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Treating Heart Defects Without Surgery

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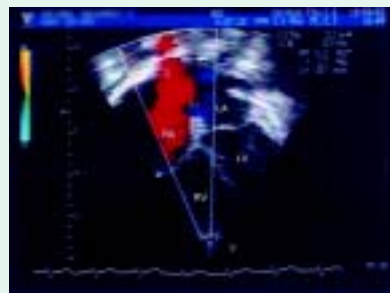
Mending holes in the heart

With recent medical advancement, some forms of congenital heart disease can now be treated using a non-surgical technique known as transcatheter technique. Between February 2003 and November 2005, some 50 patients have successfully undergone the procedure at the National University Hospital. This represents the biggest number for such a procedure performed in a restructured hospital in Singapore.

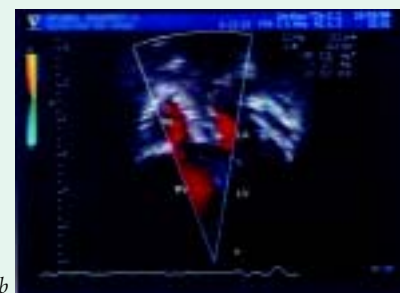
Congenital heart disease, a broad term that describes abnormalities of the heart structure and function, occurs in one out of 100 live births. Of these, the most common forms of the disease are ventricular septal defects (VSD) and atrial septal defects (ASD). While traditional treatment for large holes in the heart has been surgery under cardiopulmonary bypass, we now perform non-surgical closure of ASD with a device during the process of cardiac catheterisation.

The transcatheter technique is performed with the patient sedated or under general anaesthesia. Our patients range from children (as young as 8 years) to adults (as old as 70 years). The size of

the ASD is determined using trans-esophageal echocardiography (Figure 1a) at the start of the procedure. This acts as a guide for the size of the device required. The device is then mounted onto the delivery catheter and positioned at the ASD site. Position and deployment of the device is performed under continuous trans-esophageal echocardiographic (TEE) guidance and fluoroscopy. Accurate positioning of the device is confirmed before it is released (Figure 1b). The catheters are then withdrawn from the groin.



1a



1b

Figure 1a and 1b:
Echocardiography
demonstrating
presence of ASD,
followed by device
closure of the ASD.

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Treating Heart Defects Without Surgery

Patients who undergo this procedure are discharged the following day, thus offering the advantage of a shorter hospitalisation stay. In comparison, the traditional method of an open heart surgery under cardiopulmonary bypass requires about one week of hospitalisation. The use of non-surgical technique also helps patients avoid the long central sternotomy scar and pain associated with surgery.

However, the use of the transcatheter technique is not suitable for all types of ASD and in some very young children with large holes. In these cases, patients will still need to undergo surgery. Careful echocardiographic assessment of each patient with ASD is vital. The availability of the non-surgical technique, however, offers a new option to majority of patients with ASD.

Closing unwanted vessels

The patent ductus arteriosus (PDA) is another form of congenital heart disease. The left to right flow of blood from the systemic circulation to the lungs may result in volume overloading of the heart and raised pulmonary pressure. There is also a risk of infective endocarditis (valve infection).

The conventional treatment for PDA (Figure 2a) is surgical ligation. Although it is a relatively less complex procedure without a need for bypass, the patient is left with a long scar on the left chest which extends to the back.

The development of interventional techniques now allows for device closure of PDA with coils or ductal occluder. Using a similar transcatheter technique, this is carried out during cardiac catheterisation where the device is introduced into the PDA to occlude (obstruct) unwanted flow across this vessel (Figure 2b).

With the availability of a device for bigger PDAs, we have progressed from the implantation of coils for PDA in children to the use of ductal occluder. We are now able to close larger PDAs successfully using the non-surgical technique with good results.

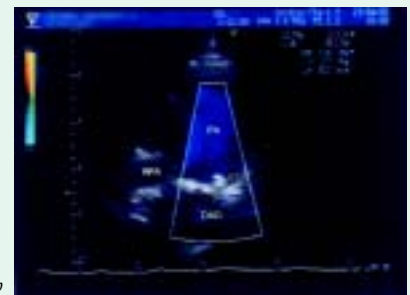
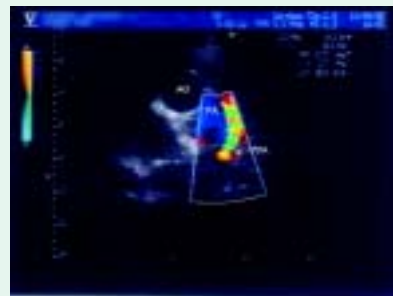


Figure 2a and 2b: Echocardiography demonstrating presence of PDA, followed by device occlusion of PDA.

Guidelines on referring patients for transcatheter technique

Patients who have cardiac murmurs (other than innocent murmur) should be referred to a specialist for assessment. Many patients with ASD or PDA may be asymptomatic, but will have abnormal heart sounds or murmurs on auscultation.

Contact Us

For more information or appointments, please contact:

Type of Patient	Clinic	Contact Details	Our Doctors <small>(Specialising in congenital heart conditions)</small>
Children	Clinic A (Children's Specialist Clinic)	Tel : 6772 5502 (appointment line) 6772 4420 (other enquires) Fax : 6774 8632	A/Prof Quek Swee Chye, Senior Consultant and Head, Paediatric Cardiology Cindy Hia, Associate Consultant, Paediatrics Terence Lim, Registrar, Paediatrics
Adults	Clinic H (Adult Congenital Heart Programme)	Tel : 6772 2090 (appointment line) 6772 4081 / 2053 (Cardiac Care Nurses) Fax : 6872 2998 Email : margaret_choong@nuh.com.sg michelle_koh@nuh.com.sg	Dr James Yip, Consultant, Cardiac