LETTERS TO THE EDITOR

- The British Heart Journal welcomes letters commenting on papers that it has published within the past six months.
- All letters must be typed with double spacing and signed by all authors.
- No letter should be more than 600 words.
- In general, no letter should contain more than six references (also typed with double spacing).

Balloon dilatation of supravulvar pulmonary stenosis after arterial switch procedure for complete transposition

SIR,—I read with interest the article by Saxena *et al* on balloon dilatation of supravulvar pulmonary stenosis that developed after previous anatomical correction of transposition of the great arteries.¹ They described the results of eight balloon dilatations in five children. In none of the dilatations was there any improvement in the pressure gradient across the area of obstruction nor was there any significant angiographic change. Yet they went on to apply balloon angioplasty in five patients and in addition repeated the procedure in three children. As they state, the residual obstruction seems to be related to shrinkage and retraction of the pericardial patch used in the enlargement of neopulmonary artery at the time of initial surgery. There is no theoretical basis why such lesions would respond to balloon dilatation. Zeevi *et al*'s observations were also similar when there was diffuse narrowing of the pulmonary artery.² I have also used balloon dilatation of supravulvar pulmonary stenosis that developed after a previous arterial switch procedure.³ There was excellent haemodynamic (fig 1) and angiographic (fig 2) improvement; however, the obstruction in my case was discrete (fig 1A) and there is theoretical reason for balloon dilatation to be effective discrete obstructions such as this.

I urge Saxena *et al* and others not to use balloon angioplasty if obstructive lesions of the pulmonary artery in children are diffuse, those described by Saxena and Zeevi.¹ Discrete lesions, however, can be dilated.

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- 1 Saxena A, Fong LV, Ogilvie BC, Keeton BR. Use of balloon dilatation to treat supravulvar pulmonary stenosis developing after anatomic correction for complete transposition. *Br Heart J* 1990;64:151-5.
- 2 Zeevi B, Keane JF, Perry SB, Lock JE. Balloon dilatation of postoperative right ventricular outflow obstructions. *J Am Coll Cardiol* 1989;14:401-8.
- 3 Rao PS. Balloon angioplasty and valvuloplasty in infants, children and adolescents. *Curr Probl Cardiol* 1989;14:417-500.

Figure 1 Pressure pullback tracings across the supravulvar stenosis showing a significant pressure gradient (A) that diminished considerably after balloon dilatation (B). Aortic pressure is also shown in B. Ao, aorta; DPA, distal pulmonary artery; PPA, proximal pulmonary artery. Reproduced with permission from the author and publisher: Rao PS. *Curr Probl Cardiol* 1989;14:417-500.

This letter was shown to the authors, who reply as follows:

SIR,—Dr Rao has misinterpreted the nature of the stenotic lesions of the supravulvar pulmonary area that we attempted to dilate after the arterial switch procedure. The angiographic appearances of the cases,¹ showed a stenotic segment that seemed to be localised to a short segment in the proximal pulmonary artery which was considerably narrower than the distal pulmonary arterial segment. The distal pulmonary artery may have looked smaller than expected, but it was comparable to the more distal pulmonary arterial tree, except where a further localised stenosis occurred. It was this short segment of proximal supravulvar pulmonary stenosis or discrete bifurcation stenosis that responded poorly to balloon dilatation. The segments appeared amenable to balloon dilatation, as judged by angiography, and did not assume the appearance of diffuse narrowing that Dr Rao has described. It was concluded that these short localised segments that responded poorly to balloon dilatation should not be described as a discrete stenosis, as their appearance suggested, because they responded like short segments with hypoplasia with both an intrinsic and post-surgical aetiology. We agree with Dr Rao that diffuse hypoplasia would not be amenable to balloon dilatation. Progress in developing effective treatment for such stenotic lesions comes not only from knowledge of successful trials, but

also from unsuccessful attempts, as anticipated by the use of endovascular stents for congenital heart disease.²

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- 1 Saxena A, Fong LV, Ogilvie BC, Keeton BR. Use of balloon dilatation to treat supravulvar pulmonary stenosis developing after anatomical correction for complete transposition. *Br Heart J* 1990;64:151-5.
- 2 O'Laughlin MP, Perry SB, Lock JE, Mullins CE. Use of endovascular stents in congenital heart disease. *Circulation* 1991;83:1923-39.

Balloon atrial septostomy via the umbilical vein

SIR,—We wish to point out that the "practicability of cannulation via the umbilical vein" was first reported by us as an alternative to the femoral route for balloon atrial septostomy over two decades ago.² Several centres have adopted the method and have confirmed the usefulness and advantages of this approach.³⁻⁵ One report was published in the *British Heart Journal* in 1974⁶ with similar conclusions to ours. The incorporation of echocardiographic imaging makes the umbilical route even more attractive. We highlighted the fact that transumbilical sep-

Figure 2 Cineangiographic frames from lateral views of pulmonary arteriograms showing supralvalvar pulmonary stenosis (arrow) after an arterial switch operation (A) that improved considerably after angioplasty (B). Reproduced with permission from the author and publisher: Rao PS. *Curr Probl Cardiol* 1989;4:417–500.

tostomy was not only less time-consuming but spared the femoral vein for possible future studies. At the time dissection of the inguinal fossa for balloon septostomies was much more common than transcutaneous catheterisations in the neonate.

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- 1 Ashfaq M, Houston AB, Gnanapragasam JP, Lilley S, Murtagh EP. Balloon atrial septostomy under echocardiographic control: six years' experience and evaluation of the practicability of cannulation via the umbilical vein. *Br Heart J* 1991;65:148–51.
- 2 Abinader E, Zeltzer M, Riss E. Transumbilical atrial septostomy in the newborn. *Am J Dis Child* 1970;119:354–6.
- 3 Romney D, Katzuni E, Aygen MM. Transum-

bilical balloon atrial septostomy in a case of transposition of the great vessels with situs inversus totalis. *Isr J Med Sci* 1972;8:529–31.

- 4 Newfeld EA, Purcell C, Paul MH, Cole RB, Muster AJ. Transumbilical balloon atrial septostomy in 16 infants with transposition of the great arteries. *Pediatrics* 1974;54:495–7.
- 5 Roguin N, Sujov P, Montag J, Zeltzer M, Riss E. Transumbilical balloon atrial septostomy for transposition of the great arteries in infants under the age of 60 hours. *Am Heart J* 1984;107:174–6.
- 6 Kaye HH, Tynan M. Balloon atrial septostomy via the umbilical vein. *Br Heart J* 1974;36:1040–2.

SIR,—The report of balloon atrial septostomy under echocardiographic control by Ashfaq *et al* makes interesting reading but certain points need to be clarified before recommending it as a procedure of choice.

On the basis of the size of the atrial septal defect they created (as seen on echocardiographic image or by colour flow mapping) Ashfaq *et al* claim that the procedure was successful. However, though they believe that such a defect can be “accurately measured” on echocardiography, they do not give the values (mean (SD)) of the defect size or flow jet width. In another study adequately palliated neonates had a post-septostomy interatrial defect of at least 12 mm in diameter as measured angiographically¹ or later at surgery or necropsy.² In most of the previous series, satisfactory early improvement after atrial septostomy has been defined as either an increase in oxygen saturation of greater than 10% with reduction in interatrial mean pressure gradient to less than 2 mm or arterial saturations of greater than 50–75%.³ Satisfactory late improvement has been defined as survival to six months with oxygen saturation at 60% or higher.³ It is surprising that none of these indices are mentioned in the results though Ashfaq *et al* call their procedure “100 per cent successful”. It is possible that these indices were not measured when the procedure was performed as an emergency measure. But Ashfaq *et al* do not give a break down of the number of procedures performed in an equipped catheterisation laboratory compared with those performed elsewhere or in the ward side room. The size of the post-septostomy inter-atrial defect can be measured only approximately by echocardiography.⁴ We were able to image a flapping torn septum primum as an indication of an adequate septostomy. Because there are so few data on the features and limitations of echocardiography and colour flow mapping in evaluating the adequacy of post-septostomy interatrial defects, we expected that Ashfaq *et al* would have clarified these before drawing conclusions and inferences. At least the echocardiographic size of the defect could have been compared with the actual measurement at necropsy in the two patients who died.

Ashfaq *et al* seem to exaggerate the complications related to fluoroscopically guided septostomy by quoting a single reference dating back to 1970 that describes 26 cases.⁵ In a more recent series of 43 infants with *d*-transposition of the great arteries studied over five years, fluoroscopy guided balloon atrial septostomy was not associated with any deaths or mechanical complications.³ Moreover, though they do not state the average procedure time, Ashfaq *et al* presume that the echoguided procedure is less time-consuming.

Thus balloon atrial septostomy under echocardiographic guidance could be recommended during emergencies or in the catheterisation laboratory for facilitating the balloon positioning, especially in cases with cardiac malposition, but until our questions are answered it should not be advocated as a better alternative to fluoroscopy.

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- 1 Baker F, Baker L, Zoltun R, Zuberbuhler JR. Effectiveness of the Rashkind procedure in transposition of the great arteries in infants. *Circulation* 1971;43–44 (suppl 1):1–6.
- 2 Powell TG, Dewey M, West CR, Arnold R. Fate of infants with transposition of the great arteries in relation to balloon atrial septostomy. *Br Heart J* 1984;51:371–6.
- 3 Henry CG, Goldring D, Hartman AF, Weldon CS, Strauss AW. Treatment of *d*-transposi-

tion of the great arteries: management of hypoxemia after balloon atrial septostomy. *Am J Cardiol* 1981;47:299-306.

- 4 Allan LD, Leanage R, Wainwright R, Joseph MC, Tynan M. Balloon atrial septostomy under two dimensional echocardiographic control. *Br Heart J* 1982;47:41-3.
- 5 Venables AW. Balloon atrial septostomy in complete transposition of great arteries in infancy. *Br Heart J* 1970;32:61-5.

These letters were shown to the authors, who reply as follows:

SIR,—We agree entirely with Dr Abinader's comments. Neither the use of ultrasound imaging nor the umbilical vein route are new techniques for the performance of an atrial septostomy and in our paper we did not intend to suggest that this was the case. The initial intention was to review our experience with the efficacy of ultrasound imaging. In most centres the umbilical route has not been used routinely in the past because of difficulty in catheter manipulation where a full catheterisation is necessary to establish the diagnosis. Catheterisation is now necessary only for the performance of a septostomy and the umbilical route is ideal for this. We thought it appropriate to add our experience of the use of the umbilical route pioneered by Abinader *et al* because we were aware that many centres still did not use it.

We referred in some detail to the different workers who have commented on the ultrasound technique, which has become popular only in recent years. The use of the umbilical vein technique has been known for over 20 years and indeed it was described in 1985 in a major textbook on paediatric cardiology to which we referred.¹ We thus considered it was not necessary to refer in detail to the initial reports on this, and we agree it would have been appropriate to quote the early paper on the subject.

We would like to take the opportunity of stating that we are no longer sure of the accuracy of the comment that the ultrasound image is of little value in the manipulation of the catheter. In a newborn the heart was only entered after the image had been used to ensure that the catheter was inserted with the bend aligned in a posterior and inferior direction and then, at the appropriate point as determined from the image, it was turned through a 180° angle to pass through the ductus venosus and into the inferior vena cava and thence the heart.

Drs Kerker and Dalvi question the validity of our supposition that a septostomy performed under ultrasound is as effective as one performed under fluoroscopy. Ours was a retrospective study and the size of the defect was not measured routinely. As their letter points out the "success" of a septostomy is difficult to define and there is more to it than simply the size of the defect. Because elective arterial switch procedures are performed within the first weeks of life data on long-term follow up can no longer be obtained. None of our patients required "emergency" surgery but in some prostaglandin therapy was continued or started after septostomy. The comment that "the size . . . showed the procedure was successful" was made on the basis of seeing a tear, a flapping septum, and an increase in the size of the defect. If the criticism is related to the use of ultrasound I cannot accept that there is any reason that the result could be different because the actual technique of pulling the catheter is no different with ultrasound or screening. We have not compared the results of using the umbilical and femoral routes but both have

been accepted techniques for years. The facilities of a catheterisation laboratory are not needed for septostomy under ultrasound screening. In our paper we stated that for 10 months the ward side room was used when catheterisation facilities were unavailable; thereafter we have used the catheterisation laboratory routinely simply as a matter of convenience to the nursing staff; the x ray imaging facilities are not used. Where necessary septostomy is undertaken in the ward, intensive therapy unit, or maternity hospital. The location is simply a matter of personal choice and hospital routine and again I cannot suppose that there is any reason that the result would be different for ultrasound and fluoroscopy.

I accept that in experienced hands the risk of mitral damage is almost negligible—but reports attest to the fact that damage does occur with fluoroscopy. I am unaware of this happening with ultrasound screening. In addition I accept that there should be little difference in the time of the procedure whether ultrasound or fluoroscopy is used. In the past there might have been a potential delay in obtaining the services of a radiographer or access to a catheterisation laboratory in an emergency, but this is now of less concern because the infant can be maintained on prostaglandins and the septostomy performed at a convenient time.

Thus I agree with some of Drs Kerker and Dalvi's comments but I disagree with the conclusion to their letter. In our centre the simplicity and convenience of ultrasound quickly made it the technique of choice. A preference for ultrasound or fluoroscopy may simply be a matter of personal choice, experience with ultrasound, and the hospital facilities available. However, my colleagues and I firmly believe that it is correct to advocate ultrasound as a more convenient and better imaging technique than fluoroscopy.

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- 1 Cardiac catheterisation and angiocardiology. In: Anderson RH, Macartney FJ, Shinebourne EA, Tynan M, *Paediatric cardiology*. Edinburgh, London, Melbourne, New York: Churchill Livingstone, 1987:372.

Cardiac catheterisation with 5 French catheters

SIR,—In his letter commenting on the use of 5F catheters for coronary angiography, Dr Raphael calls for further randomised studies to compare the latest 5F catheters with conventional 7F catheters (*British Heart Journal* 1991;66:114). He and your readers may be interested to know that such a trial was undertaken in Bristol using the types of 5F catheter available in 1988 and 1989.¹ The full results of this trial are due to be published soon in the *International Journal of Cardiac Imaging*; however, the main message of the trial was that the 5F catheters available at that time proved extremely unsatisfactory for coronary angiography and could not be recommended for routine use. Catheter design has progressed rapidly, or at least so we are told by the catheter manufacturers. It may be that the time is now right for a further randomised study to compare the current generation of 5F catheters with conventional catheters. Such a study will need to include not only subjective assessments of catheter performance but will also need to document

objective measures of catheter performance such as procedure time, injection pressures, and incidence of significant complications.

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- 1 Brown E, Morris K, Wild RPH, Hartnell GG. Limitations in the performance of 5-F coronary catheters in routine angiography [abstract]. *Clin Radiol* 1989;40:648.

Genesis of Still's innocent systolic murmur

SIR,—The recent publication of the paper on Still's innocent systolic murmur¹ prompted queries about who Still was and whether Still's disease commemorates the same individual.

George Frederic Still was indeed the author of early descriptions of both conditions. His personal history has been elegantly described by Hamilton.² Still was educated at Caius College, Cambridge, qualified in medicine at Guy's Hospital in 1893 and, after posts at the Hospital for Sick Children, Great Ormond Street, was appointed to the first chair of paediatrics in London, at King's College Hospital, in 1906. His publications included five books and 108 papers,³ among the earliest being his classic description of the form of chronic arthritis in childhood that bears his name.⁴

In his book *Common Disorders and Diseases of Childhood*⁵ the innocent systolic murmur is referred to as a "physiological bruit" which must be differentiated from the "sometimes musical character of murmurs occurring in bacterial endocarditis". He describes the innocent murmur in these terms: "It is heard usually just below the level of the nipple, and about half way between the left margin of the sternum and the vertical nipple line; it is not heard in the axilla nor behind; it is systolic and is often so small that only a careful observer would detect it; moreover, it is very variable in audibility...; its characteristic feature is a twanging sound, very like that made by twanging a piece of tense string". This description remains accurate and authoritative to this day.

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- 1 Gardiner HM, Joffe HS. Genesis of Still's murmurs: a controlled Doppler echocardiographic study. *Br Heart J* 1991;66:217-20.
- 2 Hamilton EBD. George Frederic Still. *Ann Rheum Dis* 1986;45:1-5.
- 3 Franklin AW. A handlist of the writings of George Frederic Still. *Arch Dis Child* 1941;16:154-5.
- 4 Still GF. On a form of chronic joint disease in children. *Med-Chir Trans* 1897;80:47-59.
- 5 Still GF. *Common disorders and diseases of childhood*. 3rd ed. London: Oxford University Press, 1920:495.

Is cardiac rehabilitation necessary?

SIR,—Precise identification of the specific needs of individual coronary patients for rehabilitative care and precise recommendations regarding the components of this care will enable precise assessment of the outcomes of these interventions.

The occurrence of a coronary event and/or