary vessel whereas intercoronary continuity is usually described in angiographically normal vessels. In our patient right coronary artery and left circumflex arteries are showing intercoronary connection and both had normal caliber.

The intercoronary connection may act as a natural bypass, if significant atherosclerosis develops in either of the arteries. Although its functional significance in normal coronaries is still unclear, however one may speculate that they may potentially protect myocardium should coronaries develop significant lumen obstruction.

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