diastase-resistant proteinaceous material that stained positive with periodic acid–Schiff (Fig 1). They were surrounded by dense fibrous stroma showing a focal lymphocytic reaction and small solid nests of squamous and sebaceous cells (Fig 1). At immunohistochemical analysis, all the cells expressed wide-spectrum cytokeratins and epithelial membrane antigen; sporadic cells were positive for calcitonin and serotonin; staining was negative for calretinin (Fig 2) [3-6].

Comment

Cystic tumor of the AV node can be defined as a congenital multicystic lesion located at the base of the interatrial septum. The differential diagnoses can include bronchogenic cysts, ectopic thyroid (struma cordis), teratomas, and metastatic adenocarcinomas. The mean age at presentation is 38 years (range, birth to 78 years) and women are more frequently affected than men (approximately 3:1). Two thirds of patients present with complete heart block, 15% with lesser degrees of AV block, and 10% with sudden death even without a history of heart block. The literature reports tumor sizes varying from 0.5 mm to 30 mm. To make an ante mortem diagnosis, special mention should be paid to female patients with electrocardiographic evidence of heart block with narrow QRS complexes (limited to the AV node). The cause of lethal arrhythmia in patients with cystic tumor of the AV node region is still controversial, without a clear relationship between tumor size and the occurrence of arrhythmia. Hypotheses that explain why lethal arrhythmia occurs are based on excessive distention of the ventricle with subsequent ventricular fibrillation. Furthermore, post-mortem studies have shown that pacemaker implantation does not prevent sudden death in patients with heart block caused by this type of tumor. Thus, surgical intervention should always be indicated.

To our knowledge, only 5 ante mortem diagnoses and resections of cystic tumors of the AV node region have been reported [7,8]. In our case, the anterior mini-thoracotomy approach was an excellent route for the right atrium and provided us with a satisfying field of view.

In conclusion, because the worst complication with this tumor is sudden death, we believe that complete resection is essential, even if subsequent pacemaker implantation becomes necessary.

References


Stingray Barb Injury: A Cause of Late Coronary Occlusion and Stent Failure

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Stingray injuries to the heart are rare, and survivors of this injury are even rarer. To date, there are only three reported survivors of this mode of penetrating cardiac...
injury, all inflicted by the living animal itself. The following is a report of a stingray injury, inflicted by a human, causing coronary complications 17 years after the injury was sustained.


Live stingray injuries are not uncommon. Approximately 750 to 1,500 are reported in the United States annually, involving either the trauma of the puncture wound or the envenomation from toxic glands running the length of the stingray barb [1]. However, stingray injuries to the heart are rare, and survivors of this injury are even rarer. To date, there are only three reported survivors of this mode of penetrating cardiac injury [2–4].

A 44-year-old man, otherwise healthy, presented to the emergency room in February 2010 with an acute inferior wall myocardial infarction, secondary to an isolated total occlusion (Fig 1A) of the proximal right coronary artery (RCA). There was no suggestion of atherosclerotic disease in the distal right or in the left coronary system. The lesion in the proximal RCA was emergently stented with a Promus Everolimus-Eluting coronary stent (Boston Scientific, Natick, MA), without complications, and with full restoration of luminal diameter and resolution of the acute infarction (Fig 1B).

The patient did well for 6 months but was admitted in August 2010 with recurrent anginal symptoms. Repeat catheterization showed in-stent stenosis, which was reopened by deploying a Taxus Paclitaxel-Eluting stent (Boston Scientific) within the previously placed Promus stent, with full restoration of luminal diameter. In addition, a foreign body was identified in close proximity to the stenosis (Fig 2).

Additional history revealed that the patient had been stabbed in the chest with a dead stingray barb 17 years previously. The patient’s recollection was that the majority of the stingray barb came out in the attacker’s hand, but it was possible some had broken off in the chest. Medical records were no longer available from that hospitalization, but according to the patient, he was hospitalized and observed without any intervention. Four days after admission, he was discharged home, asymptomatic, with the apparent assumption that no foreign body remained in the chest.

On September 14, 2010, after a 30-minute run, the patient experienced chest pain and shortness of breath. He was again admitted to the cardiac unit. A computed tomographic angiogram identified the foreign body, consistent with the history of a stingray barb, lying in the intraatrial septum, directly adjacent to the RCA stent (Fig 3). Evaluation of intrastent stenosis was not possible.

On September 22, 2010, the patient was electively taken to the operating room for the planned procedure of removal of the foreign body and grafting of the RCA. The heart was exposed through a full sternotomy. There were mild pericardial adhesions and an intrapericardial tract from the penetrating stingray barb coming from the mid-anterior right chest. This tract was surgically divided at the level of the pericardium, leaving a few millimeters of the visible stingray barb protruding from the heart anteriorly in the atrial ventricular groove.

With the heart beating, a meticulous dissection was begun by sharp dissection of the serrated edges of the stingray barb from a thickened fibrotic reaction surrounding the barb. At the level of the RCA, the barb was intimately adhered, and a small amount of arterial bleeding was controlled with a single Prolene suture (Ethicon, Inc., Somerville, NJ).

At this point we converted to an on-pump procedure and did the remainder of the dissection with the patient under cardiopulmonary bypass with cardioplegic cardiac arrest. The course of the stingray barb was through the pericardium, over the top of the right atrium, between the proximal RCA and the right ventricle, and down the atrial ventricular groove, stopping adjacent to the aortic root and the base of the anterior leaflet of the mitral valve.

Upon removal of the barb, one of the retroserrations of the barb was actually engaged in the stent, causing disruption of the RCA. The coronary was ligated proximally and distally to the stent, and an aortocoronary bypass was performed in the standard fashion with a reversed graft.

**Figure 1.** Angiogram showing totally occluded right coronary artery on the (A) left and the (B) opened vessel after stenting.
saphenous vein graft from the proximal aorta to the portion of the RCA near the acute margin of the heart.

The postoperative course was uneventful; the right ventricular function improved to normal, and the patient was discharged home on the fifth postoperative day.

Comment

This patient’s stingray injury is unique. It is primarily a penetrating stab wound with a nonviable, nonvenomous barb, inflicted by another human being, and without the envenomation that usually accompanies stingray injuries. Therefore, this injury was not associated with the usual inflammatory response and tissue necrosis that can accompany an attack from a live stingray.

This fact, along with the fact that the barb broke off at the level of the myocardium and remained remarkably and asymptomatically imbedded in nonvital areas of the heart for 17 years, obviously not only saved this patient’s life but also saved his attacker from a murder charge.

The stingray barb is a remarkable feat of bioengineering. It is stiletto thin and sharp, and its edges are lined with backward-pointing, harpoonlike, retro serrations (Fig 4A) that are anchored in soft tissue, preventing its easy removal without severe tissue damage (Fig 4B).

The patient was free of other coronary disease. The mechanism of coronary artery occlusion from the presence of a long-standing foreign body, with the notable exception of intracoronary stents, has never been reported to our knowledge. It is postulated, however, that slow migration of the foreign body and the surrounding fibrotic reaction impinging on the lumen would be a likely mechanism of action.

End-to-end reconstruction of the RCA after removal of the stent was not feasible because of the length involved. The right internal mammary artery could not be used because of the old penetrating injury of the chest wall. Therefore, a short segment of a reversed saphenous vein, without valves or size change, was grafted in the standard fashion from the proximal aorta to the RCA just distal to the ligation.

References