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CASE STUDY

Abdominal Aortic Aneurysm Repair – Life Insurance Implications

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Aortic aneurysms can be managed surgically using an open graft replacement approach, or the less invasive approach, endovascular repair. The endovascular devices and patient selection methodology have evolved over the past decade. Intuitively, it would appear that the open approach affords a better long-term survival in low operative-risk individuals, but some current studies suggest otherwise. Until there are more long-term (20+ year) mortality studies that compare the open approach with the endovascular repair approach, we will not know with certainty how their survival outcomes compare.

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CASE PRESENTATION

Mr. F is a 65-year-old man who was applying for a universal life product for $1,000,000 of coverage. The proposed insured indicated on his application that he had surgery for an aneurysm. The insurance exam revealed a height of 5′9″ (175 cm) and weight of 195 lbs (88.6 kg). The heart rate was 58 beats per minute, and the average blood pressure was 134/88 mmHg. The insurance lab results included a total cholesterol of 220 mg/dL, an HDL of 37 mg/dL, an LDL of 147 mg/dL, and a triglyceride of 170 mg/dL. The renal function and liver enzymes were normal as was the urine including a negative cotinine result. An attending physician statement (APS) showed that his primary medical impairment was an aortic abdominal aneurysm measuring 5.3 cm; it was picked up as an incidental finding on an abdominal computerized CT scan in November 2004. A follow-up CT scan was done in February 2005. The aneurysm diameter was 5.4 cm. His medical records did not indicate a history of coronary artery disease, cerebrovascular disease, or diabetes. His hypertension was well controlled on atenolol 25 mg and hydrochlorothiazide 25 mg each daily.

Because his general health was good and to avoid life-long CT-surveillance, his surgeon advised him to have the aneurysm resected rather than having an endograft repair. The proposed insured would consent only to the endovascular repair approach. On March 25, 2005, he had an elective uncomplicated endovascular repair of his

abdominal aortic aneurysm using one of the latest generation endografts. Since his surgery, he has had yearly abdominal CT scans. None showed stent device migration or endoleak.

DISCUSSION

Sir William Osler (1849–1919) wrote, ''There is no disease more conducive to clinical humility than aneurysm of the aorta.'' Mortality for elective repair is 2% to 5%, and of those who have aneurysm rupture and make it to the hospital, their mortality is 40% or greater. An aneurysm is considered large if its diameter is greater than 5.5 cm. Surgical management of abdominal aortic aneurysms (AAA) are of two basic types, open graft replacement (OGR) and endovascular repair (EVAR). The former is the conventional open surgical technique and the latter is a ''minimally invasive procedure.'' In the right setting, as defined by the individual's risk profile and vascular anatomy, both approaches are appropriate. Utilizing both approaches allows for a decrease in the overall mortality rate and, at the same time offering a cure for more individuals.[1]

The open graft replacement was introduced in 1951; the most common surgical approach is a vertical laparotomy incision. Open graft replacements have more than an insignificant amount of intraoperative and perioperative mortality, however they are durable and rarely is reintervention necessary. Endovascular repairs were introduced in 1991. The procedure involves introducing an endograft through the femoral arteries, and it is deployed just distal to the renal arteries. The stent-graft is then fixed in the iliacs, distally. Endovascular aneurysm repair (EVAR) requires life-long surveillance. CT imaging is used to detect graft migration or leakage around the stented graft, so called ''endoleaks.'' Annually, about 6% of individuals undergoing EVAR require secondary interventions for graft-related problems.[2]

From an insurance medicine perspective, which approach more favorably impacts long-term mortality? Cao et al compared open graft replacement with endovascular aortic aneurysm repair over a maximal 7 years. Although the group having an EVAR was less healthy, they had a lower late-aneurysm-related mortality, and they also had lower perioperative mortality. And whereas this group also had a higher need for secondary procedures, it did not affect the superiority of early and later EVAR performances compared to OGR.[3]

In an early study by Bush et al, mid-term experience with EVAR was assessed by studying early and late outcomes of low-risk and increased-risk groups of individuals treated for abdominal aortic aneurysms. They concluded that since there was uncertainty about clinical outcome and the need for life-long surveillance, using the EVAR approach in someone who was an ideal candidate for standard open surgical repair might be ill advised.[4]

In a more recent study, Chahwan and others looked at an institution's 10-year experience (June 1996 to Mar 2005) of performing both the EVAR and OGR procedures. The overall mortality of both groups was 3.1%. The mortality of the EVAR group was 2.7%; the mortality of the OGR was 3.5%. A Kaplan-Meier log-rank analysis showed that the early and long-term survival of the two groups were about the same. However, the OGR group had a significantly better survival rate at 3 years compared with the EVAR group. In assessing survival analysis by age, those 70 years and older and those less than 70 years, there was no difference between these two treatment groups.[5]

Brooks et al found that patients ''unfit'' to undergo surgery did not benefit from EVAR during the first 4 years. However, for those ''fit'' for open AAA repair but had EVAR, there was a 3% improvement in the operative and 4-year aneurysm-related mortalities compared to those having OGR.[6]

As the EVAR approach does carry increased risk of failing, is it necessarily catastrophic? In a single center, May and others compared findings at presentation and surgical outcome in groups of individuals in whom abdominal aortic aneurysms ruptured. A group treated with EVAR was compared with a surgically untreated group. The study showed that while a failing graft due to an endoleak did not prevent rupture, the graft did attenuate major hemodynamic changes and mortality compared to the untreated group.[7]

Rutherford's EVAR 1 and 2 trials looked at management of AAAs larger than 5.5 cm. The EVAR 1 trial randomized individuals who were good surgical candidates into OGR and EVAR groups. There was a 3% lower initial mortality for EVAR that persisted through the first 4 years. However, continued improved survival long-term was not demonstrated. The EVAR 2 trial randomized individuals who were poor surgical candidates for OGR into two groups, those having EVAR and those having no surgical therapy. The results of the study were not clear; EVAR may or may not offer improved survival over non-operative management in this group. Those having EVAR who were fit for OGR but had large AAAs, had better survival initially and fewer AAA-related deaths at 4 years. Longer term, EVAR offered no overall survival benefit.[8]

Brewster and colleagues did a 12-year study looking at aneurysm-related mortality (ARM) in a group of patients having endovascular abdominal aortic aneurysm repair. In this group of 871 patients, 3.1% died from an aneurysm-related reason. Of these, 1.8% died perioperatively, 1.5% died from late rupture, and 0.3% died from complications following secondary reinterventions. Survival at 1 year was 97%, at 5 years 96%, and at 9 years 93%. The most important predictors for ARM were: family history of aneurysmal disease (OR, 9.5), renal insufficiency (OR, 7.1), need for any reintervention (OR, 5.7) and large preoperative aortic aneurysm size (OR, 1.1). Late survival was much better in standard risk patients compared to high-risk patients especially in those with renal insufficiency (OR, 14.1). This study showed that EVAR was successful in preventing AAA rupture and ARM. Effective isolation of the AAA from the circulation remained stable in 92% of these patients. Beyond 5 years, using current generation devices has been proven successful, as defined by stable rupture, ARM, and open conversion rates. With proper patient selection, EVAR can achieve acceptable short and long-term mortality and morbidity results in a relatively high-risk population. The study concludes that in addition to the already established role EVAR has in the high-risk patient, EVAR is also an acceptable alternative to the standard open surgical approach in the younger, lower-risk patient with favorable vascular anatomy.[1] So, in the final analysis, patient preference may be a very reasonable determinant in which procedure to use.

Prior papers have noted that less favorable outcomes of the EVAR approach in earlier studies might be due to using devices that were less effective than those of the more recent generations along with less refined patient selection methodology. However, until there are more comparative long-term (20+ years) studies looking at aneurysm-related-deaths following OGR with EVAR, we will continue to be uncertain as to which yields the best long-term survival.

With respect to long-term survival, the author feels that current data does not refute the following: in a low-risk individual who might be a suitable candidate for ORG and is likely to be compliant in doing long-term imaging follow-up testing, then it probably does not make too much difference whether he or she has had an open repair or endovascular repair of the abdominal aortic aneurysm. However, future long-term data may eventually prove what seems more likely – that those having open repair as opposed to endovascular repair using to-

day's devices will have a better 20+ year survival rate.

Our proposed insured, Mr. F, opted for the EVAR approach because he wanted to compress his recovery time, despite being advised to have an OGR approach. Thus far, he has demonstrated compliancy in his imaging follow-up surveillance. Based on current data, the author would not assign a higher impairment ''rating'' because of this choice.

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