ELSEVIER

Rapid Renal Function Deterioration: An Unusual Presentation of Coral Reef Plaque

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Coral reef aorta is an uncommon variant of atherosclerotic disease. We report a rare presentation of rapid renal function deterioration in a patient with coral reef plaque protruding into the renal orifices without significant disease elsewhere. The patient was successfully treated with aorta endarterectomy, resulting in complete resolution of renal dysfunction. This case highlights the importance of prompt intervention for renal rescue.

Atherosclerotic disease is a systemic disease that diffusely affects arterial trees. On rare occasions, the atherosclerotic burden primarily develops in the visceral areas of the aorta, and one such entity is the coral reef aorta (CRA). First described by Qvarfordt et al.[1] in 1984, CRA is an uncommon clinical entity that involves a severe calcifying disease in the paravisceral aorta obliterating the lumen. It typically affects young women, presenting as visceral ischemia or lower extremity claudication. We report a rare case of rapid renal function deterioration without associated visceral ischemia in a 49-year-old woman who was successfully treated with aortic endarterectomy that resulted in full recovery of renal function.

CASE REPORT

A 49-year-old African American woman presented to the Palo Alto Veteran's Affairs Medical Center with complaints of acute sharp pain in her right hip and buttock and associated paresthesia for 2 weeks that prevented her from walking >2 blocks at a time. She had difficulty flexing her hip because of excruciating pain. Her medical history was significant for a relatively recent history of hypertension, for which she had been taking 3 medications. On physical examination, her blood pressure was 166/85 mm Hg and she appeared well without apparent distress. She did not have a palpable femoral, popliteal, dorsalis pedis (DP), or posterior tibial (PT) pulse in her right lower extremities, but she had monophasic DP and PT signals on Doppler examination. She had a weak palpable left femoral pulse and Doppler signals on left DP and PT. Flexion of her hips was not possible because of associated pain, but her lower extremity strength was 5 of 5 bilaterally. A laboratory evaluation revealed an elevated creatinine level (2.15 mg/dL); her creatinine level had been normal (0.89 mg/dL) 12 months before presentation, according to outside records. A noncontrast computed tomography scan of her abdomen revealed a large coral reef—like calcified lesion in the pararenal aorta that impinged upon the renal orifices (Fig. 1). There was no evidence of bowel ischemia or kidney atrophy. No other abnormality was detected. A T_2-weighted gradient echo sequence magnetic resonance imaging scan confirmed a flow-limiting protrusion plaque at the region of the pararenal aorta extending to the renal arteries. Although her acute presenting symptoms were unlikely related to the aortic plaque, we recommended an elective aortic endarterectomy given the recent renal deterioration and lower extremity arterial insufficiency.

The patient presented to the operating room 1 month later after preoperative evaluations for an elective surgery. Her creatinine level had risen to 3.0 mg/dL on the day of the procedure. A thoracoabdominal approach through the eighth intercostal space was used. The left lung was deflated to allow safe access to the aorta at the level of the diaphragm. The celiac, superior mesenteric, and left renal arteries were individually isolated and secured with a vessel loop. Both the supraceliac and infrarenal aortas

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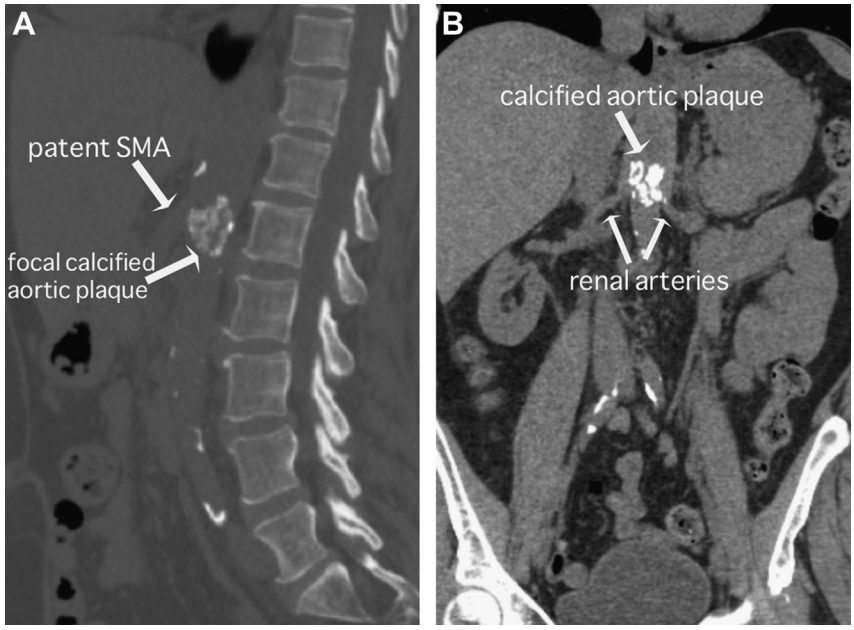

Fig. 1. (A) A noncontrast abdominal computed tomography scan revealed a large coral reef—like calcified lesion in the pararenal aorta not affecting the superior mesenteric artery, but **(B)** impinging the renal orifices. No significant disease was seen in the remaining aorta.

were soft without evidence of significant atherosclerotic disease and were secured with a Rumel tourniquet. The left renal and infrarenal aortas appeared to be underfilled (Fig. 2A). After systemic anticoagulation, the aorta was opened with a trap door incision extending to the left of the celiac artery proximally and between the renal arteries distally. A calcified, coral reef—like protruding plaque was visualized and removed in its entirety (Fig. 2B). Patent bilateral renal arteries without significant disease were observed and the aortotomy was closed with running 4-0 Prolene suture (Ethicon, Inc., Somerville, NJ). Multiphasic Doppler signals were appreciated in all visceral vessels, and notably the left renal artery appeared significantly more distended compared to pre-endarterectomy (Fig. 2C). The patient remained hemodynamically stable during the entire procedure and regained palpable pedal pulses at the completion of the procedure. The patient had an uneventful postoperative course and was discharged on postoperative day 5. She had a significant improvement in renal function. Her creatinine dropped after the procedure and was maintained in the normal range during follow-up examinations (Fig. 3A). Although the symptoms of paresthesia and intermittent sharp pain persisted as expected, the patient had no symptoms of claudication and her hypertension was well-controlled on 2 medications. Her additional neurologic work-ups revealed mild disc protrusion that was managed conservatively. Repeat computed tomography angiography at 3 months revealed patent aorta and visceral vessels without significant atherosclerotic disease (Fig. 3B).

DISCUSSION

CRA is commonly referred to as a rare distribution of calcifying aortic plaque localized in the paravisceral aorta obliterating the lumen. This entity has only been described in isolated case reports.[2] The putative etiology of CRA has been debated at some length. One popular proposed mechanism is that the continuous contraction of the crux of the diaphragm or other exogenous forces causes traumatic injury to vascular endothelium, leading to the formation of a fibrin—platelet thrombus that is in turn calcified over time.[3] However, the pathophysiology for this rare vascular entity has not been fully elucidated. Although the focus has been on paravisceral aorta, CRA most frequently occurs in patients with general atherosclerotic disease.[4] We report a rare variant in that a globular calcified mass was limited to the paravisceral aorta without significant disease elsewhere.

Symptoms of CRA, including renal insufficiency, renovascular hypertension, intermittent claudication, visceral ischemia, and blue toe syndrome, have been well described.[1–3] Although these symptoms are well known, only a few cases of isolated renal insufficiency in the absence of visceral complications have been reported.[2,5] Unlike what has been described in the literature, our patient had relatively