Eur J Pediatr (1999) 158: 281–283

CARDIOLOGY

A. Ravelli · E. Pedroni · S. Perrone · R. Tramarin · A. Martini · G. R. Burgio

Aortic valve regurgitation as the presenting sign of Takayasu arteritis

Received: 13 May 1998 / Accepted in revised form: 25 August 1998

Abstract Takayasu arteritis is a rare chronic vasculitis primarily involving the aorta and its main branches. We report an adolescent girl with Takayasu arteritis who presented with an isolated aortic valve regurgitation as part of a systemic inflammatory process. This patient was initially misdiagnosed as having rheumatic heart disease and the correct diagnosis was made only 1 year later.

Conclusion Takayasu arteritis should be considered among the diagnostic possibilities in patients who present with an unexplained systemic inflammatory syndrome and a cardiac murmur.

Key words Takayasu arteritis · Valvular heart disease · Aortic regurgitation

Abbreviations *TA* Takayasu arteritis

Introduction

Takayasu arteritis (TA) is a chronic inflammatory disease of unknown aetiology primarily affecting large vessels such as the aorta and its major branches [3, 4]. Although TA has a worldwide distribution, it is more frequent in Japan, Southeast Asia, and Africa, whereas it is rare in North America and Europe. Unexplained geographical variations in disease expression have been identified [2, 7] and it has been suggested that TA may show a less malignant progression in Western countries [10].

The clinical features of TA are diverse. Although in some cases the presentation may be acute or even fulminant with malignant hypertension, stroke, or congestive heart failure, most patients follow a chronic progressive course, characterized by nonspecific symptoms such as malaise, myalgia, arthralgia, weight loss, and fever, beginning months to years prior to the onset of overt vascular disease (so-called prepulseless phase) [1, 2]. This protracted clinical presentation may pose a diagnostic challenge and lead to a delay in diagnosis.

We report an adolescent girl with TA whose presenting clinical manifestation was an isolated aortic valve regurgitation.

Case report

A 15-year-old girl had recurrent episodes of abdominal pain, which lasted for few days, was preferentially located in the left abdomen, and was occasionally accompanied by transient knee arthralgia. She was diagnosed by her local physician as having an irritable bowel syndrome and no specific investigations were performed. At age 17 she was hospitalized elsewhere because of persistent low-grade fever which started 1 week after a mild sore throat. A loud cardiac murmur was detected and echocardiography revealed aortic regurgitation. The haemoglobin concentration was 7.6 g/dl, ESR 90 mm/h and the antistreptolysin O titre 300 units. A diagnosis of rheumatic heart disease was made and the patient was given aspirin and oral iron; a monthly benzathine penicillin G prophylaxis was started. Over the subsequent months she remained

A. Martini (✉) · A. Ravelli · E. Pedroni · S. Perrone
G. R. Burgio
Clinica Pediatrica, IRCCS Policlinico S. Matteo,
P.le Golgi 2, I-27100 Pavia, Italy,
e-mail: amartini@smatteo.pv.it,
Tel.: +39-382-528156, Fax: +39-382-527976

R. Tramarin
IRCCS Fondazione Salvatore Maugeri, Tradate, Italy

This work has been partially supported by
IRCCS Policlinico San Matteo

in good health, but had unchanged cardiac murmur and persistent ESR increase. Two short courses of corticosteroid therapy led to normalization of the ESR, which however increased rapidly after corticosteroid discontinuation. She was first admitted to our department at age 18 years, after having started a third course of daily prednisone. On physical examination, the only abnormal finding was a diastolic murmur grade 3/6 and a systolic ejection murmur grade 2/6. Peripheral pulses were bounding and symmetric. Blood pressure was 180/90 mm/Hg in both arms and heart rate 90 beats/min. Leucocyte count was $16.6 \times 10^3/mm^3$, haemoglobin level 15.3 g/dl, platelet count $629 \times 10^3/mm^3$, ESR 8 mm/h, and antistreptolysin O titre 200 units. Laboratory tests with normal or negative findings included urinalysis, liver and kidney function studies, serum complement levels, stool analysis for occult blood, Venereal Disease Research Laboratory test, *Mycoplasma* serology, and tests for rheumatoid factor, serum hepatitis B surface antigen, and antinuclear, anti-double-stranded DNA, and anti-neutrophil cytoplasmic antibodies. A Mantoux test was negative after 48 h. Chest X-ray was remarkable for cardiomegaly. Trans-thoracic echocardiography disclosed a slight left ventricular enlargement (end diastolic diameter = 56 mm) and severe aortic regurgitation (3+) due to a dilatation of the aortic root (37 mm); aortic cusp motion and thickness were normal. Trans-oesophageal echocardiography confirmed aortic root dilatation and showed a segmental and circumferential wall thickening involving the ascending aorta, the mid distal portion of the aortic arch and most of the descending thoracic aorta. MRI performed using spin-echo sequences and echocardiography-gated multiple slices of 5 mm thickness in axial, sagittal, and coronal planes confirmed the presence of segmental diameter and wall thickness irregularities of the thoracic aorta (Fig. 1). Aortography revealed irregularity, with narrowing followed by dilatations, of the thoracic and abdominal aorta, stenosis of the left renal artery, and occlusion of the superior mesenteric artery. These findings were consistent with a segmental arteritis involving large arteries. A diagnosis of TA was made and she was discharged on prednisone therapy (40 mg/day).

At follow up, after 6 months, she was in good general condition and had tapered prednisone to 10 mg/day. The ESR was normal and repeated MRI showed a reduction of aortic wall thickening. One year after discharge she was on the same dose of prednisone and had quiescent disease.

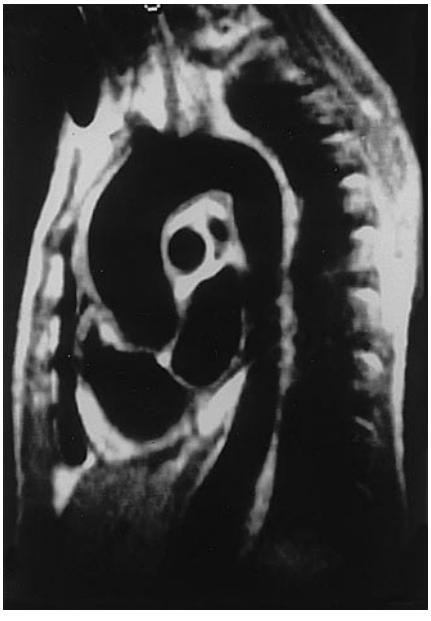

Fig. 1 Magnetic resonance spin-echo image (TE 60 ms) showing dilatation of the aortic root and wall thickening and irregularities of the thoracic aorta

Discussion

The diagnosis of TA can be very difficult and is often delayed for long periods due to its frequently insidious onset and the nonspecific nature of early manifestations [1, 2]. The delay in establishing a correct diagnosis appears to be longer in children than adults. Kerr et al [3] found that paediatric patients with TA had a mean delay in diagnosis of 19 months, whereas the delay in adults was only 5 months. In a review of 44 consecutive Mexican patients, Robles and Reyes [8] found that late diagnosis was common: indeed, although 53% of patients had the first symptoms of the disease before 20 years of age, in only 33% the diagnosis was established before 24 years of age. Early diagnosis of TA is important because early treatment may prevent progression of vascular lesions and the occurrence of acute catastrophic events such as hypertensive encephalopathy with seizures or severe congestive heart failure.

Aortic valve regurgitation has been reported in TA, although its prevalence is largely variable among different countries, being as high as 50% in Japanese patients but much less common in Indian or Mexican series [4, 7, 8]. Aortic regurgitation, which occurs in patients with aortic arch involvement and is due to the dilatation of the ascending aorta, is a serious complication because it may gradually progress to cause hypertension, arrhythmia, and congestive heart failure. At present, this morbid condition represents the most common cause of death in Japanese patients with TA [7].

Because patients with TA may present with valvular heart disease in the context of a systemic inflammatory process, in its early phase the disease can be mistaken for acute rheumatic fever [6]. Our patient was initially misdiagnosed as having rheumatic fever because of the association of aortic regurgitation and elevated ESR. The main clues for questioning the diagnosis of rheumatic heart disease were the absence of other Jones criteria [9] and the normality of the aortic valve leaflets on echocardiography; other indirect evidences against acute rheumatic fever were the lack of increased antistreptolysin O titre and the presence of isolated aortic valve disease, which is unusual in rheumatic carditis. Furthermore, the clinical course was marked by a corticosteroid-dependent inflammatory process whose recurrences were not preceded by streptococcal infections. Several other rheumatic disorders must be considered in the differential diagnosis of aortitis with aortic insufficiency in paediatric and adolescent patients, including ankylosing spondilitis and other seronegative spondiloarthropathies, seropositive rheumatoid arthritis, Behçet disease, Cogan syndrome, and relapsing polychondritis. However, aortitis in these disorders is characterized by dilatation of the aorta rather than by the stenosing lesions most commonly observed in TA [5].

Our report shows that TA should be taken into account in the diagnostic work up of patients who present with an unexplained systemic inflammatory process and

a cardiac murmur. This is becoming more important nowadays since other traditional causes of heart valve disease such as rheumatic fever have become quite rare in Western countries.

References

1. Goldsmith DP (1988) Takayasu's arteritis. In: Hicks RV (ed) Vasculopathies of childhood. PSG, Littleton, pp 297–315
2. Kerr G (1994) Takayasu's arteritis. Curr Opin Rheumatol 6:32–38
3. Kerr GS, Hallahan CW, Giordano J, Leavitt RY, Fauci AS, Rottem M, Hoffman GS (1994) Takayasu arteritis. Ann Intern Med 120:919–929
4. Lupi-Herrera E, Sanchez-Torres G, Marcushamer J, Mispireta J, Horwitz S, Vela JE (1977) Takayasu's arteritis: clinical study of 107 cases. Am Heart J 93:94–103
5. Martini A (1995) Behcet's disease and Takayasu's disease in children. Curr Opin Rheumatol 7:449–454
6. Morales E, Pineda C, Martinez-Lavin M (1991) Takayasu's arteritis in children. J Rheumatol 18:1081–1084
7. Numano F (1997) Differences in clinical presentation and outcome in different countries for Takayasu's arteritis. Curr Opin Rheumatol 9:12–15
8. Robles M, Reyes PA (1994) Takayasu's arteritis in Mexico: a clinical review of 44 consecutive cases. Clin Exp Rheumatol 12:381–388
9. Special Writing Group of the American Heart Association (1992) Guidelines for the diagnosis of rheumatic fever. JAMA 268:2069
10. Vanoli M, Miani S, Amft N, Bacchiani G, Radelli L, Scorza R (1995) Takayasu's arteritis in Italian patients. Clin Exp Rheumatol 13:45–50

ANNOUNCEMENTS

CARS'99- 13th International Congress and Exhibition on Computer Assisted Radiology and Surgery

June 23–26, 1999

Venue: Palais des Congrès de Paris, France

Organiser: Prof. Heinz U. Lemke
c/o Technical University Berlin
Institute for Technical Informatics
Sekr. Computer Graphics FR 3-3
Franklinstr. 28 – 29
10587 Berlin, Germany

Tel.: +49-30-314 73100
Fax: +49-30-314 23596
Email: hul@cs.tu-berlin.de
WWW: http://cars.tu-berlin.de/

Deadline for submission of abstracts:
January 5th, 1999

7th Salzburg Weekend Seminar Oral Diseases in Children

October 23–24, 1999

Guest lecturer: Prof. Dr. C. Scully,
Eastman Dental Institute, London

Information: Dr. J. Beck-Mannagetta,
Dept. of Macillofacial Surgery,
Landeskrankenhaus,
Müllner Hauptstrasse 48
A-5020 Salzburg, Austria
Tel.: +43-662-4482-3601
Fax: +43-662-4482-884

4th International workshop on resistance to thyroid hormone

May 23–25, 1999
Reboucas Convention Center,
São Paulo, Brazil

For further information contact:
Geraldo Medeiros-Neto, MD, FACP
Thyroid Unit, Hospital das Clinicas
Av Eneas C Aguiar 155-8A Bl-3
05403-900 São Paulo, Brazil

Tel.: (55) (11) 212-5711
Fax: (55) (11) 211-5194
e-mail: medneto@uol.com.br