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P5437 | BEDSIDE
Cardiac auscultation in diagnosing valvular heart disease: a comparison between general practitioners and cardiologists

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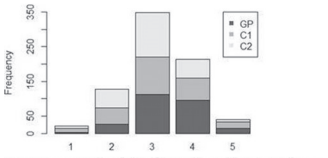
Background: Cardiac auscultation is a primary clinical skill used by physicians in diagnosing valvular heart disease (VHD). Its application in clinical practice has diminished considerably in the last two decades, owing to widespread use of echocardiography.
Purpose: We aimed to determine the accuracy of cardiac auscultation in diagnosing VHD among General Practitioners (GPs) & Cardiologists using transthoracic Doppler-echocardiography as the reference standard.
Methods: 251 asymptomatic OxVALVE study participants underwent cardiac auscultation by two experienced GPs prior to undergoing blinded screening echocardiography. Heart sounds were subsequently recorded using an electronic stethoscope. The recorded heart sounds were assessed by two Consultant Cardiologists. 5-point Likert scale was used to describe the ability to hear heart sounds (Figure-1) in addition to the presence or absence of a murmur & the type of murmur. VHD was categorised as mild (mild regurgitation or aortic sclerosis) or significant (moderate/severe regurgitation or at least mild stenosis). Standard measures of diagnostic accuracy were calculated and comparison between GPs and Cardiologists was performed using Chi-squared test.
Results: Mild VHD was identified in 174 (69%) of the 251 participants & significant VHD in 37 (15%). GP Auscultation had a sensitivity of 32% and specificity of 67% for diagnosing mild VHD & a sensitivity of 43%, and specificity of 69% for significant VHD. Analysis of 251 pre-recorded heart sounds by Cardiologists revealed a mean sensitivity of 22% and specificity of 85% for diagnosing mild VHD & a sensitivity of 31% and specificity of 81% for diagnosing significant VHD. The comparison between GPs and Cardiologists for diagnosing mild and significant VHD revealed that GPs had a better overall sensitivity whereas the Cardiologists had a better specificity (Table 1).

Table 1

n =251	General practitioners	Cardiologists (mean)	p-value
Significant valvular heart disease			
Sensitivity	43%	31%	0.004
Specificity	69%	81%	0.001
Mild valvular heart disease			
Sensitivity	32%	22%	0.01
Specificity	67%	85%	<0.0001

p-value <0.05 is considered significant.



X-aixs represents the ability of GPs to hear a heart sound on auscultation or a Cardiologist on playing back the pre-recorded heart sounds, on a Likert scale of 1-5 (1 being poorly & 5 being perfectly). Y-axis represents the number of participants.
C1 = Cardiologist1, C2 = Cardiologist2

Figure 1

Conclusion: Cardiac auscultation has a modest accuracy for diagnosing VHD in an unselected population of asymptomatic individuals. The presence of a lone murmur on auscultation, without symptoms is not a reliable indicator of valve disease.
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OPEN QUESTIONS IN VALVULAR HEART DISEASE

P5438 | BENCH
Expression of IL-10 on mitral valve and myocardium in patients with rheumatic mitral valve disease

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Background: The pathophysiology of rheumatic heart disease (RHD) is still not completely understood. The progressive and persistent inflammatory process on the cardiac valves compared to the myocardium in RHD is suspected to be related to the different expression of IL-10 as an anti-inflammatory cytokine.
Purpose: This study aims to evaluate the difference of IL-10 expression on mitral valve and myocardium in patients with rheumatic mitral valve disease (RMVD).
Methods: A cross sectional study in which mitral valves and anterior papillary muscles were obtained from 20 RMVD patients undergoing mitral valve replacement surgery at Dr. Kariadi Central General Hospital. IL-10 expressing cells were detected by using immunohistochemical staining technique.
Results: Seventy percent of 20 samples has shown lower IL-10 expression on the mitral valve compared to the myocardium. IL-10 expression on mitral valve and myocardium were significantly different, p=0.001 (p<0.05). IL-10 expression on mitral valve was not correlated with sex, age and cardiac rhythm.
Conclusion: This study showed that expression of IL-10 at the mitral valve significantly lower than the myocardium, which may play a role in the progression of valve damage in patients with RMVD.

P5439 | BENCH
Nanomechanical characterization by atomic force microscopy of allograft pulmonary valve transplanted in porcine model

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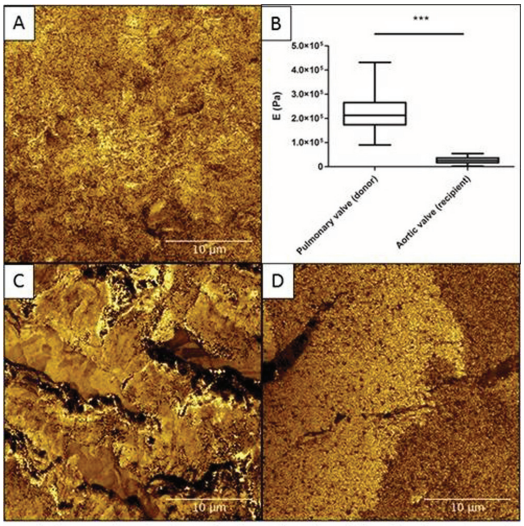
Porcine xenografts and homografts are frequently utilized as bioprosthesic valves, suffering unavoidable degradation. This process has never been described on nanomechanical level, therefore we applied atomic force microscopy (AFM) in description of allograft of glutaraldehyde-fixed (GA) porcine pulmonary valve and artery. The aim of this study is to provide complementary methods to investigate degradation of bioprosthetic valves not visible to gross inspection on small samples using AFM.
All manipulations with the animals respected the European Convention for experimentation with laboratory animals. Two 6-month old porcine wild type females, weight 56 / 55 kg respectively were used as acceptor and donor. Recipient was sacrificed at 2 months later. Graft consisting of proximal pulmonary artery, valve and 5–10 mm of outflow tract was harvested. With cardiopulmonary bypass, proximal and distal anastomosis were performed. After euthanasia of transplanted animal, samples were fixed in 4% paraformaledhyde (for 1h at 4°C). Small samples of 2x2mm, were placed on Petri dish and measured under AFM (in PBS 37°C). Force-volume maps 30x30μm, 256x256 pixels, 10Hz, were performed with maximum indentation force of 3nN (maximum indentation 300nm). Maps were analyzed using Hertz-Sneddon model, for elastic modulus estimation and maps of point of contacts for topography.
Data were treated for image processing and statistical analysis of the elastic modulus values (expressed in mean±SD). Transplanted pulmonary valve showed an elasticity value of 0.225±0.070 MPa, whereas internal control from aortic valve presented much lower module of 0.028±0.015 MPa (p<0.001).
The endothelium of donor pulmonary artery coming showed calcification at visual inspection, conversely to the valve. AFM topography showed micro-plaques with bimodal elasticity distribution (0.546±0.415 MPa, soft phase, and 2.666±0.573 MPa, hard phase). The acceptor part of the pulmonary artery showed roughly the



Result of topography and mechanical analysis on the explanted allograft and native tissue. A) Topography of the implanted pulmonary valve, where unorganized fibrillar structures are visible. B) Elastic modulus comparison between pulmonary artery (implanted, stiffer) and aortic valve (native, softer). C) topography of the implanted tract of pulmonary artery, with visible deposits. D) Topography of the native tract of the pulmonary artery, microdeposits seem to cover the original fibrillar structure.