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CLINICAL RESEARCH

Repeat mitral valve repair for haemolysis in children

Chirurgie redux pour hémolyse après plastie chirurgicale de la valve mitrale de l'enfant

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KEYWORDS
Reoperation;
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Summary
Background. — Severe haemolysis is a rare complication after mitral valve repair in congenital heart disease.
Aim. — We describe four children with severe mitral regurgitation who underwent valve repair and subsequently developed profound haemolytic anaemia.
Methods. — Clinical, echocardiographic and surgical data were collected retrospectively from a surgical centre in France during a 5-year period.
Results. — Two patients had atrioventricular septal defects, one patient had congenital mitral dysplasia and one had anomalous left coronary artery from the pulmonary artery with mitral regurgitation. Haemolysis was diagnosed 20 to 75 days after surgery, as a result of clinical and biological examination; it was severe, and blood transfusion support was necessary in all cases. Haemolysis was always associated with eccentric mitral regurgitation with a variable degree of severity (from low to severe). After exclusion of other haemolysis aetiology, redo mitral repair surgery was performed successfully in all cases. The haemolysis was considered to be mechanical in origin, caused by regurgitation of blood through the residual mitral regurgitation and stitches.

Abbreviations: AVSD, Atrioventricular septal defect; LAVV, Left atrioventricular valve; MR, Mitral regurgitation.

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Conclusion. — Severe haemolysis is a rare complication that can occur after mitral valve repair in congenital heart disease. All patients underwent successful redo repair and had resolution of haemolysis after surgery. Even if redo surgery is required, iterative mitral repair is possible.

MOTS CLÉS
Réopération ;
Cardiopathie congénitale ;
Valvuloplastie

Résumé
Contexte. — La survenue d'une hémolyse après chirurgie mitrale est une complication rare et décrite le plus souvent après remplacement valvulaire mécanique.
Objectif. — Cette étude décrit la survenue de quatre cas d'anémies hémolytiques symptomatiques survenues après plastie mitrale chirurgicale chez des enfants opérés pour diverses cardiopathies congénitales.
Méthodes. — Les données cliniques, biologiques et chirurgicales ont été collectées de façon rétrospective dans le centre de chirurgie cardiaque pédiatrique Marie-Lannelongue sur une période de cinq ans.
Résultats. — Les enfants avaient un canal atrio-ventriculaire dans deux cas, une dysplasie mitrale isolée dans un cas et une naissance anormale de la coronaire gauche à partir de l'artère pulmonaire associé à une insuffisance mitrale dans le dernier cas. Tous ces enfants ont développé une anémie hémolytique symptomatique. Le diagnostic de cette complication a été clinique et biologique. Tous les enfants avaient une insuffisance mitrale résiduelle de grade léger à sévère. Tous les enfants ont nécessité des transfusions sanguines. Après exclusion de toute autre cause, tous les enfants ont bénéficié d'une nouvelle plastie mitrale chirurgicale. Cette nouvelle intervention a permis la correction de l'hémolyse dans tous les cas. Il s'agissait d'hémolyse mécanique liée à une fuite mitrale résiduelle ou une fuite entre les sutures.
Conclusion. — La survenue d'une anémie hémolytique est une complication rare de la plastie mitrale chirurgicale chez l'enfant. La reprise chirurgicale permet de traiter l'hémolyse. Quand une ré-intervention est nécessaire, une nouvelle plastie mitrale reste possible.

Background

Congenital mitral valve disease presents with a wide variety of morphological abnormalities and a high incidence of associated intracardiac anomalies. In light of improvements in surgical techniques, repair rather than replacement is preferred because of the deleterious effects associated with prosthetic valve placement in small children [1]. While haemolysis after mitral repair (and its remedial management) has been reported in adults [2,3], it has been described rarely for isolated mitral disease in children [4].

Methods

Since 2006, 493 mitral repair procedures in children aged < 15 years were performed at our institution (100 partial, 249 complete atrioventricular septal defects [AVSDs], 144 isolated congenital mitral valve diseases). We detail our experience and management strategy in four children with post-repair haemolysis. No other case of severe haemolysis was observed in the centre's experience.

In all four children, blood tests demonstrated haemolytic anaemia without thrombotic microangiopathy; they all underwent blood transfusions and received beta-blockers (except patient 4), but the condition did not improve. Intraoperative trans-oesophageal echocardiography was used systematically in the repair procedures.

Results

Case descriptions

Patient 1

A newborn was diagnosed with a partial AVSD, right chamber dominance and aortic arch obstruction. After neonatal arch repair (Crafoord through thoracotomy), the atrial septal defect was closed at day 14, because of large symptomatic shunt, without left cleft closure, as no regurgitation was found at the time of surgery. The child progressively developed congestive heart failure due to severe left atrioventricular valve (LAVV) regurgitation and subaortic stenosis. Cleft suture and subaortic enlargement were performed at 8 months. Twenty-two days later, the patient was admitted for macroscopic haematuria. Echocardiography demonstrated two new-onset LAVV jets, one directed towards the septum and one towards the lateral atrial wall (Fig. 1). Three weeks after admission, completion of LAVV cleft closure was performed with subsequent resolution of haemolysis.

Patient 2

A 2-year-old girl presented with a partial AVSD with significant right chamber dilatation. Closures of the LAVV cleft and the ostium primum were performed. Postoperative echocardiography showed mild regurgitation. Two months later, the