Chapter 11

Coronary Angiography

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Additional information is available at the end of the chapter

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1. Introduction

Our understanding of the concept of cardiac anatomy and physiology has been greatly enhanced in the last 70 years due to tremendous advances in the field of cardiac catheterization. Cardiac catheterization was first performed methodically and with careful application of scientific methods, by Claude Bernard in 1844. He entered both the left and right ventricles of a horse through the retrograde approach via the carotid artery and jugular vein.[1] This led to a period of intense investigation into the cardiac physiology of animals.

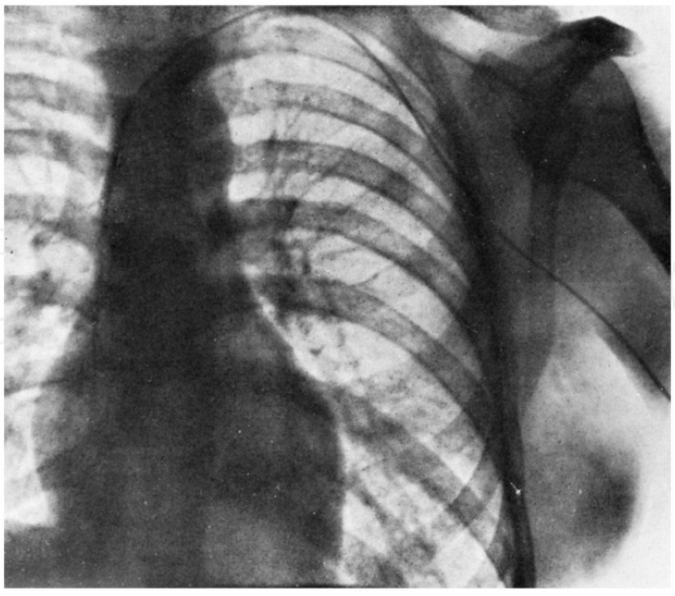

Figure 1. The first fluoroscopic guided view of the right heart catheterization. Klin Wochenschr 1929; 8:2085-87. Springer-Verlag, Berlin, Heidelberg, New York.

The next step into investigating human physiology was aided greatly by Werner Forssmann who performed the first cardiac catheterization on a living person, having passed a 65 cm catheter through his left antecubital vein and into his right atrium under fluoroscopic guidance in 1929 (Figure 1).[2] Further development in selective coronary arteriography was generated by Sones and others by 1959 with greater emphasis on better catheterization techniques, improved radiographic images and less toxic radio-contrast agents. Cumulatively, these developments led to marked improvement in the adoption of cardiac catheterization as an important diagnostic tool.

Andreas Grüntzig then heralded the next great step in cardiac catheterization when he introduced balloon angioplasty of the coronary arteries in 1977.[3-5] This led to the mushrooming of cardiac catheterization into the new field of interventional cardiology with ever expanding indications and improved results.[6]

2. Coronary angiographic views

Accurate diagnosis of a coronary stenosis is dependent on acquiring multiple views to enable accurate visualization of all the coronary segments without foreshortening or overlap. This is achieved by maneuvering the image intensifier into the right and left anterior oblique planes and either the cranial or caudal projections as is seen in Figures 2 and 3 below.

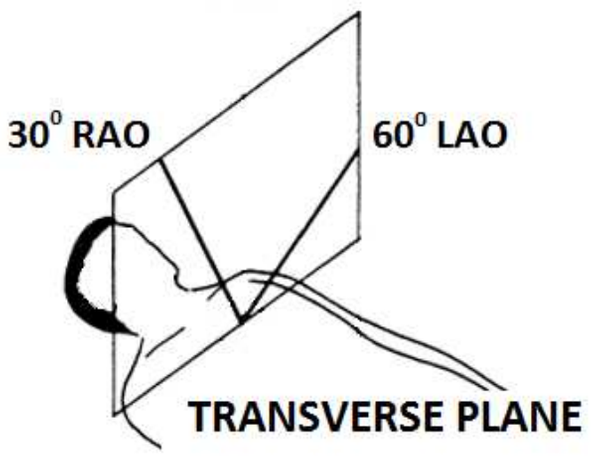

Figure 2. The right and left anterior oblique planes corresponding to the planes of the AV valves and the interventricular septum respectively.

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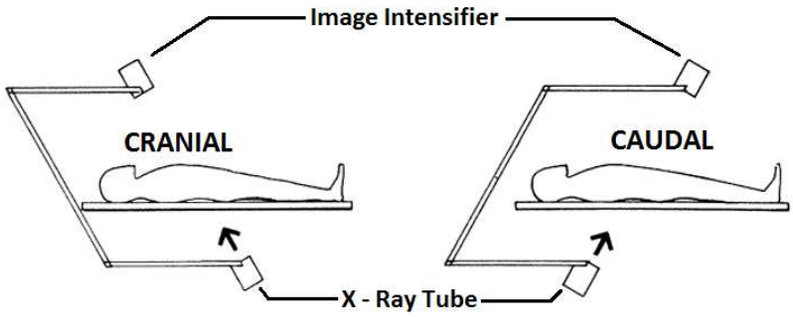

Figure 3. The cranial and caudal projections which when combined with the oblique planes, ensures the capture of most normal segments.

3. Viewing the LAD and LCx

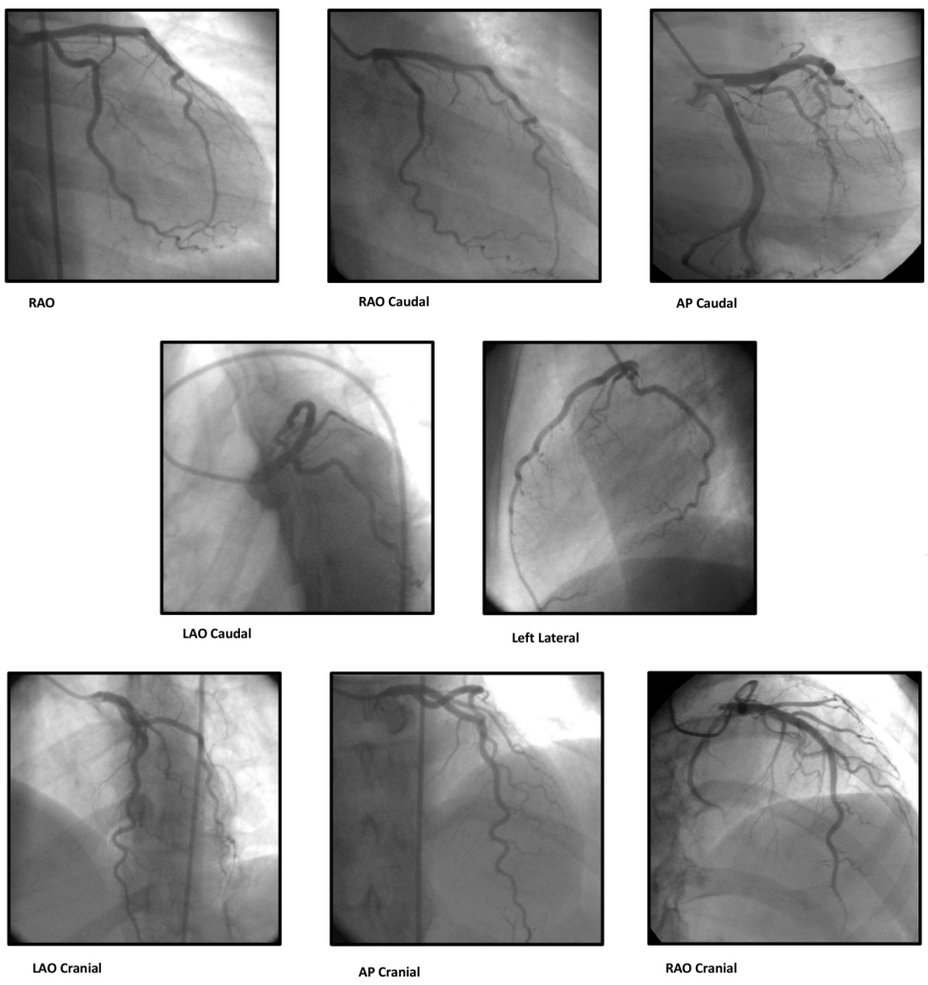

Figure 4.

4. Viewing the RCA

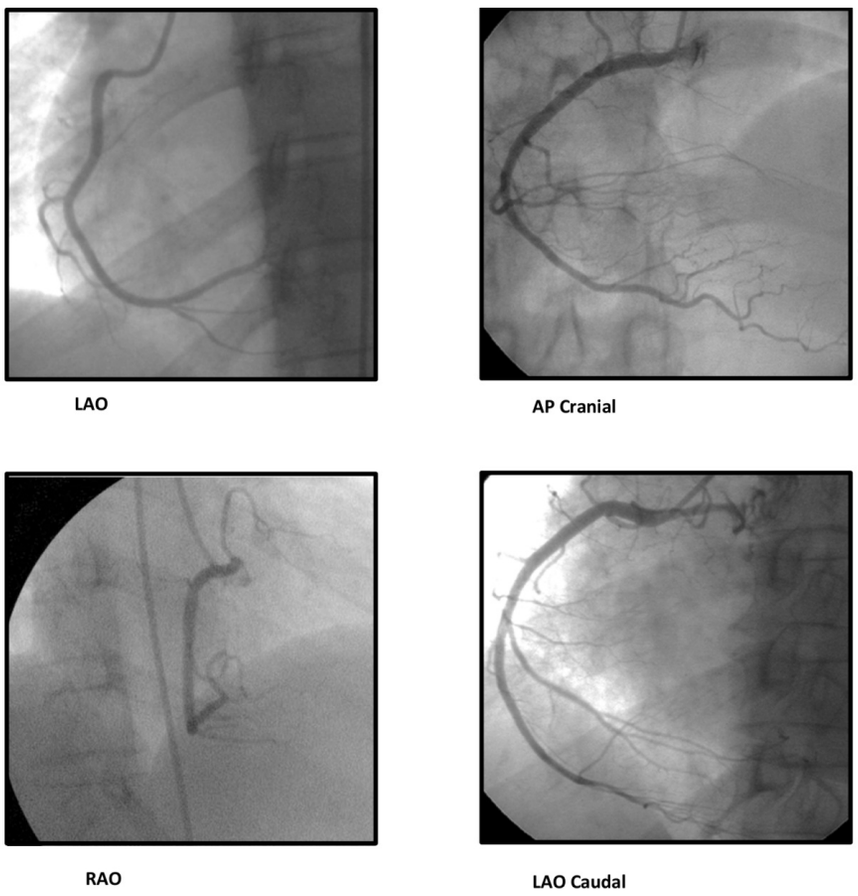

Figure 5.

Author details

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References

[1] Cournand A. Cardiac catheterization; development of the technique, its contributions to experimental medicine, and its initial applications in man. Acta Med Scand Suppl. 1975; 579:3-32

[2] Forssmann W. Die Sondierung des rechten Herzens [Probing of the right heart]. Klin Wochenschr 1929; 8:2085-87

[3] Sones FM, Shirley EK, Proudfit WL, Wescott RN. Cine coronary arteriography. Circulation 1959; 20:773 (abstract)

[4] Ryan TJ. The coronary angiogram and its seminal contribution to cardiovascular medicine over five decades. Circulation 2002; 106: 752–56

[5] Grüntzig A, et al. Coronary transluminal angioplasty. Circulation 1977; 56(II):319 (abstract)

[6] King SB 3rd. The development of interventional cardiology. J Am Coll Cardiol 1998; 15:31(4 Suppl B):64B-88B

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