The 8th Conference on Health Care of the Chinese in North America

Abdominal Aortic Aneurysm – An Increasing Disease

James S.T. Yao, MD, PhD, Division of Vascular Surgery, Department of Surgery, Northwestern University Medical School, Chicago, Illinois

---

With increasing use of diagnostic tests such as ultrasound or computed tomography (CT) scan and a better longevity for the aged population, the incidence of aortic aneurysm has increased significantly in recent years. [1]In the United States, death from aortic aneurysm is now ranked as the tenth cause of death in men over 55 years of age. In 1991, 16,606 deaths were attributed to aortic aneurysms, with abdominal aneurysm accounting for 52%. The number of discharges with a first-listed diagnosis of aortic aneurysm increased from 39,000 in 1979 to 67,000 in 1992. The increase of incidence of aneurysm appears to be world-wide, occurring not only in North America but also in England and Wales. [2-3]Because of the common occurrence of atherosclerosis in the western world, information on the incidence of aortic aneurysm is readily available. In contrast, there is a paucity of literature on aortic aneurysm in Asian publications, making the question of whether this condition is being recognized more frequently remain unanswered. Nevertheless, aortic aneurysm appears to be the second most common atherosclerotic manifestation in the Hong Kong population. [4]Of interest is the common association of gastric malignancy with aortic aneurysm in Japan reported by Komori and his colleagues.[5]

In the last decade, there have been significant advances in both the clinical and basic study of aortic aneurysm. [6]The current presentation aims to review the new findings in the understanding of aneurysm, including:

1. pathogenesis of aneurysm formation,
2. newer diagnostic techniques,
3. epidemiology, and, most important,
4. the new endovascular grafting technique for elimination of aortic aneurysm.

I. Pathogenesis of Aortic Aneurysm

Recent studies have shown there is a 10% to 15 % familial history of aneurysm in patients harboring aortic aneurysm. Although the genetic basis of aneurysm formation has yet to be firmly established, there is good reason to believe that screening of the first-degree relatives of the patient should be instituted. In addition to hemodynamic factors, it is now recognized that formation of aneurysm is multifactorial in origin. Using molecular biology techniques, we have begun to understand the matrix protein metabolism, the role of enzymes for degradation of collagen and elastin, and the importance of inflammatory cells in aneurysm formation. All these factors have been cited as causing aneurysm formation. This presentation will attempt to elucidate these new findings.

II. Newer Diagnostic Techniques

Ultrasound is best suited as a screening test because of its cost; however, the presence of aortic aneurysm is best confirmed by infusion CT scan. Computed tomography scan is sensitive to the diagnosis of an inflammatory aneurysm and is able to determine the size and the extent of the aneurysm accurately. One of the recent advances in CT scan is the introduction of helical CT with 3-dimensional reconstruction of images. With this technique, it is now possible to assess the origin of renal and mesenteric arteries in relationship to the aneurysm, without arteriography. The technique is of particular use in detecting tortuosity of the aorta. It is expected that this technique will be the imaging technique of choice in the next decade.

III. Epidemiology

The epidemiology of aortic aneurysm has been studied in detail recently[6]. The impact of size on rupture is now well understood by most vascular surgeons. A good-risk patient with the presence of an aneurysm confirmed by CT should be considered for surgery. At present, it is generally recommended that for a patient with an aneurysm larger than 5.0 cm, surgical intervention is appropriate. The size of the aneurysm, however, should not be the only determining factor. The surgeon needs to consider the risks to the patient, the longevity, and the size to arrive at the final recommendation. This presentation will discuss factors other than size as an indication for surgical intervention.

IV. Treatment

At present, the surgical treatment of aortic aneurysm using prosthetic graft has been standardized with a mortality and morbidity rate less than 5% in most medical centers. Depending on the status of the iliac artery, either a tube graft or bifurcated graft has been used for replacement. The choice of graft material is largely up to the surgeon. Unless there is prohibitive surgical risk, aortic graft is a safe and standard technique in the treatment of aortic aneurysm.

Since Parodi of Argentina introduced the concept of intraluminal placement of aortic graft in 1989[7], the endovascular graft has received much attention. An FDA-approved multicenter trial is now in progress to evaluate the feasibility and results of endovascular graft. At the initial trial, tube graft was used. In recent months, a bifurcated graft has been introduced and is now being tested in several centers in the United States. As one of the trial centers, we have attempted endovascular grafting in nine patients at Northwestern. Up to now, more than 100 patients have completed the study in the multi-center trial[8]. The technique and the interim results of this new technology will be presented.

References

1. Gillum RF. Epidemiology of aortic aneursym in the United States. J Clin Epidemiol 1995;48:1289-1298
2. Coggon D, Winter P, Martyn C, et al. Contrasting epidemiology of aortic aneurysm and peripheral vascular disease in England and Wales. Brit Med J 1996;312:948-949
3. Wen SW, Simunovic M, Williams JI, et al. Hospital volume, calendar age, and short-term outcomes in patients undergoing repair of abdominal aortic aneurysms: The Ontario experience, 1988-92. J Epidemiol & Community Health 1996;50:207-213
4. Cheng SWK, Wong J. Development of vascular surgery in Hong Kong. Asian J Surg 1996;19:6-10
5. Komori K, Okadome K, Sugimachi K. Simultaneous resection of abdominal aortic aneurysm and gastrointestinal malignancy. Asian J Surg 1996; 19:19-22
6. Yao JST, Pearce WH, eds. Aneurysms: New Findings and Treatments. Appleton & Lange, Norwalk, Connecticut, 1994
7. Parodi JC, Palmaz JC, Barone HD. Transfemoral intraluminal graft implantation for abdominal aortic aneurysm. Ann Vasc Surg 1991;5:491-499
8. Colburn MD, Moore WS. Endovascular repair of abdominal aortic aneurysms using the EGS tube and bifurcated graft systems. World J Surg 1996;20:664-672