

Abstract

Changes in ascending aorta wall in aortic valve diseases – clinico-pathological correlation

Ascending aorta is an initial portion of the thoracic aorta. Ascending aorta and aortic valve share an intimate anatomical position and influence each other hemodynamically. Surgical specimens from the ascending aorta are mostly removed for aortic aneurysm or dissection, which are the consequences of a wide range of risk factors, diseases, syndromes, or ageing.

In most cases, aneurysms are asymptomatic being diagnosed incidentally during imaging for another reason. The dangerous clinical manifestation of aneurysms is called an acute aortic syndrome, including aortic dissection. Surgical replacement of the affected aorta by a prosthesis in either case (aneurysm and dissection) represents the method of choice. If the aortic valve displays a defect, it is possible to replace it as well. In 2015 and 2016, The Society for Cardiovascular Pathology and The Association for the European Cardiovascular Pathology published consensus documents on the aortic wall. The nomenclature and grading schemes are unified and specified in detail. The incidence and grading of particular lesions significantly differed in various studies until the consensus documents were published. Diseases of the aortic wall include medial degeneration and inflammatory conditions such as infectious and non-infectious aortitis and atherosclerosis.

We applied the new consensus documents to reveal histopathologic changes in aortic samples. The clinico-pathological features were examined. We assumed that there are differences between dissections and aneurysms influenced by aortic valve cuspidity and disease. Moreover, we expected differences in the distribution of findings in aortic circumference.

From September 2018 to February 2022, a total of 160 cases was collected and examined, comprising 108 aneurysms (40 tricuspid, 68 malformed) and 52 dissections (48 tricuspid, 4 malformed). The most common finding was medial degeneration. Atherosclerosis and vasa vasorum abnormalities also significantly contributed. The most severe findings were in dissected aortae, the least severe changes in aneurysms with malformed valves. The composition of the findings varies between the groups. Aortic circumference revealed only a slight variation. Some of the results correlate with age and aortic diameters.

The study results complement the knowledge of the etiopathogenesis of aortic diseases. Moreover, it correlates the histopathological findings with clinical data. The study also points out the importance of histological examination – severe medial degeneration might indicate genetic cause mainly in young patients and warrant further investigation. If the biopsy reveals aortitis, a systemic disease should be excluded. This study has been conducted thanks to close cooperation with The Cardiosurgery Department.