An unusual complication of sternal and clavicle osteomyelitis in a child with sickle cell disease

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ABSTRACT

We report an unusual child with sickle cell disease, in which osteomyelitis of the sternum and clavicle was diagnosed at the same time. The standard x-ray failed to demonstrate the lesion. Magnetic resonance imaging was very helpful in locating the site and degree of involvement. We recommend the use of magnetic resonance imaging to delineate such findings.

Keywords: Osteomyelitis, sternum, clavicle, sickle cell disease.

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Osteomyelitis is a relatively common complication of sickle cell disease (SCD). It usually involves the long bones. When it occurs in the flat bones such as the sternum, differentiation from bone infarction becomes difficult especially in the early stage. We report an unusual case of SCD with primary osteomyelitis of the sternum and left clavicle and the usefulness of magnetic resonance imaging (MRI) in the diagnosis.

Case Report. A 10-year-old Saudi male child who presented to the hospital for the first time at one year of age with history of pallor, pain and swelling of his fingers. Due to this typical presentation and positive family history of SCD in his sibling, the diagnosis of SCD was made and confirmed by hemoglobin electrophoresis. He was put on prophylaxis of oral penicillin V, multivitamins and folic acid. He required frequent hospitalizations for hemolytic and painful crises. Owing to frequent hemolytic crises and signs of hypersplenism, he was transferred to Asir Central Hospital (ACH), Abha, Kingdom of Saudi Arabia (KSA) for further management. He had splenectomy performed at 4-years-old after *pneumococcal* and *hemophilus influenza vaccine* administration. Following that, he was admitted on many occasions due to febrile and vaso-occlusive crises for which he received the appropriate management. Recently, he was admitted to our hospital with fever and anterior chest pain. Initial examination revealed mild tenderness over the sternum, but there were no signs of inflammation. Blood and urine cultures were obtained, and the patient was started on intravenous ceftriaxone and cloxacillin. Initial chest x-ray was normal, the erythrocyte sedimentation rate was 102 mm/first hour, corrected white blood cell (WBC) count of 21,000/cc and blood and urine cultures were sterile. While in the hospital, patient continued to spike fever up to 39^{o}C. He was also complaining of

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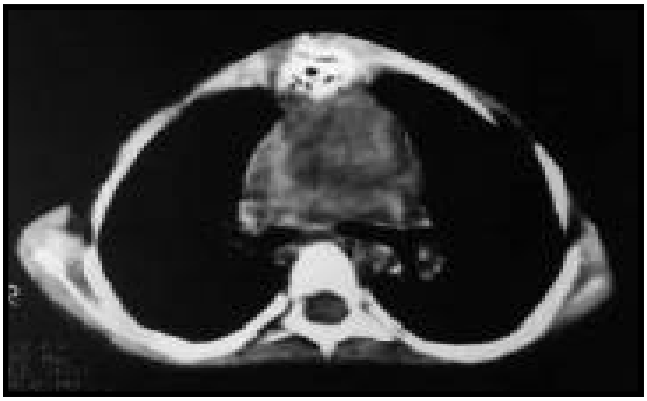

Figure 1 - Magnetic resonance imaging (cross section of the chest) showing air-fluid at the site of the lesion around the sternal bone.

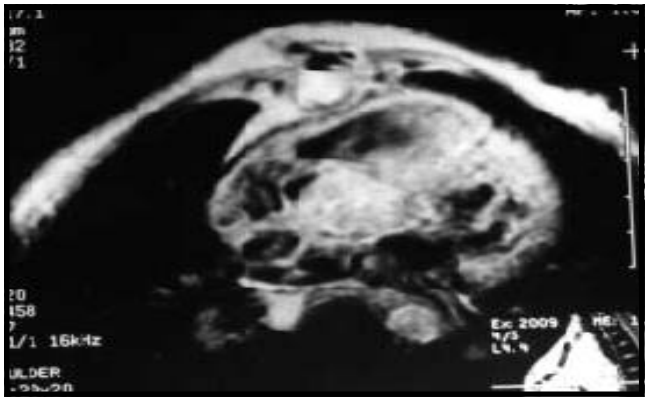

Figure 2 - Magnetic resonance imaging (magnified view) showing pus collection around the sternal bone.

increasing anterior chest pain. Repeated chest examination revealed swelling, redness as well as severe tenderness over the sternum, and to a lesser degree tenderness was also elicited over the medial 3rd of the left clavicle. The sternal swelling progressed inspite of antibiotic treatment. Indurations became obvious over a few days and the patient remained febrile. Lateral chest x-ray showed only soft tissue swelling. Magnetic resonance imaging of the chest showed pus collection over the anterior and posterior aspects of the sternum as well as the medial aspect of the left clavicle (**Figures 1 & 2**). The patient was taken to the operating room and pus was drained from the aforementioned sites and drainage tubes were inserted. Pus culture grew *Salmonella* species, which was sensitive to ceftriaxone and cloxacillin. The patient was treated with intravenous ceftriaxone for 6 weeks. His regular folates and multivitamins were continued. He made a full recovery with no chest wall deformities and he was discharged from the hospital after 7 weeks of hospitalization.

Discussion. Due to the high rate of consanguinity,[1] SCD is a common pediatric disease in KSA. With the improved health care, the serious complications in SCD patients are recognized and treated early. This approach, in addition to the use of prophylactic penicillin, prophylactic vaccinations and frequent blood transfusions, improved the survival rate of individuals with SCD.[2] The majority of our admissions as well as in other part of the world, for SCD are for vaso-occlusive crises.[2] We see patients with osteomyelitis of the long bones of the lower limbs more often than the upper limbs. The management is carried out in collaboration with the orthopedic surgeons. Cerebro-vascular accidents are also seen in younger patients but with less frequency.[3] Interestingly, the incidence of acute chest syndrome and priapism in our population were also very rare in contrast with other studies.[2] It is not very clear the reason behind this low incidence in this part of KSA. In spite of our large sickle cell population, this is the first time we encountered osteomyelitis of the sternum and clavicle in the same patient over 15 years of experience. Narchi[4] reported sternal osteomyelitis in 5 patients with SCD from the Eastern Province of KSA and these patients represented 37.5% of the total cases of osteomyelitis in SCD. The diagnosis of osteomyelitis of the flat bones such as sternum and clavicle appear to be more difficult with the usual standard radiography. Previous studies have shown the usefulness of gallium and technetium bone scanning in the diagnosis of bone infarctions and osteomyelitis.[5] The usage of MRI in the diagnosis of this condition was very helpful and it delineated the extent of the collection as well as the state of adjacent tissues. This test made the surgical intervention easier and complete. We believe that high index of suspicion, repeated examinations in highly febrile patient with SCD will be of great importance. Our case demonstrates that MRI is more sensitive in diagnosing osteomyelitis of the flat bones than the standard radiographs.

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