Acute Type A Aortic Dissection Presenting with Paraplegia with Complete Neurologic Recovery Following Branched Stented Anastomosis Frozen Elephant Trunk Repair

A complication of acute type A aortic dissection (ATAAAD) is end organ malperfusion, which can present with paraplegia. We present a patient with an ATAAD who presented with lower extremity paraplegia who recovered neurologic function following branched stented anastomosis frozen elephant trunk repair (B-SAFER). The patient was a 67-year-old male with a history of hypertension, hyperlipidemia, and tobacco smoking who presented with chest and back pain. Physical examination showed normothermia, a heart rate of 38 beats per minute, a mean arterial pressure of 137 mm Hg, oxygen saturation of 85%, respiratory rate of 21 breaths per minute, and a weight of 79 kg. The patient did not have identifiable lower extremity vascular signals by Doppler. He also did not have sensation below the umbilicus. Motor strength was 0/5 in the bilateral lower extremities. Computed tomography angiography revealed an ATAAD that extended from the non-coronary Sinus of Valsalva to the right common carotid artery and distally to the left common iliac artery. The majority of the circumference of the descending thoracic aorta was made up of false lumen which had completely thrombosed. Emergent median sternotomy was performed. The distal ascending aorta was cannulated over a wire. Bicaval venous cannulation was chosen to allow for direct retrograde cardioplegia perfusion. The patient was initiated on cardiopulmonary bypass and, while cooling to 19 degrees Celsius, the aorta was cross clamped, cardioplegia infused, and arrest was achieved. The aorta was divided to the sinotubular junction and the false lumen was noted to extend to the level of the non-coronary Sinus. The aortic root was reconstructed using a piece of felt between the layers and the aortic valve was resuspended. Circulatory arrest was then initiated and balloon tip catheters were inserted into the innominate and left common carotid arteries to maintain antegrade cerebral perfusion. A 31 x 150 mm Gore CTAG stent graft (W.L. Gore and Associates, Inc., Flagstaff, AZ) was deployed in zone 2 of the arch that extended into the descending aorta. A fenestration was created over the left subclavian artery orifice and two 11 x 29 mm Gore VBX stent grafts (W.L. Gore and Associates, Inc., Flagstaff, AZ) were deployed. The proximal end of the stent graft was sutured to zone 2 of the arch. A 30 mm Hemashield (Getinge US Sales, LLC, Wayne, NJ) tube graft with a side branch was anastomosed to the hemiarch incorporating the stent graft into the suture line. Arterial cannulation of the side branch allowed for the resumption of systemic perfusion. The duration of hypothermic circulatory arrest was 50 minutes. The tube graft was anastomosed to the proximal aorta. The cross clamp time was 1 hour and 39 minutes and cardiopulmonary bypass time was 3 hours and 26 minutes. The patient was extubated on postoperative day 0. Over several days, his strength improved so that he was able to ambulate with a rolling walker. He was discharged on postoperative day 11. At three months he was ambulating without an assist device. Repeat computed tomography angiography showed that there was no contrast filling of the false lumen and that the stent grafts were appropriately positioned. In conclusion, an ATAAD can present with paraplegia. In our patient, timely repair utilizing a B-SAFER technique allowed for end-organ reperfusion and subsequent return of neurologic function as he was able to walk out of the hospital at the time of discharge.

Ryan Holcomb (1), Abdulrhman Elnaggar (1), (1) Penn State College of Medicine, Hershey, PA