THE CCU CORNER

Aortic Dissection

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The Patient

A 52-year-old hypertensive woman was brought to her local emergency room after developing sudden chest pain and dyspnea, followed by a witnessed syncopal event. Her BP was 110/60 mm Hg, her heart rate was 95 beats per minute, and she was neurologically intact. Physical examination, laboratory values, and a chest x-ray were unremarkable. Over the next several hours she became obtunded and required pressors for hypotension. A head CT revealed diffuse cortical edema. A CT pulmonary angiogram revealed no pulmonary embolism; however, an ill-defined abnormality of her aortic arch was noted. She was transferred to our facility where emergent transesophageal echocardiogram (TEE) showed an extensive dissection of her ascending aorta and arch, occlusion of all great vessels, and severe aortic insufficiency. Given her severe neurologic impairment she was not deemed to be a surgical candidate, and supportive care was withdrawn.

The Problem

Aortic dissection is an increasingly recognized problem, in part because of the prolonged exposures to hypertension in aging population, and in part related to improved imaging techniques. Mortality is exceedingly high, approaching 1%/hr during the first 48 hours, highlighting the need for early diagnosis and definitive therapy.

Pathophysiology

Aortic dissections usually arise from a tear in the aortic intima; a primary intramural hematoma with subsequent rupture into the aortic lumen may also occur. The most common predisposing conditions in the International Registry of Aortic Dissection (IRAD) were hypertension, in 72% of cases; atherosclerosis, in 31%; and previous cardiac surgery, in 18%. Connective tissue disorders such as Marfan syndrome and Ehlers-Danlos syndrome accounted for fewer than 5%. Dissections are classified as those involving the ascending aorta (Stanford type A) and those limited to the descending aorta (Stanford type B). This distinction is important as their presentation, natural history, prognosis, and treatment differ.

Clinical Presentation

Chest pain is the most common symptom in aortic dissection, occurring in 73% of patients in the IRAD report. Type A dissections are more commonly associated with anterior chest pain; type B dissections are more frequently associated with back or abdominal pain. Ascending dissections may propagate anteriorly and occlude the great vessels with resultant neurologic symptoms and upper extremity pulse deficits. Retrograde propagation may cause acute aortic regurgitation or cardiac tamponade, the latter resulting from rupture into the pericardial space. Descending dissections may result in leg ischemia and hypoperfusion of abdominal organs. Syncope has been reported to occur in up to 13% of acute dissections (usually type A), and may result from cardiac tamponade, cerebral ischemia or stroke, or activation of aortic baroreceptors. Importantly, as in this case, 30% of patients with dissection are initially suspected of having other conditions, including acute coronary syndrome, pulmonary embolism, pericarditis, or an acute abdominal process.

Diagnostic Options

The primary diagnostic modalities are TEE, spiral CT, and aortic MRI. A recent meta-analysis demonstrated their sensitivity (98%-100%) and specificity (95%-98%) to be similar. The choice of modality depends in part on the clinical setting and local expertise. TEE can be performed at the bedside; it often demonstrates the site of origin of the dissection and provides assessment of ventricular function, aortic valve involvement, and pericardial effusion. However, TEE gives little information regarding branch vessel involvement. CT can be performed rapidly and visualizes the entire aorta and its branches as well as pericardial effusions; however, it cannot assess ventricular or valvular function. Additionally, the contrast load is problematic in patients with renal dysfunction. MRI can define the entire aortic and branch vessel anatomy, and assess ventricular and valvular function. However, it is not readily available, is time intensive, and cannot be used in patients with pacemakers or implantable cardioverter defibrillators. At our institution, CT is the primary modality used. TEE is reserved for those patients who are too unstable for CT, have renal insufficiency, or have a nondiagnostic CT. MRI is rarely used in the acute setting. Recently, serum levels of smooth muscle myosin heavy chain or elastin compounds have been found to have diagnostic utility in acute dissections; their role awaits further study.

Therapeutic Options

In the IRAD report, the 30-day mortality of type A dissections was significantly less with surgical than with medical management (20% vs 50%), whereas type B dissections fared better with medical therapy (30-day mortality of 10% vs. 25%). Type A dissections are surgical emergencies. Conservative therapy is only appropriate if the patient is not a surgical candidate or refuses surgery. Type B dissections should be managed medically unless organ or limb ischemia forces surgery. Stent graft placement in type B dissection may be an effective way to treat branch vessel involvement or expanding aneurysms, and may aid in healing of the distal dissections; however, this approach awaits further study. Regardless of the type of dissection, hypertension needs to be aggressively managed, with a goal systolic BP of about 110 mm Hg. We prefer to use intravenous β-blockade (i.e., labetalol) as the decrease in ventricular contractility (dP/dt) may reduce propagation of the dissection. Nitroprusside or enalaprilat are used for refractory hypertension or for patients with β-blocker intolerance. Hypotension in the face of aortic dissection should prompt evaluation for tamponade, acute aortic insufficiency, coronary artery occlusion, or aortic rupture.

Summary

The diagnosis of aortic dissection requires a high index of suspicion. Recognition of signs and symptoms of dissection should prompt immediate diagnostic testing as survival depends in large part on rapid diagnosis and therapy.

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After Gastric Bypass, 65% Showed Improved Hypertension

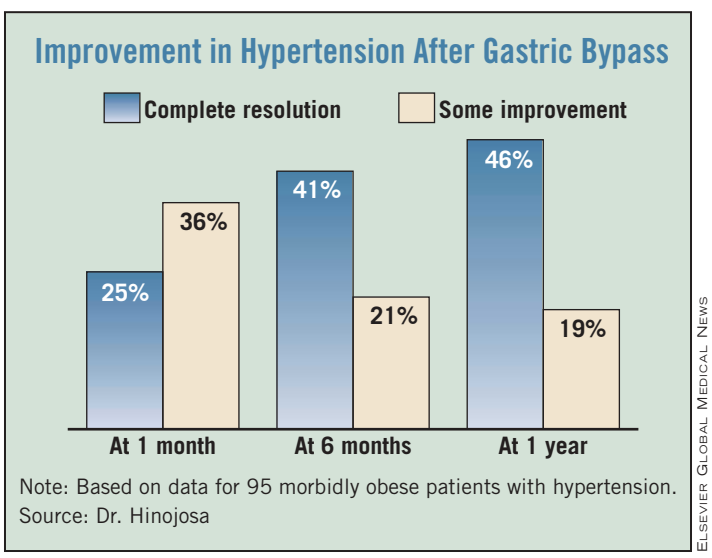
BY ROBERT FINN
San Francisco Bureau

HUNTINGTON BEACH, CALIF. — In a study of 95 morbidly obese patients with hypertension, 46% had complete resolution of their hypertension and another 19% showed some improvement 12 months after laparoscopic Roux-en-Y gastric bypass surgery, Dr. Marcelo W. Hinojosa reported at the Academic Surgical Congress.

It's well known that when obese patients lose weight, their hypertension often improves, and when obese patients have gastric bypass surgery, they usually lose weight. It's therefore reasonable to assume that when obese patients have gastric bypass surgery, their hypertension will probably improve. The study data provided evidence to support these relationships.

The research was a retrospective review. All of the patients in the study were taking at least one antihypertensive medication, and 40% were on two or more. Their mean age was 47 years at the time of surgery, and their mean body mass index was 47 kg/m^2.

As expected, the surgery resulted in significant weight loss. Within 1 month after the surgery, patients had lost an average of 23% of their excess weight, and that increased to 66% at the end of 12 months.



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Dr. Hinojosa and his colleagues at the University of California, Irvine, defined complete resolution of hypertension as a systolic blood pressure less than 140 mm Hg and diastolic pressure less than 80 mm Hg without the use of any antihypertensive medication. They defined improvement as maintaining that pressure or less while decreasing the requirement for antihypertensives.

Within 1 month, the average blood pressure declined from 139.8/79.9 to 123.3/75.3, a significant difference. At 12 months, the group showed evidence of further decline, with an average blood pressure of 120.0/71.3.

At 1 month, 25% of the patients had complete resolution of their hypertension, and 36% showed some improvement. The proportion showing complete resolution increased to 41% at 6 months and 46% at 12 months. The proportion showing some improvement was 21% at 6 months and 19% at 12 months.

The patients in the study had experienced hypertension for an average of approximately 6 years. The investigators determined that the patients with a disease duration of less than 4 years were significantly more likely to have complete resolution of their hypertension than were those with a longer duration of disease.

Dr. Hinojosa declared that he had no relevant financial relationships associated with this study. ■