of lesions on the face, wrists, and extremities with spreading to the trunk. He also noted that it may occur in epidemics, with seasonal clusters.

CONCLUSION

The close contact among the members of a group of teenage girls apparently is conducive to the spread of tinea corporis due to *M. canis* originating from a newly acquired kitten. The variable and widespread presentation of the rash can present a diagnostic dilemma but the fungal etiology can be successfully demonstrated by culture, and it responds to topical antifungal therapy.

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REFERENCES


Normal Thymus Simulating Pericardial Disease: Diagnostic Value of Magnetic Resonance Imaging

The clinical significance and differential diagnosis of thymic enlargement have been persistent problems. Differentiation between cardiomegaly and enlargement of the thymus is important and may be difficult by radiographic means alone. Echocardiography is usually effective in distinguishing cardiac enlargement from an enlarged thymus. In the case to be reported, clinical evaluation, routine roentgenograms, and the echocardiogram were not definitively diagnostic and magnetic resonance imaging was necessary for accurate assessment. Thymic involution followed by thymic rebound further complicated the picture.

CASE REPORT

The patient was a 4-month-old Latino boy who was well until 6 weeks of age, when he had two episodes of total-body cyanosis lasting 5 minutes immediately following uncomplicated feedings. He was limp but not apneic during these episodes.
A murmur had been noted shortly after birth and the child was examined at age 5 weeks in the Cardiology Clinic, at which time a murmur believed to be related to peripheral pulmonary artery stenosis was heard. The chest roentgenogram showed mild, generalized cardiac enlargement and normal lung vascularity (Fig 1, A).

Examination in the hospital revealed an acyanotic, healthy-appearing, smiling boy who showed normal development. There was a grade II pulmonary systolic ejection murmur heard over the precordium and transmitting to both axillae and to both sides of the back. The liver and spleen were not enlarged.

Workup included a cranial ultrasonogram and electroencephalogram, both of which were normal. Upper gastrointestinal series revealed gastroesophageal reflux.

At 4 months of age he was examined in the Cardiology Clinic. His mother reported that he had been doing well at home, without cyanosis and without any feeding problems or problems with respiration. He now had only a minimal grade I vibratory innocent systolic murmur at the mid-left sternal border. The rest of the physical examination results were normal, and an electrocardiogram showed a normal tracing for age. The chest roentgenogram was remarkable in that it showed apparent increase in heart size since the last film; however, the lungs were clear, with normal vascularity (Fig 1, B).

Echocardiographic assessment revealed intact intracardiac anatomy, great vessel anatomy, and great vessel relations. Both ventricles manifested qualitatively normal contour and contractility, with left ventricular shortening fraction of 38%. The atria and ventricles were not dilated. Homogeneous echodensity around the heart was visualized (Fig 2, A, B, C). Infrapericardial tumor or thrombosis was considered in the differential diagnosis. There was no evidence of either pericardial tamponade or constrictive pericarditis.

To define further this apparent infrapericardial thickening, magnetic resonance imaging was performed. This showed normal cardiac anatomy with an extrapericardial smooth-bordered mass surrounding the mediastinal and cardiac structures, extending from the thoracic inlet to the diaphragm (Fig 3, A, B, C). Signal intensity of the mass on these relatively T1-weighted images was increased compared with the adjacent muscle tissue but decreased compared with subcutaneous fat. Findings were consistent with thymic tissue.

The patient was seen again at 6 months of age. He was eating well and having no difficulty at home. Examination revealed a smiling, healthy boy who was gaining weight and developing well. There was no cyanosis. At this time no murmur was heard. Chest roentgenogram revealed a normal heart with subsidence of the abundant thymic tissue.

**DISCUSSION**

The morphology of the thymus changes dramatically with age, and there are variations in its normal size and consistency. An understanding of the variety of appearances is important so that errors in diagnosis are not made. The thymus is a bilobe structure, most of which is positioned anteriorly to the great vessels. It is relatively largest with respect to total body weight in the neonate and young infant (average weight 20 g) and increases slightly in size to reach a maximal weight at puberty (average 30 g). During childhood the thymus consists of lymphocytes, separated by fibrous septa. Beginning at puberty, involution takes place and there is gradual reduction in the lymphocyte population, with replacement of the thymic follicles by fat.

In this infant, apparent cardiomegaly and a murmur led to further diagnostic procedures. The echocardiogram was unusual in that while the cardiac chambers showed normal anatomy and function, the entire heart was surrounded by a homogeneous, echodense material suggestive of possible pericardial tumor or thrombosis. For that reason, magnetic

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**Fig 1.** A, Chest roentgenogram at 6 weeks of age shows mild, generalized cardiac enlargement. B, Chest film suggests marked increase in cardiac size.
resonance imaging was done, which showed that this echocardiographic density around the heart was extrapericardial and was related to encircling thymic tissue.

Subsequent events suggest that the apparent enlarged cardiac contour initially consisted of a normal heart with some persistent prominence of the thymus, but with partial thymic involution related to the baby’s hypoxemic stress and/or sepsis. Thymic involution has been described in patients with persistent infantile thymic tissue who suffer severe life-threatening illnesses. In accord with this, the thymus appears absent in babies born with transposition of the great vessels. In these latter patients, thymic rebound is often seen after surgical
correction. Thymic hyperplasia is a normal physiologic response in infants and children during the recovery period from life-threatening illnesses. Thymic rebound is also seen following chemotherapy in children with a malignant disease. In the past, concern about the possibility of persistent or recurrent tumor frequently necessitated a trial of steroids, open biopsy, or a period of roentgenographic observation. Now echocardiography can usually help the clinician make this critical differential diagnosis. However, our experience and that of others suggest that magnetic resonance imaging with analysis of signal intensity can more accurately and definitively differentiate new or recurrent tumor from physiologic thymic hyperplasia. The normal thymus shows more uniform signal intensity slightly greater than muscle on T1-weighted images and close to that of fat on T2-weighted images. In contrast, the abnormal thymus tends to be more multilobular and inhomogeneous because of cystic generation, hemorrhage, septations, fibrosis, or calcification. Associated lymphadenopathy is helpful in diagnosing lymphoma.

The changing murmur in our patient is probably a normal transition seen in infants with normal cardiovascular anatomy and function. While thymomas have been known to press on the heart and cause murmurs, normal soft thymic hyperplasia is usually not believed to be associated with extrinsic cardiac and vascular pressure. However, a recent report of a heart murmur believed to be related to true benign thymic hyperplasia may be a rare exception to this concept.

SUMMARY

Normal enlargement of the thymus in infancy can often lead to erroneous clinical suspicion of cardiomegaly. Roentgenographic differentiation is not always definitive but echocardiography is generally effective in differentiating cardiac pathology from an enlarged thymus. In this patient, magnetic resonance imaging was necessary to differentiate benign thymic hyperplasia from pericardial or mediastinal pathology. Thymic involution with a severe neonatal illness, followed by thymic rebound, which later subsided, added to the interest and initial confusion in this patient.

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