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TRAUMATIC CORONARY ARTERY DISSECTION: A CASE REPORT AND LITERATURE REVIEW

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□ **Abstract—Background: Coronary artery dissection after blunt chest trauma is a rare, life-threatening condition. Objectives: To present a case of coronary artery dissection after blunt chest trauma and to outline the appropriate management of this condition based on a literature review. Case Report: We report the case of a 50-year-old woman with traumatic coronary artery dissection after a high-speed motor vehicle collision. She presented to the Emergency Department via ambulance within a few hours of the collision, and her clinical condition deteriorated rapidly. A 12-lead electrocardiogram on arrival demonstrated anterolateral ST-segment elevation. The patient was intubated due to hypoxemic respiratory failure and she required inotropes for blood pressure support. Computed tomography imaging revealed pulmonary edema and right third and fourth rib fractures. Emergent angiography demonstrated dissection of her left main coronary artery, requiring placement of a stent. Conclusion: Early recognition of this clinical entity with a screening electrocardiogram, and aggressive management, may result in a favorable outcome. A literature review reveals that coronary artery bypass grafting, angiography with stent placement, and conservative management may all be considered viable treatment options for this condition.** © 2012 Elsevier Inc.

□ **Keywords—coronary artery dissection; cardiac injury; blunt chest trauma; steering wheel trauma; coronary vessel injury**

INTRODUCTION

Cardiac injury after blunt chest trauma can involve any major cardiac structure, including the pericardium, myocardium, endocardium, and coronary arteries (1). Isolated coronary artery (CA) dissection has been previously reported, but is an uncommon event. Early recognition and appropriate management of this condition is critical in ensuring a favorable patient outcome.

CASE REPORT

A 50-year-old woman presented via ambulance to our emergency department (ED) complaining of retrosternal chest pain after colliding at highway speed with the side of a half-ton truck with five occupants. The collision occurred in a rural location approximately 100 km west of the city of Edmonton. She was the restrained driver and lone occupant of her car, which suffered severe front end and windshield damage. Her airbag deployed. She did not lose consciousness, and extricated herself from the car. Shortly after the collision she experienced severe 8/10 retrosternal chest heaviness radiating to her left arm. Her initial vitals on-scene were: pulse 112 beats/min, blood pressure 116/85 mm Hg, respiratory rate 28 breaths/min, and oxygen saturation 91% on room air. She had a Glasgow Coma Scale score of 15/15. She was placed in full spinal immobilization at the scene, and transferred by ground ambulance to hospital. A delay in ambulance departure of approximately 15 min was apparently due to triage of the multiple injured patients. Total transport time was approximately 1 h by ground. En route, an

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intravenous catheter was inserted and morphine 12.5 mg total administered for pain. A 12-lead electrocardiogram (ECG) performed during transport reportedly demonstrated "sinus tachycardia with global ST changes in all leads." Her vital signs remained stable during transport and no fluid boluses were given. Her past medical history was significant for a partial hysterectomy, and her lone risk factor for coronary artery disease was smoking.

On arrival to the hospital, she complained of ongoing severe chest pain and worsening dyspnea. Her chest was tender to palpation, and contusions consistent with a chest seat belt injury were present. No flail segment was noted and no subcutaneous emphysema was identified. Her trachea was midline, and she was not using accessory muscles of respiration. Equal but decreased breath sounds were present. Cardiac auscultation demonstrated normal S1, S2 and no S3, S4 or murmurs. Her abdomen, pelvis, and long bones were unremarkable. Her peripheral pulses were palpable and symmetrical. A 12-lead ECG (Figure 1) demonstrated ST elevation in leads V2–V6, 1, and aVL. Reciprocal ST depression was noted in leads 2, 3, and aVF.

She was given aspirin 160 mg orally and 5 mg metoprolol intravenously. Heparin and clopidogrel were withheld given concerns regarding potential active internal bleeding. Shortly thereafter she became markedly hypoxemic despite 15 L oxygen through a non-rebreather mask. A chest X-ray study showed diffusely increased interstitial lung markings consistent with pulmonary edema (Figure 2). She was intubated using rapid sequence induction with fentanyl, midazolam, and succinylcholine. Post intubation she was started on a dopamine infusion to support her blood pressure.

After the patient was stabilized, she underwent helical computed tomography of the chest, abdomen, and pelvis with intravenous contrast to rule out an aortic dissection and other injuries. Findings consistent with pulmonary edema and right third and fourth rib fractures were noted. No intimal flap or secondary findings consistent with aortic injury were present.

Figure 2. Initial portable chest X-ray study on presentation to hospital.

Urgent angiography (Figure 3) revealed dissection of the left main coronary artery proximal to the left anterior descending (LAD) coronary artery with 90% occlusion, and a 40% lesion distal to the dissection. A CYPHER® (Cordis Corporation, Warren, NJ) drug-eluting stent (3.5 mm × 13 mm) was successfully placed in her proximal LAD coronary artery. The time from event to stenting was 4 h 18 min, and from ED arrival to stenting was 2 h 48 min.

Laboratory tests drawn 5 h after the collision showed a significant elevation in troponin I to > 50 ng/mL and a

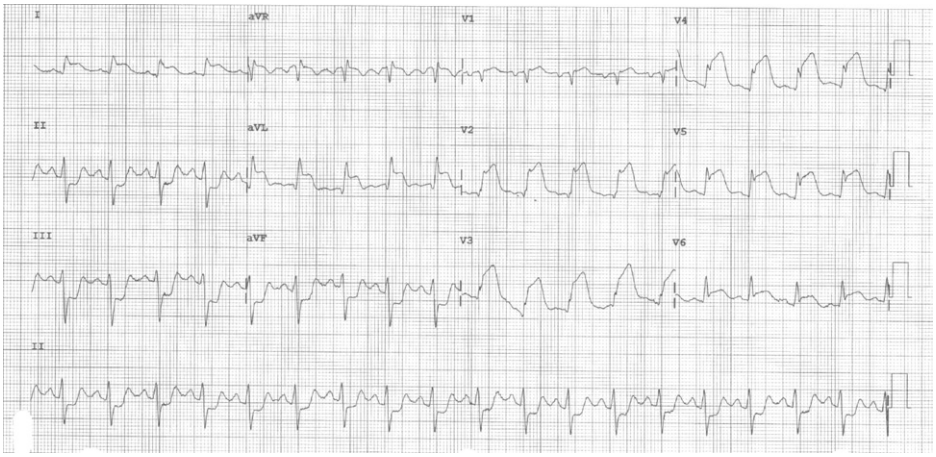

Figure 1. Twelve-lead electrocardiogram at the time of presentation to hospital.