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Management of Tamponade Complicating Catheter Ablation for Atrial Fibrillation

Early Removal of Pericardial Drains is Safe and Effective and Reduces Analgesic Requirements and Hospital Stay Compared to Conventional Delayed Removal

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ABSTRACT

OBJECTIVES This study reports on the safety of early removal of pericardial drains after cardiac tamponade complicating atrial fibrillation catheter ablation (AFCA) procedures, the need for repeat pericardiocentesis, major adverse outcomes, as well as length of stay, and the need for opiate analgesia.

BACKGROUND Tamponade from AFCA is traditionally managed by pericardiocentesis with delayed removal of the drain (typically 12 h to 24 h later) in case of re-bleeding. A drain in situ often causes severe pain but ongoing blood loss is rare. Our institution adopted the practice of early removal of drains before leaving the laboratory if bleeding has stopped.

METHODS The authors performed a retrospective descriptive analysis of 43 cases of tamponade complicating AFCA from 2006 to 2015, comparing patients in whom the drain was removed early (group early removal [ER]; n = 25) versus traditional delayed removal (group delayed removal [DR]; n = 18).

RESULTS The groups were similar with respect to clinical/demographic characteristics, proportions of first-time versus re-do and pulmonary vein isolation versus pulmonary vein isolation + additional ablation. There were no deaths. No ER patients required drain re-insertion before discharge. The length of stay was shorter in the ER group (3 days; range, 1 to 9 days) than in the DR group (4 days; range: 2 to 60 days). The requirement for opiate analgesia was less in the ER group (8%) than in the DR group (72%).

CONCLUSIONS Early removal of pericardial drains after tamponade complicating AFCA procedures appears to be safe and effective, with re-insertion not required in this cohort. The traditional practice of leaving drains in situ for 12 h to 24 h may result in more patient discomfort and longer hospitalization. (J Am Coll Cardiol EP 2016;■:■-■)

Atrial fibrillation catheter ablation (AFCA) is one of the more complex interventional procedures in cardiology and carries a risk of complications. Cardiac tamponade is the most frequently encountered procedure-related complication occurring in 1.2% to 1.3% of patients in 2 worldwide surveys (1,2) and 1.3% in a European survey (3). It is also the main cause of procedure-related mortality, responsible for 25% of fatalities (4,5).

The majority of episodes of cardiac tamponade complicating AFCA can be managed successfully by immediate percutaneous drainage and reversal of systemic heparinization with protamine (6-8). There are no recommendations as to the length of time to

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ABBREVIATIONS AND ACRONYMS

AFCA = atrial fibrillation catheter ablation

DR = delayed removal

ER = early removal

LOS = length of stay

PCC = prothrombin complex concentrate

PVI = pulmonary vein isolation

TTE = transthoracic echocardiogram

leave the drain in situ. The only guidance on management of cardiac tamponade complicating ACFA we are aware of is in the 2012 Heart Rhythm Society (HRS)/European Heart Rhythm Society (EHRA)/European Cardiac Arrhythmia Society (ECAS) Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation, which states, "Once the pericardial space has been drained, the patient needs to be monitored for ongoing bleeding with the drainage catheter in place. Rarely, if there has been a tear, percutaneous drainage may be inadequate and surgical drainage and repair is needed" (6).

Traditionally the drain is left in the pericardial space for approximately 12 h to 24 h in case of re-bleeding (7,8). Because this has the potential to cause severe chest discomfort from pericardial irritation, and ongoing blood loss is rare, our institution has gradually adopted the practice of early removal of drains before leaving the catheter lab if the bleeding has stopped. The aim of this study was to compare clinical outcomes after cardiac tamponade among patients who had early removal of the pericardial drain versus the more traditional delayed removal.

METHODS

STUDY SUBJECTS. A systematic search of electronic patient records and the morbidity and mortality audits was performed identifying patients who had had an atrial fibrillation (AF) procedure complicated by pericardial effusion or tamponade requiring drainage. The medical notes, including anesthetic charts, were reviewed for each case, and the relevant information extracted and added to information from the procedure database and the electronic patient's records. All patients who had a drain inserted in the electrophysiology (EP) lab for a pericardial effusion at the time of an AF ablation since 2006 were included. We did not include pericardial effusions caused by other types of ablation, for example, ablation of ventricular tachycardia, and patients who required drain insertion at a later date, for example, due to a late post-cardiac injury syndrome. Finally, if the bleeding did not stop in the laboratory and immediate surgery was required, patients were excluded for analysis. All data collected for this paper are observational.

The cases were then divided according to whether the drain had been removed in the laboratory (early removal [ER] group) or whether the drain had been removed at a later stage (delayed removal [DR] group). After the pericardial effusion had been drained to dryness, the drain was clamped. During the subsequent observational waiting period of at least 30 min, repeated transthoracic echocardiograms (TTEs) were performed to monitor for re-accumulation. If there was re-accumulation, the effusion would again be drained to dryness, the drain clamped, and another period of monitoring started. Once the operator was satisfied that there was no re-accumulation, the patient would be deemed ready to leave the laboratory. At this point it was left to operator discretion whether the drain could be removed (ER) or left in for monitoring (DR). The practice of early removal was gradually established between 2008 and 2013, as confidence and experience grew. Thus, in our earlier cases the predominant strategy was to leave the drain in for up to 24 h and in later cases to take the drain out before leaving the EP laboratory.

The groups were assessed for similarity in baseline: 1) clinical and demographic characteristics; 2) proportion of first-time versus re-do ablation; and 3) proportion of pulmonary vein isolation (PVI) alone versus PVI plus additional treatments (e.g., linear lesions).

ABLATION PROCEDURE. All procedures were performed under general anesthesia apart from 3 patients; 1 patient in the ER group and 2 patients in the DR group were performed under conscious sedation. Venous access was obtained via the femoral veins and a multipolar catheter placed in the coronary sinus (CS). In cases performed under general anesthesia, all transseptal punctures were carried out under transesophageal guidance. In cases carried out under sedation, 1 case was done with intracardiac echocardiography (ICE probe, Siemens, Munich, Germany) for transseptal puncture guidance, 1 was via a patent foramen ovale (PFO)/atrial septic defect (ASD) and the remaining case was done with fluoroscopic guidance only. The punctures were done using either the Brockenbrough (Medtronic, Inc., Minneapolis, Minnesota), Endrys (Cook Medical, Bloomington, Indiana) or the NRG RF (Baylis Medical, Montreal, Quebec, Canada) transseptal needle through a long introducer sheath, usually the Mullens (Cook Medical) or a sheath of the FastCath Transseptal Guiding Introducer SL Series (St. Jude Medical, Austin, Texas). At the operator's preference, either a second separate transseptal puncture was done or the ablation catheter was passed through a second sheath, usually an Agilis