PREVALENCE OF INADVERTENT MALPOSITION OF TRANSVENOUS PACING OR DEFIBRILLATION LEAD IN THE LEFT HEART

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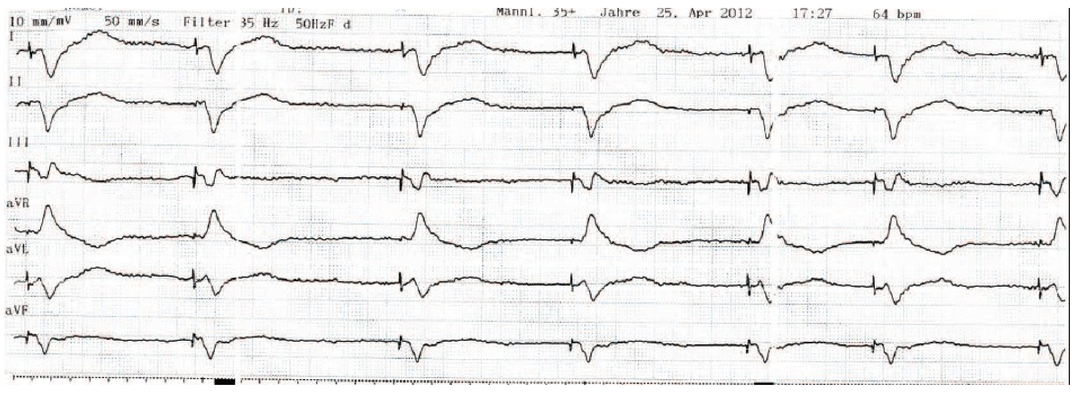
Background: Inadvertent lead malposition (ILM) in the left heart is a potential cause of thromboembolism, and is therefore a complication of heart rhythm device implantation (HRDI: pacemaker, implantable cardioverter defibrillator [ICD], cardiac resynchronisation therapy [CRT], cardiac contractility modulation). Aim of the study was to report prevalence and clinical outcome of ILM.



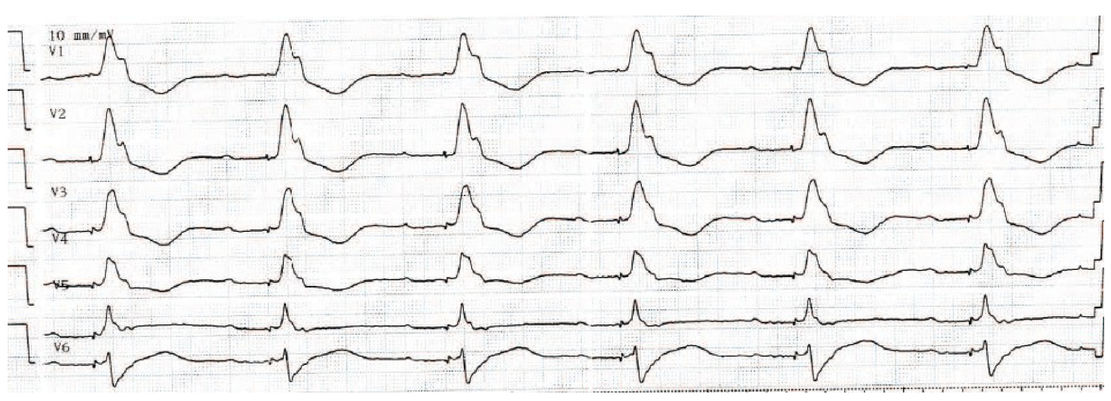


Figure 1 and 2: ECG of inadvertent malposition of pacemaker lead into the left ventricle

Methods: Postoperative lateral and posteroanterior chest x-rays of all consecutive patients undergoing HRDI from 2007 through 2013 were retrospectively analysed.

Results: During the study period 1,764 patients (71% male, mean age 69.8±10.6 years) underwent HRDI (57% ICD/CRT-D). ILM was found in 6 (0.34%) patients (50% male, mean age 71.5±9.4 years, 17% ICD/CRT-D). In 1 (17%) and 4 (67%) patients malposition was in the left atrium and ventricle, respectively. In one case the lead was placed in the coronary sinus. In 4 (67%) patients ILM was detected intraoperative or in the early postoperative period. In the remaining 2 (33%) patients malposition was not seen and they suffered of cerebral embolism 4 weeks and 1 year after implantation. ILM was corrected either intraoperative (1 case), during the same hospital stay (3 cases), or during follow-up by surgical extraction (2 cases; Table 1). Patients with ILM more frequently had pacemaker implantation (83% versus 38%; p=0.03); significant scoliosis (17% versus 0.14%; p<0.001), and prior surgery for congenital heart disease (17% versus 0.5%; p=0.03). HRDI implantation by inexperienced operator (less than 100 HRDI) was also associated with ILM (p<0.001).

Table 1: Clinical characteristics

Gender	Age [years]	BMI [kg/m²]	Indication	Device type	Side of operation	Heart disease	Medical history	LA/LV	Route to the LA/LV	Time to diagnosis	Adverse events	Therapy
M	63	22	SAB	PM	Right	None	ASD + PV-OP	LA	Via Shunt	during OP	None	Intraoperative correction
W	70	35	PP	ICD	Left	DCM	None	LV	Via PFO	1 day	None	Redo OP
W	63	27	BTS	PM	Right	None	None	LV	Arterial puncture	4 month	TIA	Surgical removal
M	77	28	AVB 2	PM	Left	CAD	None	CS	RA	1 day	None	Redo OP
W	86	23	SSS	PM	Left	None	Scoliosis	LV	Via ASD	1 year	TIA	Surgical removal
M	70	30	AVB 3	PM	Left	CAD	None	LV	Via PFO	1 day	None	Redo OP

ASD: atrial septum defect; AVB: atrio-ventricular-block; BMI: body-mass-index; BTS: bradycardia-tachycardia-syndrome; CAD: coronary artery disease; CS: Coronary sinus; DCM: dilated cardiomyopathy; LA: left atrium; LV: left ventricle; OP: operation; PFO: patent foramen ovale; PM: pacemaker; PP: primary prevention; PV: pulmonary vein; SAB: sino atrial block; SSS: sick-sinus-syndrome; TIA: transient ischemic attack;

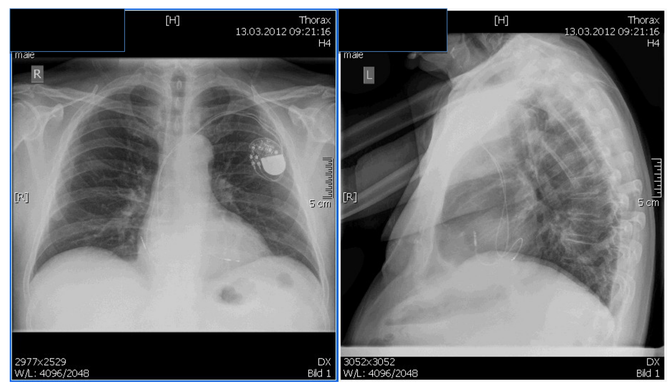
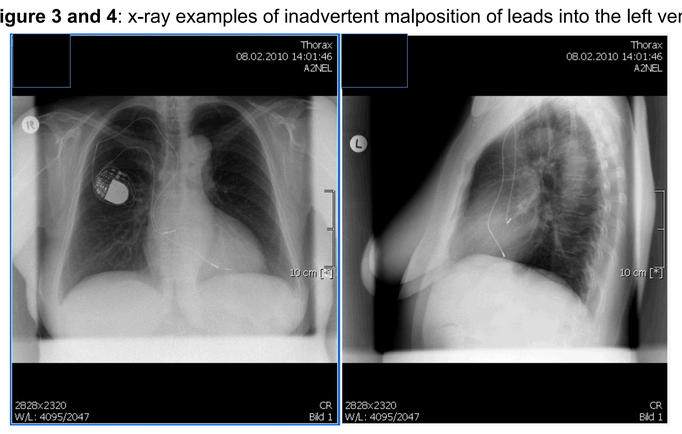


Figure 3 and 4: x-ray examples of inadvertent malposition of leads into the left ventricle



Conclusion: In this series the prevalence of inadvertent lead malposition was 0.34%. Scoliosis, prior surgery for congenital heart disease, and limited operator experience were identified as risk factors.

The authors have no conflicts of interest to declare

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