Severe haemolysis after transcatheter duct occlusion: a non-surgical remedy

Alison M Hayes, A N Redington, M L Rigby

Abstract
Severe mechanical haemolysis occurred in a seven month old infant after the insertion of a 17 mm Rashkind double umbrella device. The placement of a second device 23 days after the initial procedure abolished haemolysis.

Transcatheter occlusion with the Rashkind double umbrella device is now widely accepted as treatment for small and moderate sized arterial ducts. The reported complications include embolisation of the device, pseudo-coarctation, left pulmonary artery stenosis, residual shunts, and mechanical haemolysis. We describe a case of severe mechanical haemolysis resulting from incomplete closure after placement of a 17 mm Rashkind occluder. Complete closure was achieved and the haemolysis ceased when a second 17 mm device was inserted.

Discussion
There have been two previous reports of severe mechanical haemolysis after percutaneous transcatheter duct occlusion. In one the device was removed surgically and the duct was ligated. It was thought that the haemolysis in this patient, who also had a small "residual leak", may have been related to the poor position of the device, with the proximal arms impinging on the left pulmonary artery. This was not true of our patient. It is much more likely that red cell destruction was caused by a high velocity jet of blood passing over or through the device within the duct. Furthermore, because of the late presentation we were concerned that surgical removal might prove difficult and possibly require cardiopulmonary bypass. We therefore elected to place a second device. The placement of a second device for a residual left to right shunt has been described previously. In the Toronto series 5-7% of patients required a second 12 mm double umbrella because of important residual flow after the initial procedure. Five of the six had successful reclosure.

To our knowledge the successful use of a second umbrella to treat severe mechanical haemolysis has been reported only once before by Rohmer and colleagues when they described the initial experience of percutaneous duct occlusion in the Netherlands. The second umbrella also promptly stopped the haemolysis.
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Figure (A) Aortogram showing satisfactory positioning of the first 17 mm device. There was a significant residual left to right shunt above the device (arrow).

(B) A further aortogram showing two 17 mm Rashkind double umbrellas positioned in the duct. At this stage, immediately after release of the second device, there was a small residual leak through the fabric of the umbrellas.

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