

Society Details

Can all societies ensure that you add useful contacts and events to the spreadsheet and keep your contact details up to date too.

If you do not have permission to share a person's contact details then please add their name to the spreadsheet, what they were helpful for and your society; then if need be anyone who would like to contact them can contact you on their behalf.

Links are available on page 3.

Next Meeting

The next ABUSS/Medical Student Liaison Committee meeting will take place on **Friday 11th March**, at the **Royal College of Surgeons**. We urge that a representative from each society is able to attend, as there will be several **major announcements!**

Use this link to fill in the form to let us know whether you can attend or not: <http://goo.gl/forms/HBY9TNdgUA>.



This Issue

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Interventions in Aortic Stenosis

Introduction

The prevalence and aetiology of valvular heart disease has changed dramatically over the past five decades.

It is estimated that in industrialised countries 2.5% of the adult population suffer from valvular heart disease, with the incidence increasing greatly with age. Only 0.7% of people aged 18-44 years suffer with valvular disease compared with 13.3% of people aged 75 years and over. This dramatic difference in incidence reflects the changing aetiology of valvular disease.

The most common cause of all valvular disease is caused by degenerative aetiologies related to increasing age; this accounts for 63% of all valvular disease cases, including, 81.9% of aortic stenosis and 50.3% of aortic regurgitation cases. The second most common cause of valvular disease is rheumatic fever which is responsible for 22% of all cases. Rheumatic heart disease used to be the main cause of valvular disease, however, over the past 60 years the incidence of rheumatic heart disease has reduced considerably in industrialised countries.

It is estimated that by 2018 there will be 4 million people in UK aged between 75 and 84 and so in line with the increase in the ageing population and the shift in aetiology towards predominantly age-related degenerative changes, it is likely that the prevalence of valvular heart disease is going to continue to rise.^{1,2}

The aortic valve is a tricuspid valve consisting of three semi-lunar leaflets. The valve itself is located within the aortic root which forms the left ventricular outflow tract and is located between the left ventricle and the ascending aorta. The aortic root provides support for the aortic valve and extends from the basal attachment of the valvular leaflets to the sinotubular junction. Distal to the attachment of the leaflets are three sinuses also known as the sinuses of Valsalva. Two of these sinuses give rise to the left and

right coronary arteries and are named respectively; the remaining sinus does not give rise to a coronary artery and so is termed the non-coronary sinus.^{3,4}

Pathophysiology

The most common type of acquired valvular disease in the developed world is aortic stenosis.⁵

Aortic stenosis is characterised by progressive narrowing of the aortic valve which causes an increased afterload, leading to secondary left ventricular hypertrophy. Initially the ventricular hypertrophy acts as a compensatory mechanism for the increased wall stress but this mechanism eventually becomes maladaptive and can lead to heart failure.⁶ Decompensation of these mechanisms leads to symptoms of inadequate cardiac output including shortness of breath on exertion, angina, dizziness and syncope.⁷ Calcific changes in the valve cusps are the most common cause of aortic stenosis. Over time the cusps become progressively thickened, fibrosed and calcified which increases their stiffness and impairs valve opening leading to a narrow valve orifice.

These changes used to be attributed to 'wear-and-tear' in the valve due to increased age, however, it has now been demonstrated that the changes are due to an inflammatory response similar to that seen in atherosclerosis.⁸ It has been proposed that mechanical stress on the valve, along with the presence of atherosclerotic risk factors, causes valvular endothelial dysfunction which allows the deposition of low-density lipoproteins and lipoprotein A.

These lipoproteins undergo oxidation which transforms them into cytotoxic substances which go on to stimulate an inflammatory response and lead to calcification.⁹ During the inflammatory response macrophages and T cells infiltrate the endothelium of the valve and release cytokines including tumour necrosis factor-alpha and interleukin-1-beta. These inflammatory cytokines stimulate the proliferation of valve interstitial cells into myofibroblasts which causes fibrosis in the

Can you help us to shape the future of the museums, library and archives at the RCS?

Come and discuss with other medical students your views on our current services and how we might develop them as we begin to plan the refurbishment of the Hunterian Museum and the redisplay of the College's internationally significant collections. Your contribution will come at a very useful point, early in the planning process.

Share your views with us at this early evening event to be held at the **RCS on Thursday 18 February at 6pm**. Enjoy a drink and some nibbles and contribute to the future of surgical heritage at the College. A small stipend is available.

If you would like to join this focus group please email jhughes@rcseng.ac.uk to confirm your attendance. There are limited places and will be allocated on a first come, first served basis.

Articles

We are looking for students to submit pieces of work to be included in our newsletter. If you are interested then please get in contact.

cusps. Myofibroblasts and inflammatory cells also lead to the over expression of matrix metalloproteinases which play an important role in the restructuring of the valve leaflets.¹⁰

Doppler echocardiography is the preferred method of assessing the severity of aortic stenosis. Assessment of the valve area combined with the flow rate across the valve, pressure gradients, degree of calcification and assessment of the left ventricular function should be used in combination to aid clinical decision making.⁷ Measurement of aortic velocity is the most reproducible measurement for grading the severity of aortic stenosis and is the strongest predictor of prognosis. Using aortic velocity, mild stenosis is classified as 2.6 to 3.0 m/s, moderate as 3.0 to 4.0 m/s and severe as greater than 4.0 m/s.¹¹

Surgical Aortic Valve Replacement

The average prognosis for patients with symptomatic aortic stenosis is between 1 and 3 years with those presenting with associated congestive heart failure having a prognosis of less than 2 years.^{12, 13} Therefore, surgical replacement of the aortic valve is strongly recommended in all patients with symptomatic aortic stenosis who have an acceptable surgical risk.⁷ The 30 day risk of mortality for a patient undergoing surgical aortic valve replacement is estimated using the EuroSCORE; this was developed using a database of 20,000 patients throughout 8 European countries and provides a mortality estimate based on both cardiovascular and non-cardiovascular risk factors.^{14, 15} Risk factors used in the calculation of the score include age, sex, chronic lung disease, left ventricular dysfunction and extracardiac arteriopathy.¹⁶ Overall, operative mortality for isolated aortic valve replacement is between 1-3% in patients under the age of 70 years and rises to 4-8% in older patients.⁷

Surgical replacement of the valve has not only been shown to provide patients with symptomatic relief but has also been shown to increase survival to rates similar to the rest of the population in the same age group.¹⁷ With an overall 5 year survival in post-operative patients of 80% this is a significant improvement compared with pre-operative 2 year survival rate of only 21%.¹⁸ The presence of left ventricular dysfunction in pre-operative patients is a poor prognostic factor; however, it has been shown that valve replacement is associated with a marked improvement in the left ventricular ejection fraction. The degree of improvement is related to the pre-operative left ventricular end systolic volume. A greater improvement in the ejection fraction is seen in patients who have a larger end systolic volume than those with a small volume.^{19, 20} Both the improvement in the left ventricular ejection fraction and the dramatic increase in survival clearly demonstrate that there are marked benefits of undergoing surgical aortic valve replacement.

The evidence for surgical treatment of severe asymptomatic aortic stenosis is less clear but it has been proposed that patients may benefit from early surgical intervention compared with a watchful waiting approach. It has been shown that in cases of mild and moderate asymptomatic aortic stenosis, delaying surgery until the development of symptoms does not affect prognosis and events of sudden death in these patients occur very rarely.²¹

However, patients with severe asymptomatic aortic stenosis have a poor prognosis and high incidence of adverse events including cardiac death and development of left ventricular failure. As these patients appear to have a poor prognosis and are at risk of rapid deterioration, consideration of early valve replacement and the risk and benefits of the procedure before the onset of symptoms may be beneficial in preventing a poor outcome.^{22, 23} Under the current guidelines aortic valve replacement is indicated in asymptomatic patients with a left ventricular ejection fraction less than 50% or with an abnormal exercise stress test which induces symptoms clearly related to aortic stenosis.⁷

There are several types of prosthetic aortic valves which can be used during surgery; broadly, these are divided into mechanical and bioprosthetic valves. The major consideration in the choice of prosthesis is balancing the risks of the long term anticoagulation therapy that is required with mechanical valves, with the risk of structural valve deterioration in a bioprosthetic valve. All mechanical valves require life-long anticoagulation with warfarin to reduce the risk of valve thrombosis and formation of a thromboembolus which could lead to a stroke. Whilst warfarin is very effective in this there are disadvantages which may influence the choice of valve. Regular blood tests are required to monitor the levels of anticoagulation through measurement of the International Normalised Ratio (INR) so as to ensure that it remains at a therapeutic level. There is also an increased risk of bleeding which increases substantially in older patients.²⁴ Bioprosthetic valves do not require long term anticoagulation except in the presence of co-morbidities such as atrial fibrillation,⁷ however, they are at risk of structural valve deterioration (SVD). SVD has been shown to occur around 15 to 20 years post valve implantation depending on the type of bioprosthesis used meaning that re-operation would be required in many patients and possibly multiple re-operations in young patients. Re-operative aortic valve replacement is associated with a greater risk of mortality and so this needs to be considered in the choice of prosthesis.^{25, 26} It has been shown that amongst patients between the ages of 65 and 80 the long term mortality rates are similar for both types of valves; however, mechanical valves have a greater risk of stroke and haemorrhage but a lower risk of re-operation due to valve deterioration and endocarditis. These risks vary depending on the patient and their co-morbidities and so it is important to consider the patient as a whole before making a decision.²⁷

Transcatheter Aortic Valve Implantation

Unfortunately there are multiple contraindications to surgical aortic valve replacement and currently one third of patients requiring surgical replacement are denied the operation due to multiple poor prognostic factors.²⁸ One of the most common extra-cardiac contraindications to surgery is advanced age. Advanced age has been shown to be a poor prognostic factor both in hospital and in the long term and is also an important predictor of surgical risk and mortality when undergoing cardiac surgery.²⁹ Existing co-morbidities are another common reason for refusal of surgery. These include co-existing cardiac conditions, such as coronary artery disease and a poor left ventricular ejection fraction, and other co-morbidities such as chronic lung disease and

Useful Links

Google Drive:

<http://goo.gl/0vPQNc>

All files available on google drive. Feel free to upload your own useful documents to share with others. Details of accessing the calendar are also located here.

Calendar Event

Submission Form:

<http://goo.gl/forms/63xXijineq>

This is the place to go if you have an event you would like publicised. It will be put onto our public calendar as well as the next E-Bulletin issue.

ABUSS Email:

rcsabuss@gmail.com

Get in touch! Also email us with any news of your societies, novel events/ ideas, and if you would like to submit something for the next E-Bulletin.

E-Bulletin Archive:

<http://goo.gl/OX6jcW>

Student Article

This month's author is Elizabeth Emo, a 3rd year student at HYMS.



Bibliography:

<https://goo.gl/wcXioe>

chronic kidney disease.² In these patients a transcatheter aortic valve implantation (TAVI) should be considered as an alternative procedure; this involves the insertion of a bioprosthetic valve to replace the native valve through either the femoral artery or directly through the apex of the left ventricle.³⁰

TAVI has been shown to significantly reduce mortality in patients with severe aortic stenosis who are not suitable for surgery compared with standard therapies, including balloon valvuloplasty.³¹ The one year mortality rate for TAVI has been shown in several trials to be at 25%; this is primarily due to severe paravalvular aortic regurgitation following the procedure or non-valve related co-morbidities including heart failure and chronic kidney disease.³² This one year survival rate for high-risk patients who undergoing TAVI is similar to that for surgical aortic valve replacement and resulted in similar symptomatic improvement.³³ However a higher stroke rate has been reported following TAVI, with one study³⁰ showing that the rate of neurological events, including major strokes, was double that which occurred in surgical aortic valve replacement. The majority of strokes which occurred during the study were embolic and related to the TAVI procedure itself. Despite this increased stroke risk, TAVI results in a significant increase in life expectancy for high-risk surgical patients; unfortunately, some symptomatic patients are still unsuitable for a TAVI. Absolute anatomical contra-indications include an inadequate annulus size, thrombus in the left ventricle, plaques in the ascending aorta or aortic arch, or inadequate vascular access.⁷ In these patients the only treatment left are non-surgical options including balloon valvuloplasty and medical therapy.

Aortic Balloon Valvuloplasty

Aortic balloon valvuloplasty is a percutaneous procedure that aims to give symptomatic relief and immediate haemodynamic improvement. During the procedure access is gained through the femoral artery and arterial catheters advanced into the left ventricle and ascending aorta; these catheters are then used to measure the transaortic gradient. A balloon is then inflated within the aortic valve to widen the valve orifice until the transaortic gradient is reduced to around a half or a third of the baseline measurement.³⁴ Survival rates following percutaneous aortic balloon valvuloplasty (PABV) are poor due to early restenosis following the procedure with a 1 year survival rate of 55%, 35% at 2 years and 23% at 3 years with the majority of deaths being due to cardiac causes.³⁵ Whilst the long term prognosis is poor following PABV, the procedure does provide the majority of patients with symptomatic relief for up to 18 months³⁶ and repeated procedures are associated with maintenance of symptomatic improvement and median survival rate of 3 years.³⁵ PABV can also be used to provide temporary symptomatic relief for high-risk patients who are suitable to later undergo either surgical valve replacement or TAVI.³⁷

Medical Therapy

Several medications have been trialled in the treatment and prevention of aortic stenosis including statins, ACE inhibitors and angiotensin receptor blockers. As mentioned previously, calcific changes in the aortic valve are the most common cause of aortic stenosis in the Western world. Calcific aortic stenosis is a chronic

inflammatory process and its progression has been shown to be linked to hypercholesterolemia.⁵ The process of calcification has been shown to have many similarities to that of atherosclerosis including the involvement of lipids and lipoproteins.⁸ Statins have been shown in multiple trials to reduce the progression of coronary artery disease and to reduce coronary calcification. With the association between aortic stenosis and coronary artery disease and the link with hypercholesterolemia it would be reasonable to suggest that statins could have a similar impact on the progression of aortic stenosis. However, there is currently no evidence that statins halt the progression of calcific aortic stenosis or cause its regression.³⁸

Angiotensin-converting enzyme (ACE) inhibitors are recommended for the treatment of aortic stenosis patients who are experiencing heart failure symptoms and may be beneficial in halting progression of the disease.⁷ ACE and angiotensin II are both present in the valve leaflets of patients with aortic stenosis³⁹ and may contribute to the calcification and the active inflammatory process occurring in the valve; therefore, inhibition of these could slow the progression of aortic stenosis.⁴⁰ However, the main recommendation for the use of ACE inhibitors is based on their impact on hypertrophic changes that occur in the left ventricle.⁵ Cardiac angiotensin II is expressed at increased levels in the myocytes of the left ventricle due to the increased pressure placed on it from the stenotic valve. Angiotensin II is thought to contribute to the development of myocardial hypertrophy and diastolic dysfunction and so inhibition of its formation through the use of an ACE inhibitor could preserve left ventricular function.⁴¹ Due to the increased levels of angiotensin II, angiotensin receptor blockers (ARBs) could also be beneficial in slowing the progression of stenosis. Research has shown that patients with varying degrees of aortic stenosis who are taking either an ARB or an ACE inhibitor have both a reduced rate of cardiovascular events and an improved survival rate compared with those who are not.⁴² Whilst there is currently no recommended medical therapy that will improve the outcome in patients with symptomatic aortic stenosis, there is scope for the control of symptoms caused by secondary heart failure through the use of digoxin, diuretics, ACE inhibitors and ARBs.⁷

Conclusion

In conclusion, the incidence of calcific aortic stenosis is expected to continue to rise due to the ageing population. The gold standard treatment for symptomatic aortic stenosis is still surgical aortic valve replacement and, whilst the evidence for the treatment of asymptomatic aortic stenosis is less well defined, early aortic valve replacement in these patients has also proven to be beneficial. The introduction of transcatheter aortic valve implantation has dramatically increased the survival rate for many patients who were previously refused surgery, however, the procedure carries a greater stroke risk and so is currently only indicated in symptomatic patients for whom there are contra-indications to surgical valve replacement. Whilst there is currently limited evidence to suggest that medical therapy can influence the progression of aortic stenosis the similarities of the disease process to that of atherosclerosis suggests that, in the future, modification of the progression of the disease may be possible.

Upcoming Events

Hull Surgical Society



Academic Presentation Competition

Hull Surgical Society are welcoming all medical students from across the country to enter their Academic Presentation Competition.

They are now accepting abstracts for the competition. These can be from any area relating to vascular surgery. Potential topics include own research, audits and case reports.

Submitted abstracts will be reviewed by a senior panel of surgeons, and those who are shortlisted will be invited to perform an oral presentation to a judging panel and an audience at their Academic Prize Evening. This will take place at the University of Hull on Wednesday 16th March 2016.

Abstracts submitted to:
hull.surgsoc@gmail.com

Abstracts should be a brief summary & description of your presentation, with no more than 250 words in length.

Deadline: 19th February 2016

Emergency Medicine Conference 2016

Two days of expert seminars and hands-on demonstrations - perfect for the budding intensivists amongst you or for anyone with an interest in emergency medicine/trauma/critical care.

The conference is open to all medicine years, plus our paramedic, nursing, midwifery, and dentistry colleagues. Lunches and certificates (plus plenty of tea/coffee/biscuits) are supplied.

More info: <http://emc-2016.eventbrite.co.uk>

Date: 27/02/16 - 28/02/16

Tickets: £30

Venue: Medical Biology Centre,
Queen's University Belfast, BT9 7AE

qubscrubs@hotmail.co.uk



National Conference for Aspiring Surgeons 2016

This will be a chance for medical students and foundation doctors to present their work to consultant surgeons for a chance to win a national prize. There are both oral and poster presentations with specific surgical categories for each. Prizes will be awarded to the best oral presentation and poster in each category as well as an overall best oral presentation.

There will also be a number of talks throughout the day by judges giving you a flavour of what a surgical career really entails and what you need to be successful if entering a career in surgery.

More info is available here: <http://www.scrubs.org.uk/aspiring-surgeons-conference-2013>

Date: 27/02/16

Tickets: £10

Venue: School of Chemistry, University of Bristol

Tickets here: <https://www.rcsed.ac.uk/education/courses-and-events/coursedetails.aspx?diaryId=1682>



Upcoming Events

Surgical Learning: Bulletin of The
Association Of British Undergraduate
Surgical Societies



AOTrauma Course - Introductory Course for Undergraduates

This one day interactive course uses case discussions and 'hands on' fracture fixation practicals to establish the basics of fracture management for medical students and foundation doctors who are planning an orthopaedic career.

Date: 28/02/16

Tickets: £15

Venue: The Royal College of Surgeons
of Edinburgh, Nicolson Street,
Edinburgh, EH8 9DW

[https://aotrauma2.aofoundation.org/
eventdetails.aspx?id=4109](https://aotrauma2.aofoundation.org/eventdetails.aspx?id=4109)

National Undergraduate Clinical Anatomy Competition

The one-day event is designed to give anatomy enthusiasts the opportunity to further their skills, increase confidence in the field, make links outside their own medical school and gain accreditation for their knowledge of clinical anatomy.

It encompasses three different exam formats to test clinical anatomy, including the use of highly acclaimed plastinated specimens (Von Hagens, Gubener, Germany). Delegates will also benefit from lectures and updates by eminent guest speakers active in the field of anatomy.

Date: 02/04/16

Venue: Clinical Sciences Building, University
Hospital Coventry and Warwickshire, CV2 2DX

info@clinanatomycomp.com



RCSEd North of England Medical Students and Foundation Doctors National Surgical Research Symposium 2016

This national Symposium will offer talks on pursuing a career in surgery, surgical research and the role of surgical simulation. There will be opportunities for students and foundation doctors to present their research and to get involved in clinical workshops.

More info: <https://goo.gl/Km0Lm0>

Date: 16/04/16

Tickets: £10

Venue: Field House, Bradford Royal
Infirmary

outreach@rcsed.ac.uk

So you want to be a vascular surgeon?

This is an exciting new course developed by the Vascular Society of Great Britain and Ireland which aims to: provide an overview of the work undertaken by vascular surgeons; expose participants to some of the basic skills required to be a vascular surgeon; and outline potential career paths to succeed in vascular surgery

Date: 14/05/16

Tickets: £50

Venue: Northwick Park Clinical Skills Unit,
Watford Rd. Harrow

s.parsapour@nhs.net

