We read with interest the manuscript by Wu and Chen and we would like to comment on the surgical complications of intracardiac pacemaker implantation [1].

The use of permanent pacemakers (PPM) and implantable cardioverter-defibrillators (ICD) is increasing due to the expansion of indications and aging of the population. As a consequence, cardiologists and cardiothoracic surgeons have to deal with a broad spectrum of complications, which are sometimes under-estimated and life-threatening.

The surgical complications of PPM and ICD may occur during the immediate or early post-operative period and can be related to venous access process (pneumothorax, hemorthorax, air embolism, haemotoma, arterial puncture, wound healing problems, infection, pain), to the pacemaker lead (cardiac perforation, tamponade, malposition or dislodgement of the lead), or to the generator device. In addition, other complications that may occur during the late post-operative period are related to infections, thrombosis, endocarditis, pulmonary embolism, superior vena cava (SVC) syndrome (due to thrombus formation and/or fibrosis of the pacing wires within the SVC) and péricarditis [2-5].

Interventional complications were more common in patients with a history of median sternotomy and the rest underwent percutaneous lead extraction. Ninety-eight percent of patients underwent complete device removal combined with antibiotic treatment and 96% of cases were observed by Ninio and Hii [2] and Turgeman et al. [3], but general complications that may occur during the late post-operative period are related to infections, thrombosis, endocarditis, pulmonary embolism, superior vena cava (SVC) syndrome (due to thrombus formation and/or fibrosis of the pacing wires within the SVC) and péricarditis [2-5].

We refer to the surgical complications of permanent pacemaker insertion [1]. The surgical complications of PPM and ICD may occur during the immediate or early post-operative period and can be related to venous access process (pneumothorax, hemorthorax, air embolism, haemotoma, arterial puncture, wound healing problems, infection, pain), to the pacemaker lead (cardiac perforation, tamponade, malposition or dislodgement of the lead), or to the generator device. In addition, other complications that may occur during the late post-operative period are related to infections, thrombosis, endocarditis, pulmonary embolism, superior vena cava (SVC) syndrome (due to thrombus formation and/or fibrosis of the pacing wires within the SVC) and péricarditis [2-5].

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In conclusion, the knowledge of all potential complications of the PPM/ICD and its multidisciplinary approach is very important for its prevention and definitive treatment.

Conflict of interest: none declared

References


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Pacemaker implantation due to sick sinus node syndrome is a routine procedure nowadays. Despite the rather small number of complications, the most challenging cases are associated with pneumothorax and infection. Air embolism is a rare complication of insertion or removal of central venous catheters, but can lead to cardiac arrhythmia, obstruction of the pulmonary outflow tract, acute cor pulmonale and asystole, depending on its volume. Furthermore, when moving to arterial circulation via patent foramen ovale, it can lead to ischaemic events. The reasons of such a paradoxical complication could be an inadequate examination of respiratory function during preoperative survey, catheters without haemostatic valve or central venous catheter procedures include large-calibre catheters, iatrogenic factors, low central venous pressure, negative intrathoracic pressure and inability for the patient to lie in a supine or Trendelenburg position. Because of the lack of specific signs and symptoms of venous air embolism, a high index of suspicion is necessary to establish the diagnosis. The primary physiological effects of air embolism are elevated pulmonary artery pressures, increased ventilation-perfusion inhomogeneity, and right ventricular failure. The degree of physiological impairment depends on the volume of gas entrained, the rate of entrainment, the type of gas entrained, and the position of the patient when the embolism occurs. This case report of repeated massive pulmonary air embolism during pacemaker implantation by Wu and Chen is very important for clinicians [1]. The reasons are that there are not so many similar cases, and that the procedure is carried out under the local anaesthesia with no need for sedation and invasive lung ventilation. Some specific causes and symptoms were observed by Ninio and Hii [2] and Turgeman et al. [3], but general principles of early diagnostic or even prevention have not yet been identified. Treatment strategies vary from putting the patient in the Trendelenburg position, 100% oxygen flow or hyperbaric oxygen treatment, in order to reduce the volume of the embolus by diffusion of oxygen to the plasma, haemodynamic support, adequate supplementation of inspired oxygen and prevention of further air entry into the circulation [4].

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