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Acute renal failure due to severe rhabdomyolysis: a rare clinical manifestation of atrial myxoma

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Rhabdomyolysis is usually caused by physical, infectious or toxic factors and may be complicated by acute renal failure (ARF) associated with a high mortality rate of more than 20% [1]. We report about a very unusual, but emergent cause of severe rhabdomyolysis due to peripheral embolism of a left atrial myxoma.

A 36-year-old male patient was admitted to hospital due to lumbalgia. Patient's history revealed neither traumatic injury nor intake of drugs. Clinical examination only showed right-sided weakness in ankle dorsiflexion, hip flexion and adduction. Vital parameters, ECG findings, X-ray and MRI of the lumbar spine were normal. Laboratory tests revealed highly elevated serum creatine phosphokinase (286,580 U/l, n: ≤270 U/l), myoglobin (56,000 μg/l, n: ≤75 μg/l), lactate dehydrogenase (4,926 U/l, n: ≤232 U/l), aspartate aminotransferase (4,263 U/l, n: ≤35 U/l), alanine aminotransferase (701 U/l, n: ≤45 U/l) levels and inflammation parameters (CRP 145 mg/l, n: ≤8 mg/l). Renal function was impaired (creatinine 173 μmol/l, n: 61–104 μmol/l; urea-

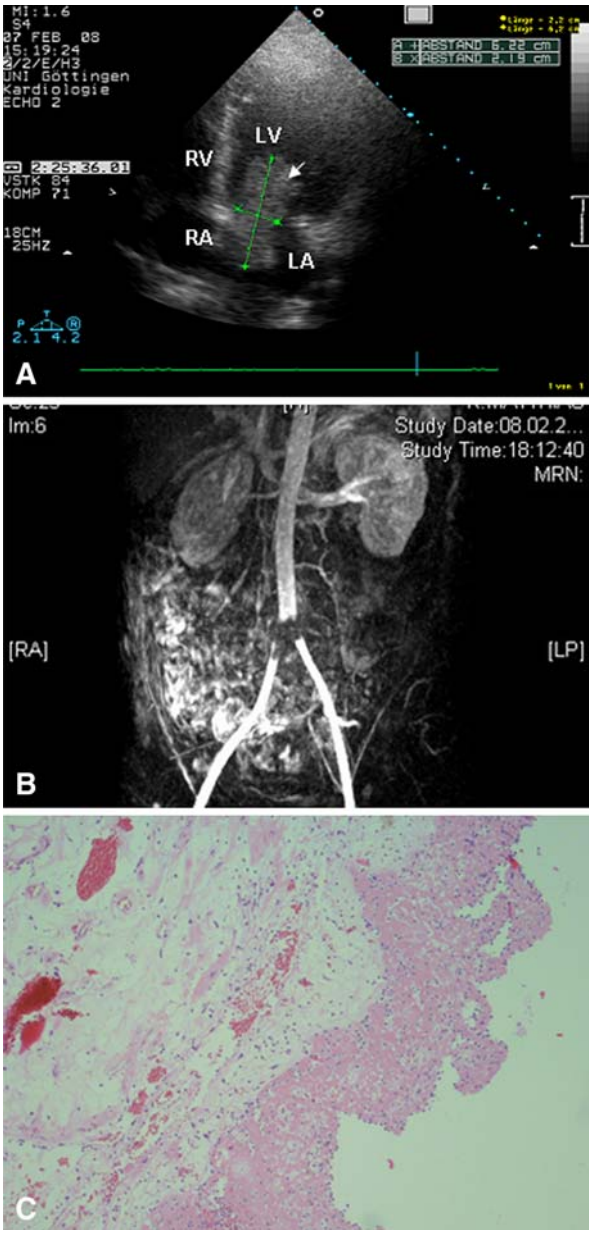

Fig. 1 Embolism of a left atrial cardiac myxoma **a** Echocardiography. Four-chamber image from ECG-gated line-balanced fast field echo pulse sequence showed an intra-atrial mass (*arrow*) with attachment to the inter-atrial septum. *LA* left atrial cavity, *LV* left ventricular cavity, *RA* right atrial cavity, *RV* right ventricular cavity **b** MRI angiography of the aortic and large lower extremity vessels. MRI perfusion image shows a circumscribed perfusion defect at the aortic bifurcation with subocclusive stenosis of the right-sided A. iliaca communis. This area revealed a bright signal enhancement on T1-weighted inversion recovery images obtained after intravenous injection of gadobutrol. **c** Histopathology. At thoracic surgery the left atrial mass was 6 × 4 × 3 cm in diameter. Histopathological examination of the resected tumor revealed a benign myxoma with characteristic myxoid stromal tissue containing a low number of tumor cells with uniform small nuclei and focal accumulation of siderophages. Tumor cells did not exhibit any signs of atypia (H&E, ×100)

N 5 mmol/l, n: 1.3–3.5 mmol/l; uric acid 655 μmol/l, n: 208–440 μmol/l; glomerular filtration rate 31 ml/min, n: 80–170 ml/min/1.73 m^2). Kidney ultrasonography revealed no signs of hydronephrosis or perfusion defects. MRI of pelvis and thighs due to the development of acute myalgias in the right leg demonstrated compartment syndrome of the M. iliopsoas and femoral muscles. After emergent fasciotomy, transthoracic echocardiography performed due to hemodynamic instability demonstrated a left atrial inhomogenous mass (Fig. 1a). Furthermore, MRI angiography initiated due to signs of lower extremity vascular occlusion revealed a circumscribed perfusion defect at the aortic bifurcation (Fig. 1b). Surgical removal of the atrial mass and its aortic embolus was immediately performed and histopathology revealed a typical cardiac myxoma (Fig. 1c). Patient's postoperative course was complicated by ARF, arrhythmias and serious infections. However, multiple organ dysfunction could completely be restored after 6 weeks of intensive care management.

Discussion

Atrial myxomas represent 50% of all primary benign cardiac tumors in adults aged 30–60 years and occur more often in women [2]. Clinical manifestations include one or more of the classical triad of cardiovascular symptoms, constitutional symptoms and peripheral or visceral signs of embolization which is detected in up to 30–50% of cases [3]. Peripheral embolism leads to clinical signs of ischemia including purple discoloration of the skin not present on admission of our case. Furthermore, renal embolism as a potential cause of ARF could be ruled out in this case by Doppler sonography. Thus, although embolism of cardiac myxomas represents a common feature, ARF due to severe rhabdomyolysis as primary manifestation of myxoma is rare and has not been published so far. To prevent ARF in rhabdomyolysis fluid resuscitation, urine alkalinization and administration of loop diuretics are recommended. In severe cases precipitation of myoglobin and uric acid crystals within renal tubules may lead to ARF.

Due to a low specificity of clinical symptoms as demonstrated in this case, diagnosis of cardiac myxomas represents a challenge. Two-dimensional echocardiography was shown to be the most useful screening method [4]. Despite adequate treatment options by open thoracic heart surgery [5], serial echocardiography at regular intervals is recommended during long-term follow-up due to recurrence in up to 5% of cases.

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