Calcific Aortic Stenosis

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Rapach, Michelle L., "Calcific Aortic Stenosis" (2016). Nursing Student Class Projects (Formerly MSN). 146.
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Calcific Aortic Stenosis
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Introduction
Degenerative calcific aortic stenosis is a progressive disease that becomes more severe with age. It is a direct result of an active inflammatory process. The life expectancy of the United States’ population is increasing with it, and the incidence of aortic stenosis has increased over the past several decades. Surgical data suggests an rise in prevalence of the disease by over 20% in the past ten years (Bonnie & Greenland, 2015). Advanced Practice Nurses (APNs) are more frequently encountering patients of an advanced age and cardiovascular disease. APNs and other healthcare providers have treated more patients with aortic stenosis in new or treatment approaches for aortic stenosis. APNs should be aware of a disease process and should be informed of the diagnosis and appropriate care can be provided.

Signs, Symptoms, and Diagnostic Evaluation
• poor exercise tolerance and exertional dyspnea (Magenit et al., 2010)
• Angina (Magenit et al., 2010)
• Syncope (Magenit et al., 2010)
• Classic features of heart failure: dyspnea, orthopnea, jugular vein distention, and rales (Carey & Pearl, 2013)
• Rasanen (2010), Me as severe as with a valve area less than 1 cm2 and pressure gradient greater than 40 (Pans & George, 2014). The decision is made to perform a transcatheter aortic valve replacement (TAVR) procedure due to its advanced age and comorbid conditions. His aortic valve was replaced with an Edwards Life Science SAPIEN valve via a right femoral approach. Mr. T’s hospital course was uneventful and he is discharged home three days post procedure.

References
Czarny, M. L., & Henry, L. (2015). Mr. T's hospital course was uneven and he is discharged home three days post procedure.

Pathophysiology
Calcific aortic stenosis goes beyond the process of wear and tear on the valve, and the development of calcium on the valve cusps can be seen in two phases: the “initiation phase” and the “propagation phase” (Pans & George, 2014). During the initiation phase, the extremely thin valve cusps are subject to mechanical stress during systolic contraction and leakage of blood into the ventricle, and the development of calcium on the valve cusps can be disrupted by the quality of life for patients who suffer from symptoms of this pathology. Aortic stenosis requires very careful planning and close monitoring of the disease progression to prevent a poor prognosis. The nature of the disease requires a variety of clinical strategies to assist in its treatment in order to provide the best outcomes. APNs can be central providers in diagnosing, monitoring, and providing appropriate pre and post valve replacement care.

Calcific aortic stenosis is a progressive disease that can disrupt the quality of life for patients who suffer from symptoms of its pathology. Aortic stenosis requires very careful planning and close monitoring of the disease progression to prevent a poor prognosis. The nature of the disease requires a variety of clinical strategies to assist in its treatment in order to provide the best outcomes. APNs can be central providers in diagnosing, monitoring, and providing appropriate pre and post valve replacement care.

Case Study
Mr. T is 82 year old male with a history of hyperlipidemia, hypertension, obstructive sleep apnea, coronary artery disease with prior coronary artery bypass grafting (CABG) in 2014, atrial fibrillation, chronic kidney disease, diabetes, obesity, and is a former smoker. Mr. T reports chest tightness and dyspnea with minimal exertion. Echocardiogram reveals a normal left ventricular chamber size and preserved fraction, and impaired relaxation. Aortic valve area measures 0.89 cm2. Mean gradient is 46 mm Hg. A left heart catheterization reveals patent grafts from prior CABG and pull back across the aortic valve measures a 50 mm Hg gradient.

Mr. T’s case is presented to a comprehensive heart valve team. Mr. T’s aortic stenosis is classified as severe with a valve area less than 1 cm2 and pressure gradient greater than 40 (Pans & George, 2014). The decision is made to perform a transcatheter aortic valve replacement (TAVR) procedure due to its advanced age and comorbid conditions. His aortic valve was replaced with an Edwards Life Science SAPIEN valve via a right femoral approach. Mr. T’s hospital course was uneventful and he is discharged home three days post procedure.

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Figure 1. Edwards Life Science SAPIEN 3 aortic valve (Widhalm et al., 2016)

Figure 2. J. Severly calcified, stenotic aortic valve (Carey & Pearl, 2013)