Minutes of Derby Medical Society
1st of December 2021
"Mitral valve surgery in the 21st century"
Mr. Stephen Billing

Apologies: Dr. Hedley
Minutes from the last meeting (Dr. H. Lever):
Learning point from the last meeting "The inside track of being inside The House", by Pauline Latham, OBE, MP for Mid Derbyshire, on the 11th of November 2021.
She talked to us about her constituency role, her legislator role, about the "Whips" name, and about the bill that she was taking through the Parliament at the time, regarding making marriage before the age of 18 illegal.
Announcements:
The Final Year Medical students aren't allowed to go abroad this year for their electives, due to the COVID pandemic, but they are allowed to do electives outside the region. So we are running a bursary application and the form will be available on the website (public access) and DMS offers 3 bursaries, each of £250.
We are opening the applications for Case presentations and Poster presentations for Doctors in Training. We will display all the posters and there is a £250 prize for each.
President welcoming speaker, **Mr. Stephen Billing, Consultant Cardiothoracic Surgeon** , Royal Wolverhampton NHS Trust, New Cross Hospital, who was our guest here 10 years ago presenting to us what was happening in Wolverhampton in Mitral valve repair.
Speaker:
Background: Cardiac Surgeon in Wolverhampton for 17 years. Trained in Mitral valve repair with Mr. Francis Wells who works at Royal Papworth in Cambridge. Trying to give patient the treatment he would like for his own family.
This is a good time to mention some new changes in the field, on the perspective of what's going on elsewhere.
Mitral Valve Disease
- more frequent in later life, up to 10% over 75 years of age
- an increasing problem. Luckily, not all of them will require surgery, but is **not** a rare condition.
Aetiology (not quite clear what the cause is): very few congenital (cleft MV), degenerative - the majority of MV regurgitation (probably congenital), functional, ischaemic - distortion of the ventricle, which distorts the valve, leading to a leak, endocarditis high risk disease, radiation (e. g. high doses of radiation used in Hodgkin's disease).
Mitral stenosis is still present.
Once you've got mitral regurgitation, it usually gets worse.
Traditional perceptions of MV surgery:
- higher risk cardiac surgery
- replace the valve
- wait for symptoms.
MV replacement has a cost for the patient. It should be a low risk procedure if it is done at the right time.
The issues with MV replacement:
- *durability* (all the biological prosthetic valve data is age related - the younger you are the less you get out of MV tissue, in a 50 years old - only lasts for 10 years)
- *anticoagulation*. A big study on patients with AF, "Risks and benefits of DOACs vs Warfarin in a real world setting: cohort study in primary care", published in the BMJ in 2018, showed a 2.5% risk of bleeding per year on Warfarin, with Apixaban being found the safest drug.
MV Repair - the game changer:

In the early 1980's *Alain Carpentier* (MD, Paris), in his paper "Cardiac valve surgery - the 'French correction' " (JTC, Sept. 1983), showed 4-5 different techniques for MV repair, which worked and really changed the field completely. *Repair is better than replacement.*
We now have Specialist MV Surgeons:
- a subspecialty within adult cardiac surgery with expertise in repair of all degenerative MVD
- concomitant tricuspid valve surgery and AF ablation (expertise also required)
- minimal access surgery
- teaching and training, research.

MV Repair - the toolkit:
- MV ring annuloplasty
- Leaflet resection - Carpentier
- Neo-chords (sutures made of Gore-Tex)
- Papillary muscle repositioning (usually has 3 heads with multiple chords) - quick repair
- Chordal transfer
- Patch repair - mostly in endocarditis
- Edge-to-edge repair - Octavio Alfiery (Milan) - stitching anterior leaflet with posterior leaflet.

Tirone E. David (MD) - his paper "Long Term Results of Mitral Valve Repair for Regurgitation Due to Leaflet Prolapse" (Journal of the American College of Cardiology - 2019); he has achieved a Cumulative Incidence (reoperation rate) of 5% at 20 years since MV procedure - never achieved before him.
The worse the patient is to start with (NIHA IV) - the worst the outcome (survivorship).
What has changed?
- Dedicated MV surgeons: 2 Wolverhampton, 2 in Nottingham , Birmingham 2-3, Coventry 2
- Guidelines - the cardiac guidelines are quite tight: American guidelines (American Heart Association
- AHA/ ACC valve Guidelines 2020) / European - ESC valve guidelines 2021
- Concomitant TV repair/ AF ablation
- Asymptomatic surgery - **refer asymptomatic patients anyway (provided you get a durable repair, the risk is low and it's performed in a centre of excellence); you should not replace a valve unless you try to repair it first; transcutaneous edge-to-edge repair (TEER) could be used where suitable**
- Reduced access surgery: robot/ mini/"modern" - not for every patient, but can be brilliant for the ones it suits
- Novel procedures (2 are cutting-edge).

Tricuspid valve repair - we owe what we know about it to Gilles D. Dreyfus (MD), one of Carpentier's senior Registrars. He was in the chair at the Brompton, then in Monaco, then London. He published a paper "Secondary Tricuspid Regurgitation or Dilatation: Which Should Be the Criteria for Surgical Repair?".
If the TV looked big, he'd put his hand in - if his hand fitted in the TV, he'd do a annuloplasty. The distance is 7 cm (as measured by Gilles' hand), as a cut-off, which corresponds to 4 cm in a the echo diameter - the current guidelines have 4 cm as an indication to do a tricuspid repair. If there is tricuspid dilatation, TR worsens. The mechanism of functional TR is dilatation of the annulus - once present, it doesn't regress.
Concomitant AF ablation - Maze procedure
- 25-40% of MV patients coming to surgery have AF
- Unique opportunity to achieve a long term sinus rhythm
- Successful AF ablation more likely if: shorter duration of AF (<5 years) and smaller Left Atrium diameter (<5 cm).

Benefits of AF ablation (*AF is not a benign disease.)*:
- symptoms relief - 75% AF free at 1-5 years; 87% of sinus rhythm at 1 year
- reduces the CVA risk
- reduces the bleeding rate of anticoagulation and prolongs life

Management of LA appendage

LAAOS III trial 2021:
- 30% reduction in stroke risk at 6 years (on top of anticoagulation), even if anticoagulated
- all AF patients coming to cardiac surgery need assessment for AF-related procedures (LAAO/ PVI/ Maze) - *we should not do nothing!*

MV repair without symptoms?

Asymptomatic surgery requires (American guidelines):
- High likelihood (95%) of successful, durable MV repair
- Low perioperative risk (1% or less)
- it has to be in a "Centre of excellence"

Preop LV dimensions and post LV function following MV repair study:
- Patients undergoing MV repair (5 years worth of asymptomatic patients)
- Preop NYHA I
- Degenerative MV disease
- Mild or no MR on F/U echo

Anterior 10%; Posterior 30%; Bileaflet 60%.

Impaired LV function has survival consequences, even in asymptomatic patients. Hence the benefit of referring patients early.

Reduced/ minimal access surgery:
- Right mini-thoracotomy (6 cm incision) - patients should not have TVR or tricuspid disease or coronary disease, and they need to be tall and slim enough.
- Robot-assisted MV repair - first performed in UK 10 years ago; very expensive.
- "Modern" sternotomy - 10-12 cm skin incision

Novel MV procedures:
- Huge success of TAVI - for the percutaneous aortic valve implant for aortic stenosis
- Trans-femoral MV not yet available

Multiple devices in development - There are 3 technologies we are exploring:
- NEOCHORD - a live, beating heart procedure, using a GORE-TEX stitch.
- MITRACLIP - a V shaped device (first imagined by Alfiery). No repair possible after this procedure, only replacement. For and elderly, frail patient, this is a good alternative
- TENDYNE - only available in the Brompton in UK. It is an umbrella-shaped device, tri-leaflet bioprosthetic valve, outer frame contoured to mitral annulus.

Future MV treatment:
- Specialist centres offering multiple therapies
- Heart team approach
- better long-term data re valve durability
- Balance between procedural risks and individual long-term outcome.

Q&A session.

Mr. President thanking presenter.

Next meeting: Thursday, 13th January 2022 - Annual Presentation Evening