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Case report

Surgical Treatment of Aortic Dissection in a Patient with Metastatic Prostate Cancer

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A B S T R A C T

Acute aortic dissection bears all the stigmata of a true clinical emergency. The natural history of this acute aortic syndrome warrants prompt surgical intervention, with only a few absolute contraindications to this line of treatment. We present a 74-year-old man with documented metastatic prostate cancer who underwent emergent surgery for acute Stanford A aortic dissection. Having acknowledged the relatively favorable evolution of our patient's malignant disease, we were not deterred by its presence from pursuing surgical treatment of his aortic dissection.

Key words: *aortic dissection, surgery, metastatic cancer*

Introduction

Prostate cancer is the most common cancer in men in Europe and North America, with its worldwide incidence progressively increasing[1]. Risk factors for its development include, among others, a genetic susceptibility, age, ethnicity and certain dietary factors[1]. The poor prognosis of untreated Stanford A dissections merits immediate surgical attention[2,3]. While there are many factors precipitating the mechanical disruption of the aortic intima, disseminated malignant disease has not been identified as a predisposing condition. The paucity of data in the literature addressing the issue of management of aortic dissections in patients with disseminated malignant disease, however, leaves the role of surgery in this patient population unclear.

Case Report

We report on a 74 year old man with a history of disseminated prostate cancer who presented to the emergency department with acute chest pain radiating to his back. A diagnostic work up, which included a transthoracic echocardiogram and contrast enhanced CT aortography, revealed a Stanford A aortic dissection. His initial diagnosis of prostate cancer antedated this event by five years, and was treated with maximal androgen blockade using goserelin and flutamide[4]. He was known to have malignant dissemination to his lymph nodes, which was corroborated once again by the presently performed CT scan (Figure 1). His most recent level of prostate specific antigen (PSA) was 5 ng/mL. Of note, the patient also had a history of a transitory neurologic deficit as well as femoral artery thrombosis, which were both believed to be parts of a paraneoplastic syndrome.

Given the ominous prognosis of surgically untreated Stanford A aortic dissection we believed that the benefit of surgery outweighed its substantial risk. The CT angiogram clearly demonstrated an intimal flap within the ascending aorta consistent with a type A aortic dissection (Figure 2). Lower level CT scans established the progression of the dissection into the abdominal aorta, and also imaged the neoplastic lymph node involvement.

Mild insufficiency of his aortic valve was documented by both transthoracic and intraoperative transesophageal echocardiography. No evidence of pericardial tamponade or end-organ malperfusion was found. Cardiopulmonary bypass was established via cannulation of the

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Fig. 1. Coronal CT image of a lymph node package (arrows) indicative of malignant dissemination of the previously documented known prostate cancer.

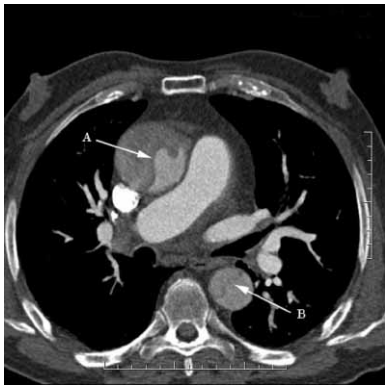

Fig. 2. Axial CT angiography showing an intimal flap consistent with aortic dissection in the ascending (A) and descending aorta (B).

right axillary artery and the right atrium. The intraoperative findings confirmed the diagnosis of aortic dissection, with the intimal tear found on the convex aspect of the ascending aorta. The operative strategy entailed replacement of the diseased segment of the supracoronary ascending aorta with a Dacron vascular prosthesis using moderately hypothermic extracorporeal circulation (28°C). The dissected layers of the aorta were reapproximated using circumferential teflon felt strips complemented with gelatin-resorcinol-formalin glue. The aortic reconstruction was further complemented with aortic valve resuspension within the Dacron graft to ensure lasting aortic valve competency. We deviated from our standard operative technique for Stanford A aortic dissections, which involves creating an open distal anastomosis under circulatory arrest. The distal anastomosis was, in this case, constructed with the distal ascending aorta cross-clamped just below the take off of the innominate artery. The early postoperative course was remarkable only for pneumonia, which resolved with appropriate antibiotic management. The patient was discharged home 14 days after surgery. He was seen at follow up one month later by which time he had resumed most of his daily activities. Six months later, however, he presented with new onset paraparesis and was found to have multiple osseous metastases to his ribs and vertebrae. The PSA level at that time increased to 633 ng/ml. His prostate cancer was thought to have become hormone-refractory, necessitating the institution of second line therapy with estramustine. He responded favorably to palliative radiation, which enabled him to become ambulatory with crutches. Fourteen months after his surgery he remains alive, without any new developments in his clinical status.

Discussion

Our report brings into focus the management strategy of a complex patient suffering from two ultimately fatal conditions: the more insidious prostate cancer and the very acute aortic dissection. The former did not, in our opinion, contraindicate the appropriate management of the latter. There is no data in the literature that reliably suggest that the use of cardiopulmonary bypass might in any way enhance the dissemination of the malignant process. A wide spectrum of coagulation disturbances have been known to occur in metastatic prostate cancer, and these include disseminated intravascular coagulation, thrombocytopenic thrombotic purpura, thrombosis, Trousseau's syndrome and acquired factor VIII inhibitor development[5].

While the use of deep hypothermic circulatory arrest is considered the standard of care for the construction of the distal aortic anastomosis in patients with aortic dissections, it is associated with platelet dysfunction, as well as multiple derangements in the coagulation cascade. We were, therefore, inclined to avoid profound hypothermia in the present case and all of its associated sequelae on the already disturbed coagulation mechanism. The uncertain interrelationship between disseminated malignant disease, circulatory arrest and the associated coagulopathy in a patient requiring major aortic surgery prompted us to avoid deep hypothermia at the expense of aortic cross-clamping. The described management strategy of our patient, which adheres to the principal surgical dogma in the treatment of this acute aortic syndrome, granted our patient survival beyond that of the expected natural history of this condition.

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LIJEČENJE AKUTNE DISEKCIJE AORTE U BOLESNIKA S METASTATSKIM KARCINOMOM PROSTATE

S A Ž E T A K

Akutna disekcija aorte eklatantni je primjer hitnoga kirurškog stanja. Smrtonosan tijek bolesti zahtijeva hitnu kiruršku intervenciju uz rijetke apsolutne kontraindikacije za hitni kirurški zahvat. Ovdje opisujemo slučaj 74 godine staroga muškarca s dijagnosticiranim metastatskim karcinomom prostate koji je podvrgnut kirurškom liječenju akutne disekcije aorte tipa Stanford A. Usprkos postojanju diseminiranog karcinoma prostate odlučili smo se za kirurški tretman akutne disekcije aorte uvažavajući tijek i prognozu njegove osnovne maligne bolesti.