

## Case Report

# Visualization of the Esophagus During Catheter Ablation of Atrial Fibrillation

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**Key Words.** catheter ablation of atrial fibrillation, esophageal injury

Catheter ablation of atrial fibrillation has become an important therapeutic option for patients over the past few years. As with any evolving technique, unexpected complications can occur. Pappone et al. [1] have recently reported two cases of atrio-esophageal fistula formation as a complication of percutaneous transcatheter ablation of atrial fibrillation. Reducing the ablation temperature and power settings along the posterior left atrial wall has been suggested to reduce the risk of this complication. Identification of the esophagus' location and avoiding lesions directly overlying the esophagus has been proposed also. Other approaches include esophageal temperature monitoring and the use of intracardiac echo to avoid esophageal injury during ablation.

We have found that inserting a small enteral feeding tube (VIASYS MedSystems, Wheeling, IL) prior to the case can be helpful. We have also routinely been injecting two cubic centimeters of radiopaque contrast into the feeding tube for improved visualization. While the feeding tube does not delineate the entire esophageal structure, it does give one a general idea of the relationship between the left atrium and esophagus which varies widely among patients. In addition, the feeding tube allows one to mark esophageal anatomic points on a three dimensional map of the left atrium allowing for further characterization of the complex atrio-esophageal relationship during ablation.

There are other methods that can be used for visualization of the esophagus during ablation of atrial fibrillation. The use of barium paste has been proposed and is currently being utilized in some electrophysiology laboratories. The difficulty

with using barium paste is that it does not remain in the esophagus throughout the entire ablation procedure. Thus, while it is possible to obtain an initial picture of the esophagus, barium paste does not allow for a constant fluoroscopic landmark of the esophagus for the entirety of the procedure. In addition, it is necessary to give the patient the barium substance after the initial three-dimensional map of the left atrium has been constructed. This can be difficult and lead to potential complications as the patient has often already received sedation by this point in the procedure.

Other investigators have suggested creating a separate esophageal map on the CARTO XP system [2]. This is accomplished by inserting a nasogastric tube into the esophagus. A 4-mm tip catheter (Navistar, Biosense Webster) is then passed down the nasogastric tube so that a pull back can be performed along the course of the esophagus near the left atrium. While this is certainly a fine method for defining the left atrial—esophageal relationship, it does add cost to the procedure because two ablation catheters are required. We have found that the fluoroscopic landmark offered by the enteral feeding tube alone allows one to adequately tag esophageal points on the left atrial map.

The left atrial—esophageal anatomic relationship is likely not constant. However, we have not noted any significant movement of the enteral feeding tube as it relates to the left atrial atrium during the ablation procedure.

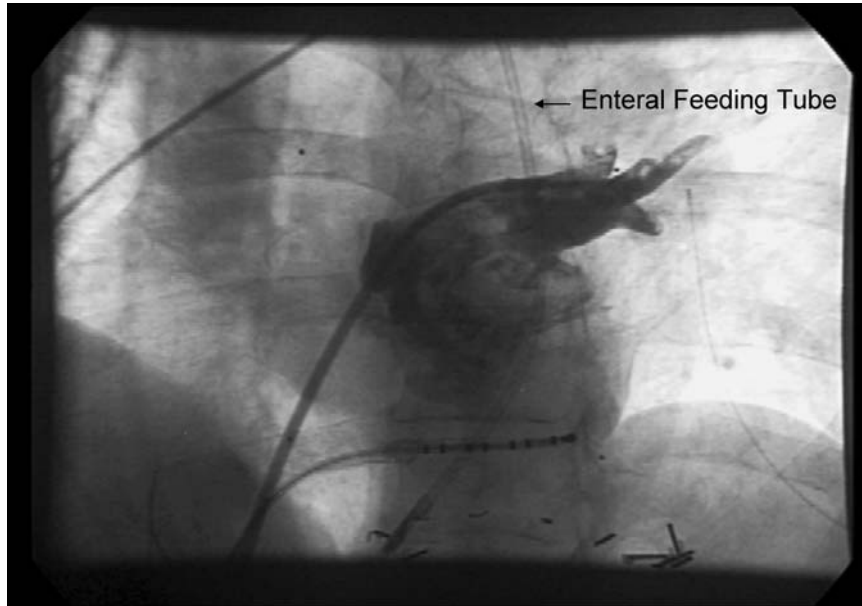
Figure 1 shows the relationship of the enteral feeding tube and the left sided pulmonary veins

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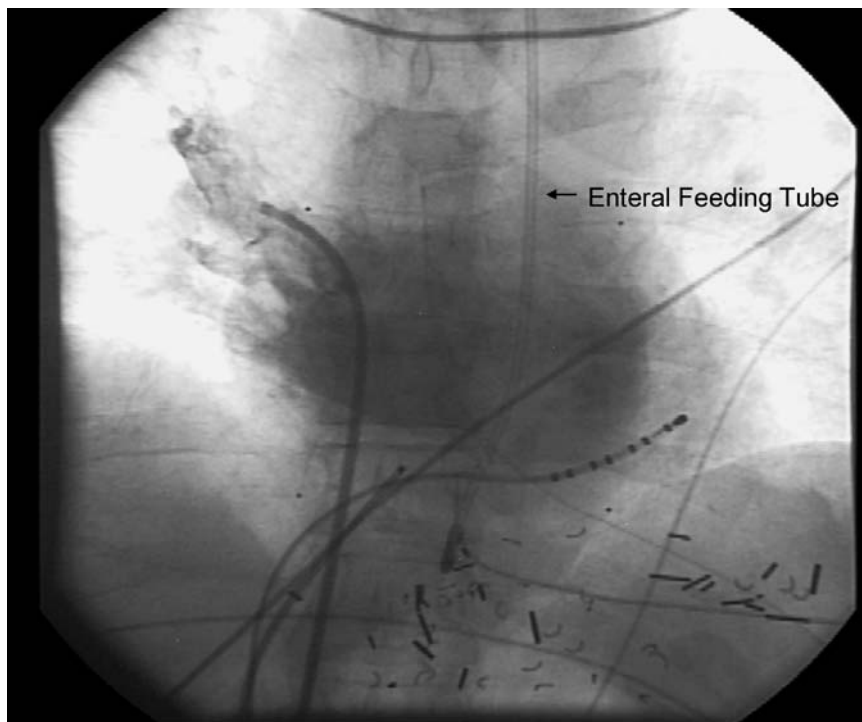
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**Fig. 1.** Contrast injection into the left sided pulmonary veins in the left anterior oblique fluoroscopic view with enteral feeding tube in place.



**Fig. 2.** Contrast injection into the right sided pulmonary veins in the anteroposterior fluoroscopic view with enteral feeding tube in place.

during a contrast injection into the left atrium in the left anterior oblique fluoroscopic view. Figure 2 shows a similar image of the right sided pulmonary veins in the anteroposterior fluoroscopic view. In this case, the esophagus takes an oblique course with the cephalad aspect much closer to the left sided pulmonary veins. Given this information, the left sided posterior ablation line was moved to a more medial location to avoid the esophagus.

## References

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