

Osteomyelitis of the calcaneus in the newborn: an ongoing complication of Guthrie test

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A term and previously healthy female neonate presented at age 17 days with redness and swelling on the left heel. Her medical history was notable for a heel stick on the same area for Guthrie test 10 days previously. The type of the device or the stylus used for the puncture is unknown.

On physical examination, she was afebrile but irritable. The skin on the left heel was oedematous with marked erythema and tenderness. A fluctuating nodule was detected, which was interpreted as an abscess formation.

Laboratory studies showed a haemoglobin of 14.3 g/dL, a white blood cell count of 14,900/ μ L, a C-reactive protein of 2.4 mg/dL and an erythrocyte sedimentation rate of 40 mm/hr.

Roentgenographic examination of the heel revealed an osteolytic lesion of the posterior portion of the left calcaneus, suggesting osteomyelitis (Fig. 1). This diagnosis was later confirmed with magnetic resonance imaging.

The abscess was drained with needle aspiration. Cefazolin and gentamicin were started. *Staphylococcus aureus*, which was susceptible to cefazolin, grew in the culture of the pus while the blood culture was negative, and gentamicin was stopped after four days. In addition to the antibiotic treatment, which was continued for a total of four weeks, the bone was curettaged.

In the follow-up visit six weeks later, the physical examination of the infant was completely normal and the roentgenogram of the left foot showed healing of the bony structures with sclerosis and periosteal reaction.

A review of the literature indicates that, as a complication of heel puncture, calcaneal osteomyelitis is very rare and no reports have been recently published. Although a well-known and serious complication, scarcity of cases in the literature gives the impression that puncture-related osteomyelitis of the calcaneus is underreported [3, 5, 6].

Prematurity, low birth weight and repeated punctures are predisposing factors for neonatal calcaneal osteomyelitis [2, 5]. However, if proper sterile technique is not used, calcaneal osteomyelitis may occur even following the first heel puncture in healthy term neonates without any risk factors, as is the case in our patient. It may develop either due to local spread to bone from an infectious site in the surrounding soft tissue or due to direct inoculation of the microorganism during heel puncture blood sampling [1, 5].

The depth of penetration and puncture site selection are two important factors in preventing puncture-related osteomyelitis. Current guidelines for these important factors of heel stick blood sampling are based on a study by Blumenfeld et al. [1]. In a post-mortem study of infants, they found that the shortest distance from skin surface to perichondrium of calcaneus was 2.4 mm [1]. This distance was reported to be 3 mm by Jain and Rutter utilizing ultrasonography [4]. The skin to bone depth is greatest

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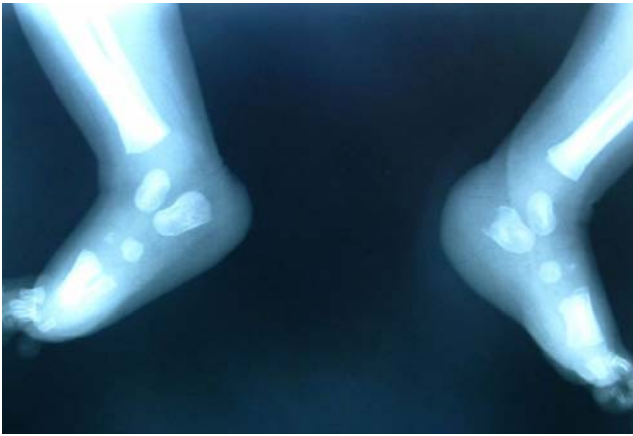


Fig. 1 Lateral radiograph of the left foot showing soft tissue swelling of the heel and focal bone destruction as finding osteomyelitis of the calcaneus

along the lateral and medial plantar surfaces. If heel is to be punctured, care should be taken to use the lateral parts and to avoid the posterior and central areas.

Conventional manual lancets and automated skin puncture devices can be used. Automated skin puncture devices

are superior to lancets in preventing calcaneal osteomyelitis for they provide better control on the depth of the puncture. Plain needles should be avoided.

We believe that our case is a reminder depicting how complications may ensue, especially if proper technique is not used.

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