

## Transcatheter, Occlusion Of Patent Ductus Arteriosis Using Rashkind's Umbrella Device

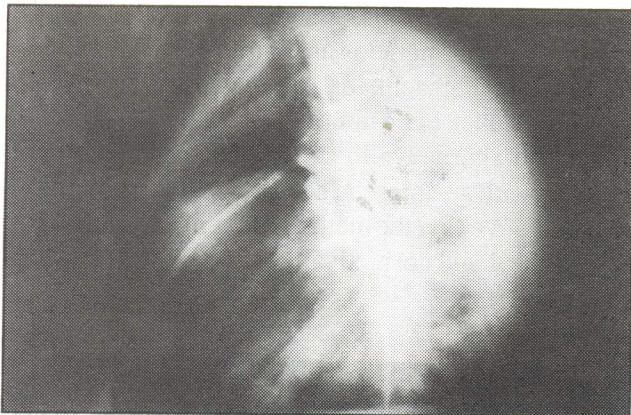
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### Summary:

Transcatheter occlusion of PDA using Rashkind's Umbrella device is a popular method of PDA closure in the first world today. We performed our first successful closure on 20.9.1994 at AFIC/NIHD, Rawalpindi.

### A Case Report:

The patient was, a nineteen-year young man, was referred to AFIC/NIHD with a continuous murmur-a provisional diagnosis of Patent Ductus Arteriosis. An



Picture 1  
Aortogram showing PDA

echocardiogram confirmed the clinical diagnosis showing situs soltus, intact atrial and ventricular septum, AV and VA, concordance normal valves and normal arch. A Patent Arterial duct was seen 5 mm at its waist with maximum instantaneous systolic gradient of 80 mm of Hg across it. The morphology was considered suitable for Transcatheter Occlusion using Rashkind umbrella device and the patient was booked for it.

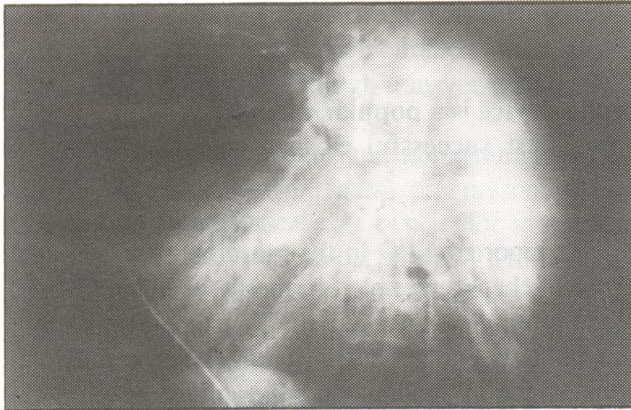
He reported NPO in the morning after an initial physical check-up, a blood sample for HB, PCV and blood grouping was taken, the IV cannula was left in situ and premedication was given. The procedure was done under IV valium and Ketamine, keeping the patient very well sedated. A 6 F pigtail catheter was passed up to descending aorta up to origin of left subclavian artery and a 7 F GL catheter was passed in the left pulmonary artery from the right femoral artery and right femoral vein using Seldinger Technique.

An aortogram in the true lateral position was done using 1ml/kg of urograffin. (PICTURE 1). Then the venous catheter was passed through the PDA into the aorta and the aortogram repeated using the same amount of contrast. The duct size came up to around 5 mm. (PICTURE 2).



Picture 2  
Aortogram showing PDA with  
a 6F 6L in it

A 0.038 heavy duty exchange guide wire was passed through the 6L catheter into the descending aorta. An 11 french Sheath dilator system coming with the device was given an extra bend 5 cm from its tip, the distance the tip of the dilator exceeded the sheath was noted and then the sheath and dilator were passed over the guide wire into the descending Aorta, after serially dilating the femoral vein using 6F, 7F, 8F, 9F and 10F vessel dilators.



Picture 3  
Duct Occluder Device open in the PDA. Still attached to the Delivery System

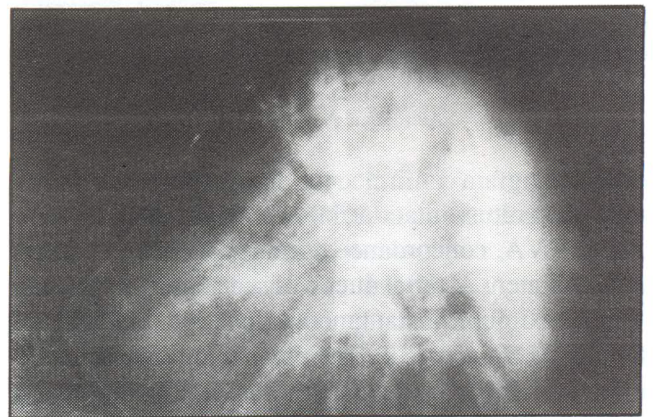
The tip of the sheath was positioned in the aorta just distal to the aortic end of the duct and the wire and the dilator were withdrawn. The sheath was put on continuous flush. The occluder was now loaded in the delivery system, the system locked and introduced into the sheath upto the junction of the IVC with the heart. Then very gently, the locking device was loosened and the occluder is opened into the sheath and pushed ahead till the distal prongs of the umbrella are released into the aorta. At this time we locked the system again and very gently withdrew the whole system, the sheath and the delivery system together into the duct, millimeter by millimeter until the pod of the umbrella reached the site of the waist of the PDA, a site predetermined in relation to the anterior wall of the trachea at that point the sheath was withdrawn to release the proximal prongs. (PICTURE 3). Then through distal control of the device was detached from the delivery system (PICTURE 4). The sheath and the delivery system were then taken out and pressure applied on the groin for half an hour to secure haemostasis. (PICTURE 5, 6).

The patient slept through the evening. He was given Injection velosef 500 mg i/v x 6 hourly and Injection amikin 250 mg x 8 hourly. He had a brief period of low grade fever during the night. He was kept in the hospital for an extra day for observation and a check. X-ray chest and colour doppler, 2D Echocardiogram were done.

The patient was fully ambulant and asymptomatic at the time of discharge.

#### Discussion:

Ductus arteriosus is an arterial connection between the descending aorta (just distal to the origin of the left subclavian artery) and the left pulmonary artery close to its origin. It closes within few hours to few weeks from birth. It causes increased left to right shunt and predisposes to volume overload of the heart, infections, infective endocarditis and to calcification, aneurysm formation and even rupture at late stages. Except when PDA is part of congenital cyanotic heart disease and helping the duct dependent circulation, the PDA has to be closed, and depending on clinical urgency various methods are employed such as intravenous Indomethacin, or surgical intervention like ligation or duct interruption. For many years now a first world alternative to surgery has been closure of the PDA with an umbrella device using a transcatheter technique. We find the method convenient, atraumatic, non-surgical and cosmetically preferable.



Picture 4  
Occluder released from the Delivery System

**Acknowledgement:**

We are thankful to excellent secretarial services of our secretary Mr. Amjad Rehman for working on this manuscript.

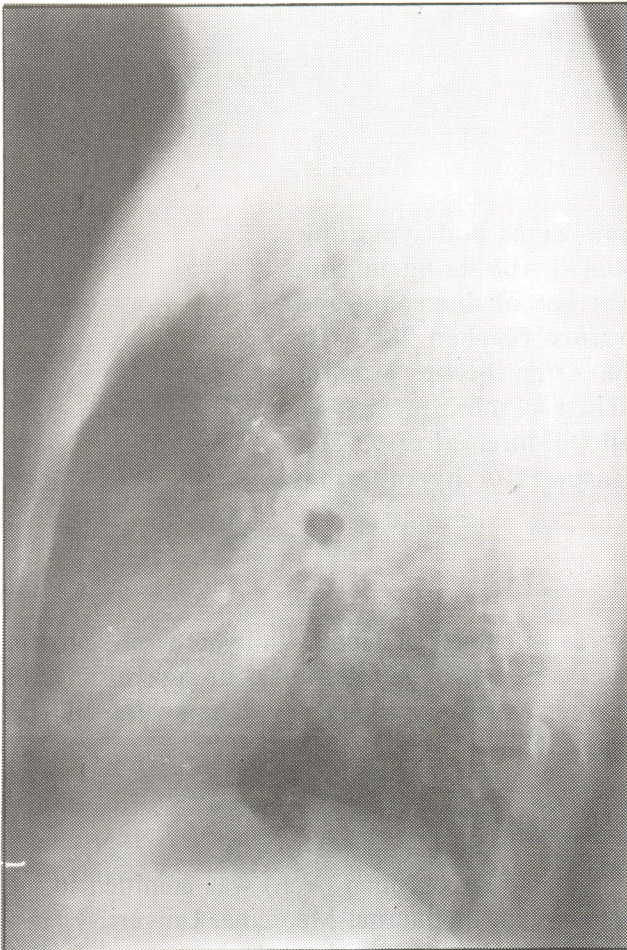


Figure 5  
Duct Occluder in Situ

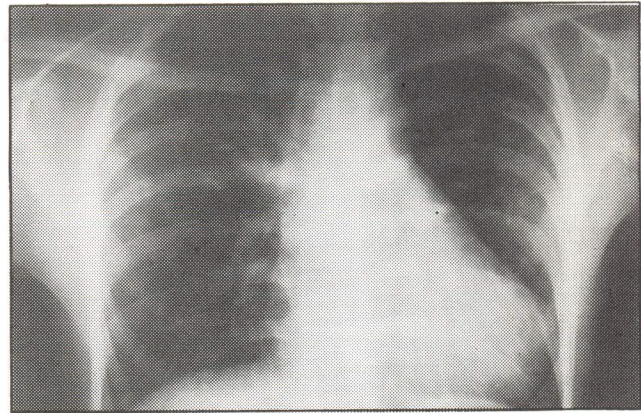


Figure 6  
Duct Occluder in PDA

**References:**

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**Note:-**

This is the first of 7 occlusions that have been done at the AFIC/NIHD, Rawalpindi.