Late Traumatic Aneurysm of the Right Atrium

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A 41-year-old man was admitted to the hospital because of palpitation, pain, and discomfort in the chest. The patient had been hospitalized 2 years previously after a traffic accident, where his chest had been crushed into the metal handle of the seat in front of him. He had suffered both proximal and distal fractures of the right leg. There had been no sign presumptive of trauma on the chest radiograph. He reported that his complaints had started 1 year after the accident and had shown a progressive increase in intensity ever since. On physical examination, arrhythmia was detected on auscultation. Atrial fibrillation was observed on electrocardiogram and the chest radiograph demonstrated mild widening of the right contour of the heart. An aneurysm in connection with the right atrium was detected after opening the pericardium (Fig. 1). After selective superior caval cannulation, the aneurysm was opened (Fig. 2) and resected and the neck of the aneurysm was closed primarily using 3-0 monofilament polypropylene continuous sutures while on pump without the application of aortic cross-clamp. Before terminating cardiopulmonary bypass, sinus rhythm was achieved with cardioversion. The patient was discharged from the hospital on the seventh postoperative day without any complication. The pathologic examination of the resected specimen showed dense collagenous tissue with a variable amount of elastic fibers, some of which were disrupted. Also, there were few fragments of myocardium within the specimen. The case presented here demonstrates the successful management of a patient with post-traumatic aneurysm of the right atrium.

DISCUSSION

Trauma patients presenting without any sign of injury to the chest such as bone and soft tissue injury and having no hemodynamic instability are assessed for cardiac injury by observation alone while additional examinations such as determination of myocardial band enzymes of creatine phosphokinase level, echocardiography, or radionuclide angiography are performed. Myocardial contusion or laceration is suspected specifically in the presence of costal or sternal fractures on the detection of a contusion or a steering wheel tattoo on the thoracic wall on physical examination. However, myocardial contusion may occur with minimal or no external signs of injury. At present, there exists no “gold standard” technique to diagnose myocardial contusion.

Of all the cardiac chambers, the most commonly ruptured one is the right ventricle, followed by the left ventricle. Atrial ruptures are rarely seen when compared with ventricular ruptures, and have a different formation mechanism. They are thought to be secondary to the compressive force transmitted directly to the heart at the end of ventricular systole. During this phase of the cardiac cycle, both atriums are full and both ventricles are in the contracted position. During this phase, simultaneous abdominal and thoracic compression can markedly elevate the pressure in the vena cava and the pulmonary vasculature. As a consequence, the atrial pressures rise against the closed atrioventricular valves and lead to the rupture of the thin wall of the atrium.
Sometimes, late rupture can occur because of myocardial necrosis and partial laceration. For the patient presented in this report, the atrial aneurysm was considered to develop as a result of the rupture of the inner atrial wall, leading to dissection of the right atrial epicardium. In a similar case, thrombosis of the aneurysm has been reported. In the present case, the risk of rupture was high, because the aneurysm wall was thin and thrombosis had not developed.

Patients with a history of blunt chest trauma might present in the absence of any presumptive signs in the earlier periods; however, these patients can later be admitted to the hospital with symptoms such as arrhythmia and chest pain which, when present, should be considered as a late complication or a late posttraumatic aneurysm. It is the conclusion of the authors that the resection of such an aneurysm with the help of cardiopulmonary bypass using femoral cannulation appears to be a safe method.

REFERENCES


Fig. 1. Intraoperative view of posttraumatic aneurysm of the right atrium.

Fig. 2. Intraoperative view after opening the aneurysm.