

ATRIOVENTRICULAR BLOCK IN HEMODIALYSIS PATIENTS

Screening, diagnosis and treatment

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Background :

Systemic calcifications are a common finding in chronic renal disease. However, cardiac involvement is especially ominous and leads to conduction defects and arrhythmia that may cause sudden death.

Patients and methods :

We conducted a prospective study in which 52 patients in maintenance hemodialysis (3x4 hours/week) were screened for cardiac arrhythmia using ECG and 24 h Holter-ECG monitoring including hemodialysis sessions. Patients with symptomatic atrioventricular block (AVB) underwent echocardiography and were treated by permanent pacing. A 64-slice spiral cardiac CT scanner (CCTS) was then performed to assess the presence and localisations of cardiac calcifications, and to determine Agatston coronary calcium-scoring (ACCS) of each patient (figure 1). Bicarbonate-based buffer dialysate contained 3 mmol/l of potassium and 1,5 mmol/l of calcium.

Results :

Atrioventricular block was found in 4 patients (7,7%) : 4 men, mean aged 61 years with a mean hemodialysis duration of 83,25 months. Two patients were diabetic and hypertensive and two had ischemic cardiopathy history (**table 1**). Clinical symptoms were especially fatigue and unconsciousness. One case of reversible cardiopulmonary arrest was noted. ECG and Holter-ECG revealed complete atrioventricular block in all cases. Mitral valve calcifications were present in 2 patients, 2 subjects had aortic valve calcifications and left ventricular hypertrophy. Systolic function was normal in 2 cases. CCTS demonstrates a high ACCS (> 401) in 3 cases with a special involvement of anterior interventricular artery (**table 2**). No short or long-term complications related to pacemaker implantation

	Genre /Age	Vintage in dialysis (months)	Comorbidities	Serum Calcium (mg/l)	Serum Phosphorus (mg/l)	iPTH (pg/ml)
Case 1	M/70	120	Isch cardiopathy	86	23	24
Case 2	M/62	170	Hypertension Diabetes	94	44	134
Case 3	M/53	36	-	96	20	615
Case 4	M/59	7	Hypertension Diabetes Isch cardiopathy	94	81	210

Table 1 : Clinical and biological specifics

	ECG	Echo cardiography	64-b CT scanner		
			Involved arteries	Agatston score	Percentile range
Case 1	Complete AVB	EF 25%	AIV, Cx, RC, Diag	1191	90
Case 2	Complete AVB	Calcif of AV, EF 64%	AIV, Cx, RC, Diag	857	80
Case 3	Complete AVB	EF 65%	AIV	9	40
Case 4	Complete AVB	Calcif of AV, EF 58%	AIV, Cx, RC, Diag	453	80

Table 2 : Cardiac explorations

Conclusion:

Coronary arteries calcifications are associated with several disturbances of the conduction system in maintenance hemodialysis, and leads to substantial morbidity and mortality. Many risk factors are established such as advanced age and duration of dialysis. In our patients, AVB was additionally attributed to metastatic calcifications involving the cardiac valves and the coronary arteries consecutive to long-term exposure to imbalances in mineral metabolism and the use of calcium carbonate as phosphate binder and vitamin D to treat secondary hyperparathyroidism. More attention should be focused on screening of conduction defects by Holter ECG in earlier chronic renal disease to avoid consequent mortality.

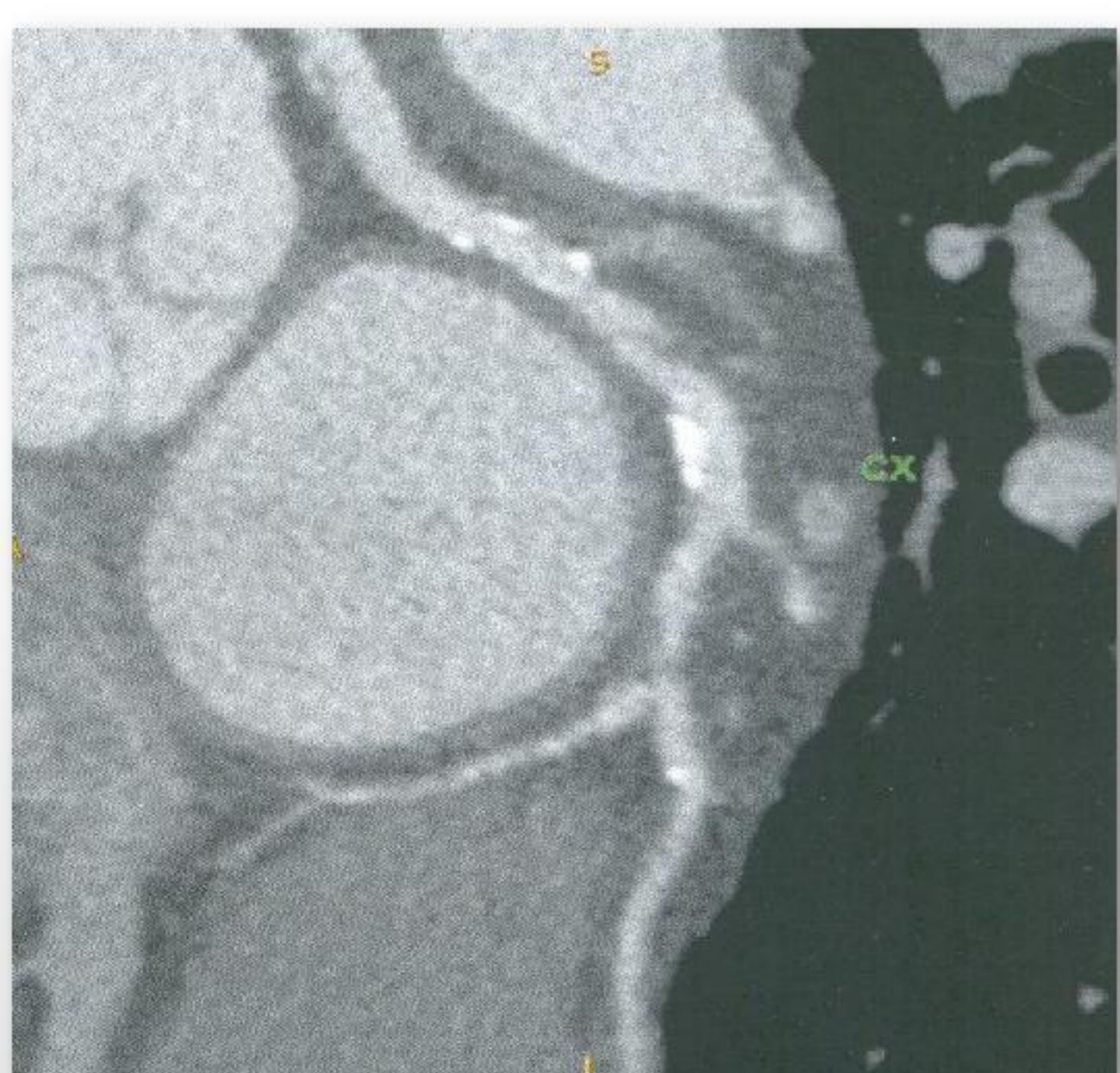


Figure 1 : CT scan calcifications of the Cx coronary artery

