Utility of the Lateral Fluoroscopic View for Subxiphoid Pericardial Access

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Transpericardial access is an important procedure in clinical cardiac electrophysiology. The ability to access the pericardial space is critical for rapid drainage in acute cardiac tamponade and is also increasingly used to perform epicardial mapping and ablation of a range of ventricular and atrial arrhythmias.1–3 The seminal description of this technique by Sosa described the use of the left anterior oblique fluoroscopic projection.4 After performing trials, we now prefer the left lateral fluoroscopic projection because it more clearly defines the desired needle pathway and maximally separates the mediastinal, pericardial, and myocardial planes without any intervening structures.

Figure 1 demonstrates the lateral fluoroscopic view demonstrating the orientation of the Tuohy needle as it enters the anterior aspect of the dry pericardial space. Small amounts of contrast are injected as the needle is advanced; the black arrow demonstrates mediastinal staining and the white arrow demonstrates pericardial staining, which is later confirmed by advancing a wire into the pericardial space and creating a large, residual loop. The defibrillator lead and 2 right ventricular endocardial mapping catheters—Pentaray (Biosense-Webster, Diamond-Bar, Calif) and an externally irrigated mapping/ablation catheter (Celsius Thermocool, Biosense-Webster, Diamond-Bar, Calif)—are also visible.

The movies show the utility of this projection during subxiphoid pericardial access in 2 patients. Movie 1 shows elective anterior transpericardial access using a Tuohy needle in a patient with a previously implanted defibrillator for arrhythmogenic right ventricular dysplasia undergoing epicardial mapping and ablation of ventricular tachycardia. The first injection of contrast is within the mediastinum immediately adjacent to the pericardium. The 2 mapping catheters within the right ventricle are a Pentaray and an externally irrigated mapping/ablation catheter (Celsius Thermocool, Biosense-Webster). In the same patient, Movie 2 shows the spread of contrast, indicating successful access of the pericardial space, which is only a virtual space in this instance. Some contrast staining of the epicardial aspect of the right ventricle can also be appreciated. Figure 2 demonstrates the lateral fluoroscopic view during drainage of acute cardiac tamponade complicating an atrial fibrillation ablation procedure. Contrast can be seen filling the widened pericardial space.

In a different patient (Movie 3) who had cardiac tamponade during catheter ablation of the left isthmus, the same view was used to perform emergency drainage via the subxiphoid approach using a Tuohy needle. The movie demonstrates the injection of contrast within the expanded pericardial space with outlining of the epicardial aspect of the right ventricle under tamponade.

Disclosures
None.

References


The online-only Data Supplement is available at http://circep.ahajournals.org/cgi/content/full/2/4/e15/DC1.

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Figure 1. Lateral fluoroscopic view demonstrates the orientation of the Tuohy needle as it enters the anterior aspect of the dry pericardial space.
Figure 2. Lateral fluoroscopic view during drainage of acute cardiac tamponade complicating an atrial fibrillation ablation procedure.
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Movie 1 – elective pericardial access 1

Movie 2 – elective pericardial access 2

Movie 3 – emergency pericardial access