Outcomes of Transvenous Lead Extraction with Preoperative Pericardial Drainage in Subacute and Delayed lead Perforation Patients: a Single-Center Experience

Xu Zhou
Xuebin Li

**Introduction**: The management of cardiac perforation by an implanted lead of a cardiac implantable electronic device is controversial. This study evaluated (1) the outcomes of percutaneous lead extraction and (2) the safety and feasibility of a prophylactic pericardial drain with a percutaneous subxiphoid puncture in high-risk patients.

**Methods**: The medical records of all patients diagnosed with cardiac perforation by a pacing or defibrillator lead in Peking University People's Hospital from January 2008 to January 2019 were reviewed. To describe the results in a homogeneous cohort, we excluded the following subjects: (1) patients with acute cardiac perforation, (2) patients who underwent surgical repair, and (3) patients whose perforating lead was abandoned. Clinical characteristics, details of the device features, outcomes and complications related to transvenous lead extraction procedures, and follow-up data were collected.

**Result**: Thirty-nine (16 men; mean age 67±15 years) patients with subacute and delayed lead perforation managed by transvenous lead extraction (TLE) were included. With surgical backup, all culprit leads were removed completely by TLE without major complications. Simple traction with or without locking stylet was sufficient in majority of the patients (94.8%). Eight patients with a high risk of haemopericardium underwent percutaneous subxiphoid pericardial puncture prior to TLE (Group A); the remaining patients were assigned to Group B. The mean dwell time of perforating leads in Group A was longer than that in Group B (1084±327 vs. 97±331 days, P=0.02). The success rate of the pericardial puncture itself was 100%. All patients showed no evidence of new-onset or worsening pericardial effusion during the procedure and hospital stay. During the follow-up period (14±12 months), one patient died of multiple organ failure, and one patient had a newly implanted ventricular lead extracted because of an elevated pacing threshold.

**Conclusion**: In patients with subacute or delayed lead perforation, percutaneous lead extraction with surgical backup is a safe and effective management approach. Prophylactic pericardial drainage with percutaneous subxiphoid puncture might be considered in patients at high risk of perioperative pericardial bleeding.